



Reliability Analysis Update

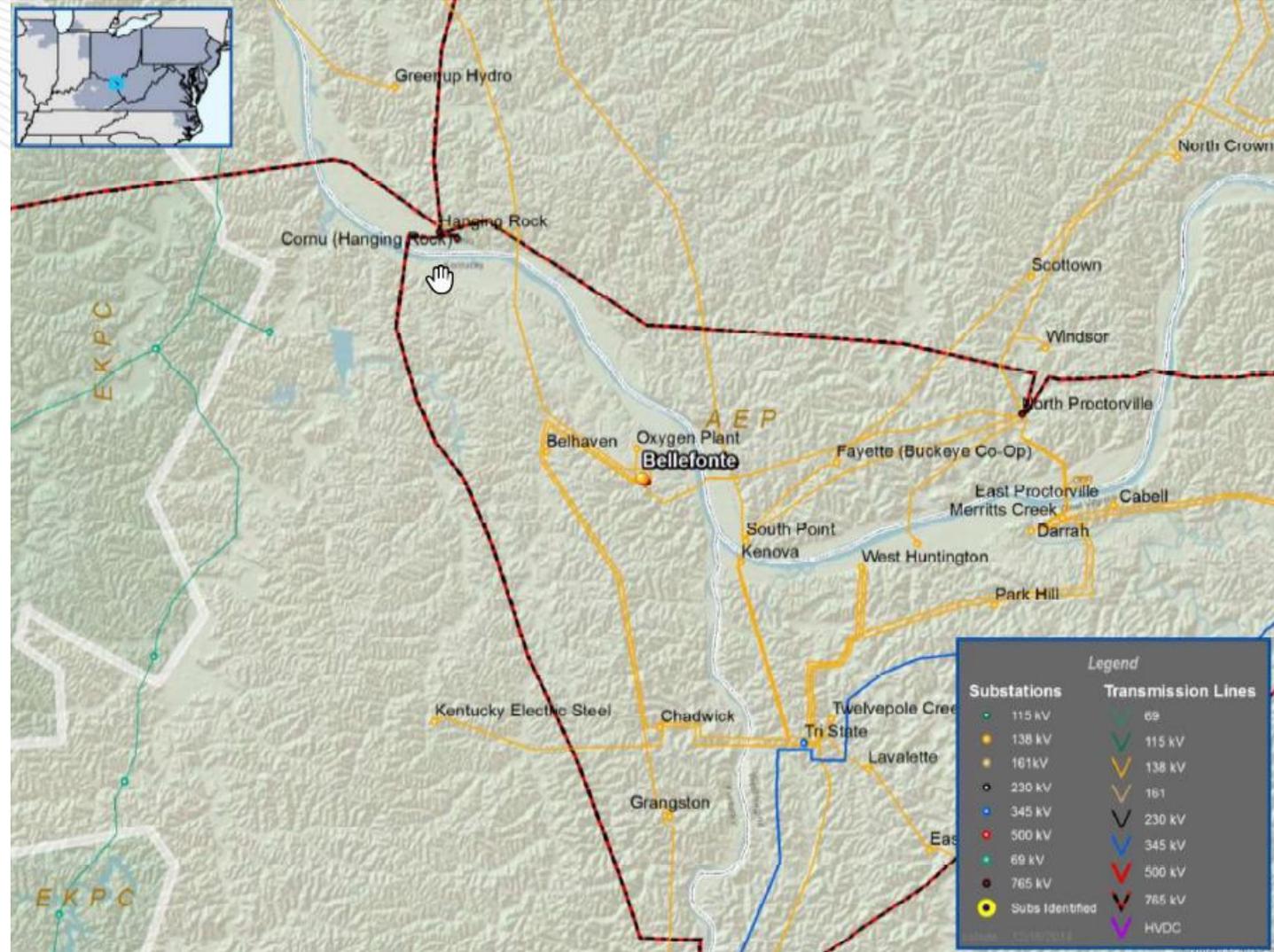
Sub Regional RTEP Committee - PJM West

February 17, 2021

Changes for Existing Projects

Baseline Reliability Projects

B2604 Scope change: Millbrook Park – Franklin Furnace



B2604 (2014-2-2L): Previously presented on 01/7/2015 TEAC

Problem Statement:

AEP Critical Thermal Violation:

- The Bellefonte 138/69/34.5 kV transformer #5 is overloaded for an N-1 contingency.
- The Franklin – Wheelersburg 69 kV line is overloaded for an N-1 contingency.

Original Proposed Solution: B2604

- Bellefonte: Install new 138/69-34.5 kV 200 MVA transformer at Bellefonte station. Install circuit switcher and 34.5 breaker on highside and lowside of transformer #5. **In-service (estimated \$3M).**
- ~~Franklin Furnace – Hayport Rd S.S 69kV line: Rebuild 1.73 mile line utilizing 795 ACSR built to 138 kV standards.~~
- ~~Hayport Rd S.S – Wheelersburg 69kV line: Rebuild 2.87 mile line utilizing 795 ACSR built to 138 kV standards~~
- ~~Sciotoville – Wheelersburg 69kV line: Rebuild 4.56 mile line utilizing 795 ACSR built to 138 kV standards~~
- ~~Millbrook Park – Sciotoville 69kV line: Rebuild 2.6 mile line utilizing 795 ACSR built to 138 kV standards~~

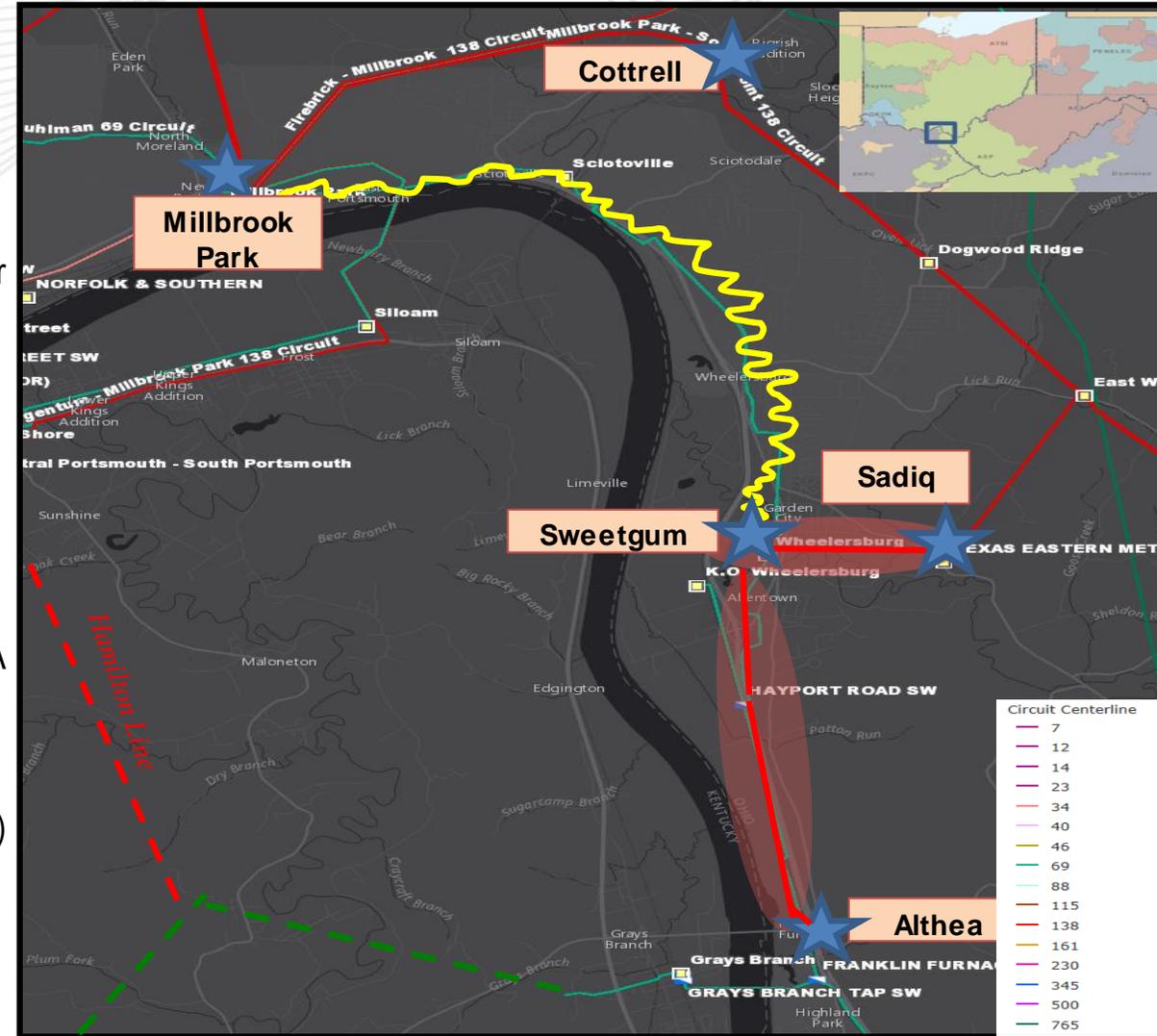
Total Estimated Transmission Cost: ~~\$31.65M~~ \$3M

Through detailed engineering on the original solution, significant siting and ROW encroachment concerns were identified that made the proposed rebuild of the existing 69 kV line between Millbrook and Franklin Furnace infeasible from a constructability perspective. Expanded easements for the line rebuild along the river and through New Boston, Sciotoville, and Wheelersburg are not possible to obtain, at which point AEP started investigating other alternatives.



Proposed Solution:

- Remove ~ 11.32 miles of the 69kV Line between Millbrook Park and Franklin Furnace. **Estimated Cost: \$1.13M**
- At Millbrook Park station, add a new 138-69kV transf #2 (90 MVA) w/3000A 40kA breakers on the high and low side. Replace the 600A MOAB Switch and add a 3000A circuit switcher on the high side of transf #1. **Estimated Cost: \$3.05M**
- Replace Sciotoville station with a new 138-12kV in-out station (Cottrell) with 2000A line MOABs facing Millbrook Park & East Wheelersburg. **Estimated Cost: \$1.4M**
Note: Cost of Distribution scope of work not included.
- Tie Cottrell switch into the Millbrook Park – East Wheelersburg circuit by constructing 0.50 miles of line using 795 ACSR 26/7 Drake (SE 359 MVA). **Existing Cost: \$1.96M**
- Install a new 2000A 3-way POP Switch outside of Texas Eastern substation (Sadiq switch). **Estimated Cost: \$1.08M**
- Replace Wheelersburg station with a new 138-12kV in-out station (Sweetgum) with a 3000A 40kA breaker facing Sadiq Switch and a 2000A 138kV MOAB facing Althea. **Estimated Cost: \$2.16M**
Note: Cost of Distribution scope of work not included.
- Build approximately 1.4 miles of new 138kV line using 795 ACSR 26/7 Drake (SE 359 MVA) between the new Sadiq switch and the new Sweetgum station. **Estimated Cost: \$3.41M**
- Remove the existing 69 kV Hayport Road Switch. **Estimated Cost: \$0.1M**

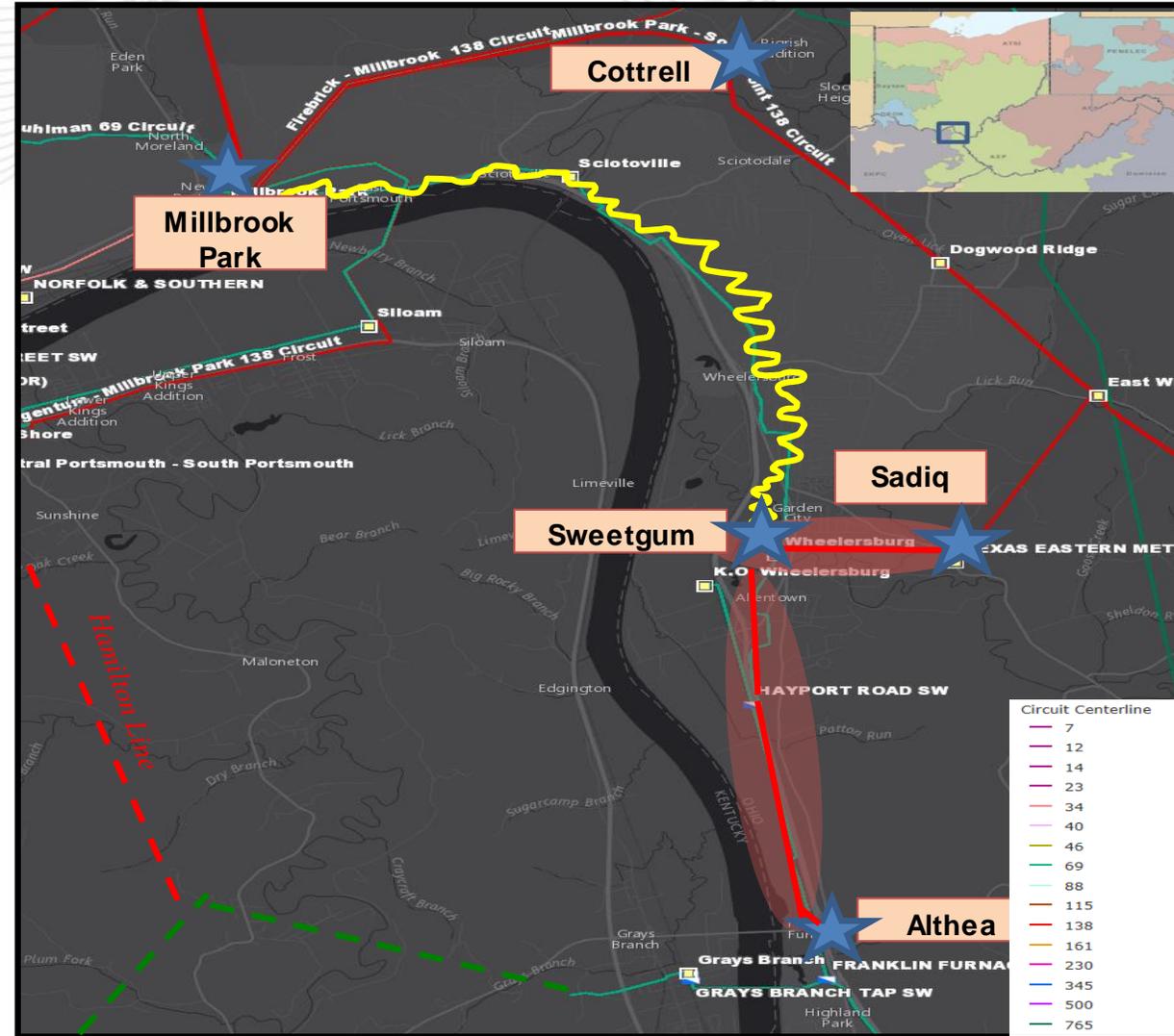


Proposed Solution Continued:

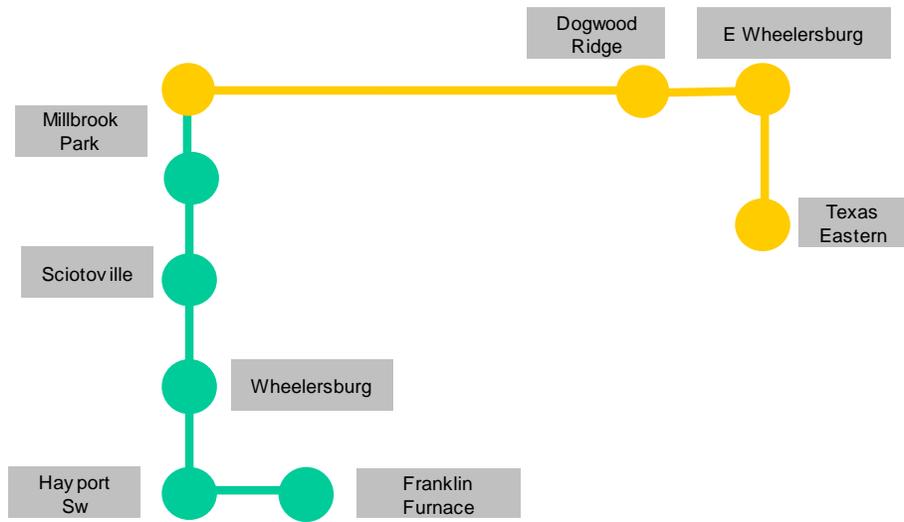
- Rebuild ~2.3 miles along existing ROW from Sweetgum to the Hayport Rd switch location as 138kV single circuit and rebuild ~2.0 miles from the Hayport Road switch to Althea with double circuit 138kV construction, one side operated at 69 kV to continue service to K.O. Wheelersburg, using 795 ACSR 26/7 Drake (SE 359 MVA). **(B2604.9) Estimated Cost: \$10.76M**
- Build a new station (Althea) with a 138-69 kV, 90 MVA transformer. The 138kV side will have a single 2000A 40kA circuit breaker and the 69kV side will be a 2000A 40kA three breaker ring bus. **(B2604.10) Estimated Cost: \$11.07M**
- Remote end work at Hanging Rock, East Wheelersburg, & North Haverhill. **(B2604.11) Estimated Cost: \$0.06M**

Total Estimated Transmission Cost: \$36.18M

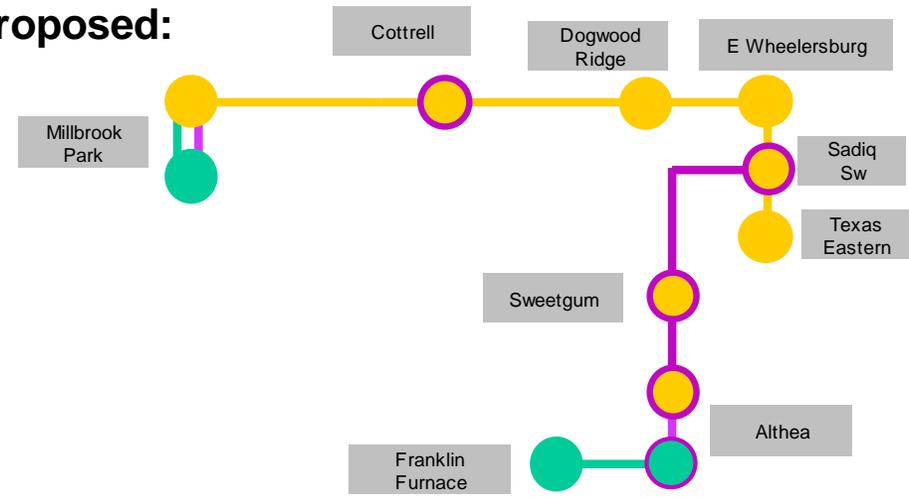
Ancillary Benefits: The new proposal also addresses needs identified under AEP-2018-OH030, including Sciotoville station, Wheelersburg station, and the three terminal 69 kV line. Constructing 1.4 miles of new 138 kV line allows for the retirement of over 11 miles of deteriorating 69 kV line. Sweetgum is proposed as in and out with a breaker to prevent more than three auto-sectionalizing MOABs in series. There is no room at the existing customer-owned Texas Eastern station site to add breakers, so a phase over phase switch is proposed.



Existing:



Proposed:



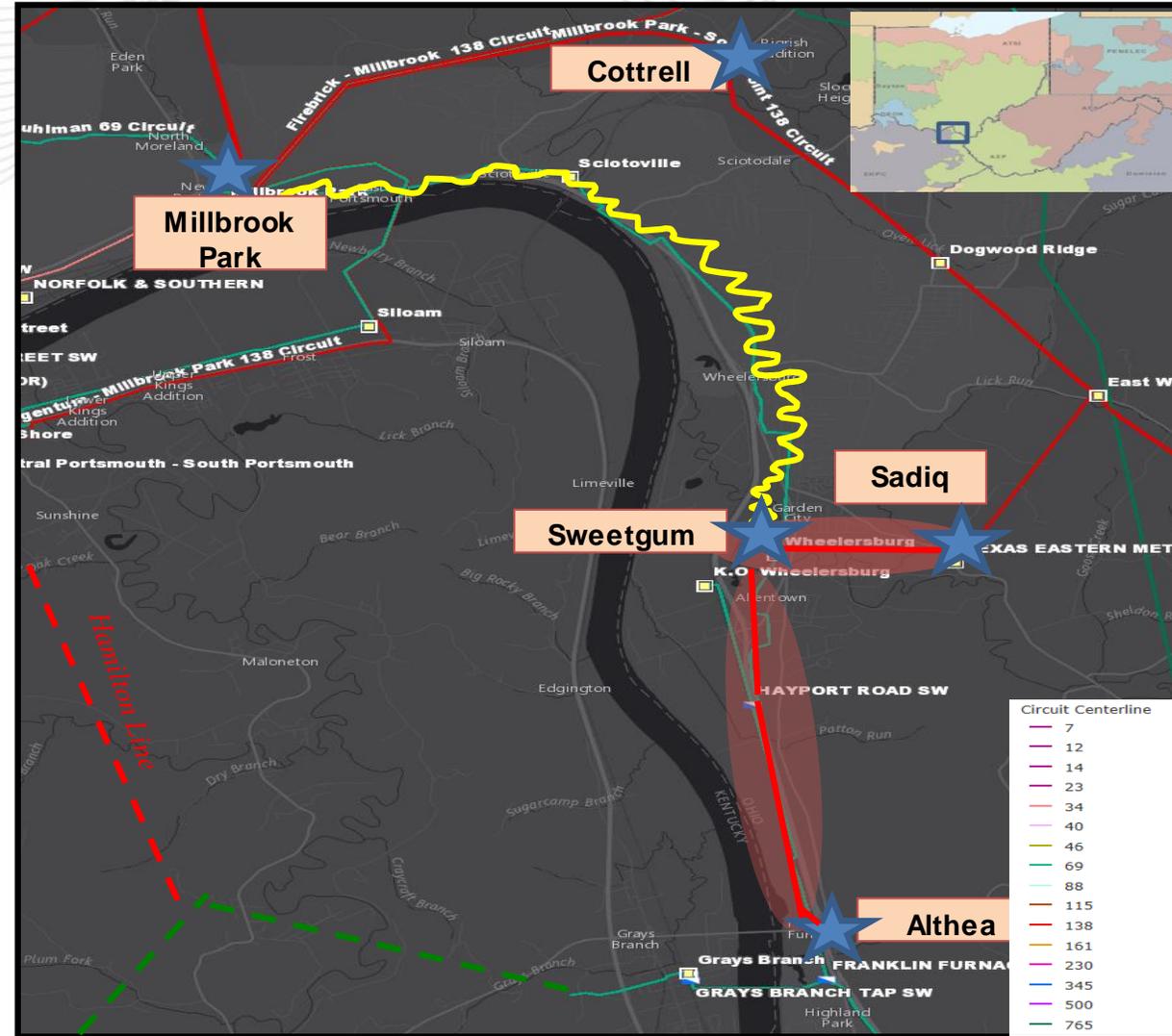
Legend	
500 kV	
345 kV	
138 kV	
69 kV	
34.5 kV	
23 kV	
New	

Alternatives:

A variation of the alternate design was considered to route the 69kV line from Millbrook Park to Wheelersburg across Kentucky. As in the proposed project, Sciotoville would still need to be relocated and there would be a 138kV extension from Wheelersburg to 138kV Texas Eastern. The remaining 69kV line from Wheelersburg to Franklin Furnace would be retired. This option was not chosen because it would leave a weak northern source for North Haverhill which serves several large loads and generation. There are additional ROW risks and costs associated with a 7-mile greenfield line and the two river crossings. **Estimated Cost: \$53.7M**

Required IS Date: 6/1/2019

Projected IS Date: 04/15/2025



First Review

Baseline Reliability Projects



AEP Transmission Zone: Baseline Arlington Voltages

Process Stage: First Read

Criteria: AEP 715 criteria

Assumption Reference: 2025 RTEP assumption

Model Used for Analysis: 2025 RTEP cases

Proposal Window Exclusion: Below 200 kV

Problem Statement:

FG: AEP-VM808, AEP-VM809

In the 2025 Summer RTEP case, low voltage violations at the Arlington 34.5 buses for an N-1-1 contingency pair.

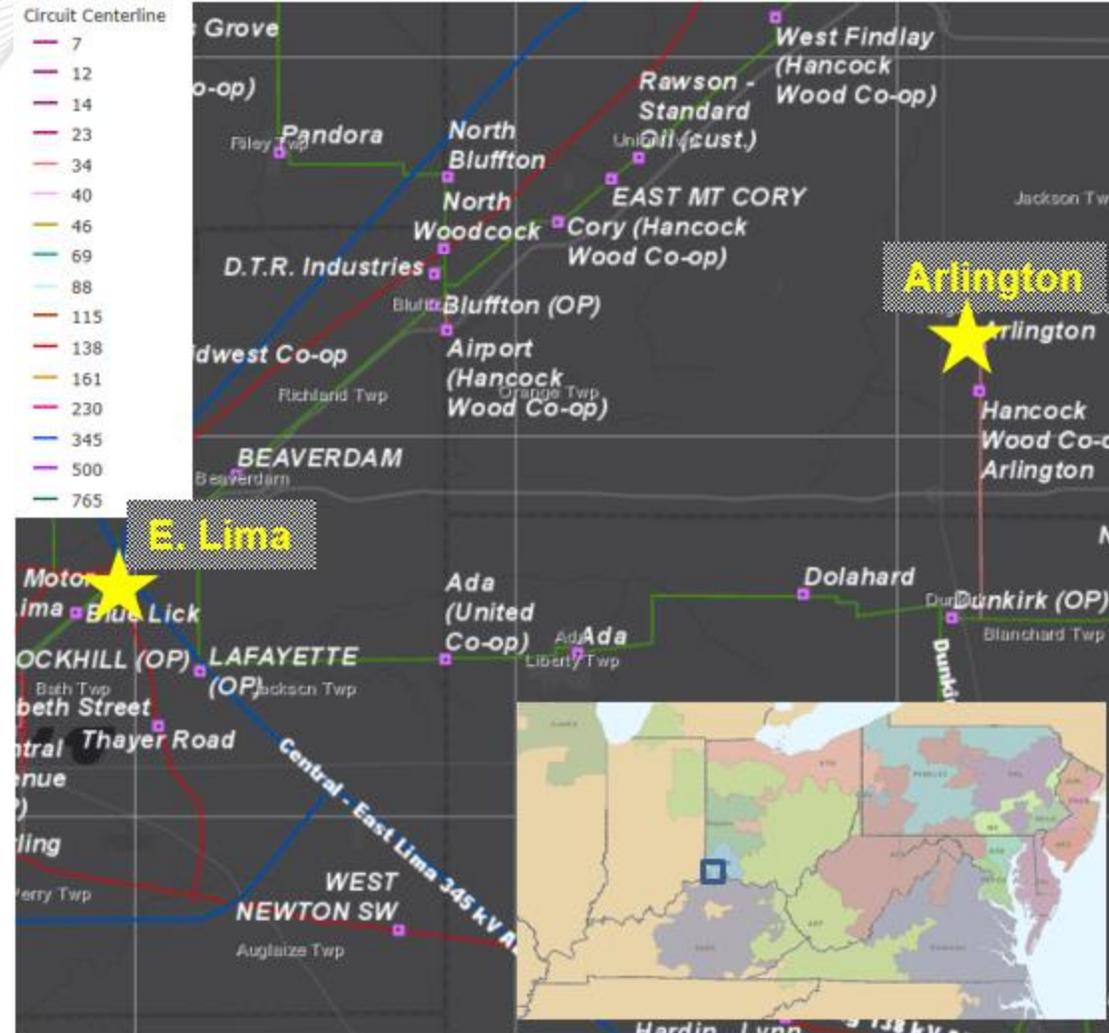
Proposed Solution: Add circuit breakers on the low and high side of East Lima 138/69 kV Transformer

Estimated Cost: \$1.2M

Alternatives:

Install a 138 kV circuit breaker on the high side of South Kenton transformers 2&3 (parallel) and rebuild 2.9 miles 69 kV line from S. Kenton to Kenton. Estimated Cost: ~\$7.0M

Required In-Service: 6/1/2025





AEP Transmission Zone: Baseline Elliot Transformer Addition

Process Stage: First Read

Criteria: AEP 715 criteria

Assumption Reference: 2025 RTEP assumption

Model Used for Analysis: 2025 RTEP cases

Proposal Window Exclusion: Below 200 kV

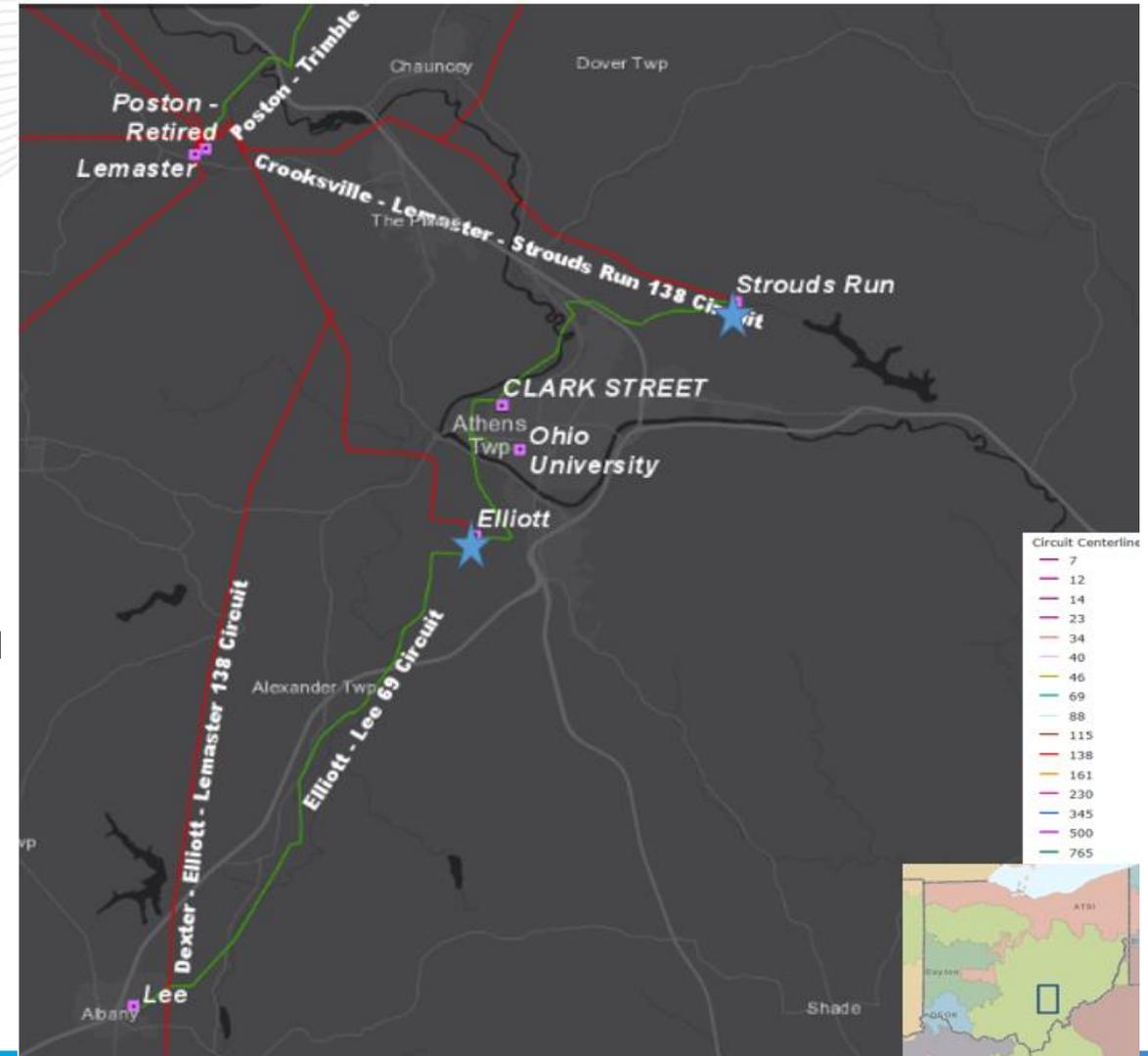
Problem Statement:

FG: AEP-T164 through AEP-T167

In the 2025 Summer and Winter RTEP cases, the Strouds Run 138/69/13 KV transformer #1 is overloaded for an N-1-1 contingency.

Existing Facility Ratings:

Branch	SN/SE/WN/WE (MVA)
05STRDREQ1– 05STROUDS 69KV winding	37/42/37/45





AEP Transmission Zone: Baseline Elliot Transformer Addition

Proposed Solution: Convert portions of s2224.5 and s2224.7 to baseline. Install a new 130 MVA transformer and associated protection at Elliot station (s2224.5).

Perform work at Strouds Run station to retire transformer #1 and install a dedicated 138/13 KV distribution transformer (s2224.7).

Estimated Transmission Cost: \$3.0M

Estimated Distribution Cost: \$0.96M

Preliminary Facility Ratings:

Branch	SN/SE/WN/WE (MVA)
05ELLIOT new 138/69KV transformer	130/130/130/130

Ancillary Benefit:

No additional work required to address baseline issues. Cost and scope already identified in supplemental project.

Alternatives:

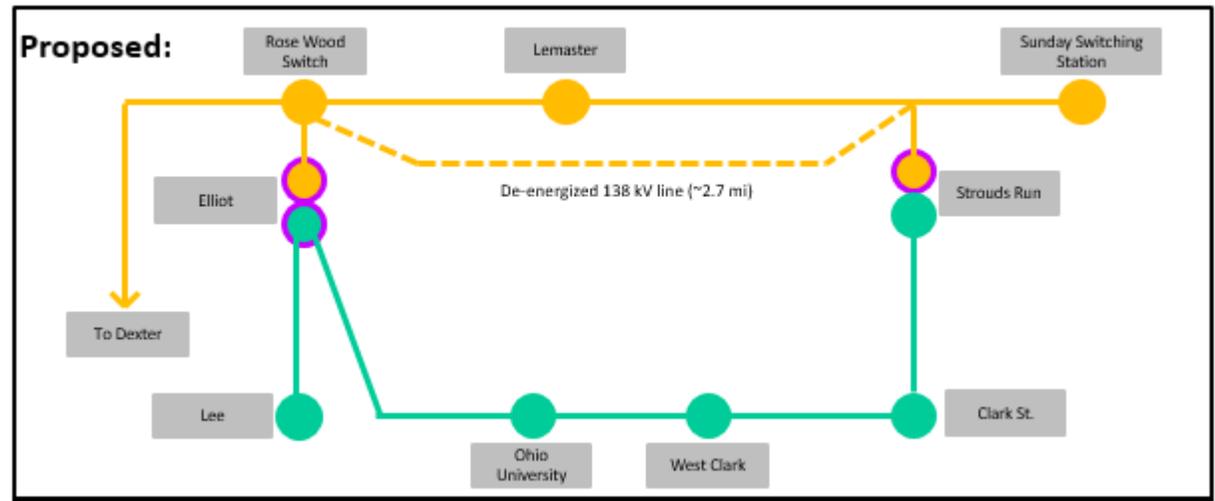
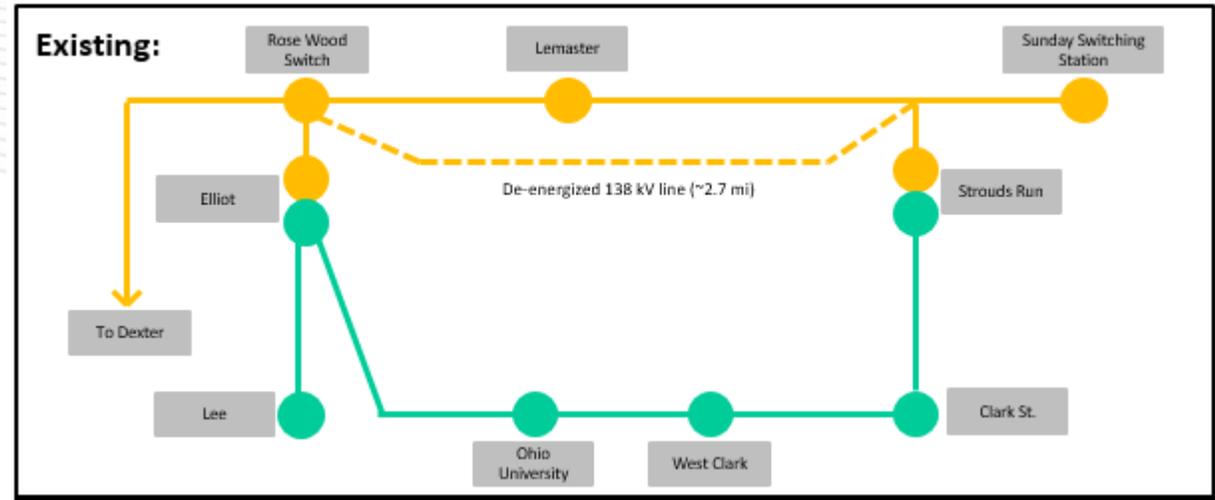
Replace Transformer #1 at Strouds Run along with the associated high side and low side protection. Install a dedicated 138/13 kV distribution transformer.

Estimated Transmission Cost: \$3.0M

Estimated Distribution Cost: \$0.96M

Required In-Service: 6/1/2025

Projected In-Service: 10/25/2024





AEP Transmission Zone: Baseline Mark Center - S.Hicksville Relay Upgrade

Process Stage: First Read

Criteria: AEP 715 criteria

Assumption Reference: 2025 RTEP assumption

Model Used for Analysis: 2025 RTEP cases

Proposal Window Exclusion: Below 200 kV

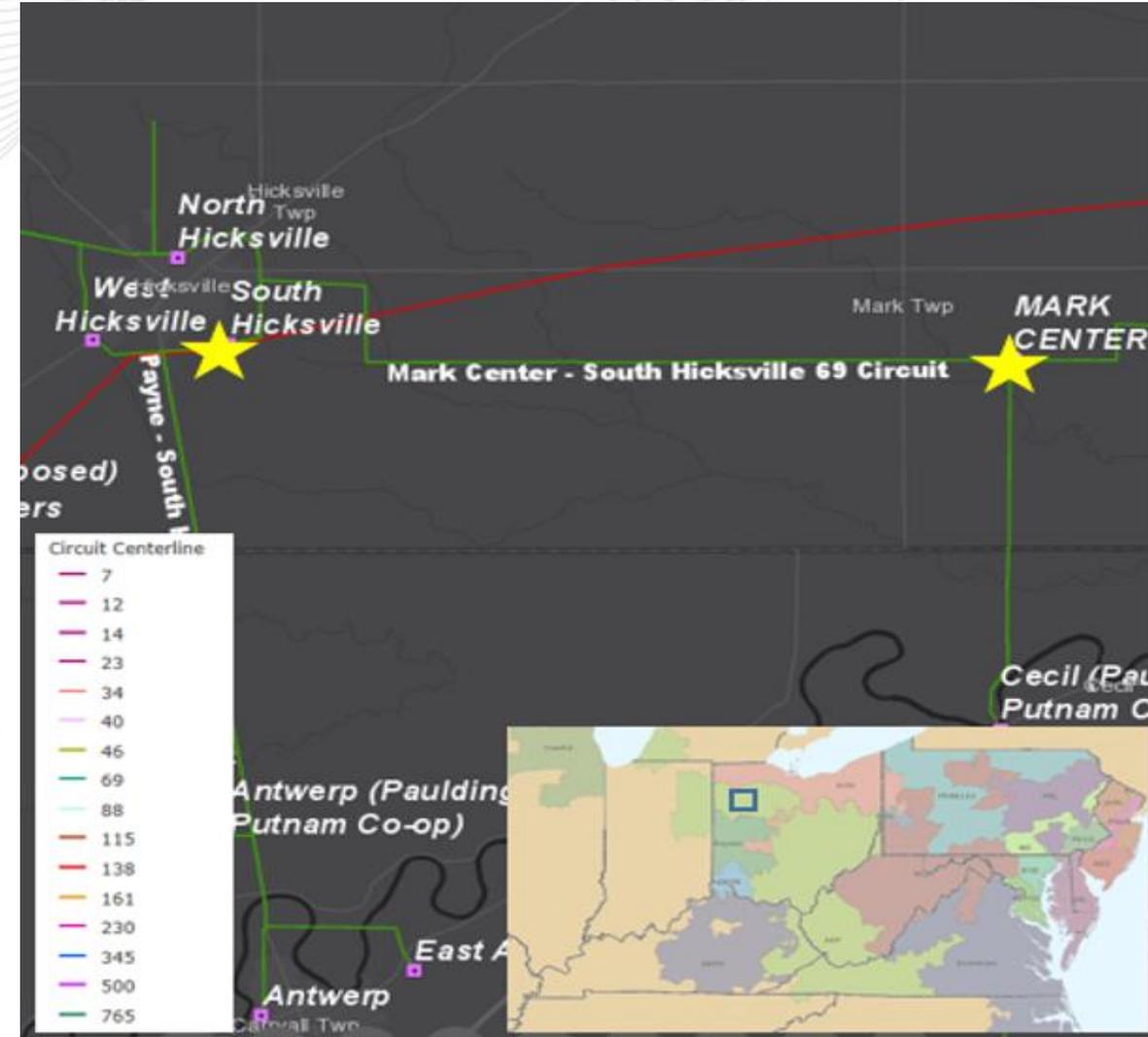
Problem Statement:

FG: AEP-T3 through AEP-T6, AEP-T432, AEP-VD916, AEP-VD920, AEP-VD921, AEP-VD923, AEP-VD948

In the 2025 Summer RTEP case, the Mark Center – South Hicksville 69 KV is overloaded for the multiple N-1-1 contingency pairs and a tower contingency; and voltage drop violations are observed at Paulding, Gen Port, Cecil, Mark Center and Sherwood 69kV buses for an N-1-1 contingency pair. In the 2025 Winter RTEP case, the Mark Center – South Hicksville 69 KV is overloaded as the result of a tower contingency.

Existing Facility Ratings:

Branch	SN/SE/WN/WE (MVA)
05S HICKSV – 05MARK CEN 69KV	49/53/53/53





AEP Transmission Zone: Baseline Mark Center - S.Hicksville Relay Upgrade

Proposed Solution: Upgrade Relaying on Mark Center - South Hicksville 69 kV line and replace Mark Center cap bank with a 7.7 MVAR unit.

Estimated Transmission Cost: \$1.25M

Preliminary Facility Ratings:

Branch	SN/SE/WN/WE (MVA)
05S HICKSV – 05MARK CEN 69KV	68/76/90/98

Alternatives:

Adjusting the CT ratio and replacing an existing wavetrapp on the line to achieve a higher rating was investigated, but was deemed infeasible during engineering review. Higher CT ratios were not available on existing equipment, so the relaying must be replaced.

Required In-Service: 6/1/2025

Projected In-Service: 6/1/2025

Existing:



Legend	
500 kV	
345 kV	
138 kV	
69 kV	
34.5 kV	
23 kV	
New	

Proposed:



Recommended Solution

Baseline Reliability Projects

Process Stage: Recommended Solution

Criteria: Summer Generation Deliverability

Assumption Reference: 2025 RTEP assumption

Model Used for Analysis: 2025 RTEP cases

Proposal Window Exclusion: Below 200 kV

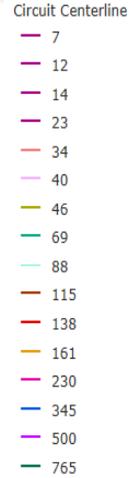
Problem Statement:

FG: GD-S293

The Chatfield – Melmore 138kV line is overloaded for a line with stuck breaker contingency.

Existing Facility Rating:

Branch	SN/SE/WN/WE (MVA)
05CHATFL – 05MELMOR	167/167/210/210





AEP Transmission Zone: Baseline Chatfield - Melmore Rebuild

Proposed Solution: Rebuild the Chatfield – Melmore 138kV line (~ 10miles) to 1033 ACSR conductor (**B3249**)

Preliminary Facility Rating:

Branch	SN/SE/WN/WE (MVA)
05CHATFL – 05MELMOR	296/413/375/464

Estimated Cost: \$27.2M

Ancillary Benefit:

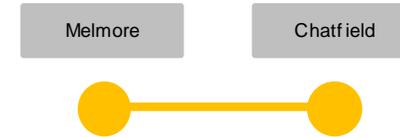
Project will rebuild approximately 10 miles of the 45 mile long Howard–Fostoria 138 kV double circuit line that utilizes lattice structures and 397.5 ACSR conductor that date back to the 1920’s.

- From 2014-2019 there were 6 momentary and 3 permanent outages on the line.
- There are currently 232 open conditions identified on the 45 mile long Howard – Fostoria line related to structure and hardware issues.
- 248 of the 258 structures that make up the 45 mile Howard – Fostoria double circuit 138 kV line are lattice structures from the 1920’s. The other 10 structures that make up the line are a mix of steel and wood structures dating between 1962 and 2016.
- ~99% of the circuit conductor is 397.5 ACSR that was installed in the 1920’s.
- The baseline proposal is rebuilding 10 miles of the existing 45 mile long line to address the overloaded 397.5 ACSR conductor between Chatfield and Melmore.

Required In-Service: 6/1/2025

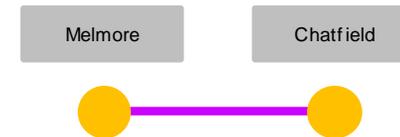
Previously Presented: 1/15/2021

Existing Configuration:



Legend	
500 kV	
345 kV	
138 kV	
69 kV	
34.5 kV	
23 kV	
New	

Future Configuration:



Process Stage: Recommended Solution

Criteria: AEP 715 criteria

Assumption Reference: 2025 RTEP assumption

Model Used for Analysis: 2025 RTEP cases

Proposal Window Exclusion: Below 200 kV

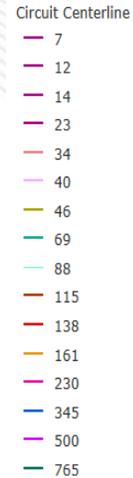
Problem Statement:

AEP-T31 through AEP-T36, AEP- T407

In the 2025 Summer RTEP case, The Howard - Willard 69 kV line overloads for various N-1 and N-1-1 contingencies in the Willard area.

Existing Facility Rating:

Branch	SN/SE/WN/WE (MVA)
05HOWARD – 05WILLARD 69KV	44/44/56/56





AEP Transmission Zone: Baseline Howard – Willard 69kV Rebuild

Proposed Solution:

Rebuild 10.5 miles of the Howard - Willard 69 kV line utilizing 556 ACSR conductor. **Estimated Cost:19.0M (B3310.1)**

Upgrade relaying at Howard station. **Estimated Cost:0.23M (B3310.2)**

Upgrade relaying at Willard station. **Estimated Cost:0.23M (B3310.3)**

Total Estimated Cost: \$19.46M.

Preliminary Facility Rating:

Branch	SN/SE/WN/WE (MVA)
05HOWARD – 05WILLARD 69KV	82/90/107/113

Ancillary Benefits: The project will rebuild approximately 10.5 miles of the 14 mile Howard – Willard 69 kV line that utilizes 1920's vintage 3/0 ACSR and 3/0 Copper conductor.

Howard – Willard 69kV Circuit (~14 miles):

- From 2015-2020 this circuit has experienced 1 permanent and 11 momentary outages.
- Majority of structures are wood poles. Close to half of the wood pole structures are 1970's or older, with the bulk of them being 1940's vintage. Other structures have been replaced sporadically on the line throughout the years (80's-90's) with like for like wood pole replacements that would not support a larger conductor than the existing 3/0 ACSR/Copper.
- Certain portions of the line have been rebuilt in the 1990's and 2000's associated with relocations and utilize a larger 556 ACSR conductor. These sections will not be rebuilt as a part of this proposal.
- ~75% of the circuit conductor is 3/0 ACSR and Copper type that was installed in the 1920's. The other ~25% is 556 ACSR conductor on sections that will not be rebuilt as a part of this proposal.

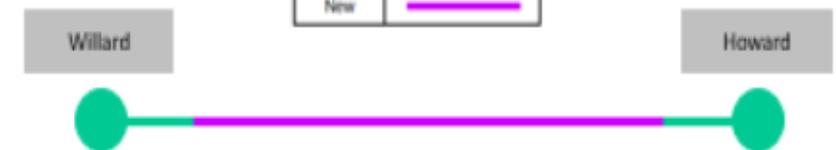
Required In-Service: 6/1/2025

Previously Presented: 1/15/2021

Existing:



Proposed:



Legend	
500 kV	
345 kV	
138 kV	
69 kV	
34.5 kV	
23 kV	
New	

Process Stage: Recommended Solution

Criteria: AEP 715 criteria

Assumption Reference: 2025 RTEP assumption

Model Used for Analysis: 2025 RTEP cases

Proposal Window Exclusion: Below 200 kV

Problem Statement:

FG: AEP-T44, AEP-T45, AEP-T46, AEP-T47, AEP-T48, AEP-T62, AEP-VM121 through AEP-VM132, AEP-VD74 through AEP-VD101

In the 2025 Winter RTEP, for multiple N-1-1 contingency pairs, thermal violation identified on the existing Meadowview's 138/69-34.5 kV TR#2. Furthermore, voltage violations are identified on the existing Glade, Owens Drive, Medallion, Hillman Highway, Arrowhead and Damascus 69KV busses.

Existing Facility Rating:

Branch	SN/SE/WN/WE (MVA)
05MEADWV – 05MEADWVW 138/69kV	60/70/69/78



Recommended Solution:

Saltville Station: Replace H.S. MOAB Switches on the high side of the 138/69-34.5 kV T1 with a H.S. Circuit Switcher. **(B3278.1) Estimated Cost: \$0.72M**

Meadowview Station: Replace existing 138/69-34.5 kV transformer T2 with a new 130 MVA 138/69-13 kV transformer **(B3278.2) Estimated Cost: \$3.14M**

Total Estimated Cost: \$3.86M

Preliminary Facility Rating:

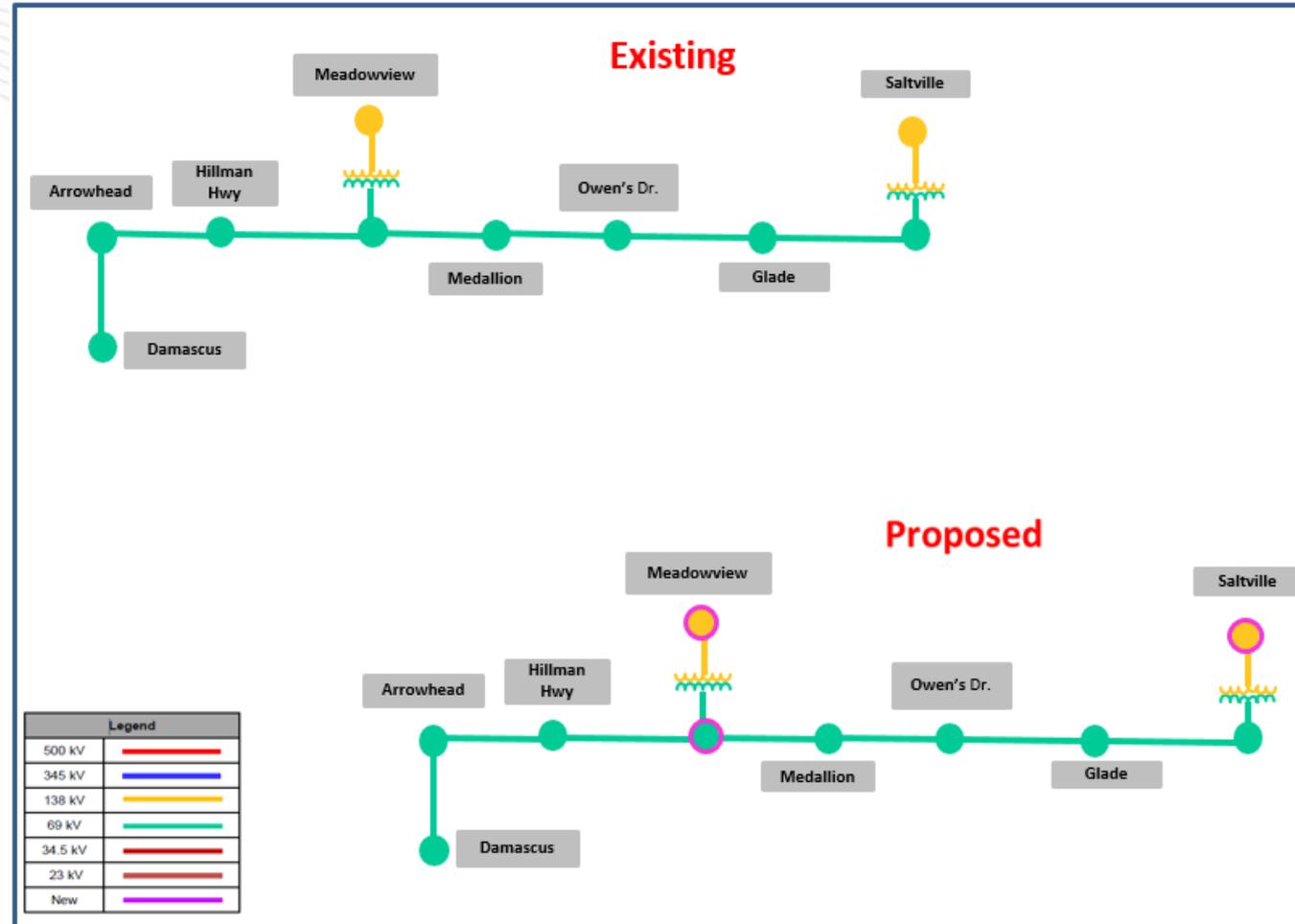
Branch	SN/SE/WN/WE (MVA)
05MEADWV T2 138/69/13 kV	130/130/130/130

Ancillary Benefits: Addresses Need AEP-2020-AP024 and partially addresses Need AEP-2020-AP037

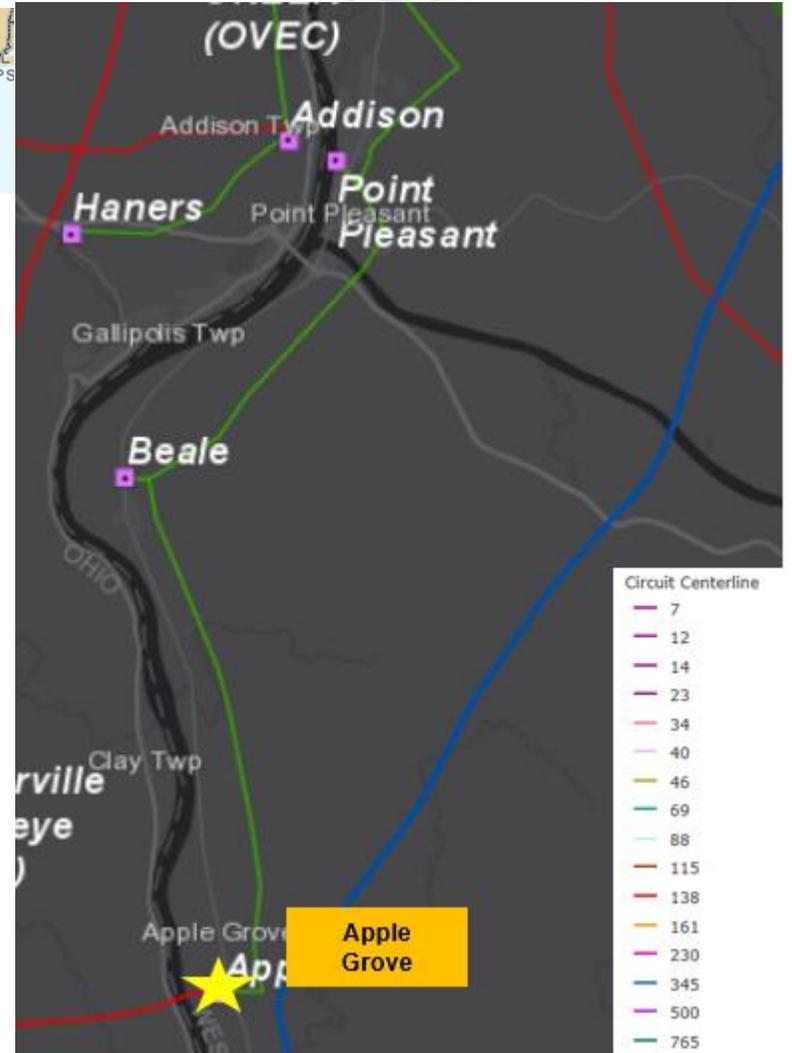
Required In-Service: 12/1/2025

Projected In-Service: 12/1/2025

Previously Presented: 12/18/2020



AEP Transmission Zone: Baseline Apple Grove Cap Bank



Process Stage: Recommended Solution

Criteria: AEP 715 criteria

Assumption Reference: 2025 RTEP assumption

Model Used for Analysis: 2025 RTEP cases

Proposal Window Exclusion: Below 200 kV

Problem Statement:

FG: AEP-VM89 through AEP-VM120, AEP-VD41 through AEP-VD73, AEP-VD580, AEP-VD583, AEP-VD606, AEP-VD607, AEP-VD608, AEP-VD609, AEP-VD614, AEP-VD615, AEP-VD616, AEP-VD617, AEP-VD785, AEP-VD788, AEP-VD897, AEP-VD898

In the 2025 RTEP summer, winter and light load cases, there are voltage violations at Apple Grove and Beale 69kV Stations for the tower contingency and multiple N-1-1 scenarios

Recommended Solution:

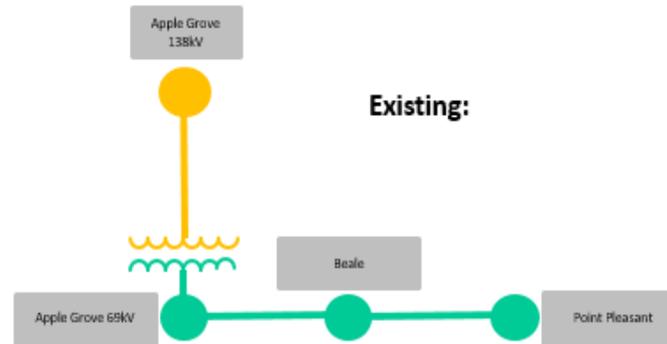
Install a new 138 kV, 21.6 MVAR cap bank and circuit switcher at Apple Grove Station. (B3279)

Estimated Cost: \$1.0M

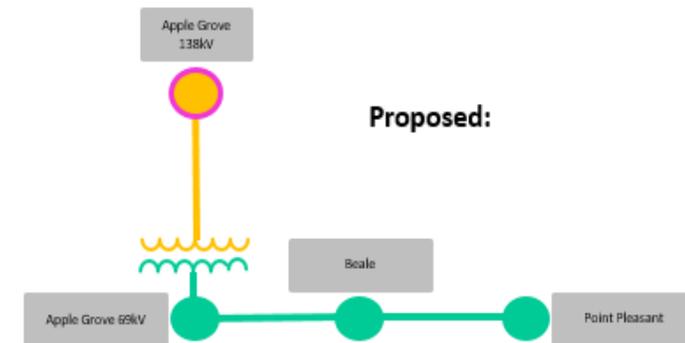
Required In-Service: 6/1/2025

Projected In-Service: 6/1/2025

Previously Presented: 12/18/2020



Legend	
500 kV	
345 kV	
138 kV	
69 kV	
34.5 kV	
23 kV	
New	



Process Stage: Recommended Solution

Criteria: AEP 715 criteria

Assumption Reference: 2025 RTEP assumption

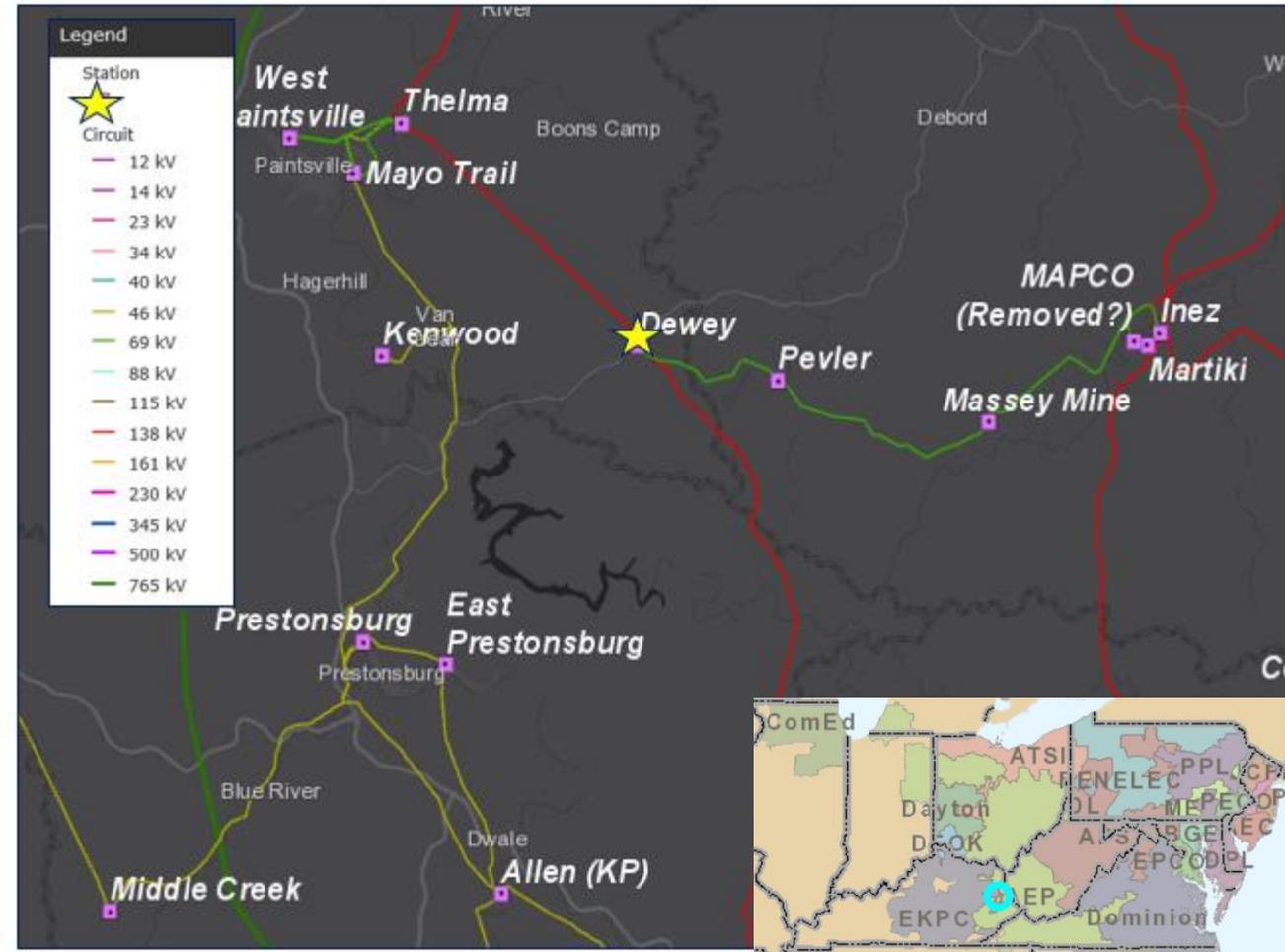
Model Used for Analysis: 2025 RTEP cases

Proposal Window Exclusion: Below 200 kV

Problem Statement:

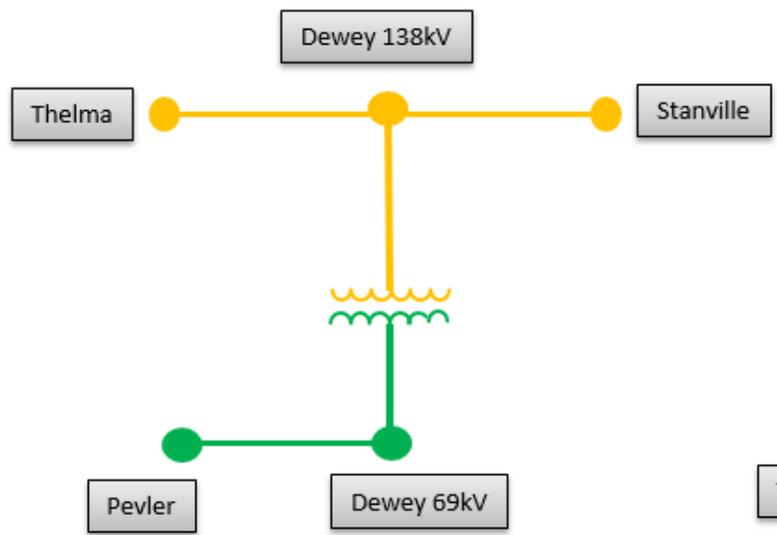
FG: AEP-VM502 through AEP-VM510, AEP-VM561, AEP-VM562, AEP-VM812 through AEP-VM816, AEP-VD481, AEP-VD482, AEP-VD483, AEP-VD1

In the 2025 Winter RTEP case, there are voltage violations at Stanville and Hays Branch 138kV buses, Mayo Trail and West Paintville 69kV buses and Kenwood, Prestonsburg, East Prestonsburg, Allen and Middle Creek 46KV in the event of an N-1-1 scenario

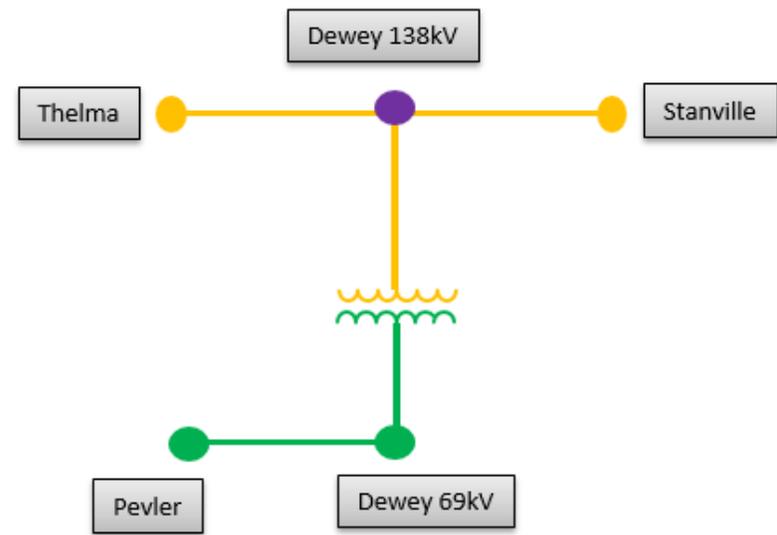


Legend	
500 kV	
345 kV	
138 kV	
69 kV	
46 kV	
New	

Existing



Proposed



Recommended Solution:

Install 138kV Circuit Switcher on the 138/69kV XF #1 and 138/34.5kV XF #2 at Dewey. Install 138kV 2000A breaker on Stanville line at Dewey 138kV substation. (B3281)

Estimated Cost: \$1.4M

Required In-Service: 12/1/2025

Projected In-Service: 12/1/2025

Previously Presented: 12/18/2020



AEP Transmission Zone: Baseline East Huntington - North Proctorville 138 kV

Process Stage: Recommended Solution

Criteria: AEP 715 criteria

Assumption Reference: 2025 RTEP assumption

Model Used for Analysis: 2025 RTEP cases

Proposal Window Exclusion: Below 200 kV & Substation equipment exclusion

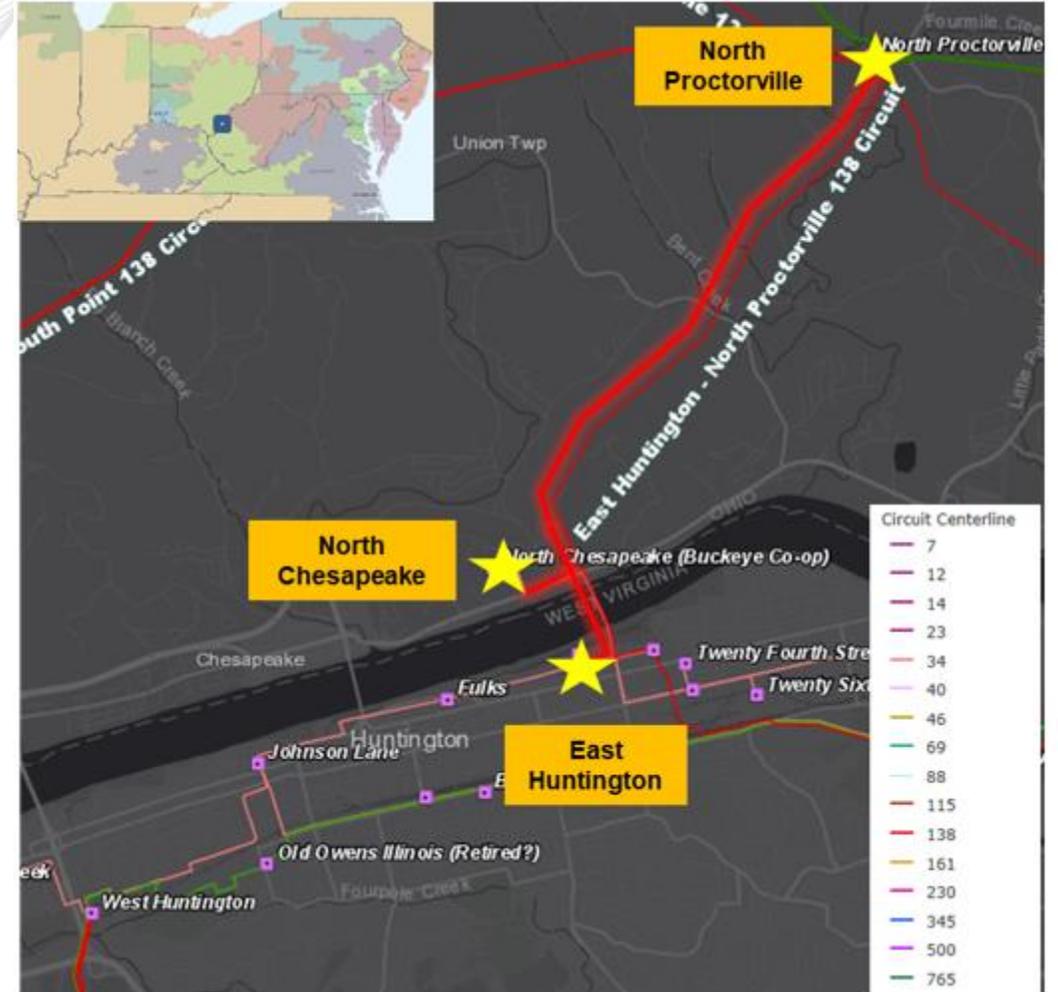
Problem Statement:

FG: AEP-T 273, AEP-T 274, AEP-VM555, AEP-VM556, AEP-VM557, AEP-VM558, AEP-V653, AEP-VM654, AEP-VM655, AEP-VM656, AEP-VM664, AEP-VM665, AEP-VM670, AEP-VM671, AEP-VM674, AEP-VM675, AEP-VM700, AEP-VM701, AEP-VM702, AEP-VM703, AEP-VM721, AEP-VM722, AEP-VM723, AEP-VM724, AEP-VM727, AEP-VM728, AEP-VM740, AEP-VM741, AEP-VM817, AEP-VM819, AEP-VM828, AEP-VM829, AEP-VM830, AEP-VM831, AEP-VM838, AEP-VM839, AEP-VM840, AEP-VM841, AEP-VD603, AEP-VD604, AEP-VD611, AEP-VD613, AEP-VD738, AEP-VD747, AEP-VD753, AEP-VD754, AEP-VD761, AEP-VD763, AEP-VD765, AEP-VD767, AEP-VD768, AEP-VD772, AEP-VD812, AEP-VD814, AEP-VD829, AEP-VD830, AEP-VD860, AEP-VD865, AEP-VD866, AEP-VD867, AEP-VD871, AEP-VD882, AEP-VD890, AEP-VD894, AEP-VD1012, AEP-VD1013, AEP-VD1022, AEP-VD1023, AEP-VD1117, AEP-VD1118, AEP-VD1119, AEP-VD1120, AEP-VD1126, AEP-VD1127, AEP-VD1129, AEP-VD1130, AEP-T 257, AEP-T 258, AEP-T 259, AEP-T 266, AEP-T 269, AEP-T 270, AEP-T 277, AEP-T 278, AEP-T 279, AEP-T 908

In the 2025 Summer case, Fulks – Johnson Lane 34.5kV line is overload and in the 2025 Summer and Winter RTEP cases, voltage violations at East Huntington 138KV buses, 23rd Street, 24th street, 26th Street, BASF, East Huntington, Johnson Lane, Fulks, Connor Street, Inco Fur and Connor F 34.5kV buses due to an N-1-1 scenario.

Existing Facility Rating:

Branch	SN/SE/WN/WE (MVA)
05FULKS – 05JOHNSON LN 34.5kV	31/43/45/51



AEP Transmission Zone: Baseline East Huntington - North Proctorville 138 kV

Preliminary Ratings:

Branch	SN/SE/WN/WE (MVA)
05NPROCT – 05N. CHESPK 138KV	257/360/325/404
05E. HUNTING2 – 05N. CHESPK 138KV	257/360/325/404

Recommended Solution:

Install a second 138 kV circuit utilizing 795 ACSR conductor on the open position of the existing double circuit towers from East Huntington - North Proctorville.

Remove the existing 34.5 kV line from East Huntington - North Chesapeake and rebuild this section to 138 kV served from a new PoP switch off the new East Huntington - North Proctorville 138 kV #2 line. **(B3282.1) Estimated Cost: \$7.1M**

Install a 138 kV circuit breaker at North Proctorville. **(B3282.2) Estimated Cost: \$1.4M**

Install a 138 kV circuit breaker at East Huntington. **(B3282.3) Estimated Cost: \$1.1M**

Convert the existing 34/12 kV North Chesapeake to a 138/12 kV station. **(B3282.4) Estimated Cost: \$0.8M**

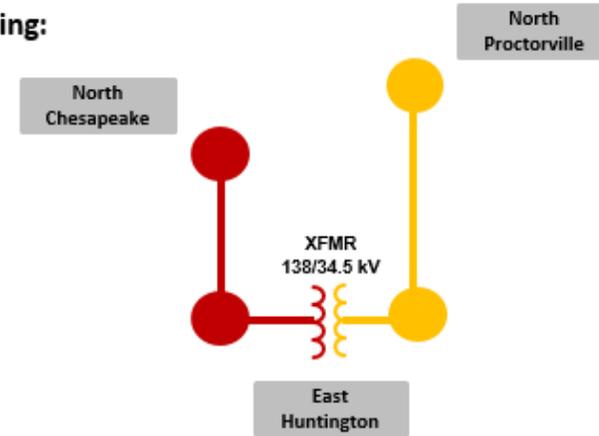
Total Estimated Cost: \$10.4M

Required In-Service: 6/1/2025

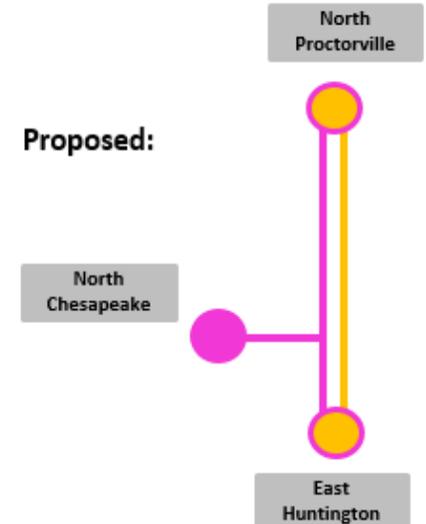
Projected In-Service: 6/1/2025

Previously Presented: 12/18/2020

Existing:



Proposed:



Legend	
500 kV	
345 kV	
138 kV	
46 kV	
34.5 kV	
23 kV	
New	

Process Stage: Recommended Solution

Criteria: AEP 715 criteria

Assumption Reference: 2025 RTEP assumption

Model Used for Analysis: 2025 RTEP cases

Proposal Window Exclusion: Below 200 kV

Problem Statement:

FG: AEP-T 158, AEP-T 160, AEP-T 161, AEP-T 162

In the 2025 Winter RTEP case, the Inez 138/69kV transformer overloads in the event of an N-1-1 scenario

Existing Facility Rating:

Branch	SN/SE/WN/WE (MVA)
05INEZ 138/69KV	70/78/70/78



Recommended Solution:

Replace the existing Inez 138/69kV 50 MVA autotransformer with a 138/69kV 90 MVA autotransformer. This is a conversion of part of s2281.1 to baseline. (**B3283**)

s2281.1 estimated cost is reduced from \$10.7M to \$7.74M due to the conversion.

Estimated Cost: \$2.96M

Preliminary Facility Rating:

Branch	SN/SE/WN/WE (MVA)
05INEZ 138/69/13KV	136.6/138.3/154.4/160.9

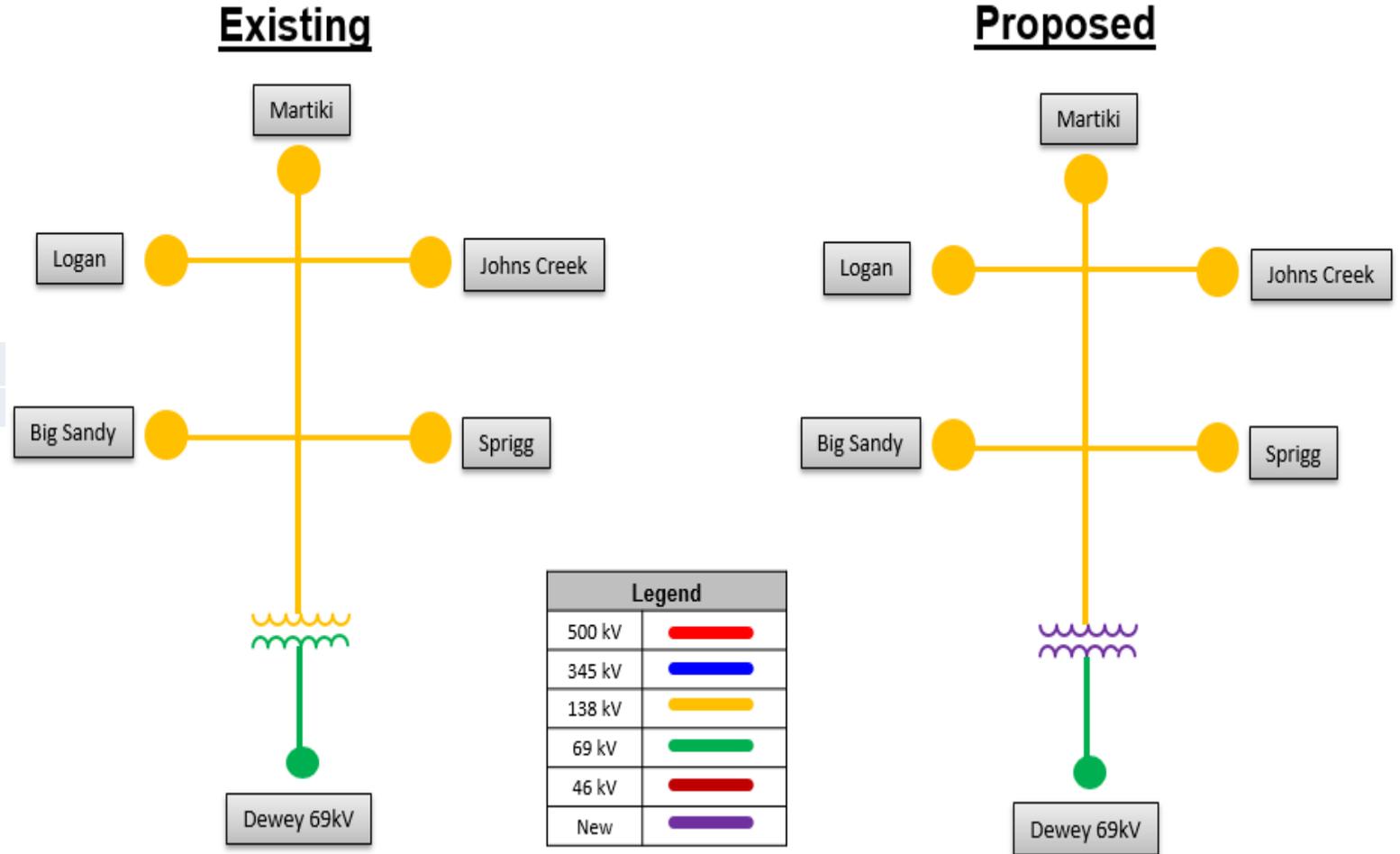
Ancillary Benefits:

This work also addresses the identified issues in AEP-2019-AP047 on the Inez 138/69kV transformer. This proposal is a conversion of a portion of s2281.1 to baseline.

Required In-Service: 12/1/2025

Projected In-Service: 12/1/2025

Previously Presented: 12/18/2020



Process Stage: Recommended Solution

Criteria: AEP 715 criteria

Assumption Reference: 2025 RTEP assumption

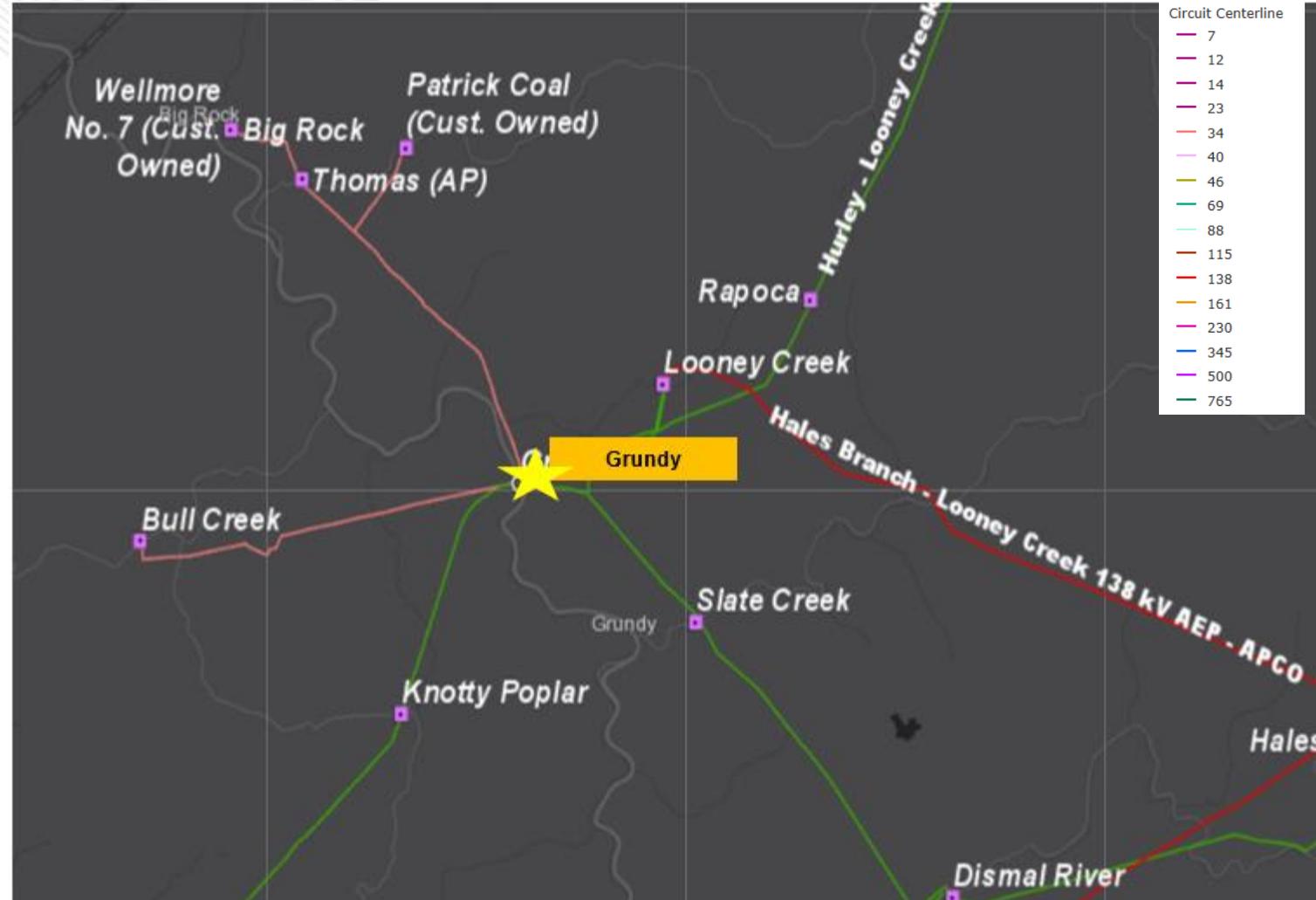
Model Used for Analysis: 2025 RTEP cases

Proposal Window Exclusion: Below 200 kV

Problem Statement:

FG: AEP-VD704 AEP-VD705 AEP-VD707 AEP-VD708 AEP-VD1002 AEP-VD1084 AEP-VD1085 AEP-VD1088 AEP-VD1089 AEP-VD1091 AEP-VD1092 AEP-VD1093 AEP-VD1148 AEP-VD1149 AEP-VD1150 AEP-VD1151 AEP-VD1152 AEP-VD1153 AEP-VD1154 AEP-VD1155 AEP-VD1156 AEP-VD1157 AEP-VD1158 AEP-VD1159

In the 2025 Summer and Winter RTEP cases, voltage violations are identified on the existing Big Rock 34.5kV, Patrick 34.5 kV, Thomas 34.5 kV, Bull Creek 34.5 kV, Grundy 34.5 kV, Grundy 69kV and Knotty Poplar 69 kV buses for one line with stuck breaker contingency and multiple N-1-1 contingency pairs.



Recommended Solution:

Grundy 34.5 kV: Install a 34.5 kV 9.6 MVAR cap bank (**B3295**)

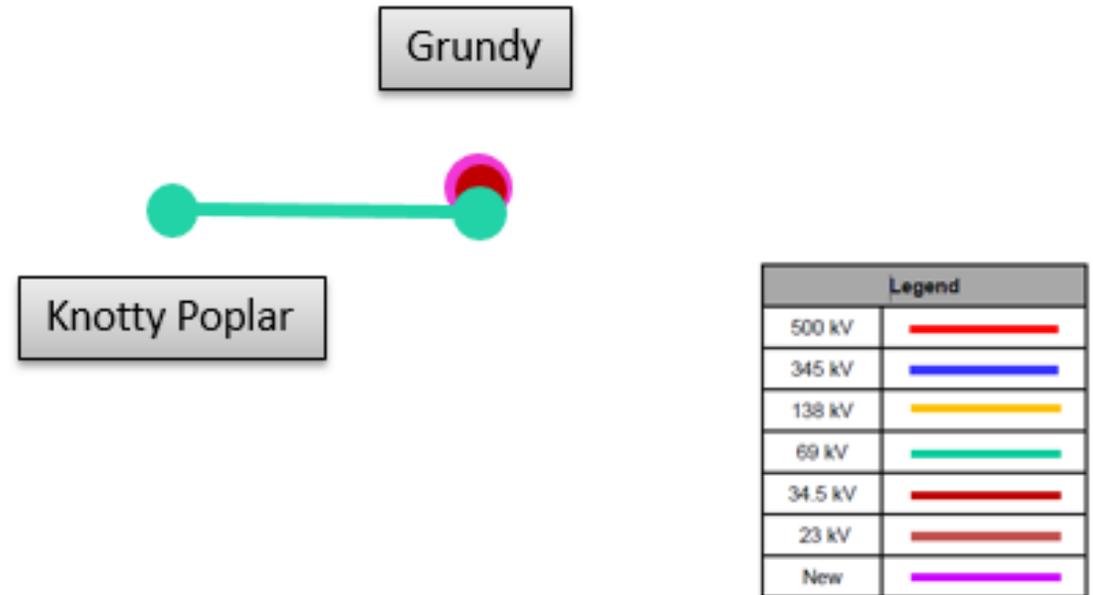
Estimated Cost: \$0.8M

Alternatives: Build a ~3.2 miles long 69 KV single circuit line with 556 ACSR conductor from Turkey Pen Station to Grundy Station. Estimated Cost: \$8M

Required In-Service: 6/1/2025

Projected In-Service: 6/1/2025

Previously Presented: 12/18/2020



AEP Transmission Zone: Baseline South Toronto - West Toronto 69 kV Rebuild

Process Stage: Recommended Solution

Criteria: AEP 715 criteria

Assumption Reference: 2025 RTEP assumption

Model Used for Analysis: 2025 RTEP cases

Proposal Window Exclusion: Below 200 kV

Problem Statement:

FG: AEP-T486, AEP-T487, AEP-T489, AEP-T490, AEP-T492, AEP-T493, AEP-T496, AEP-T497

In 2025 Summer RTEP case, the South Toronto-West Toronto 69kV branch is overloaded for multiple N-1-1 contingency pairs.

Existing Facility Rating:

Branch	SN/SE/WN/WE (MVA)
05S TORONT – 05W TORONT 69KV	49/49/61/61
05S.TORONTOZ – 05SUNSTBL 69KV	54/54/76/76





AEP Transmission Zone: Baseline South Toronto - West Toronto 69 kV Rebuild

Recommended Solution:

Rebuild 0.8 miles of double circuit 69kV line between South Toronto and West Toronto. Replace 219 kcmil ACSR with 556 ACSR. **(B3298)**

Estimated Cost: \$2.83M

Replace the 69kV breaker D at South Toronto station with 40 KA breaker **(B3298.1)** **Estimated Cost:** \$0.7M

Total Estimated Cost: \$3.53M

Preliminary Facility Rating:

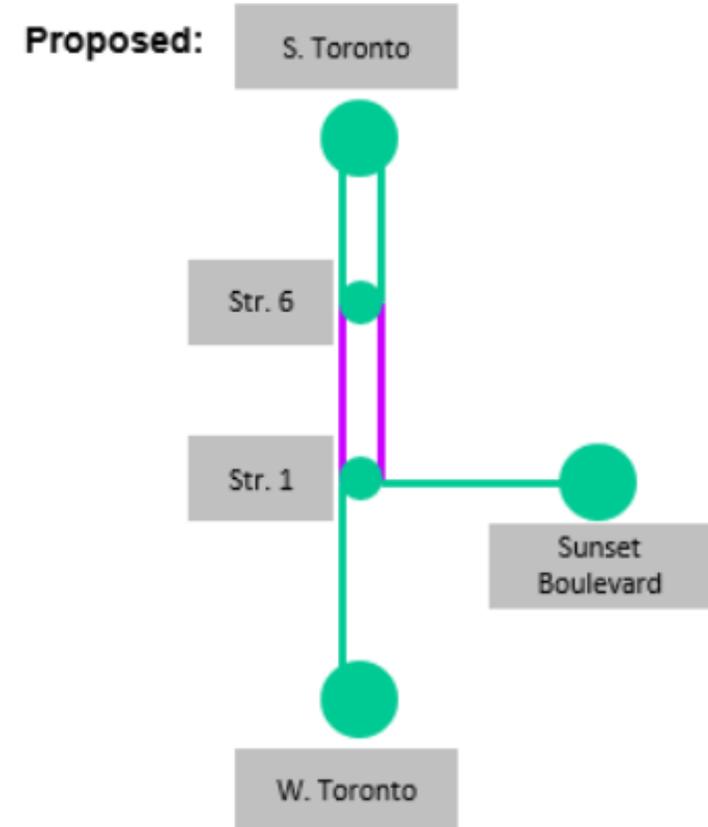
Branch	SN/SE/WN/WE (MVA)
05S TORONT- 05W TORONT 69KV	68/68/90/103
05S.TORONTOZ - 05SUNSTBL 69KV	64/64/90/96

Required In-Service: 6/1/2025

Projected In-Service: 6/1/2025

Previously Presented: 12/18/2020

Legend	
500 kV	
345 kV	
138 kV	
69 kV	
34.5 kV	
23 kV	
New	



Questions?



- V1 – 2/11/2021 – Original slides posted
- V2 – 2/17/2021 – Added Slide #5
 - Slide #16, updated contingency description
- V3 – 2/19/2021 – Slide #29, updated Preliminary Rating
- V4 – 5/6/2021 – Slide #3, Corrected Bellefonte transformer voltages