

# SRRTEP Committee: Western EKPC Supplemental Projects

October 18, 2024

# Needs

Stakeholders must submit any comments within 10 days of this meeting in order to provide time necessary to consider these comments prior to the next phase of the M-3 process

**Need Number:** EKPC-2024-004

**Process Stage:** Need Meeting SRRTEP-W - 10/18/2024

**Project Driver:** Operational Flexibility and Efficiency

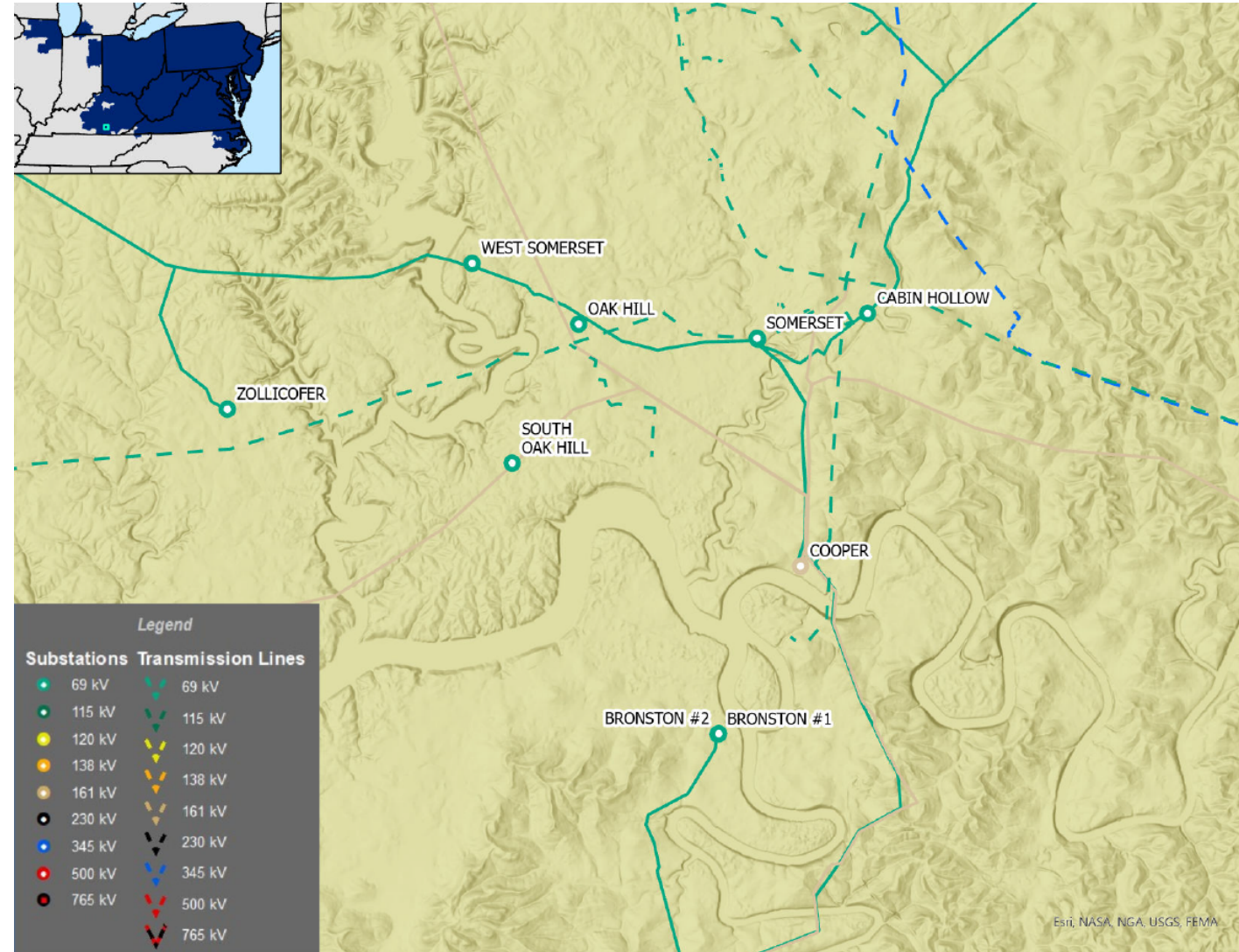
**Specific Assumption References:**

EKPC Assumptions Presentation Slide 14

**Problem Statement:**

EKPC set back-to-back all-time winter peaks during winter storm Elliott in December 2022 and Winter Storm Gerri in January 2024. During these storms EKPC faced many real time operational challenges due to the extreme cold temperatures, high loads and unplanned outages around the southern portion of the EKPC transmission system. EKPC’s only generation in the southern portion of the system is comprised of the Cooper 1 and 2 generators with around 30 load serving substations in the immediate area. System Operation and Planning studies have shown during these conditions if the Cooper generators are unavailable, voltage constraints around the Cooper area would be certain. EKPC’s System Operations group has requested additional voltage support for this area as risk management against similar future winter weather conditions.

**Model:** N/A



# Solution

Stakeholders must submit any comments within 10 days of this meeting in order to provide time necessary to consider these comments prior to the next phase of the M-3 process

**Need Number:** EKPC-2024-001

**Process Stage:** Need Meeting SRRTWP-W - 09/20/2024

**Project Driver:** Equipment Condition/Performance/Risk

**Specific Assumption References:**

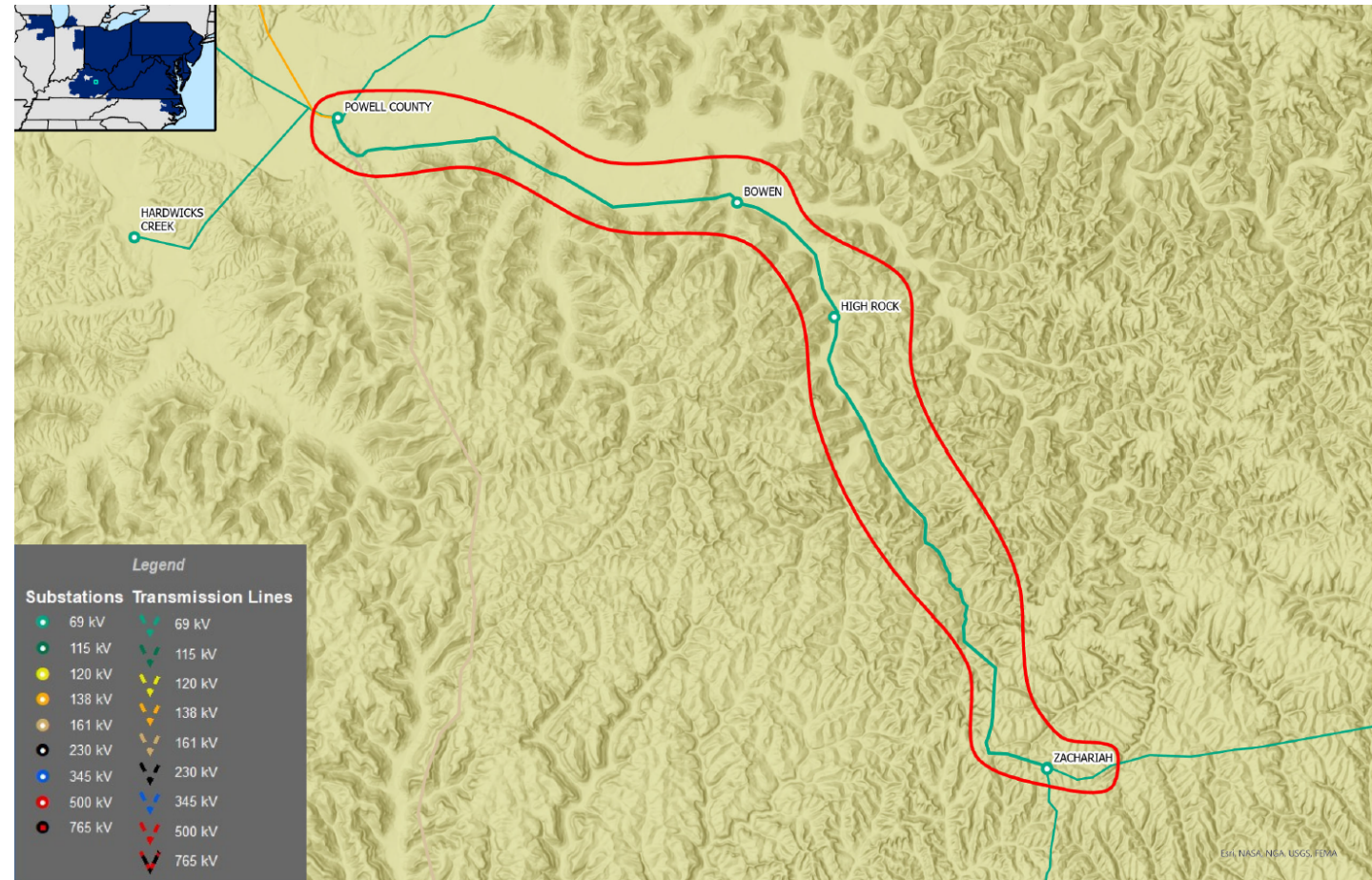
EKPC Assumptions Presentation Slide 13

**Problem Statement:**

The EKPC reliability team has been working to identify transmission lines sections, with single wood pole structures and 556.5 ACSR wire or larger that are known to have structural design issues. Most of the structures on these lines are believed to be over 100% capacity if the structure was new, based on EKPC current design standards. Many of the lines have been re-conducted with larger wire and very little structure design was performed at the time of the re-conductor.

The 16.85 mile, Powell County-Zachariah 69 KV line sections has been identified from the above to be addressed. The line was originally built in 1954.

Alternatives will be developed to address these structural loading concerns.



**Need number(s):** EKPC-2024-001

**Process Stage:** Solution Meeting SRRTEP-W - 10/18/2024

**Proposed Solution:**

**Powell County-Zachariah:** Rebuild the Powell County-Bowen-High Rock-Zachariah 69kV line section.

**Transmission Cost Estimate:** \$16.56 M

**Alternatives Considered:**

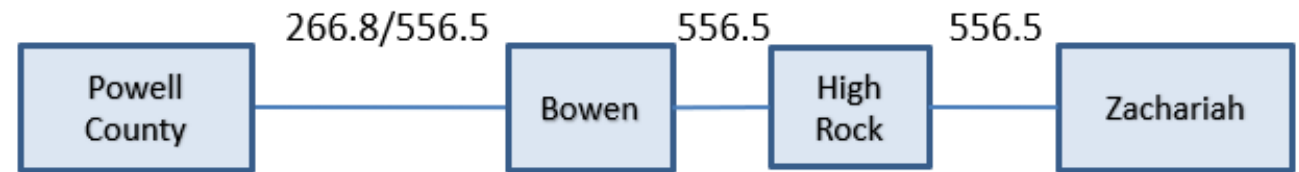
N/A

**Projected In-Service:** 12/31/2029

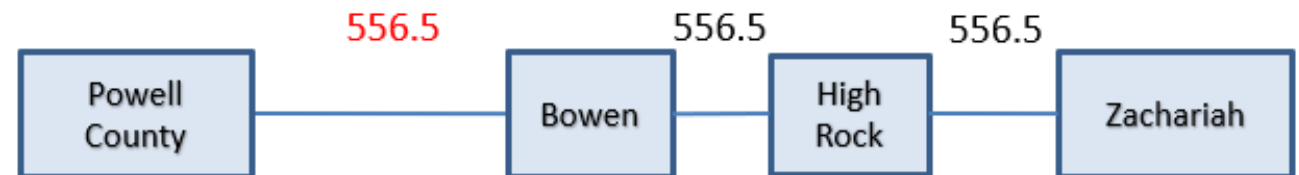
**Project Status:** Engineering

**Model:** N/A

Before



After



**Need Number:** EKPC-2024-002

**Process Stage:** Solution Meeting SRRTEP-W - 10/18/2024

**Previously Presented:** Need Meeting SRRTEP-W - 09/20/2024

**Project Driver:** Customer Service

**Specific Assumption References:**

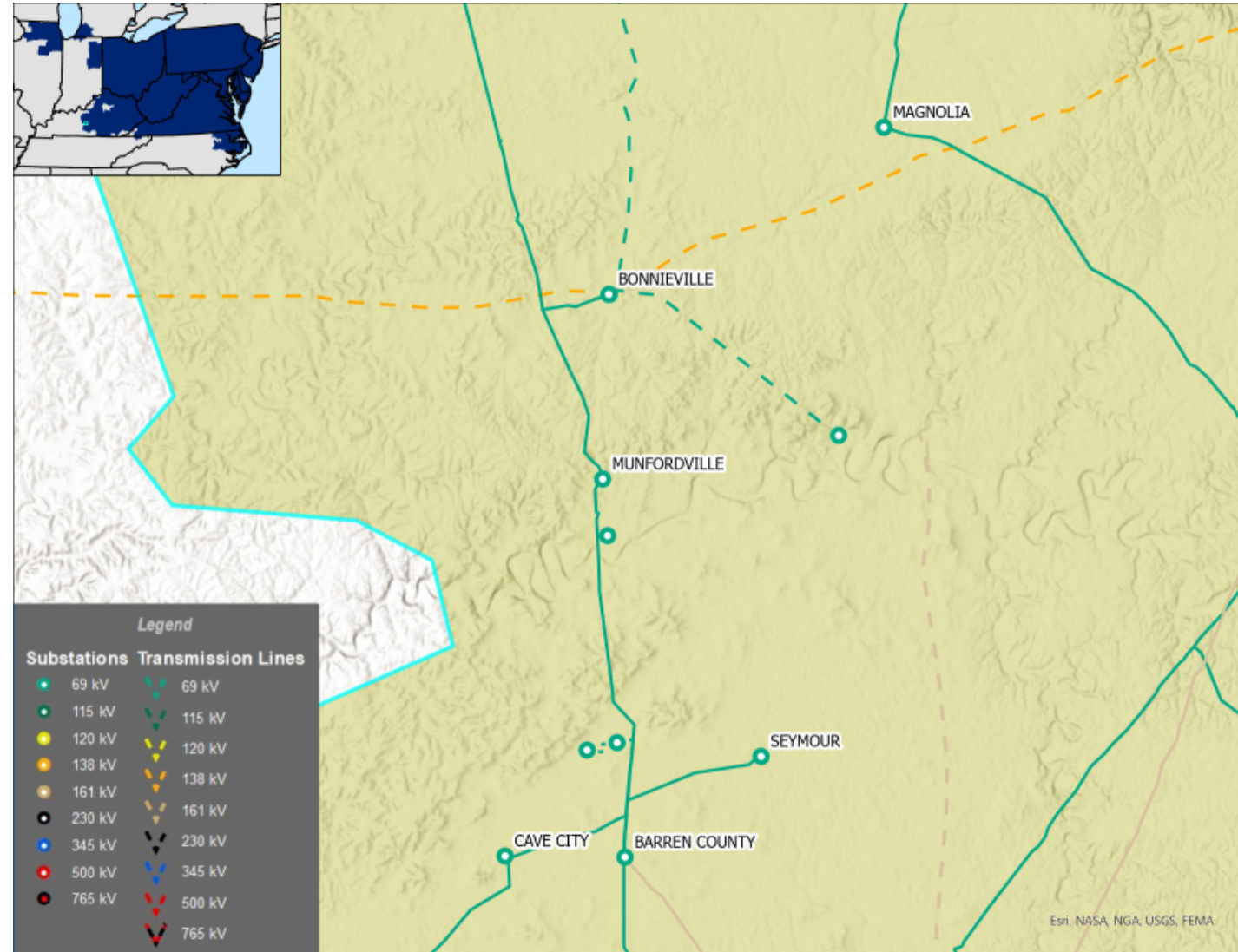
EKPC Assumptions Presentation Slide 15

**Problem Statement:**

The Munfordville substation distribution feeder currently serves ~1,800 customers and is roughly 175 miles in length. The feeder serves the area surrounding the Nolin Lake and is ~15 miles from the Munfordville substation.

Approximately 50% of the feeders load is at the tail end of the circuit where load growth is expected to continue.

During high loading customers near the end of the line are experiencing low voltage. Existing distribution infrastructure is not capable of addressing the issues in this area. EKPC will develop and evaluate alternatives to address all issues listed above.



**Need number(s):** EKPC-2024-002

**Process Stage:** Solution Meeting SRRTEP-W - 10/18/2024

**Proposed Solution:**

**Cub Run 69-25 KV, 12/16/20 MVA distribution substation:** Construct a 69-25 KV, 12/16/20 MVA distribution substation (“Cub Run”). Estimated Cost:

**Bonnieville - Cub Run 69kV Tap:** Construct a new 11.4 mile 69 kV transmission line from EKPC’s Bonnieville substation to serve the Cub Run distribution substation. Estimated Cost:

**Bonnieville 69kV Substation:** Construct a new 69 kV box structure, install 3 new 69kV breakers and reconfigure Bonnieville 69 kV circuits to accommodate the Cub Run circuit.. Estimated Cost: \$1.579 M

**Transmission Cost Estimate:** \$1.579 M

**Alternatives Considered:**

Alternative 1 – Tap the Bonnieville – Munfordville 69kV line and construct a new 9.1 mile 69 kV transmission line and a 69-25 KV, 12/16/20 MVA distribution substation (“Cub Run”).

Distribution Cost: \$13M

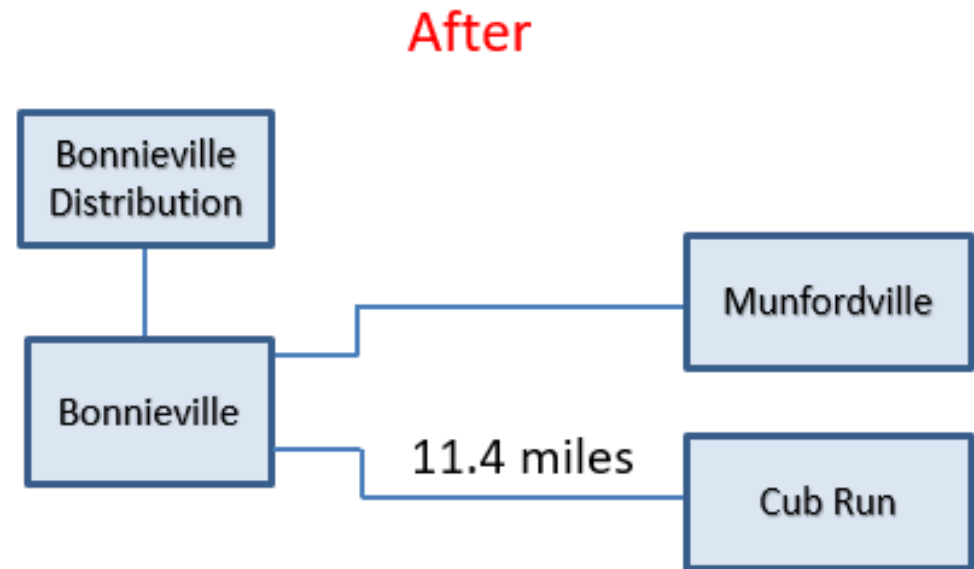
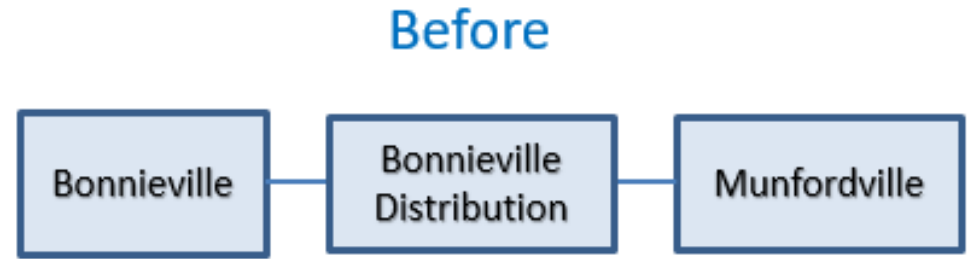
Alternative 2 – Tap the KU 138 kV transmission line and construct a new 5.65 mile 138 kV transmission line and a 138-25 KV, 12/16/20 MVA distribution substation (“Cub Run”).

Distribution Cost: \$28.6M

**Projected In-Service:** 12/31/2026

**Project Status:** Engineering

**Model:** N/A





**Need Number:** EKPC-2024-003

**Process Stage:** Need Meeting – September 18, 2024

**Supplemental Project Driver:**

Equipment Material Condition, Performance and Risk

**Specific Assumption Reference:**

EKPC Assumptions Presentation Slide 13

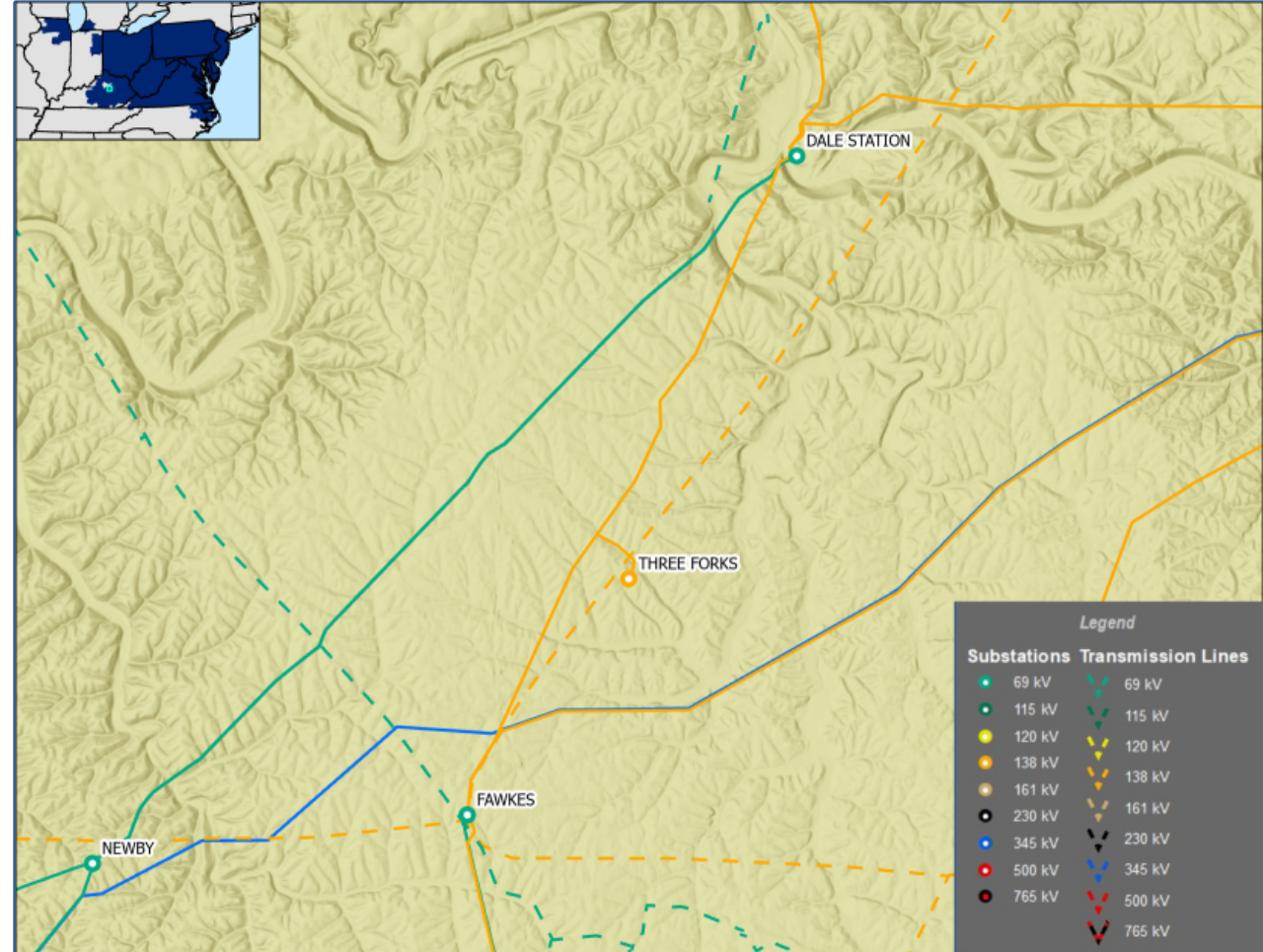
**Problem Statement:**

The Dale Station 69 & 138 kV substation was constructed in 1954 and is experiencing numerous of issues associated with aging condition and safety.

- Breakers antiquated and less reliable compared to newer breaker designs.
- Switches severely limit access to the end bays for performing switch maintenance, and can be susceptible to operational and maintenance issues.
- Arrestors are reaching end of useful life due to an older porcelain design that is prone to catastrophic failure.
- Bus potential transformers require a bus outage in order to properly service and maintain minimum approach distance.
- The main and transfer buses are cable design with outdated insulators (evidence of corona).

Based on this information, the EKPC Reliability team has concluded that this substation is at or near end of life and should be addressed due to the condition.

**Model:** N/A



**Need Number:** EKPC-2024-003

**Process Stage:** Solution Meeting – October 18, 2024

This proposed solution was determined after a holistic assessment of the Need EKPC-2024-003 and the aging condition and safety concerns of the Newby Distribution substation. The Dale 69 & 138 kV substation and the Newby substation are the terminating ends of the Dale-Newby 69 kV line section. This resulted in a review of the previous approved EKPC-2022-004 solution (s2873) which resulted in a EKPC-2022-004 scope change.

**Proposed Solution:**

Rebuild the Dale substation as a 138 kV transmission station only, retiring the last remaining 69 kV transmission equipment at the station.

Transmission Cost: \$8.8M

**Ancillary Benefits:**

- Eliminates O&M of the 69 kV station and associated equipment

**Alternatives Considered:**

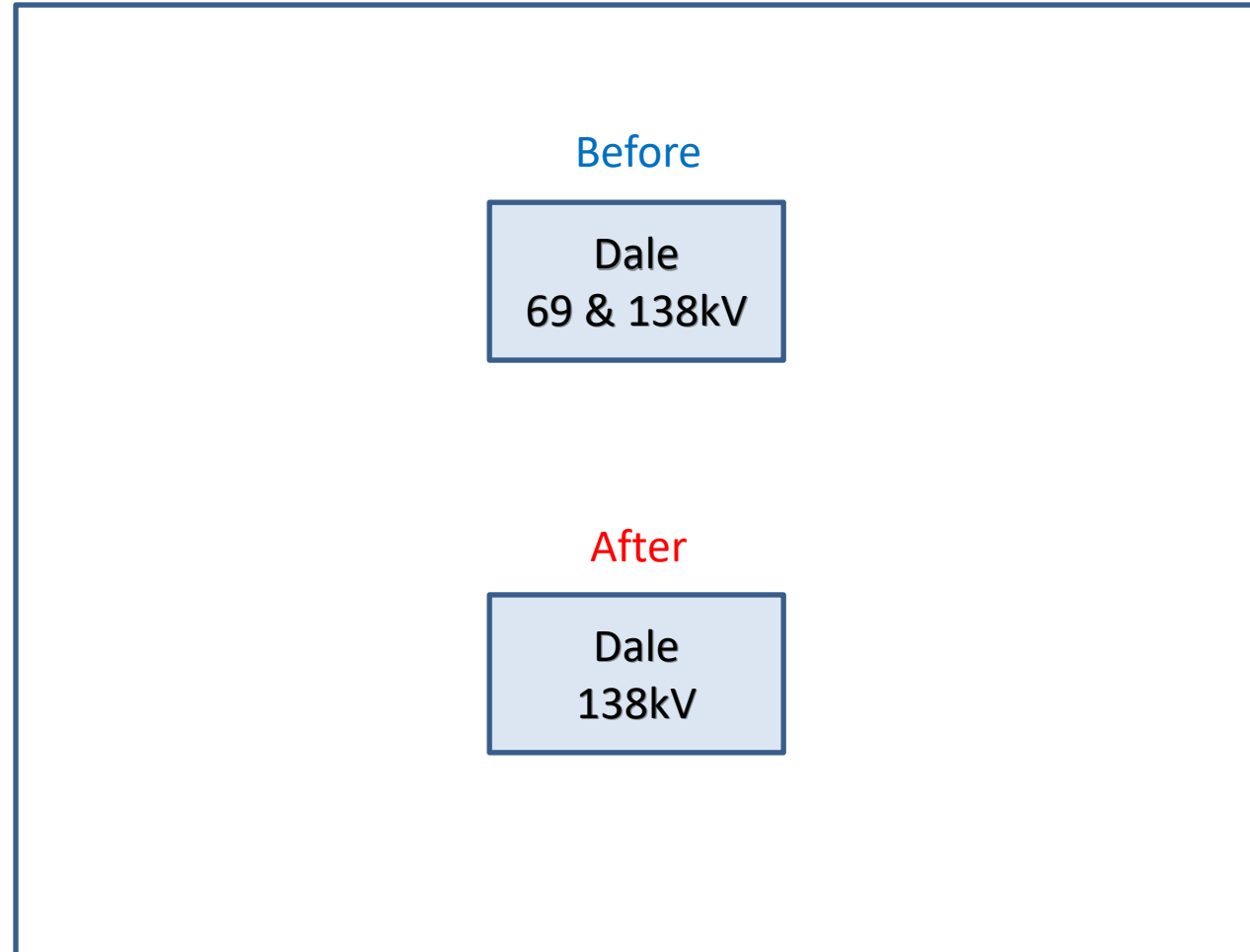
Rebuild Dale as a 69 & 138 kV transmission station

Transmission Cost: \$13.3M

**Projected In-Service:** 6/1/2029

**Project Status:** Engineering

**Model:** N/A



**Need Number:** EKPC-2022-004

**Process Stage:** Re-Present Solution Meeting – October 18, 2024

**Reason for Scope Change:** All-inclusive review of the area including Need EKPC-2024-003, the aging condition and safety concerns of the Newby Distribution substation and Need-EKPC-2022-004.

**Newby Distribution Concerns:**

- Built in 1954.
- There are grounding wells, but no ground grid.
- The high side structure is rusting and has porcelain lightning arrestors which should be changed to a polymer type for safety.
- The high side switch needs replacing.
- The low bay structure is extremely compact with metering equipment, regulators, and OCRs in close proximity. This arrangement creates difficulties for safety, maintenance, and restoration.
- No bypass bus.
- Failing fence, foundations and deterioration across various other station components.

**Previously Presented:**

Needs Meeting – May 19, 2022

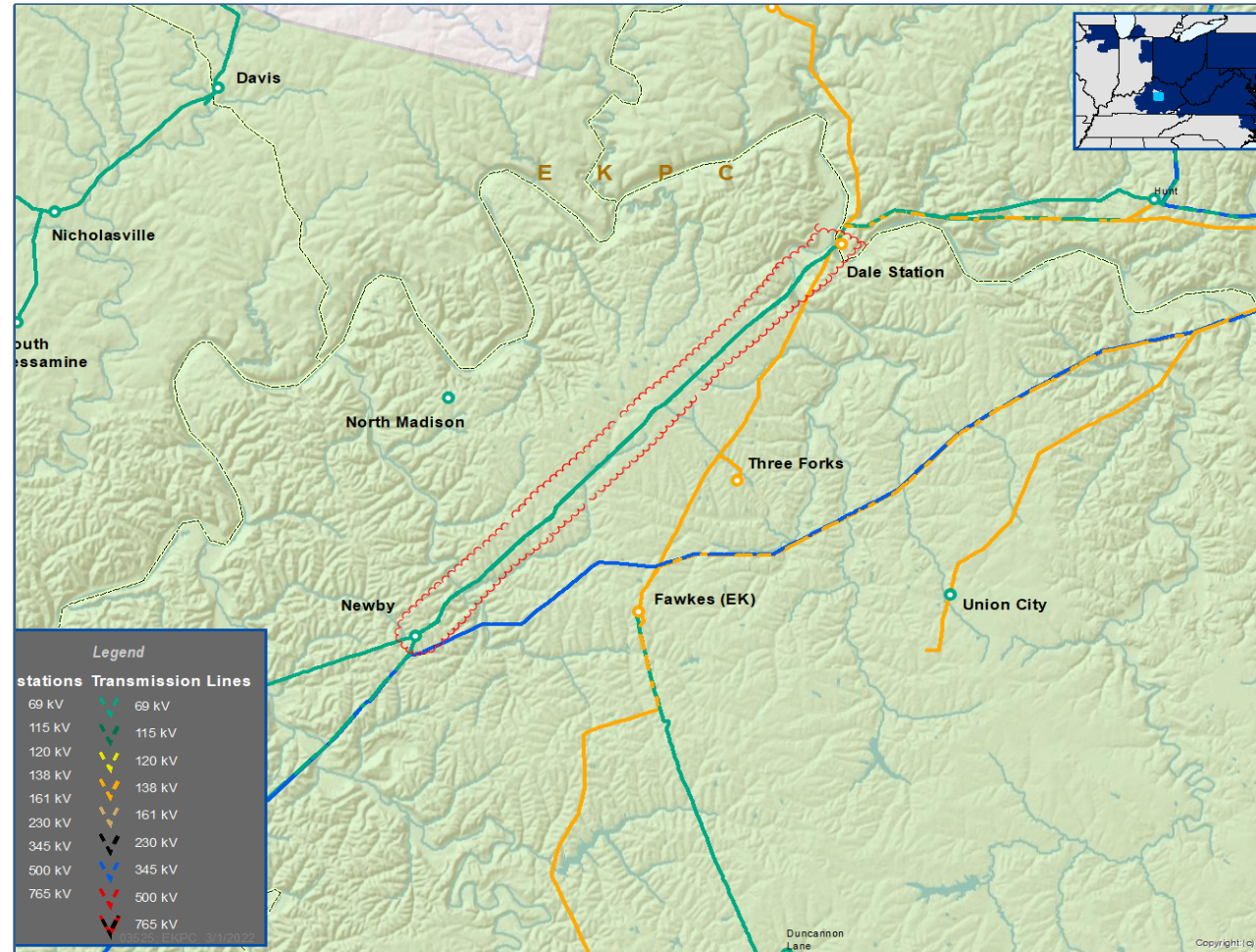
Solutions Meeting – October 14, 2022

**Supplemental Project Driver:**

Equipment Material Condition, Performance and Risk

**Specific Assumption Reference:**

EKPC Assumptions Presentation Slides 13



**Need Number:** EKPC-2022-004

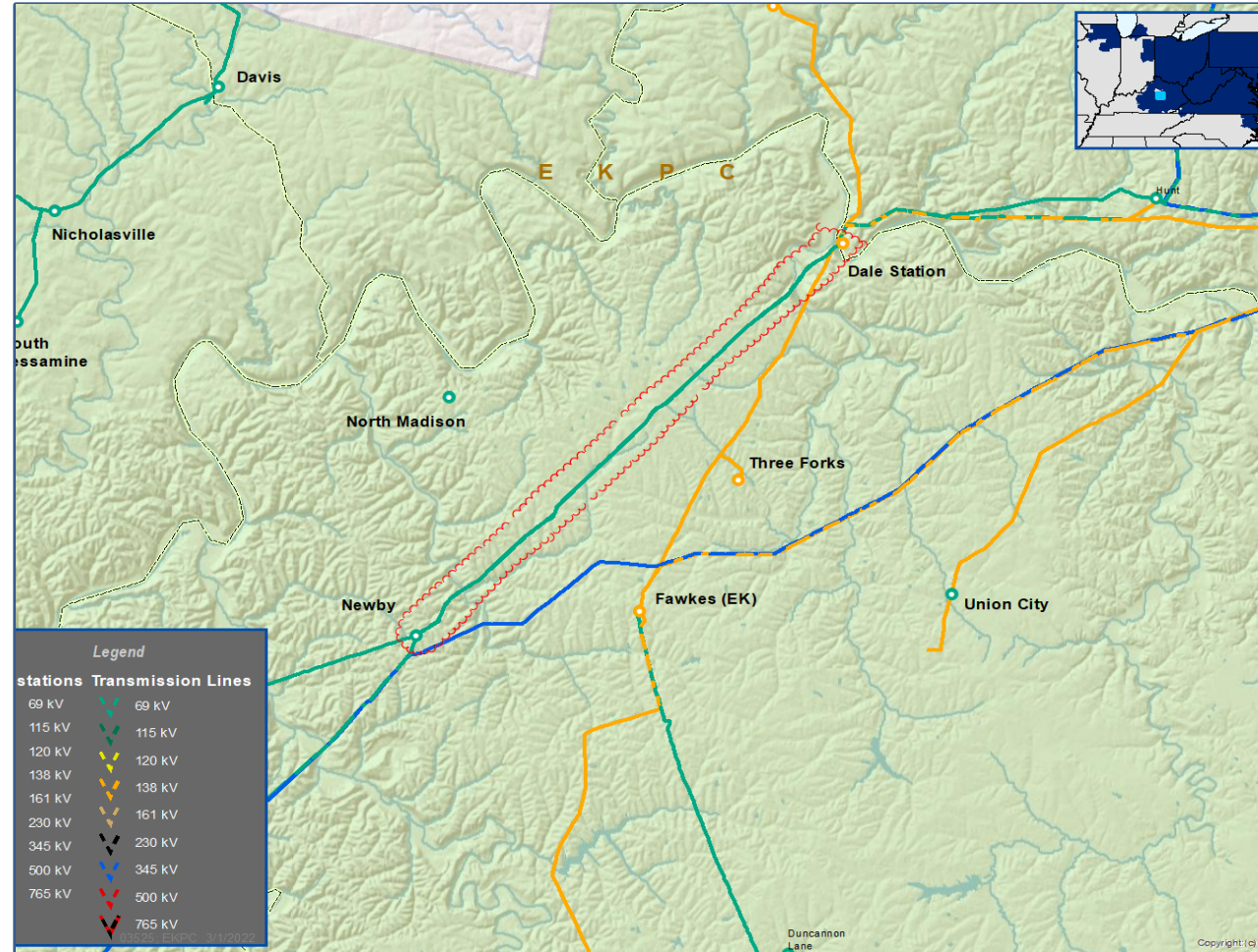
**Process Stage:** Re-Present Solution Meeting – October 18, 2024

**Problem Statement:**

The 11.1 mile, Dale - Newby double circuit 69 KV transmission line section is 70 years old.

Testing from the LineVue robot from Kinectrics Corporation deemed the condition of the line as unacceptable. The testing identified instances of rusting, pitting, and broken strands. Based on this testing information, the EKPC Reliability team has concluded that this line should be addressed due to the condition assessment.

**Model:** N/A



**Need Number:** EKPC-2022-004

**Process Stage:** Re-Present Solution Meeting – October 18, 2024

**Proposed Solution:** (s2873)

~~Rebuild 11.1 mile Dale-Newby line section as double circuit 69 kV using 556 ACSR Conductor.~~

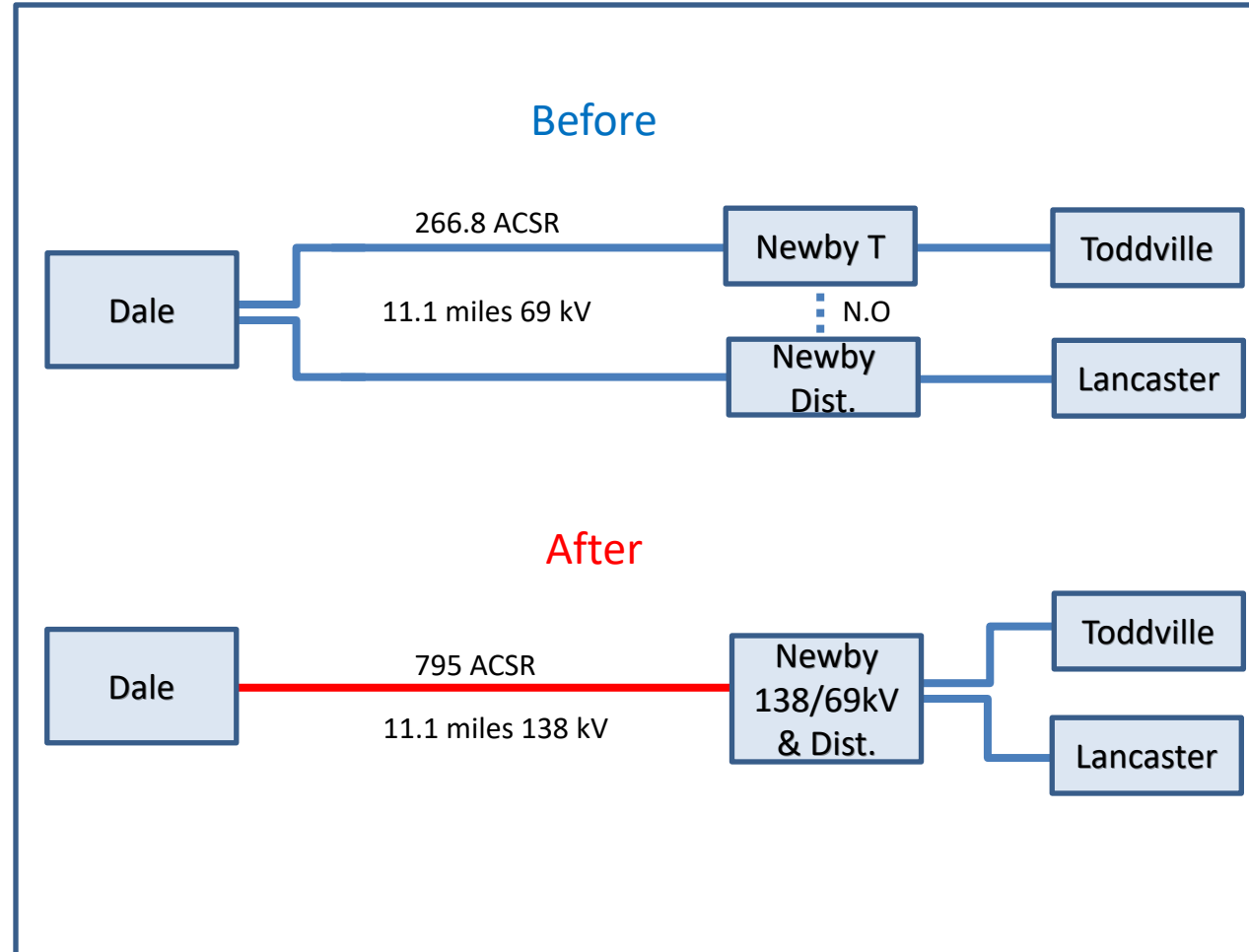
Rebuild 11.1 mile Dale-Newby line section as single circuit 138 kV using 795 ACSR, rebuild Newby as 138/69 kV and relocate the Dale 138/69 kV transformer, construct a 69 kV box structure and install 4 – 69 kV circuit breakers at Newby, rebuild Newby 69/12.5 kV distribution station.

Transmission Cost: ~~\$12.6M~~ \$22.9M

Distribution Cost: \$3.7M

**Ancillary Benefits:**

- None
- Brings a new 138 kV source to the area, enabling future expansion capabilities.
- Expands 69 kV station at Newby to allow for future expansion.



**Need Number:** EKPC-2022-004

**Process Stage:** Re-Present Solution Meeting – October 18, 2024

**Alternatives Considered:**

Alternative 1 – Rebuild Dale-Newby 69kV dbl circuit, rebuild Newby 69/12.5 kV distribution as a 69 kV switching station with 4-69 kV circuit breakers.

Transmission Cost: \$21.7

Distribution Cost: \$3.7M

Alternative 2 - Retire Dale-Newby; Construct EK Fawkes-Newby 138 kV and rebuild Newby as 138/69 kV transmission station w/ 4 – 69kV circuit breakers and rebuild Newby 69/12.5 KV.

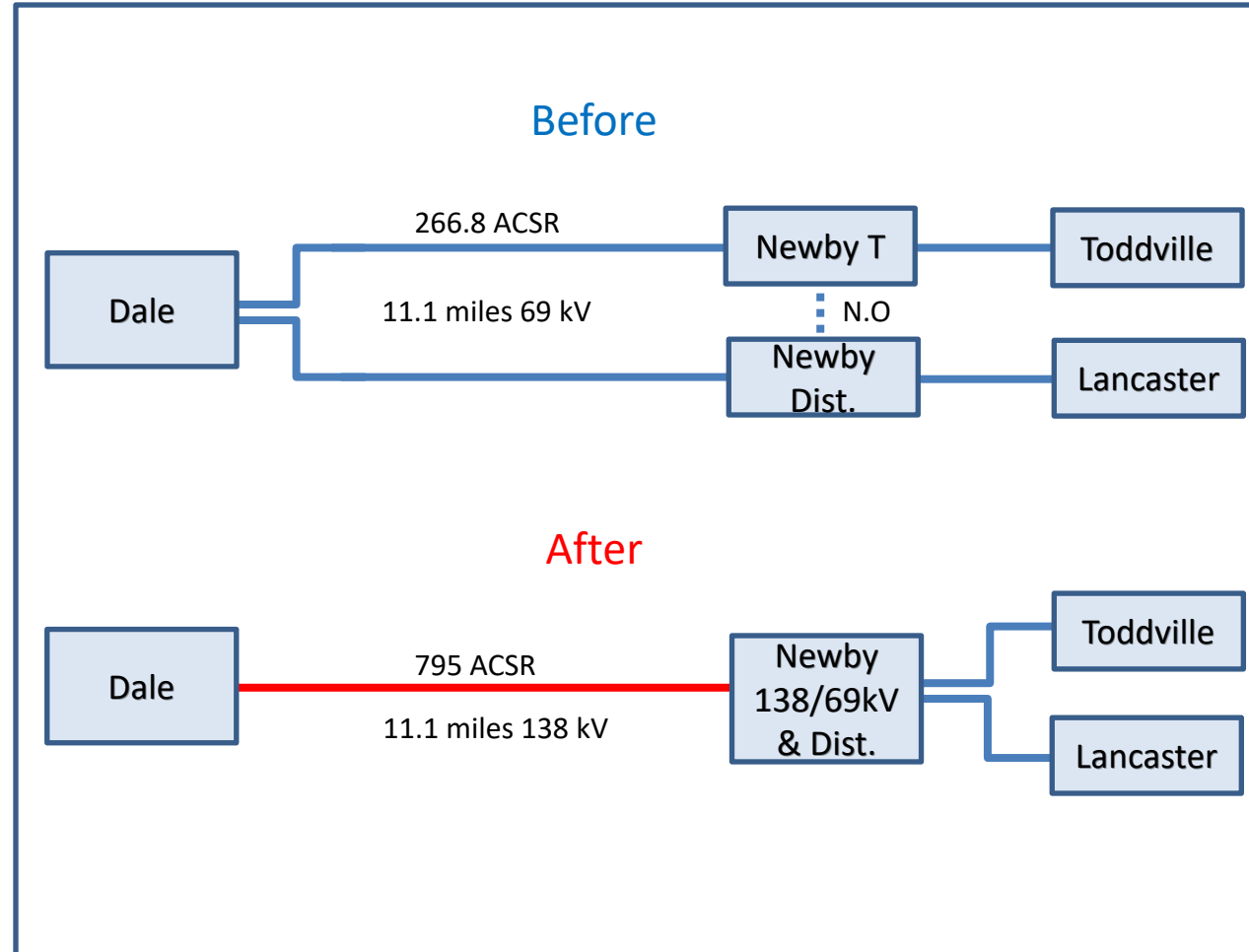
Transmission Cost: \$32.4M

Distribution Cost: \$3.7M

Alternative 3 - Retire Dale-Newby; Construct EK Fawkes-Newby 69 kV and rebuild Newby 69/12.5 kV distribution as a 69 kV switching station with 4 – 69 kV circuit breakers.

Transmission Cost: \$30.2M

Distribution Cost: \$3.7M



**Need Number:** EKPC-2022-004

**Process Stage:** Re-Present Solution Meeting – October 18, 2024

**Previous Alternatives Considered:**

~~Alternative 1—Retire Dale Newby; Construct a new 69 KV line from Fawkes Crooksville to serve Newby.~~

~~—Transmission Cost: \$5.8M~~

~~Alternative 2—Retire Dale Newby; Construct a new 138 KV line from Fawkes West Berea. Rebuild Newby as 138/12.5 KV to serve Newby from new line.~~

~~Transmission Cost: \$8.5M~~

~~Alternative 3—Rebuild Dale Newby as single circuit 69 kV and serve Newby from this line. Construct 69 KV line from Lancaster to Toddville.~~

~~Transmission Cost: \$18.1M~~

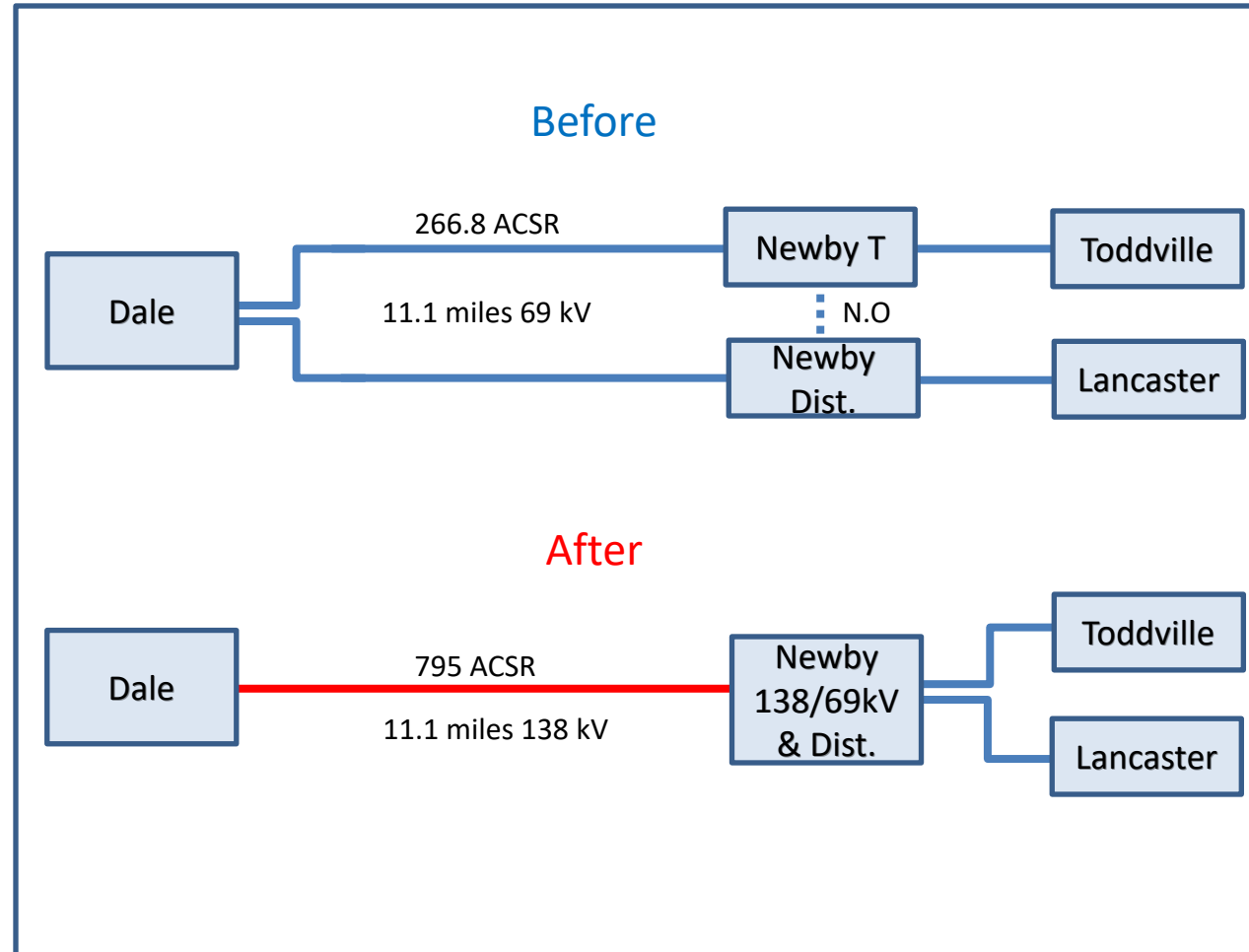
~~Alternative 4—Retire Dale Newby; Construct EK Fawkes Newby 138 kV and rebuild Newby as 138/12.5 KV to serve from new line.~~

~~Transmission Cost: \$14.2M~~

**Projected In-Service:** ~~12/31/2028~~ **6/1/2029**

**Project Status:** Engineering

**Model:** N/A



# Appendix



# High Level M-3 Meeting Schedule

Assumptions	Activity	Timing
	Posting of TO Assumptions Meeting information	20 days before Assumptions Meeting
	Stakeholder comments	10 days after Assumptions Meeting
Needs	Activity	Timing
	TOs and Stakeholders Post Needs Meeting slides	10 days before Needs Meeting
	Stakeholder comments	10 days after Needs Meeting
Solutions	Activity	Timing
	TOs and Stakeholders Post Solutions Meeting slides	10 days before Solutions Meeting
	Stakeholder comments	10 days after Solutions Meeting
Submission of Supplemental Projects & Local Plan	Activity	Timing
	Do No Harm (DNH) analysis for selected solution	Prior to posting selected solution
	Post selected solution(s)	Following completion of DNH analysis
	Stakeholder comments	10 days prior to Local Plan Submission for integration into RTEP
	Local Plan submitted to PJM for integration into RTEP	Following review and consideration of comments received after posting of selected solutions

# Revision History

10/8/2024 – V1 – Original version posted to pjm.com