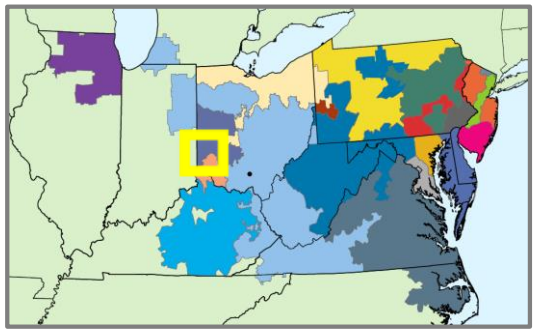
SRRTEP - Western Committee
Dayton Supplemental Projects

February 17, 2021

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

Dayton Transmission Zone M-3 Process
Preble County, Ohio



Need Number: Dayton-2021-001
Process Stage: Needs Meeting
Date: 2/17/2021

Supplemental Project Driver(s):
Requested Customer Upgrade, System Configuration Improvements, Operational Performance

Specific Assumption Reference(s):
DP&L 2021 RTEP Assumptions, Slide 5

Problem Statement:

- DP&L Distribution has requested a new 69kV or 138kV delivery point to replace the existing New Westville 33kV Substation due to poor performance and lack of standard equipment which could lead to prolonged system outages.
  - Presently, New Westville Substation is radially fed via a 9.6-mile 33kV line that was constructed in the 1930's.
  - New Westville Substation has three single phase 33/4kV transformers that provide service to 1,428 customers.
  - In the last five years, the 3302 line has experienced 12 permanent outages and 18 momentary outages.
    - Permanent Outages: six insulator failures, five pole failures, and one crossarm
    - Momentary Outages: one animal, five auto accidents, three insulator flashovers, seven lightning, one high side transformer fuse, one unknown.
    - Due to the remote location of the substation, there are little to no distribution circuit ties to transfer or pick-up loads if there are extended outages.

- In addition, Buckeye Power, on behalf of Darke Electrical Cooperative has indicated they are considering a new transmission delivery located east of New Westville and west of the Garage Rd – West Manchester 6656 circuit.
- Solution development will need to take into consideration recently reviewed need: DPL-2020-011 presented on 12/18/2020.

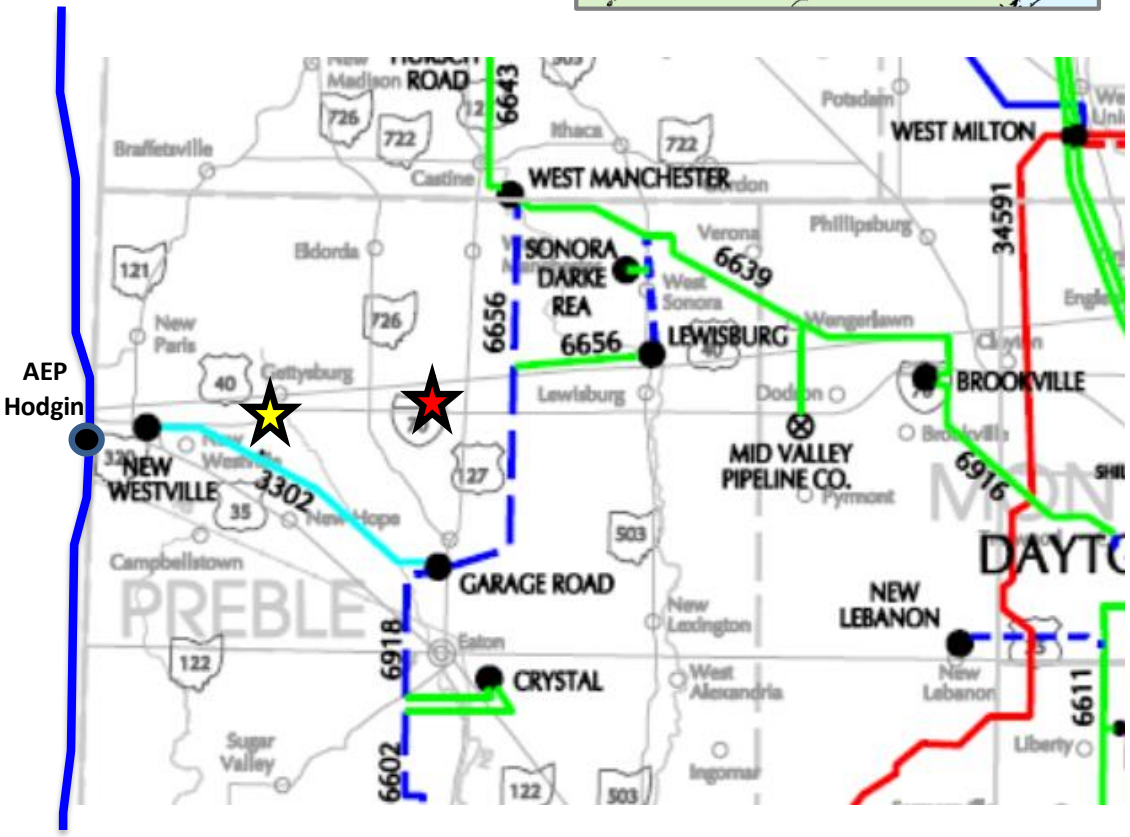
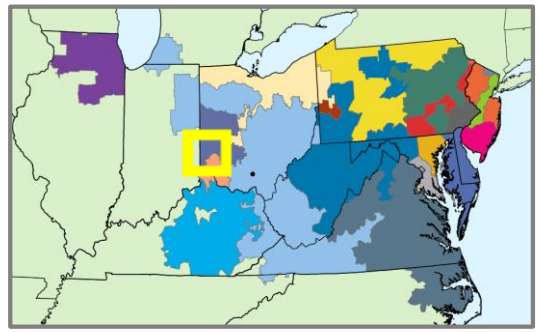
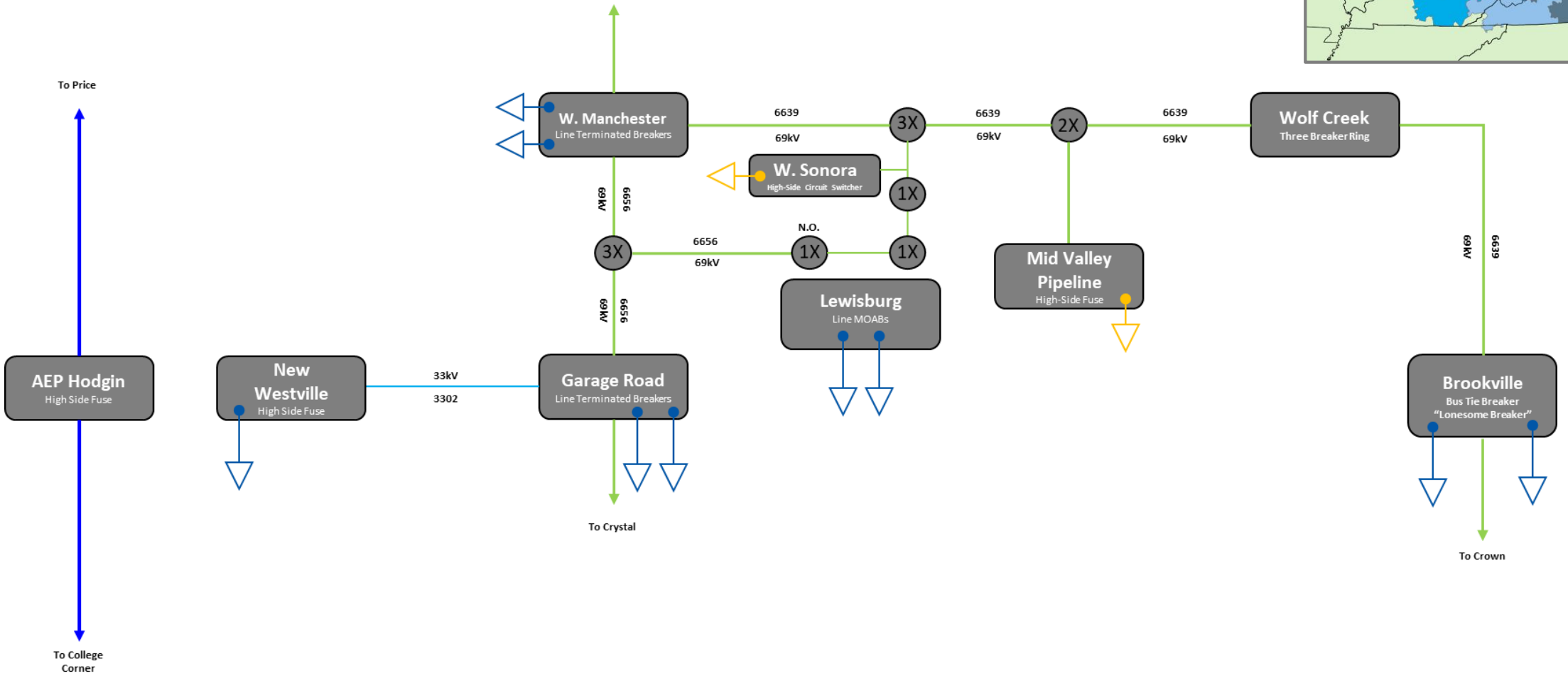


Figure 1 : Area Map

Dayton Transmission Zone M-3 Process
Preble County, Ohio



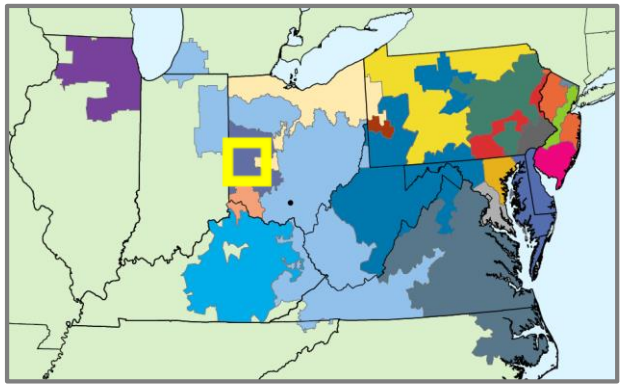


Solutions

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

This slide is intentionally left blank.

This slide is intentionally left blank.



Need Number: Dayton-2020-010
Process Stage: Solutions Meeting 2/17/2021
Previously Presented: Need Meeting 11/20/2020

Supplemental Project Driver(s):
Requested Customer Upgrade, Operational Performance

Specific Assumption Reference(s):
DP&L 2020 RTEP Assumptions, Slide 5

Problem Statement:

- Buckeye Power, on behalf of Pioneer Rural Electric Cooperative, has requested reliability upgrades on the Staunton-KTH 69kV 6657 line located in Miami and Champaign Counties.
- The 6657 line is a radial 17-mile 69kV wood pole line connecting DPL's Staunton Substation to Pioneer's KTH delivery point.
  - The line was constructed primarily in the 1960's and is approximately 17 miles long.
  - The line has experienced 2 permanent and 3 momentary outages since 2016. Most outages were caused by lightning.
  - The line serves approximately 19MW of load between East Casstown, St. Paris, and KTH substations.
  - Loss of the 6657 line could lead to extended customer outages for customers served via East Casstown, St. Paris, and KTH due to the current radial configuration and limited switching options.
- The KTH delivery point served at the end of the radial 6657 line provides service to KTH a large auto parts manufacturer and the largest employer in Champaign County.

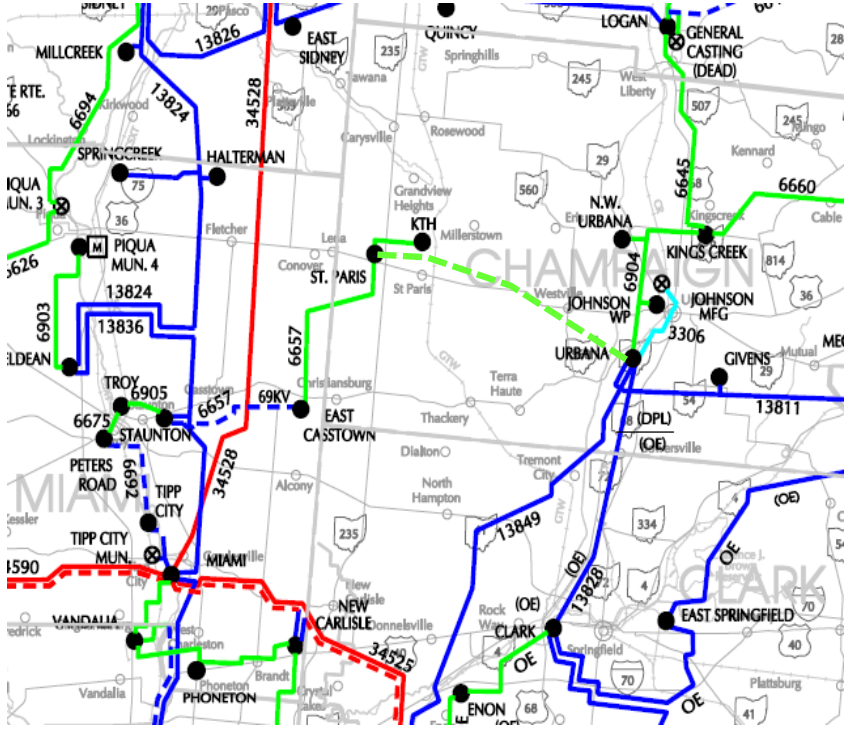


Figure 1 : Area Map

Model: 2020 RTEP Series, 2025 Summer Case

Potential Solution Slide

Need Number: Dayton-2020-010
Process Stage: Solutions Meeting 02/17/2021

Proposed Solution:
St. Paris – Urbana 69kV Line & KTH Alternate Delivery: Construct a new 12.6-mile single circuit 69kV line utilizing 1351 AAC conductor. (Ratings: SN-151, SE-187) **Estimated Transmission Cost: $13.65M, ISD 12/31/2023**

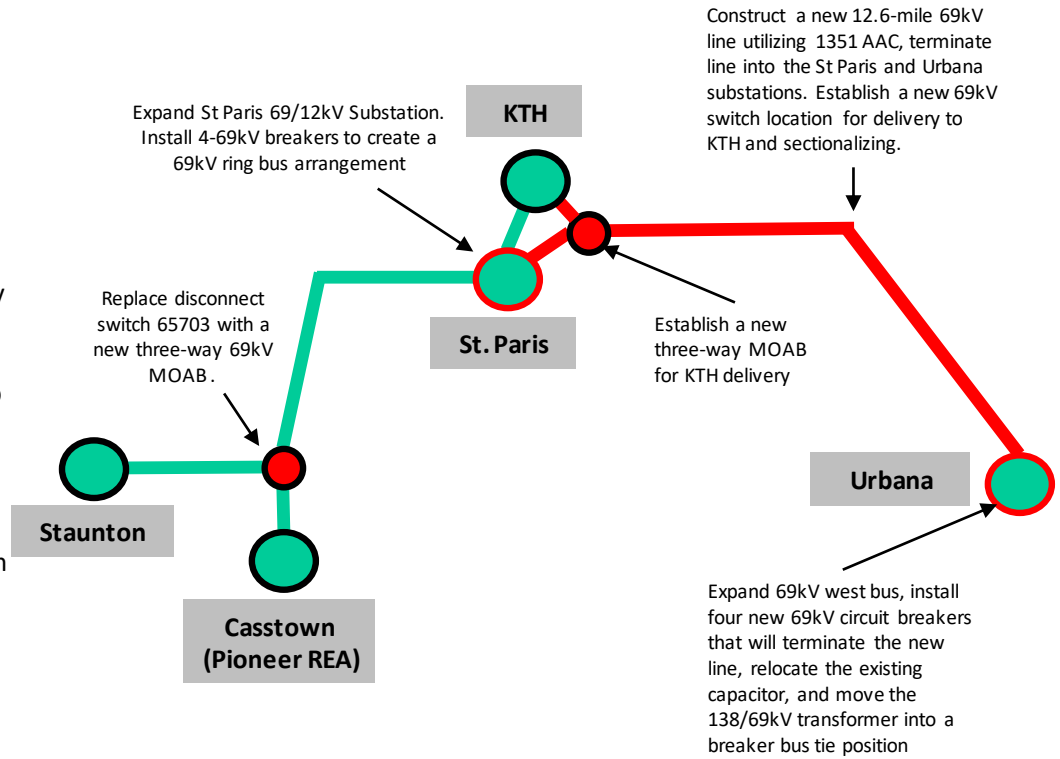
Second KTH Delivery: Provide a second delivery to KTH, who is a large auto parts manufacturer and Champaign County's largest employer. Establish a new 69kV three-way MOAB switch along the St. Paris – Urbana 69kV line.
Estimated Transmission Cost: $0.55M, ISD 12/31/2023

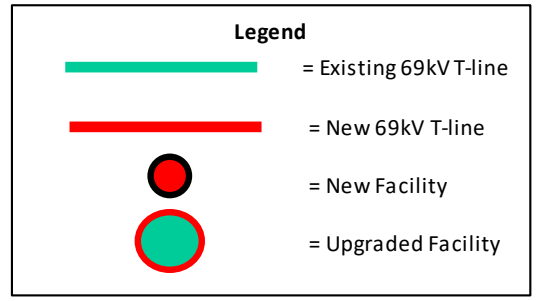
Urbana Substation: Extend the 69kV west bus and install four new 69kV circuit breakers. The new line will terminate into a single 69kV circuit breaker off the existing east bus and relocate the capacitor to a new 69kV circuit breaker off the west bus. The 138/69kV transformer will be relocated to a new double bus double breaker string that will serve as a second bus tie at the substation. This additional bus tie breaker position will provide additional operational flexibility to take maintenance outages at the substation and keep the transformer source connected to the 69kV load center.
Estimated Transmission Cost: $3.5M, ISD 12/31/2023

Casstown Switching Enhancement: Replace the 65703 line disconnect switch toward St. Paris with a new three-way MOAB switch to eliminate the Casstown hard tap configuration. With the new source being added, the Casstown load will now be able to be served from the Urbana Source for permanent outages on the Staunton source.
Estimated Transmission Cost: $0.55M, ISD 12/31/2023

St. Paris Substation: Construct a new four breaker 69kV ring bus configuration to terminate the new 69kV transmission line from Urbana. The new ring bus will expand the existing substation to ensure a two-way source to load at St. Paris and provides switching flexibility for maintenance of equipment at St. Paris.
Estimated Transmission Cost: $2.8M, ISD 12/31/2023
Total Transmission Cost: $21.05M, ISD 12/31/2023
Alternatives Considered:
1. Establish a new 69kV four breaker ring station directly adjacent to the KTH facility. Construct a new 9.0-mile 69kV line terminating into NW Urbana feed. Establish a new three breaker ring replacing the tap arrangement supplying Pioneer REA's 69kV station. Install two 69kV circuit breakers at the St. Paris Substation. **Estimated Cost: $23.4M**

Projected In-Service: 12/31/2023
Project Status: Conceptual
Model: 2020 RTEP – 2025 Summer Case





Dayton Transmission Zone M-3 Process
Dayton, Ohio

Need Number: Dayton-2020-012

Process Stage: Solutions Meeting 02/17/2021

Previously Presented: Need Meeting 12/18/2020

Project Driver:
Source for underlying distribution

Specific Assumption Reference:
Dayton Local Plan Assumptions (Slide 5)

Problem Statement:

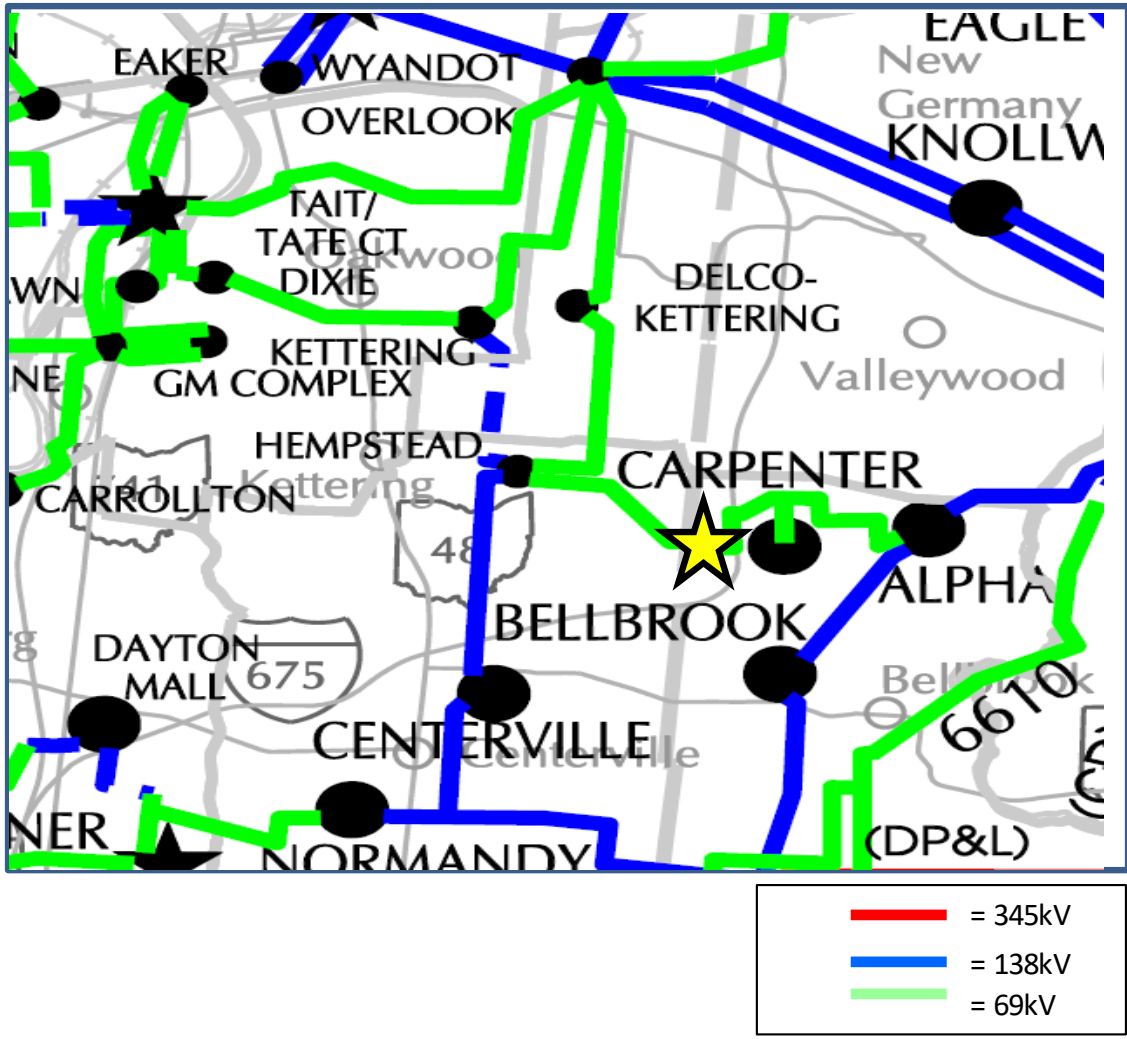
- A large new senior community featuring a mix of residential and retail is being constructed in the Cornerstone Development located in Centerville, OH. This area, served from Dayton's Carpenter Substation, has experienced growth in recent years and this load addition of 5MVA will require additional capacity. Dayton must develop a solution to have capacity to serve distribution load in this load center or risk overloading existing equipment and not having sufficient distribution capacity to serve growing load.

- Carpenter Substation is served via a short 0.1 mile tap from the Alpha-Hempstead 6622 69kV transmission line. Carpenter Substation provides distribution service to the 3,400 customers served in this area via a single 69/12kV 30MVA transformer. A single outage to the 6622 transmission line or distribution transformer at Carpenter would result in a complete loss of service to the 3400 customers.

- The current load (24.4 MVA) and reserved emergency switching capacity (3.5 MVA) place the current 69/12kV 30MVA transformer at Carpenter above 90% of its rating during peak times before the 5MVA load addition.

- Additional circuit ties exist in the area but do not have enough capacity for significant load transfers and would further limit the ability to conduct circuit switching during outages.

Model: 2020 RTEP – 2025 Summer Case



Potential Solution Slide

Need Number: Dayton-2020-012

Process Stage: Solutions Meeting 02/17/2021

Proposed Solution:

Carpenter Substation: To accommodate the installation of a second 69/12kV transformer, expand the Carpenter 69kV bus arrangement and install three new 69kV circuit breakers and associated disconnect switches. The proposed 69kV ring bus arrangement will be configured in a source sink, source sink arrangement. **Estimated Transmission Cost: $3.2M, ISD 12/31/2021 (Does not include distribution costs)**

6622 Alpha – Hempstead 69kV: To accommodate the new ring configuration, extend the 6622 line four spans to terminate the 6622 line into two new breaker positions. **Total Transmission Cost: $0.3M, ISD 12/31/2021**

Total Transmission Cost: $3.5M, ISD 12/31/2021

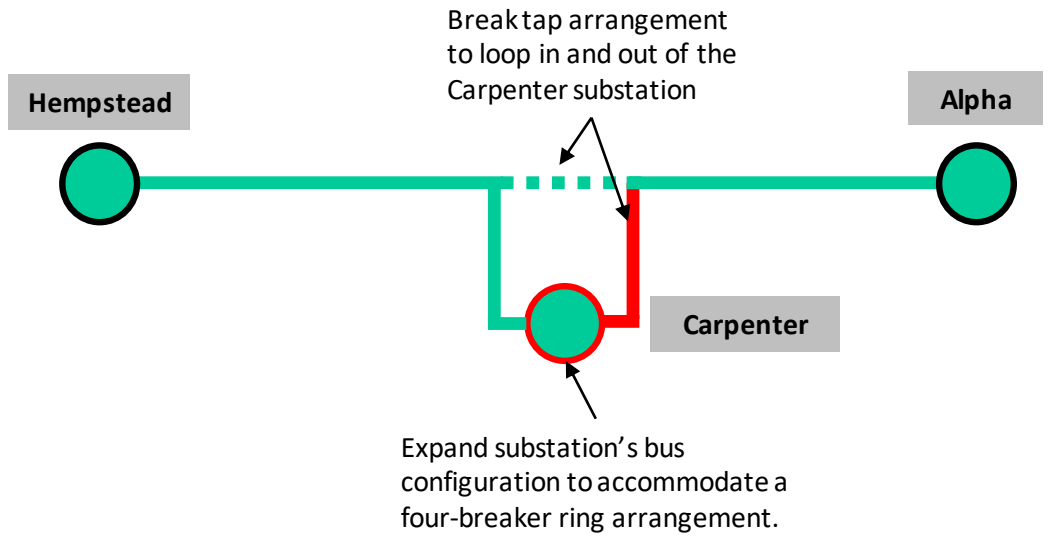
Alternatives Considered:

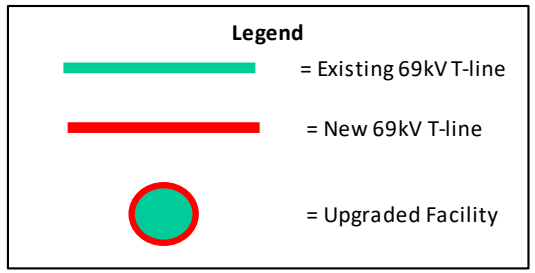
1. Expand the 69kV straight bus arrangement, install three new 69kV breakers (two new high side TF breakers, one new line breaker). Straight bus design would require the same number of breakers but would provide a lower level or reliability and operational flexibility for maintenance activities **Estimated Cost: $3.3M**

Projected In-Service: 12/31/2021

Project Status: Conceptual

Model: 2020 RTEP – 2025 Summer Case





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

2/5/2021 – V1 – Original version posted to pjm.com

2/8/2021 – V2 –Slide #6 and #7, Remove Dayton-2020-007

–Slide #9, Added St. Paris substation work and total cost Remove Dayton-2020-010

2/16/2021 – V3 –Corrected the title of the presentation

2/17/2021 – V4 –Slide #9, Changed Projected IS date to 12/31/2023