

Submission of Supplemental Projects for Inclusion in the Local Plan

- **Need Number:** Dayton-2021-009
- **Process Stage:** Submission of Supplemental Project for inclusion in the Local Plan 2/1/2022
- **Previously Presented:** Need Meeting 8/16/2021
Solutions Meeting 10/15/2021
- **Project Driver:** Source for underlying distribution
- **Specific Assumption Reference:** Dayton Local Plan Assumptions (Slide 5)

- **Problem Statement:**
 - A major customer served from Xenia substation is planning to add approximately 4MW of load by 2023. This potential growth paired with the development of two nearby industrial parks will trigger the need for potential system reinforcements east of Xenia.
 - AES Ohio is planning to build a new 69kV ring bus substation called Jasper in 2023 (s2255.1) to eliminate a three terminal line and to improve reliability on the 6636 Jamestown-Cedarville-Xenia-Glady Run circuit. The 6636-transmission line is a 31-mile circuit constructed primarily with wood poles. The yellow star shown on the map is an approximate location of Jasper Substation and is centrally located to serve future load growth.
 - There have been a total of 17 outages on this circuit for a total of 1245 minutes over the last 5 years.
 - The performance of this line will improve with the addition of Jasper Substation but Xenia Substation will still have exposure to transmission outages with the distribution transformers tapped from a line position between Xenia and Jasper.

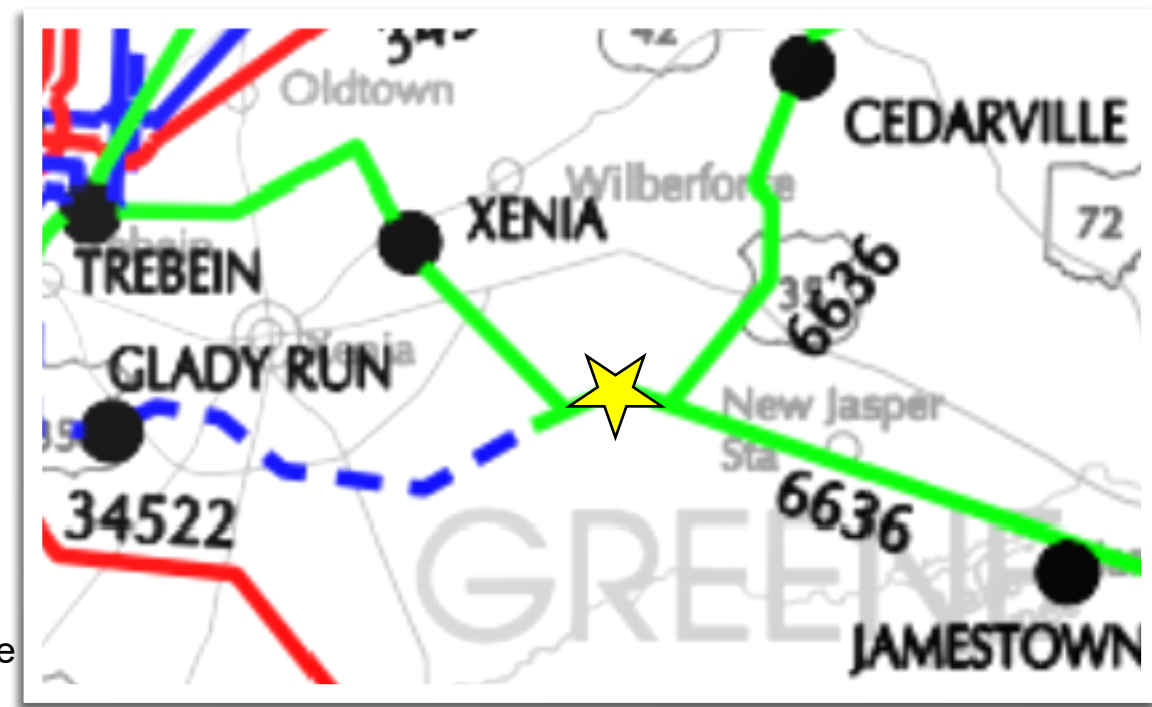
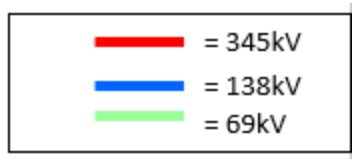
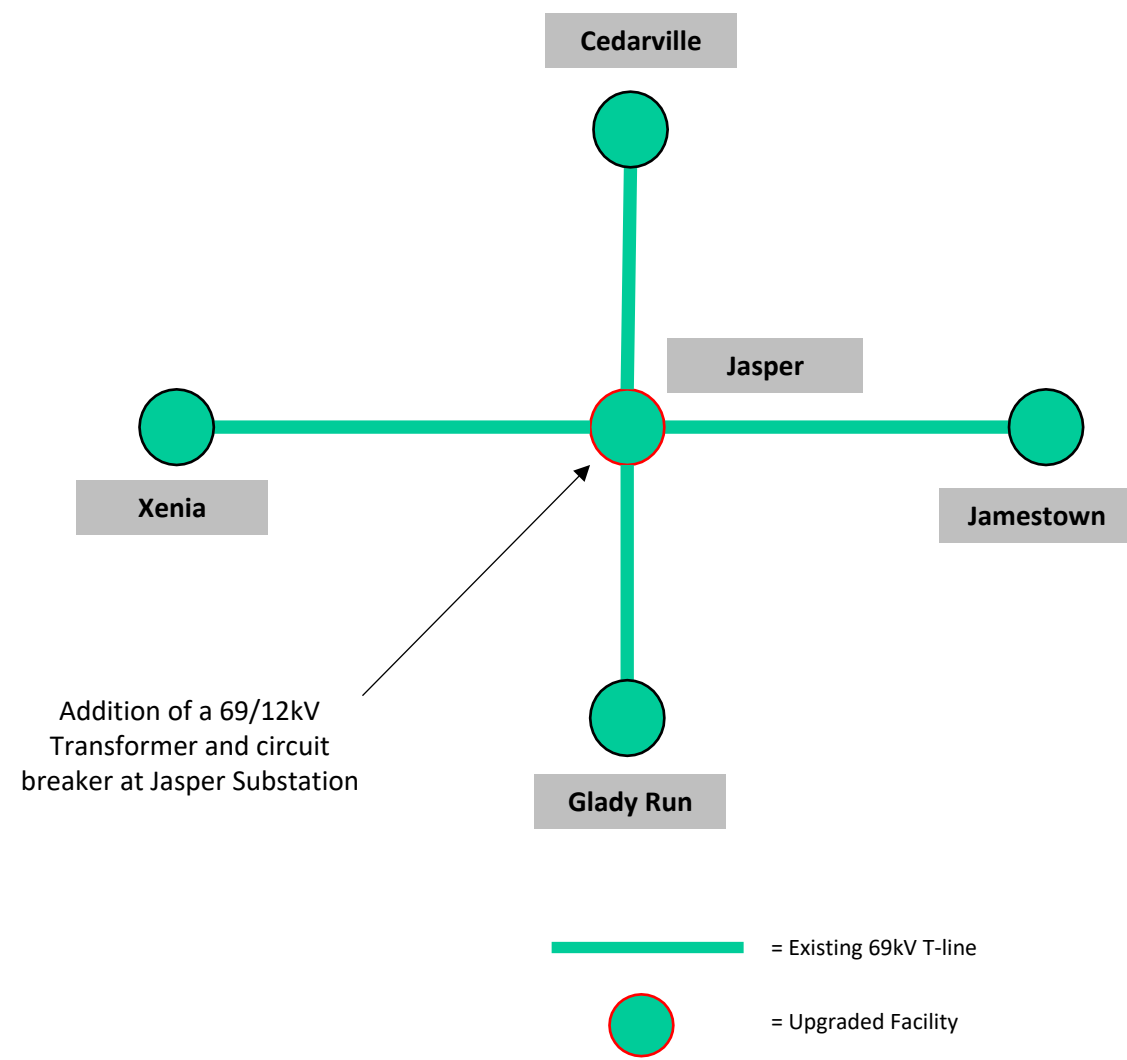


Figure 1 : Area Map



- **Need Number:** Dayton-2021-009
- **Process Stage:** Submission of Supplemental Project for inclusion in the Local Plan 2/1/2022
- **Project Driver:** Source for underlying distribution
- **Specific Assumption Reference:** Dayton Local Plan Assumptions (Slide 5)
- **Selected Solution:**
 - Jasper Substation : A new 69/12kV transformer will be installed at Jasper Substation and terminated into a new 69kV breaker position. This will expand Jasper Substation from a four breaker 69kV ring bus to a five breaker 69kV ring bus. This transformer will increase capacity to serve the new customer load addition coming online and will also support growth in the nearby industrial parks. Further, this will enhance operational flexibility via adding new switching capability between Jasper and Xenia Substations to perform maintenance and help reduce extended outage times due to enhanced switching between the substations. (S2660)
 - **Estimated cost :** \$310K
 - **Projected In-Service:** 12/31/2023
 - **Project Status:** Conceptual
 - **Model:** 2021 RTEP – 2026 Summer Case
 - **Supplemental Project ID:** S2660



Need Number: Dayton-2020-011, Dayton-2021-001, Dayton-2021-008
Process Stage: Submission of Supplemental Project for inclusion in the Local Plan 2/2/2022
Previously Presented: Need Meetings 12/18/2020, 2/17/2021, 5/21/2021
 Solutions Meeting 8/16/2021

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

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

Dayton-2020-011 Problem Statement:

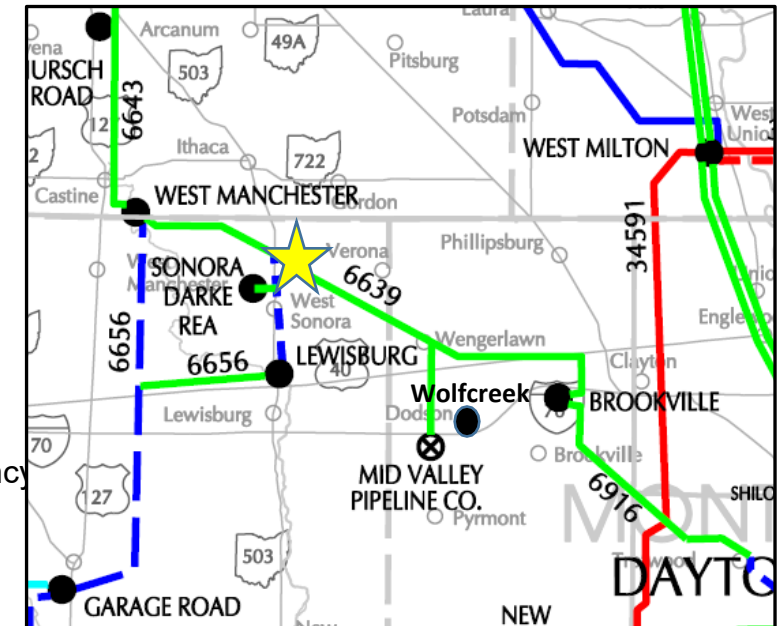
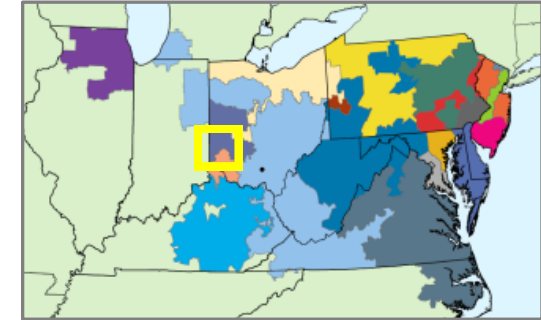
- Buckeye Power, on behalf of Darke Rural Electric Cooperative, has requested reliability upgrades on the West Manchester–Brookville 69kV 6639 and the West Manchester–Garage Road 69kV 6656 lines located in Preble and Montgomery Counties.

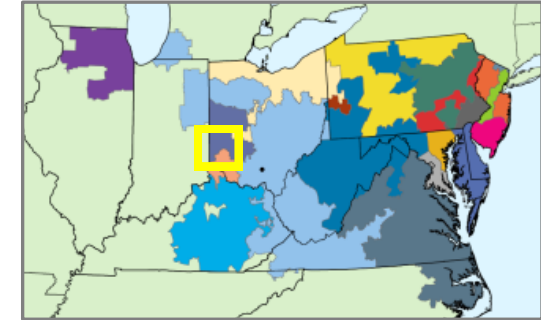
Area Transmission Configuration:

- The 6639 line is a 20-mile 69kV wood pole line serving three Dayton substations (Brookville, Lewisburg, West Manchester), one Darke REA Delivery Point at West Sonora, and one 69kV industrial customer.
 - Lewisburg & West Sonora Stations are both served via a 3.2-mile tap from the 6639 line.
- The 6656 line is a 16-mile 69kV wood pole line built to 138kV standards connecting Dayton substations at Garage Road and West Manchester .
- Lewisburg & West Sonora utilize a 4.61-mile 69kV tap from the 6656 line as a normally open tie for emergency situations. Due to protection limitations, this normally open tie cannot be closed in during normal operations.

Historical Performance

- West Manchester – Brookville 69kV 6639
 - Constructed primarily in 1953
 - Wood pole, crossarm design, 477 ACSR 18/1 conductor
 - 10 permanent outages over last five years
 - The primary causes are equipment failures with broken crossarms being the leading outage cause.
 - 18 momentary outages over last five years
 - The primary causes are lightning, static wire issues, and wind related events.





Need Number: Dayton-2020-011, Dayton-2021-001, Dayton-2021-008

Process Stage: Submission of Supplemental Project for inclusion in the Local Plan 2/2/2022

Previously Presented: Need Meetings 12/18/2020, 2/17/2021, 5/21/2021
Solutions Meeting 8/16/2021

Supplemental Project Driver(s):

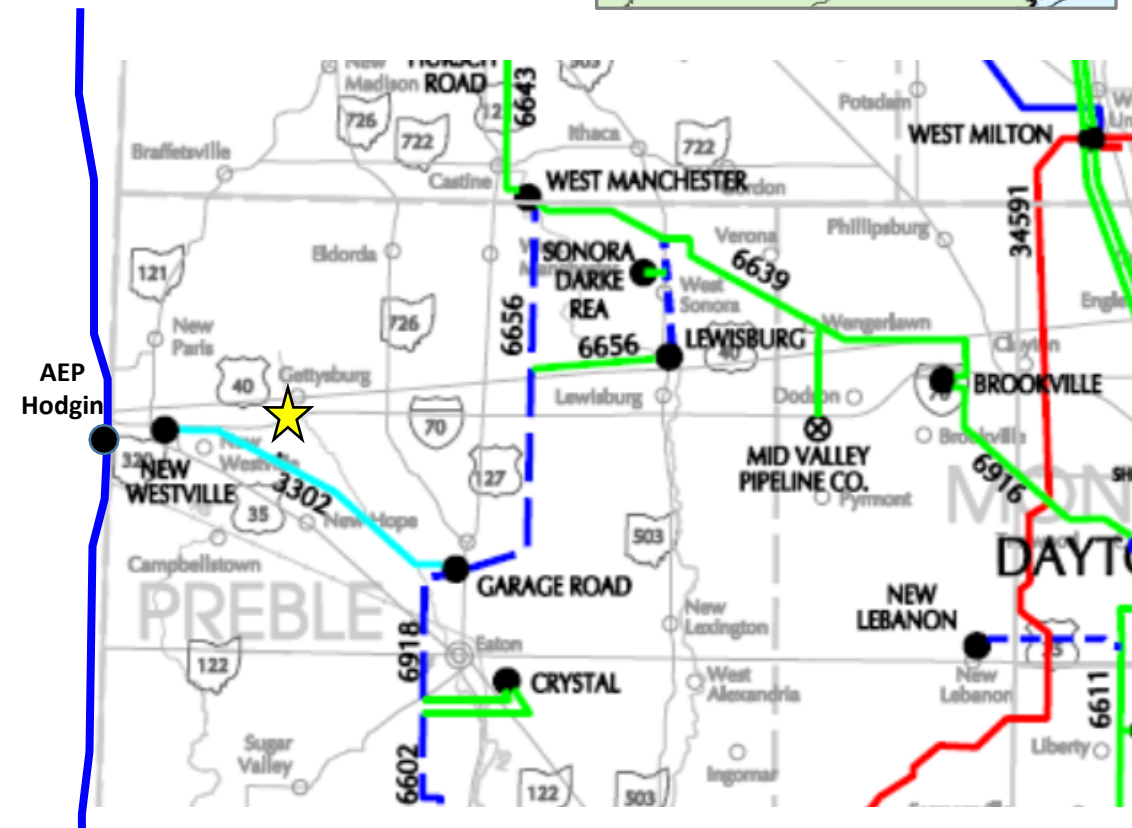
Requested Customer Upgrade, System Configuration Improvements, Operational Performance

Specific Assumption Reference(s):

DP&L 2021 RTEP Assumptions, Slide 5

Dayton-2021-001 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. There are limited transformer spares of this vintage and size so both a near term and long-term solution may be required.
 - 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.



Need Number: Dayton-2020-011, Dayton-2021-001, Dayton-2021-008

Process Stage: Submission of Supplemental Project for inclusion in the Local Plan 2/2/2022

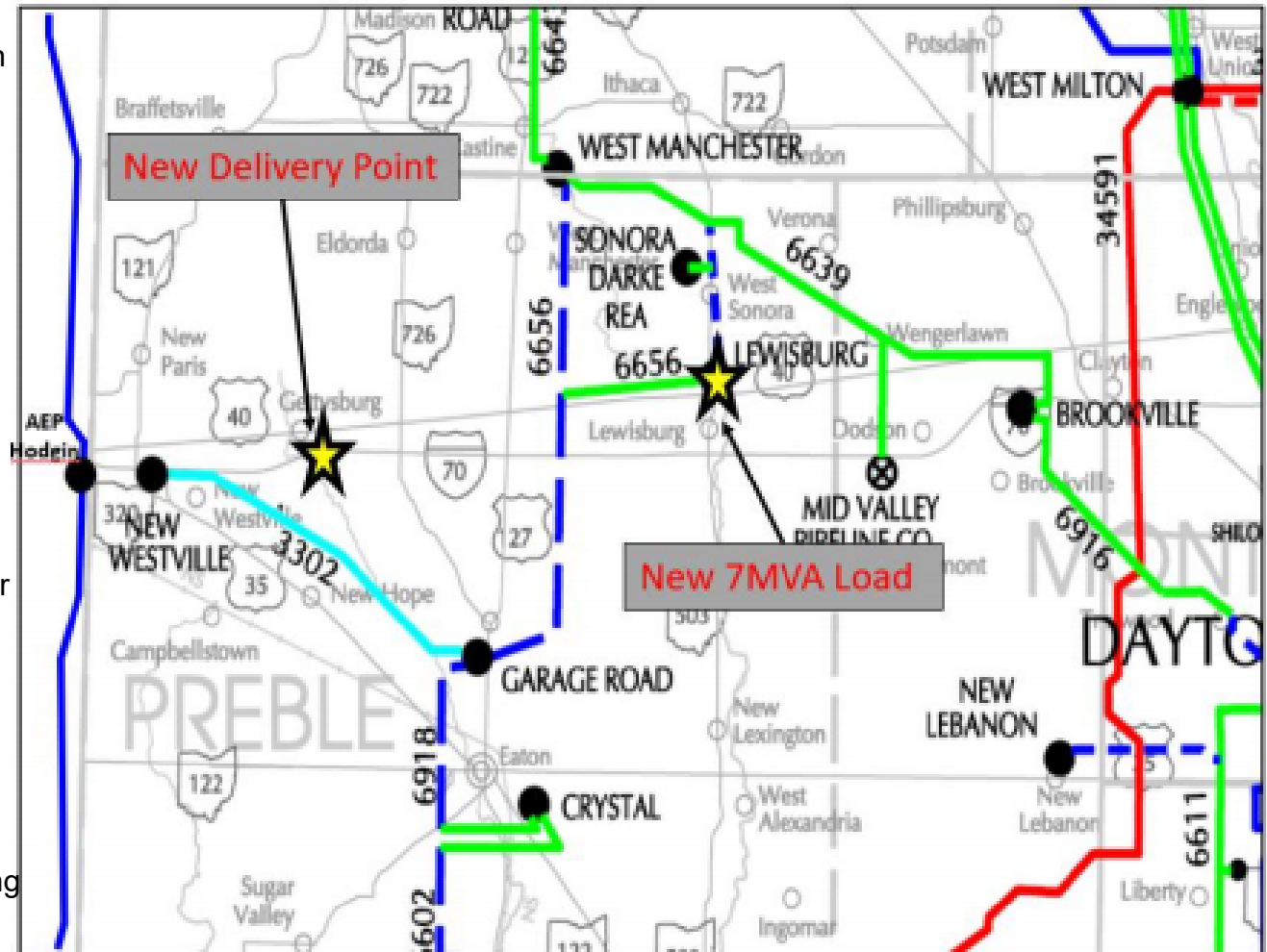
Previously Presented: Need Meetings 12/18/2020, 2/17/2021, 5/21/2021
Solutions Meeting 8/16/2021

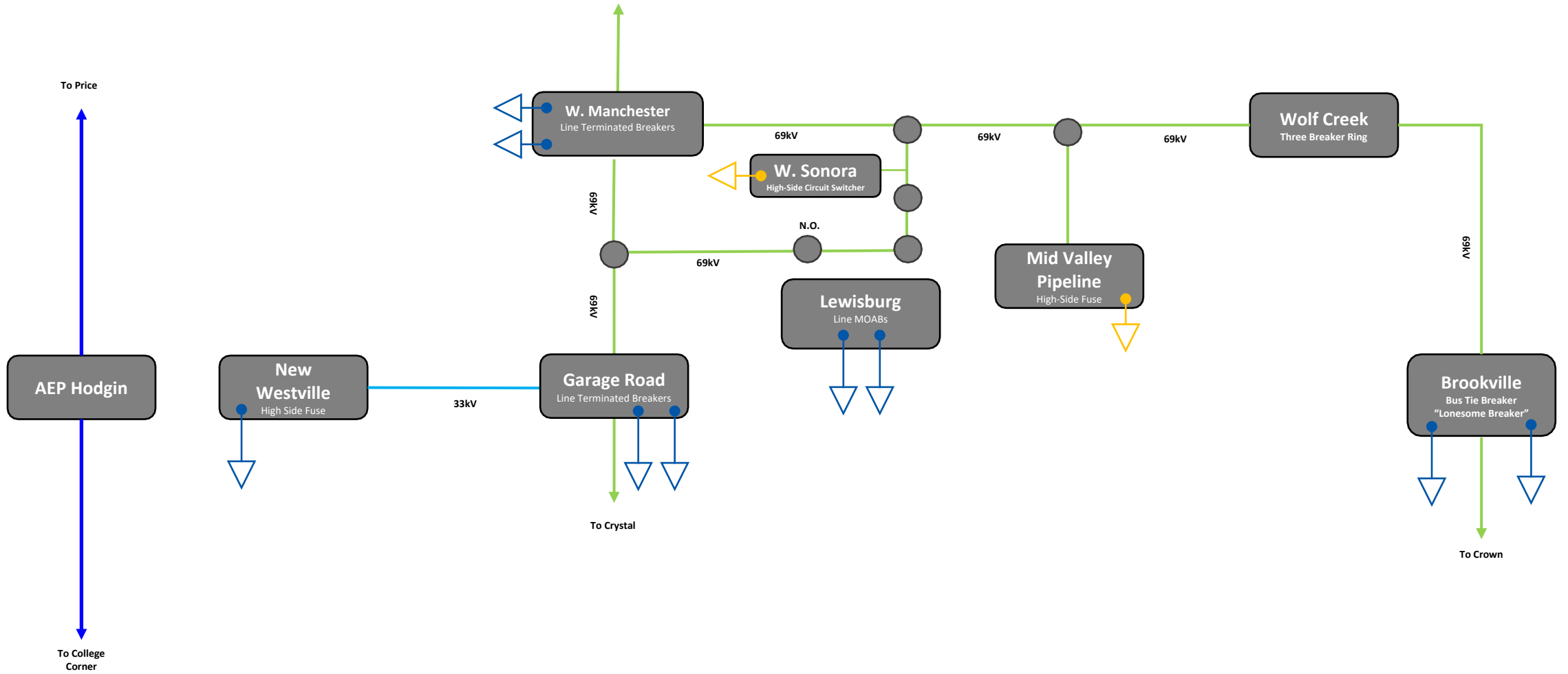
Supplemental Project Driver(s):
Requested Customer Upgrade

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

Dayton-2021-008 Problem Statement:

- Ohio Electric Cooperatives on behalf of Darke Rural Electric has requested a new 138kV delivery point located north of the Rockford 69kV substation.
 - New delivery point is expected to serve 1.86 MVA of load with a ten-year projected load exceeding 1.92 MVA.
 - New POI will be referred to as Orphan Rd
- AES Ohio distribution has received a request to serve a new 7MVA load in the vicinity of the AES Ohio Lewisburg substation.
- The following needs previously presented will be taken into consideration during the development of solutions to meeting the submitted request:
 - DP-2020-011: Need presented on 12/18/2020
 - [20201218-dayton-supplemental-projects.ashx \(pjm.com\)](https://www.pjm.com/20201218-dayton-supplemental-projects.ashx)
 - DP-2021-001L Need presented on 2/17/2021
 - [20210217-dayton-supplemental-projects.ashx \(pjm.com\)](https://www.pjm.com/20210217-dayton-supplemental-projects.ashx)





Need Number: Dayton-2020-011, Dayton-2021-001, Dayton-2021-008

Process Stage: Submission of Supplemental Project for inclusion in the Local Plan 2/2/2022

Proposed Solution:

Part #1: Project Description:

➤ **New Westville Substation Replacement:**

- Establish a new 138kV three breaker ring bus substation that will tie into AEP's Hodgin, connect back to AES Ohio's West Manchester Substation, and serve AES Ohio distribution in the New Westville area. Once the new substation is online, the existing New Westville 33kV Substation will be retired. This will help improve reliability to customers served via New Westville and eliminate vintage 33kV system. The new substation will upgrade the obsolete and non-standard equipment at New Westville
- **Estimated Cost: \$6.0M, In-service Date: 12/31/2025 (s2585.1)**

➤ **New Westville – AEP Hodgin 138kV Line:**

- Construct a 138kV 1.86-mile single circuit transmission line. This transmission line will help loop the radial load served at New Westville as part of the overall effort to improve reliability in this area. Also, it provides a source to feed New Westville load while the 138kV tie built back into the AES Ohio system.
- **Estimated Cost: \$3.7M, In-service Date: 12/31/2025 (s2585.2)**

➤ **New Westville – West Manchester 138kV Line:**

- Construct a new approximate 11-mile single circuit 138kV line from New Westville to the Lewisburg tap off 6656. Convert a portion of 6656 West Manchester – Garage Rd 69kV line between West Manchester - Lewisburg to 138kV operation (circuit is built to 138kV). This will utilize part of the line already built to 138kV and will take place of the 3302 that currently feeds New Westville. The 3302 line will be retired as part of this project.
- **Estimated Cost: \$16.0M, In-service Date: 12/31/2026 (s2585.3)**

➤ **West Manchester Substation:**

- The West Manchester Substation will be expanded to a double bus double breaker design where AES Ohio will install one 138kV circuit breaker, a 138/69kV transformer, and eight new 69kV circuit breakers. These improvements will help improve a non-standard bus arrangement where there is only one bus tie today and will improve the switching arrangement for the West Sonora Delivery Point.
- **Estimated Cost: \$9.9M, In-service Date: 12/31/2026 (s2585.4)**

➤ **New Orphan Rd POI (Darke REA):**

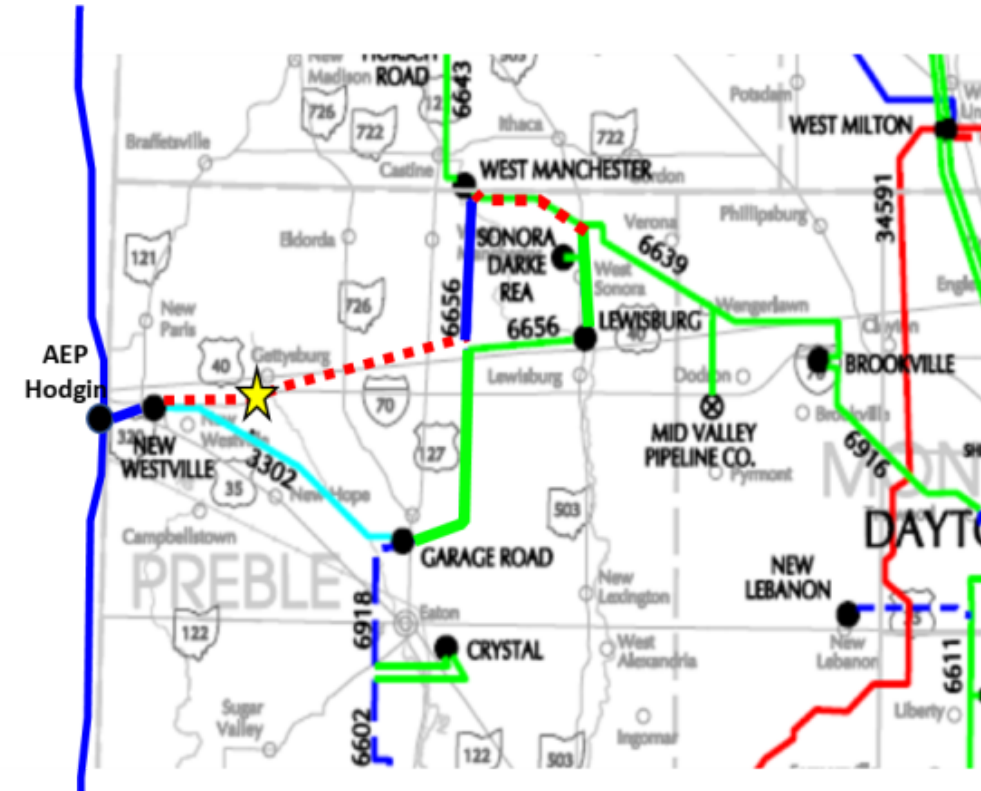
- Install a new three-way phase over phase MOAB to serve a new 138kV delivery point for the Darke REA Electric Co-operative.
- **Estimated Cost: \$0.5M, In-service Date: 12/31/2026 (s2585.5)**

Total Part 1 Cost: \$36.1M

➤ **Project Status:** Conceptual

➤ **Model:** 2021 RTEP – 2026 Summer Case

➤ **Supplemental Project ID: s2585.1-.5**
Dayton Local Plan 2022



Need Number: Dayton-2020-011, Dayton-2021-001, Dayton-2021-008
Process Stage: Submission of Supplemental Project for inclusion in the Local Plan 2/2/2022
Selected Solution:

Part #2: Project Description:

- **West Manchester – West Senora Tap Double Circuit Rebuild**
 - Retire the existing single circuit section of the 6639 line tap to Sonora up to West Manchester and rebuild as a 4-mile double circuit 69kV line. One circuit will connect West Manchester to Lewisburg and the other circuit will connect back to West Manchester to Wolfcreek.
 - **Estimated Cost: \$8.0M, In-service Date: 12/1/2026 (s2585.6)**

- **Lewisburg Substation**
 - The Lewisburg 69kV Substation will be converted to a new four breaker 69kV ring station and will serve the 7MVA additional customer load that is being added in Lewisburg. Also, this conversion will allow AES Ohio to close in the normally open feed at Lewisburg when complete.
 - **Estimated Cost: \$4.5M, In-service Date: 12/1/2025 (s2585.7)**

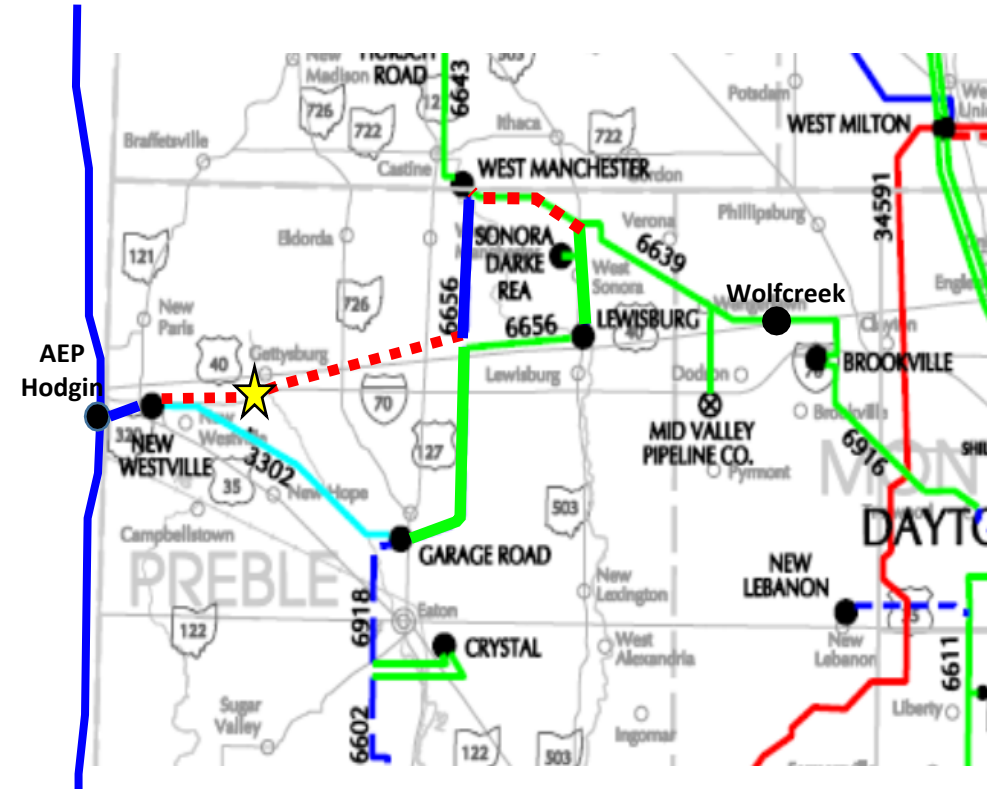
- **West Sonora (Darke REA)**
 - Install a new three-way phase over phase MOAB to serve the Sonora Darke REA delivery point that is currently served via a one-way switch. Retire the existing switch.
 - **Estimated Cost: \$0.5M, In-service Date: 12/1/2025 (s2585.8)**

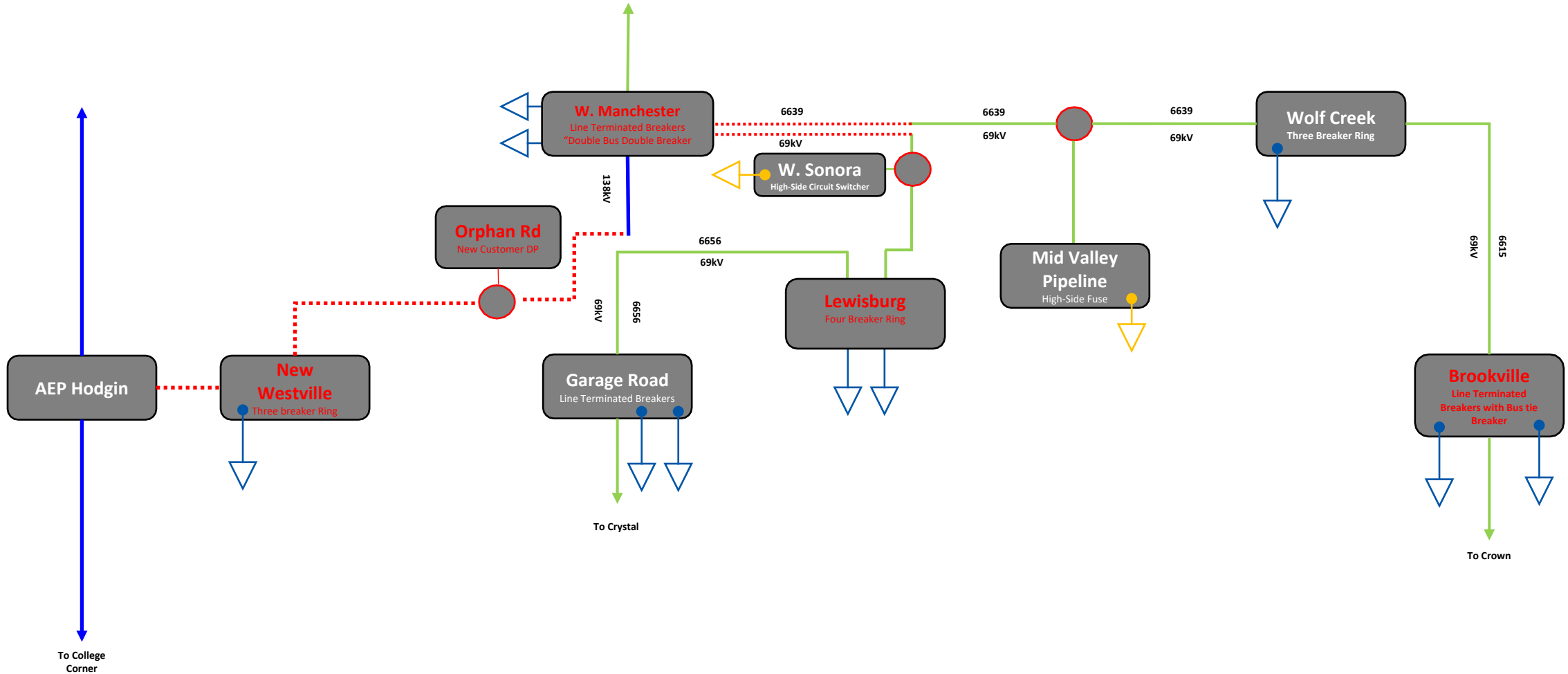
- **Mid-Valley Pipeline Tap**
 - Replace the existing two-way switch with a new three-way phase over phase MOAB switch. This will provide greater flexibility to switch during outages on the portion of the tap down to the customer.
 - **Estimated Cost: \$0.5M, In-service Date: 12/1/2026 (s2585.9)**

- **Brookville Substation:**
 - Modify the bus arrangement at Brookville Substation to install two new 69kV line circuit breakers. This will improve reliability at Brookville Substation by removing tapped transformers from the transmission lines.
 - **Estimated Cost: \$2.9M, In-service Date: 12/1/2026 (s2585.10)**

Total Part 2 Cost: \$16.4M

- **Project Status: Conceptual**
- **Model: 2021 RTEP – 2026 Summer Case**
- **Supplemental Project ID: s2585.6-.10**





Need Number: Dayton-2019-005

Process Stage: Submission of Supplemental Project for inclusion in the Local Plan 5/4/2022

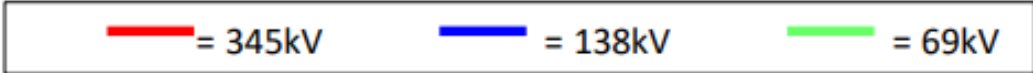
Previously Presented: Needs Meeting 2/20/2019, Solution Meeting 11/20/2020 and 2/18/2022

Project Driver: Source for Underlying Distribution

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

Problem Statement:

- Existing distribution circuits AZ1210 and AZ1205 from Vandalia Substation exceeded their thermal rating this past summer. There continues to be strong load growth in this area with multiple transmission and distribution customer requests.
- Distribution circuits that supply the growing load center emanate from distant substations and end-use customers are beginning to see voltage issues. Specifically, this has been an issue on distribution circuit OC1204 from West Milton.
- There are critical customers served in this area and there is a need to supply sufficient capacity and diversity to ensure continued reliable operations amid the rapid load growth.



Need Number: Dayton-2019-005

Process Stage: Submission of Supplemental Project for inclusion in the Local Plan 5/4/2022

Previously Presented: Needs Meeting 2/20/2019, Solution Meeting 11/20/2020 and 2/18/2022

Selected Solution: (originally presented on 11/20/2020, changes are redlined below)

This project will tap the existing West Milton to Miami 138kV line and build ~~a two new 1.9-mile~~ 138kV circuits, each extending approximately ~1 mile from the tap point to the new substation. ~~to double circuit loop in and out of a new distribution substation.~~ There will be a single 138/12kV 30 MVA distribution transformer, a 138kV delivery to Pioneer REC, ~~installed at the new substation~~ and ~~three four~~ new 138kV breakers arranged in a ring bus configuration, ~~expandable to four breakers.~~ ~~OPGW will be installed between West Milton, the new substation, and Miami substation as part of this project.~~ The new substation will be in proximity to the growing load center near the Dayton airport and will provide critical distribution sources for ~~DP&L AES Ohio's~~ distribution load and Pioneer Electric distribution load in this area.

Estimated cost: ~~\$8.7M~~ \$12.9M

Reason for Revision:

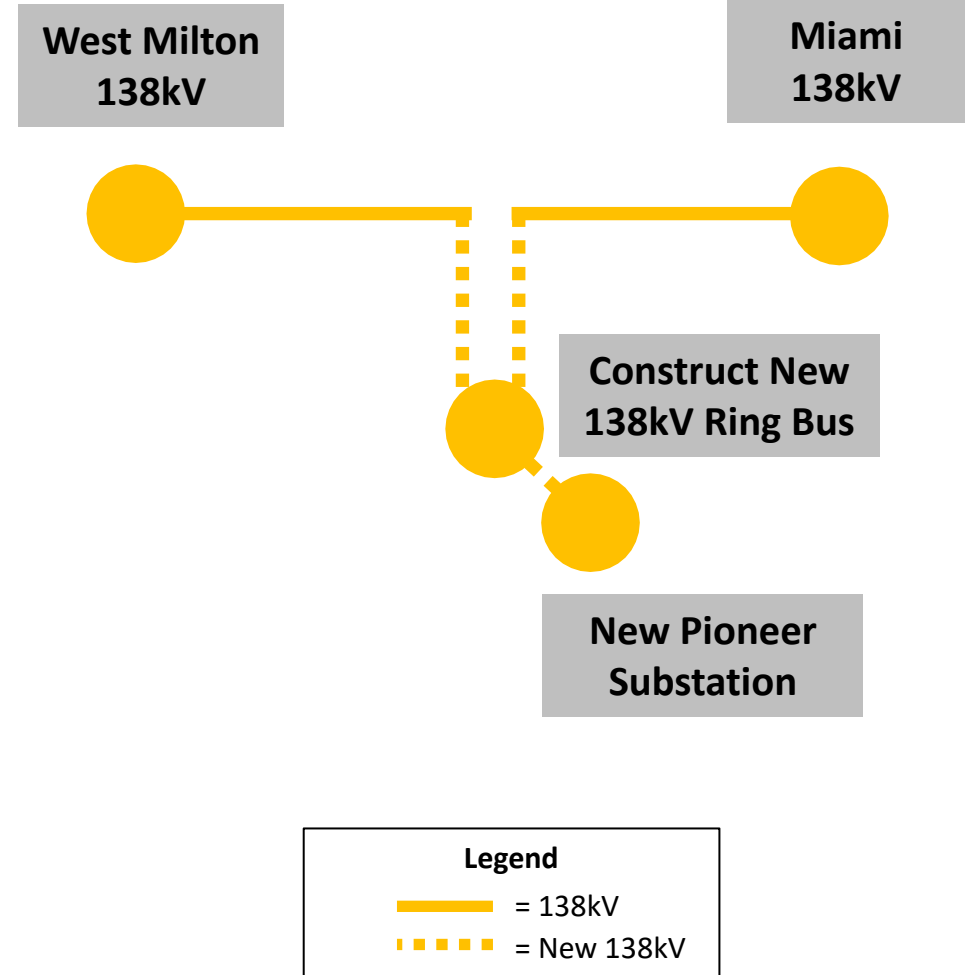
- A fourth breaker and short line extension has been added to accommodate a new 138kV delivery to Pioneer who has recently finalized agreements to serve additional large new customer loads in the vicinity of the City of Union.

Projected In-Service: 12/31/2022

Project Status: Engineering

Model: 2020 RTEP – 2025 Summer Case

Supplemental Project ID: s2422



- **Need Number:** Dayton-2021-011
- **Process Stage:** Submission of Supplemental Project for inclusion in the Local Plan 5/4/2022
- **Previously Presented:** Needs Meeting 12/17/2021, Solutions Meeting 2/18/2022
- **Project Driver:** Source for underlying distribution
- **Specific Assumption Reference:** Dayton Local Plan Assumptions (Slide 5)
- **Problem Statement:**
 - AES Ohio transmission has received a request for a new distribution delivery point out of its proposed Octa substation.
 - AES Ohio's Jeffersonville substation provides service to the local area distribution system and to a large industrial customer. For the contingency loss of the 69/12kV transformer serving the industrial customer, the remaining distribution source is unable to adequately support the customer's load.
 - There are two 69/12kV distribution delivery points served via the Washington Court House substation. For the contingency loss of bank 2, the remaining distribution sources are unable to restore service to all load served from the substation
 - As part of previously presented supplemental project (S2256), AES Ohio plans to construction a new 69kV ring bus substation designated as Octa. The Octa substation allows for a second 69kV source to be established into the radially fed Jeffersonville substation while avoiding the creation of a new three terminal line configuration. This proposal seeks to address historical reliability concerns associated with the radial 6902 Jamestown-Jeffersonville-Washington Court House circuit.
 - The 6902-transmission circuit is approximately 31.16 miles in length utilizing wood pole construction and has recorded a total of 24 outages total to 1,887 minutes over the last 5 years.

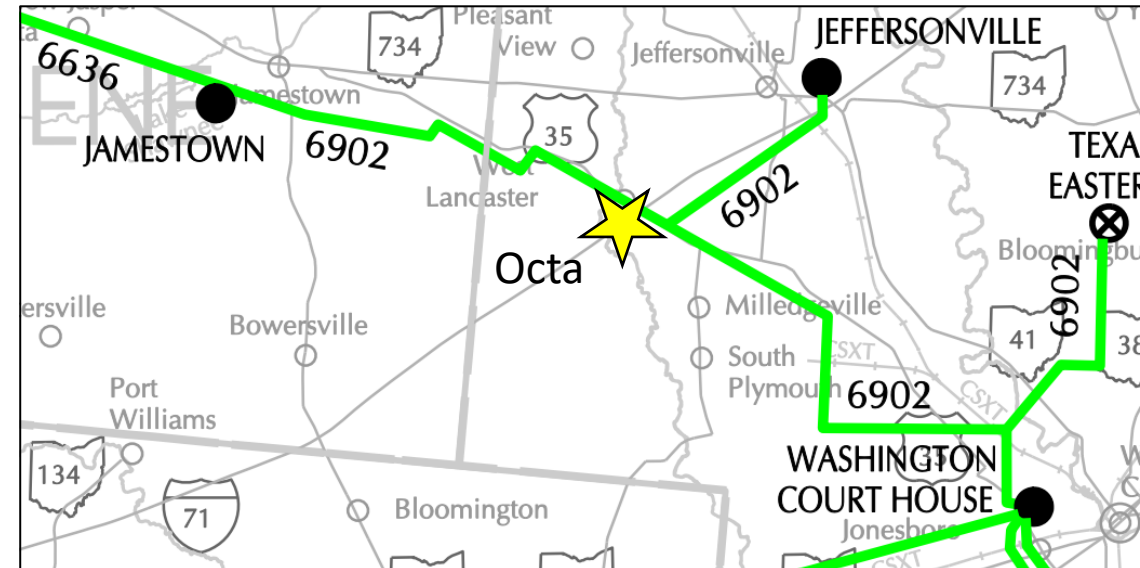
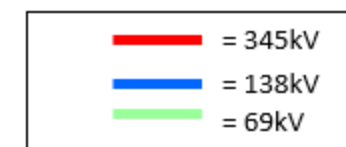


Figure 1 : Area Map



Need Number: Dayton-2021-011

Process Stage: Submission of Supplemental Project for inclusion in the Local Plan 5/4/2022

Previously Presented: Needs Meeting 12/17/2021, Solutions Meeting 2/18/2022

Selected Solution:

➤ **Octa Substation :** A new 69/12kV transformer will be installed at Octa Substation and terminated into a new 69kV breaker position. This will expand Octa Substation from a three breaker 69kV ring bus to a four breaker 69kV ring bus. This transformer will create a new delivery point for AES Ohio distribution. This delivery point will provide capacity and switching flexibility, particularly at the Washington Courthouse and Jeffersonville substations, ensuring load can be restored under contingency conditions.

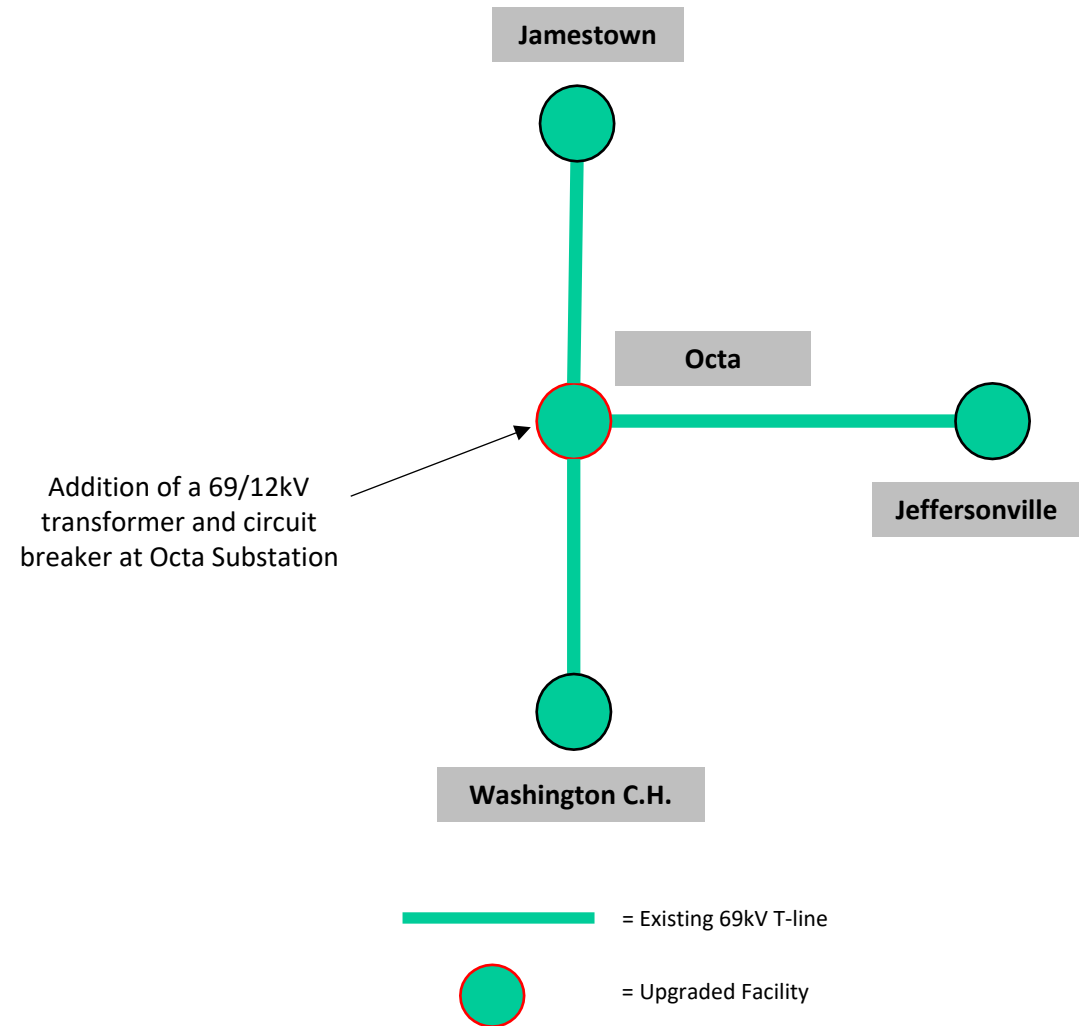
➤ **Estimated cost :** \$310K

➤ **Projected In-Service:** 12/31/2023

➤ **Project Status:** Conceptual

➤ **Model:** 2021 RTEP – 2026 Summer Case

➤ **Supplemental Project ID:** s2695



Need Number: Dayton-2021-012

Process Stage: Submission of Supplemental Project for inclusion in the Local Plan 12/14/2022

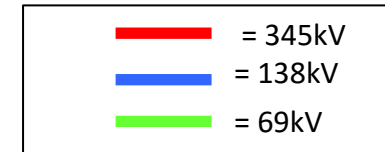
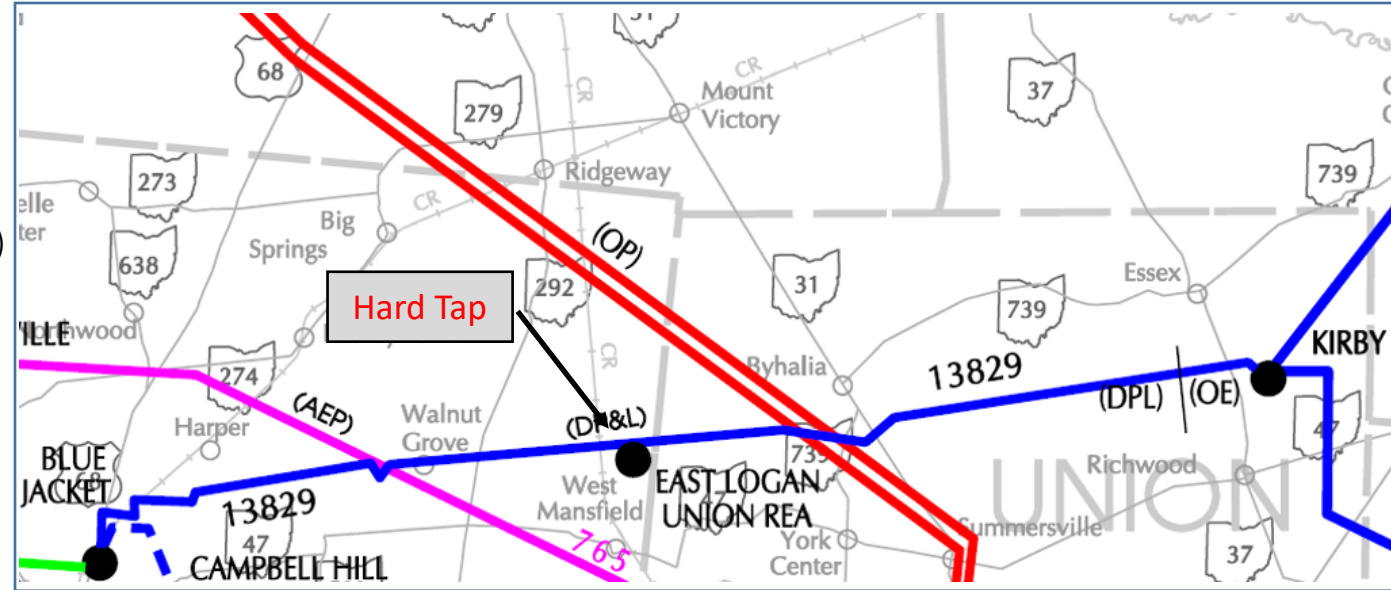
Previously Presented: Needs Meeting 12/17/2021, Solutions Meeting 5/19/2022

Project Driver: Requested Customer Upgrade, Operational Performance

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

Problem Statement:

- Logan County Electric Cooperative and Union Rural Electric Cooperative have both requested system upgrades due to being hard tapped off the 13829 Blue Jacket-Kirby 138kV line. The total combined load served by the tap is 10MWs.
- Due to lack of sectionalizing associated with the hard tap configuration, during outage conditions the Logan CEC & Union REC are forced to manually transfer the load served from the POI to alternate POIs.
- If any outages occur on the 14-mile Blue Jacket-Kirby 138kV line between the East Logan tap in AES Ohio's service territory and Kirby in First Energy's service territory, there is no way to restore service to the POI due to the lack of sectionalizing.
- Since 2016, the Blue Jacket-Kirby 138kV line has experienced 6 outages (4 permanent and 2 momentary). There has been 2 multi-day outages in the past five years due to poles going down on the First Energy side and no quick way to restore service to the East Logan delivery point.



Need Number: Dayton-2021-012

Process Stage: Submission of Supplemental Project for inclusion in the Local Plan 12/14/2022

Previously Presented: Needs Meeting 12/17/2021, Solutions Meeting 5/19/2022

Proposed Solution:

- Install two new supervisory controlled automatic sectionalizing switches on each side of the East Logan tap.

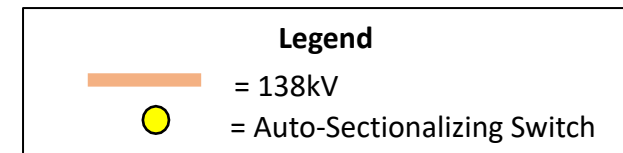
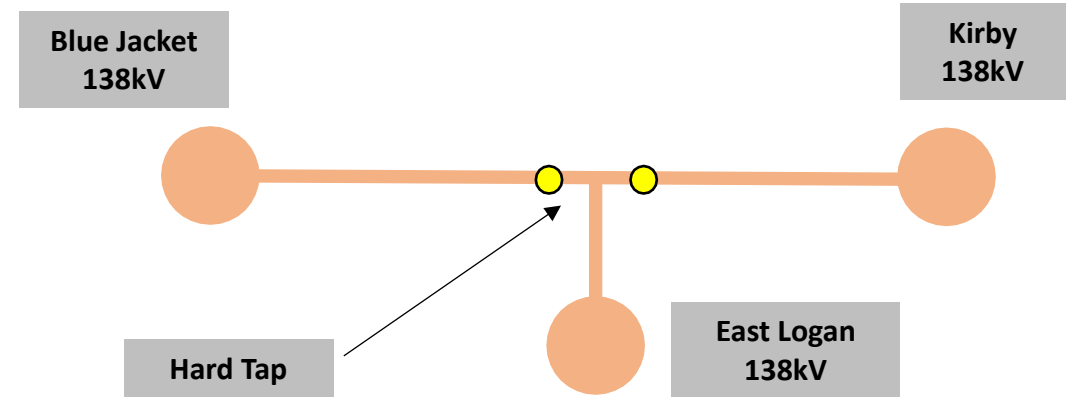
Estimated Cost: \$550k

Project In-Service Date: 12/31/2025

Project Status: Conceptual

Model: 2021 RTEP Series, 2026 Summer Case

Supplemental Project ID: S2790



Need Number: Dayton-2022-003

Process Stage: Submission of Supplemental Project for inclusion in the Local Plan 12/14/2022

Previously Presented: Need Presented, 3/18/2022; Solution Presented, 07/22/2022

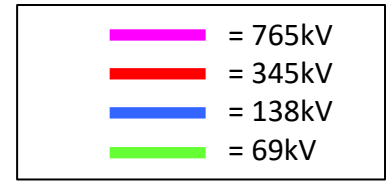
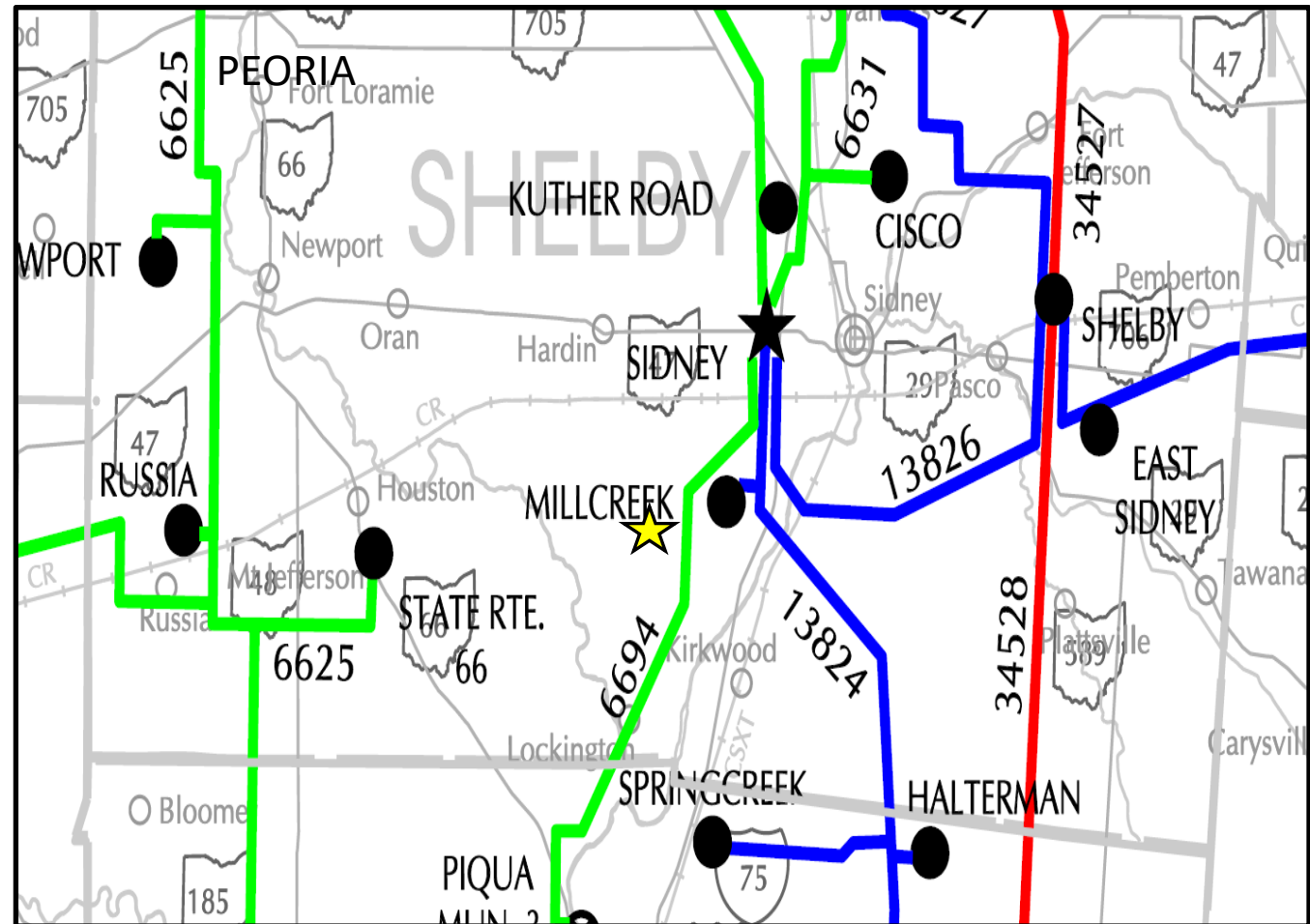
Project Driver: Customer Service

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

Problem Statement:

- AES has received multiple customer requests for new interconnections in the vicinity of its Millcreek Substation
- Total MW load requests, associated timelines, & load totals

Request	In-Service Date	Total New Connected Load
+5.0 MWs	10/1/2023	5 MWs
+14.4 MWs	4/1/2024	19.4 MWs
+14.0 MWs	10/1/2024	33.4 MWs
+14.4 MWs	4/1/2025	47.4 MWs
+19.0 MWs	10/1/2025	66.4 MWs



Need Number: Dayton-2022-003

Process Stage: Submission of Supplemental Project for inclusion in the Local Plan 12/14/2022

Previously Presented: Need Presented, 3/18/2022; Solution Presented, 07/22/2022

Project Driver: Customer Service

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

Proposed solution:

Dayton has developed a comprehensive distribution and transmission solution to meet the needs identified in the problem statement. The proposed customer load center is less than a mile from the existing 138kV substation at Millcreek. With this solution, a double circuit 138kV line will tap the Millcreek to Eldean line and loop in and out to the new Creekside sub. Three 138/12kV transformers will be installed in the additional breaker positions to provide express service to the customer.

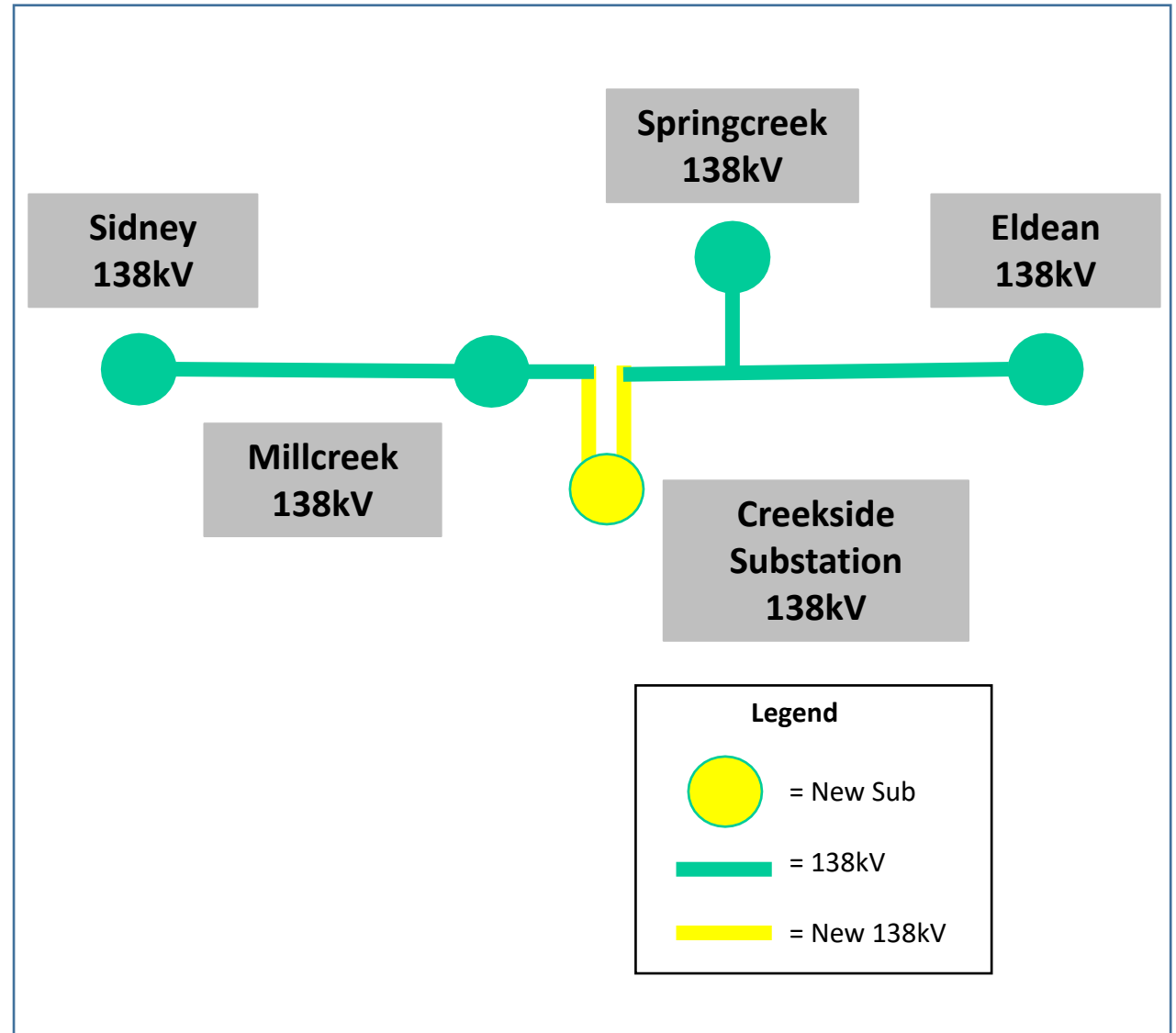
- **Estimated Cost: \$13.5M**

Projected In-Service: 06/1/2024

Project Status: Conceptual

Supplemental Project ID: S2799

Model: 2021 RTEP Series, 2026 Summer Case



Revision History

2/1/2022 – V1 – Added Slides #2-3, S2660

2/2/2022 – V2 – Added Slides #4-10, S2585.1-.10

5/4/2022 – V3 – Added Slides #11-14, S2422 and S2695

10/14/2022 – V4 – Added Slides #15-18, S2790 and S2799