Sub Regional RTEP Committee: Western
Dayton Supplemental Projects

March 15, 2024

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

Dayton Transmission Zone M-3 Process
Dayton, Ohio

Need Number: Dayton-2021-002

Previously Presented: Need Presented, 3/19/2021

Process Stage: Solution Meeting 03/15/2024

Project Driver: Customer Service

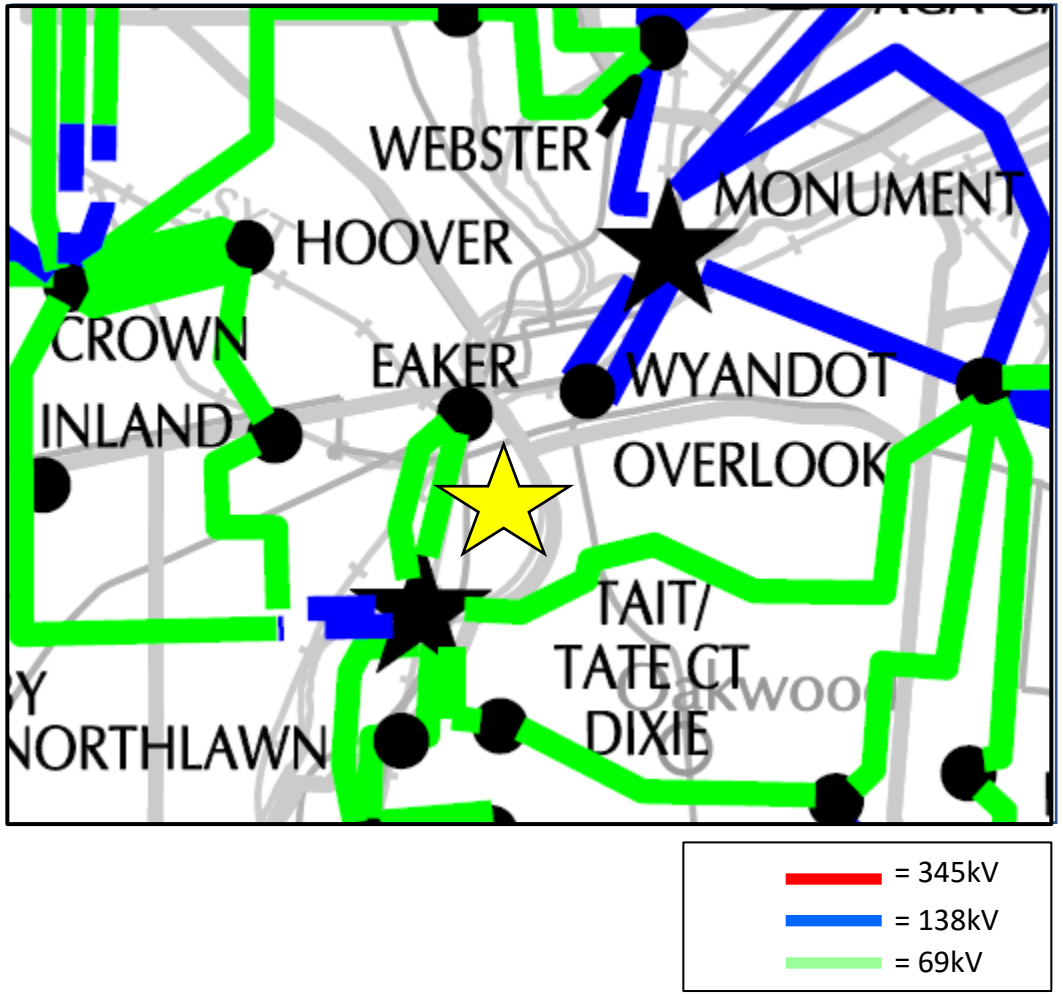
Specific Assumption Reference: Dayton Local Plan Assumptions (Slide 5)

Problem Statement:

- DP&L d/b/a AES Ohio Distribution is planning for a 5MVA load increase from a new development near the Montgomery County Fairgrounds. Currently, this area is served via the Eaker Substation and the distribution circuits out of Eaker are heavily loaded and would be over 100% with the addition of this new load. This general area has experienced growth in recent years and the load addition of 5MVA will require additional capacity.

- Additionally, the Tait substation provides distribution services to The University of Dayton and a local critical facility through a 2.0+ mile long URD cables. The cables have historically been difficult to work with during outages and will need future upgrades. It is essential that a new source is located near the load center and critical customer to reduce exposure to cable faults and serve the growing load.

- 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.



Need Number: Dayton-2021-002
Previously Presented: Need Presented, 3/19/2021

Process Stage: Solution Meeting, 03/15/2024

Project Driver: Customer Service

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

Selected Solution:

- **Midtown Substation:** install a new four breaker ring bus substation downtown Dayton. The solution will allow us to serve the load increase near the Montgomery County Fairgrounds and create shorter, more reliable feeds to local critical facilities. **Estimated Transmission Cost: $8.3M, ISD 12/31/2028**
- **Midtown – 6651 69kV Line:** Cut in/out of the existing Tait – Eaker 1 circuit (6651) and build ~ 1.44-mile double circuit line looping in and out of the new Midtown substation using 1351 AAC conductor with OPGW. **Estimated Transmission Cost: $4.6M, ISD 12/31/2028**
- **Eaker Substation:** AES will install a new 2000A 69kV circuit breaker at the Eaker Substation to sectionalize the existing transmission. AES will also install transmission lines relays for 6650 and the new 69KV from Eaker to the Midtown sub. **Estimated Transmission Cost: $4.0, ISD 12/31/2028**

Total Estimated Transmission cost: $16.9M

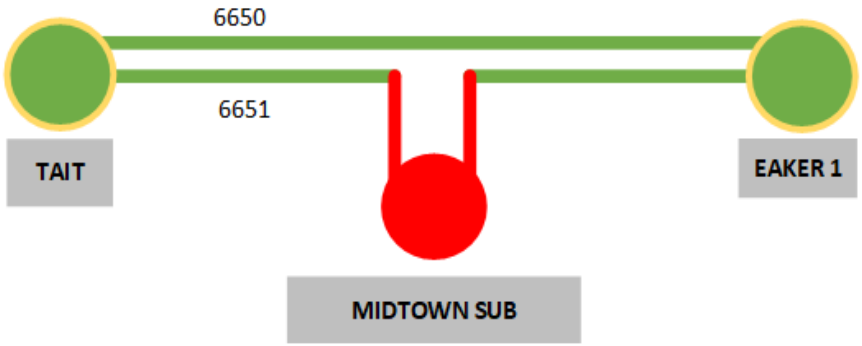
Projected In-Service: 12/31/2028

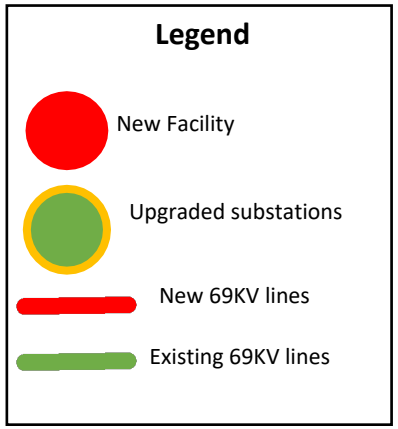
Alternatives Considered:

- Replace the long underground distribution feeders which are nearing their lifespan and have been historically difficult to work with during outage**. Estimated Transmission Cost $ 5.5M**

Project Status: Conceptual

Model: 2023 RTEP – 2028 Summer Case





Need Number: Dayton-2021-005

Previously Presented: Need Presented, 05/21/2021

Process Stage: Solution Meeting 03/15/2024

Project Driver: Operational Flexibility and Efficiency, Equipment Material Performance & Risk

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

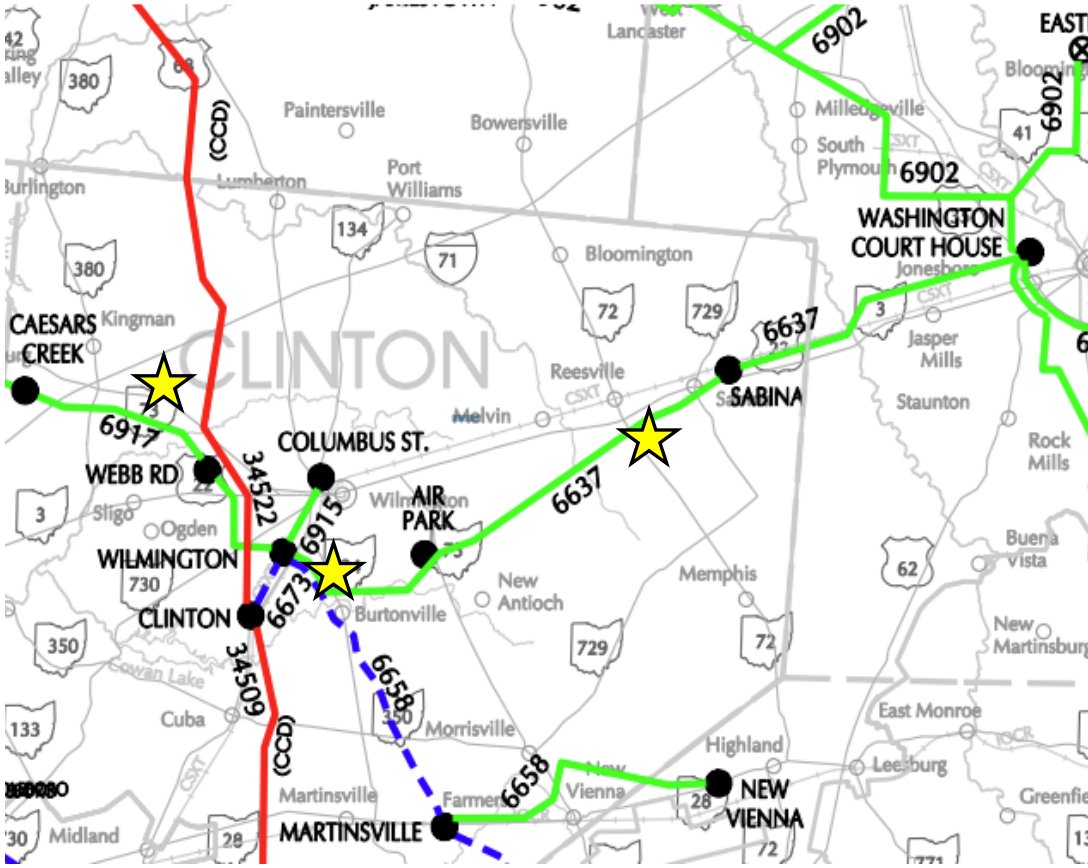
Problem Statement:

- The line 6915 from Wilmington-Columbus Street is a 2.60-mile radial 69kV transmission line (6915) was primarily constructed using wood pole, cross-arm and brace design in 1978. The line 6915 provides transmission and distribution level service to 5190 customers in Clinton county totaling approximately 35MW of load. A fault occurring anywhere on this line will result in the permanent outage to all 5190 customers. The line has experienced 6 outages (6 momentary) since 2016.

- The line 6917 from Wilmington to Caesars Creek is a 9.24-mile-long line, primarily constructed using wood pole, cross-arm and brace design in 1978, has seen 11 outages (6 permanent, 5 momentary) over the last 5 years. A fault occurring anywhere on this line will result in the permanent outage to all 2120 customers.

- The line 6637 (23 miles) from Washington CH to Wilmington constructed in 1967 is also wood pole, cross-arm brace design and has seen 13 outages in the last 5 years. The line has limited protection, there are existing sectionalizing switches at Sabina to help reduce outage time, but the switches have not operated reliably during outage conditions due to alignment issues and any fault will result in dropping the load at Sabina (13 MVA, 2664 customers) and Airpark (16MVA, 1171 customers)

- The line 6673 (1.97 miles) constructed in 1974, from Wilmington to Clinton is also wood pole, cross-arm brace design and has seen 1 permanent outage in the last 5 years.



Need Number: Dayton-2021-005

Previously Presented: Need Presented, 05/21/2021

Process Stage: Solutions Meeting 03/15/2024

Project Driver: Operational Flexibility and Efficiency, Equipment Material Performance & Risk

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

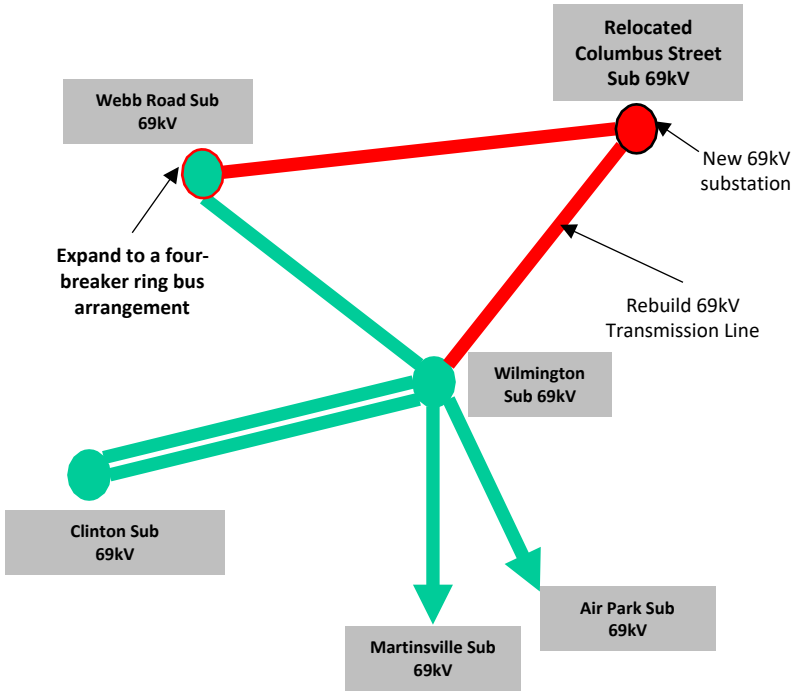
Proposed Solution (Part 1):

- **Columbus Street Substation:** Retire the existing Columbus Street 69/12kV substation. Construct a new replacement Columbus Street substation. Install four 69kV circuit breakers arranged in a four-breaker ring configuration. **Estimated Cost: $11.2M, ISD 12/31/2027**

- **Columbus Street – Webb Road 69kV Line:** Construct a new 7.1 miles 69kV line with 1351 AAC and OPGW from Webb Road station to the newly established Columbus Street replacement substation **Estimated Cost: $17.2M, ISD 12/31/2027**

- **Wilmington – Columbus Street 69kV Line:** Rebuild the 2.6-miles Columbus Street – Wilmington 69kV line with 1351 AAC and OPGW. Construct a new 0.9-mile 69kV line extension into the newly relocated Columbus Street substation. Upgrade relaying at both remote ends. **Estimated Cost: $8.8M, ISD 12/31/2028**

- **Webb Road Substation:** Expand the Webb Road 69kV substation and construct a new 69kV four breaker ring. **Estimated Cost: $9M, ISD 12/31/2028**



Estimated Transmission Cost Part 1: $46.2M, ISD 12/31/2028

Alternatives Considered Part 1:

- Construct a new approximately 7.9-mile single circuit 69kV line from new Columbus Street to Air Park and expand the Air Park substation to a 4-breaker ring bus. **Estimated Cost $51M**

Project Status: Conceptual

Model: 2023 Series RTEP - 2028 Summer Case

Need Number: Dayton-2021-005

Previously Presented: Need Presented, 05/21/2021

Process Stage: Solutions Meeting 03/15/2024

Project Driver: Operational Flexibility and Efficiency, Equipment Material Performance & Risk

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

Proposed Solution (Part 2):

- **Washington CH – Wilmington 69kV Line (6637) Rebuild with OPWG Fiber** : AES will rebuild ~ 23.0-mile 69kV line from Washington CH to Wilmington Substation utilizing 1351 AAC conductor with OPGW fiber, including remote ends upgrades at Wilmington and Washington CH substations. **Estimated Cost: $60.1M, ISD 12/1/2030**

- **Sabina 69kV Substation:** AES will install a new 4 breaker ring bus configuration between the two 69/12kV banks, replace four switches, replace the existing wood structures with steel. **Estimated Transmission Cost: $9M, ISD 12/1/2030**

- **Air Park 69kVSubstation:** AES will install two new 2000A 69kV circuit breakers to establish three breaker ring bus at the existing Air Park substation. **Estimated Cost: $5.2M, ISD 12/1/2029**

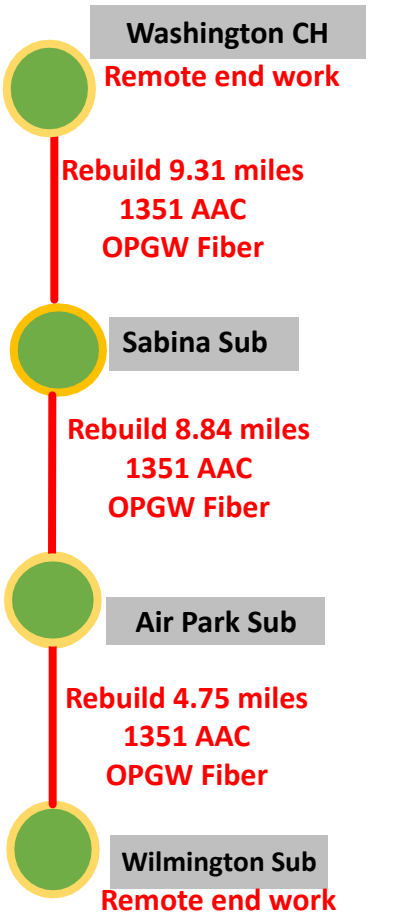
Estimated Transmission Cost Part 2: $74.3M

Alternatives Considered Part 2:

- Install breakers at Air Park to break up the line instead of the switches and Install a breaker at the Sabina substation – Not selected, because this option only addresses part of the need.

Total Estimated Transmission Cost Part 1 & 2: $120.5M
Projected In Service: 12/1/2030

Project Status: Conceptual
Model: 2023 RTEP Series - 2028 Summer Case



Dayton Transmission Zone M-3 Process

Need Number: Dayton-2022-005

Previously Presented: Need Presented, 09/16/2022

Process Stage: Solution Meeting 3/15/2024

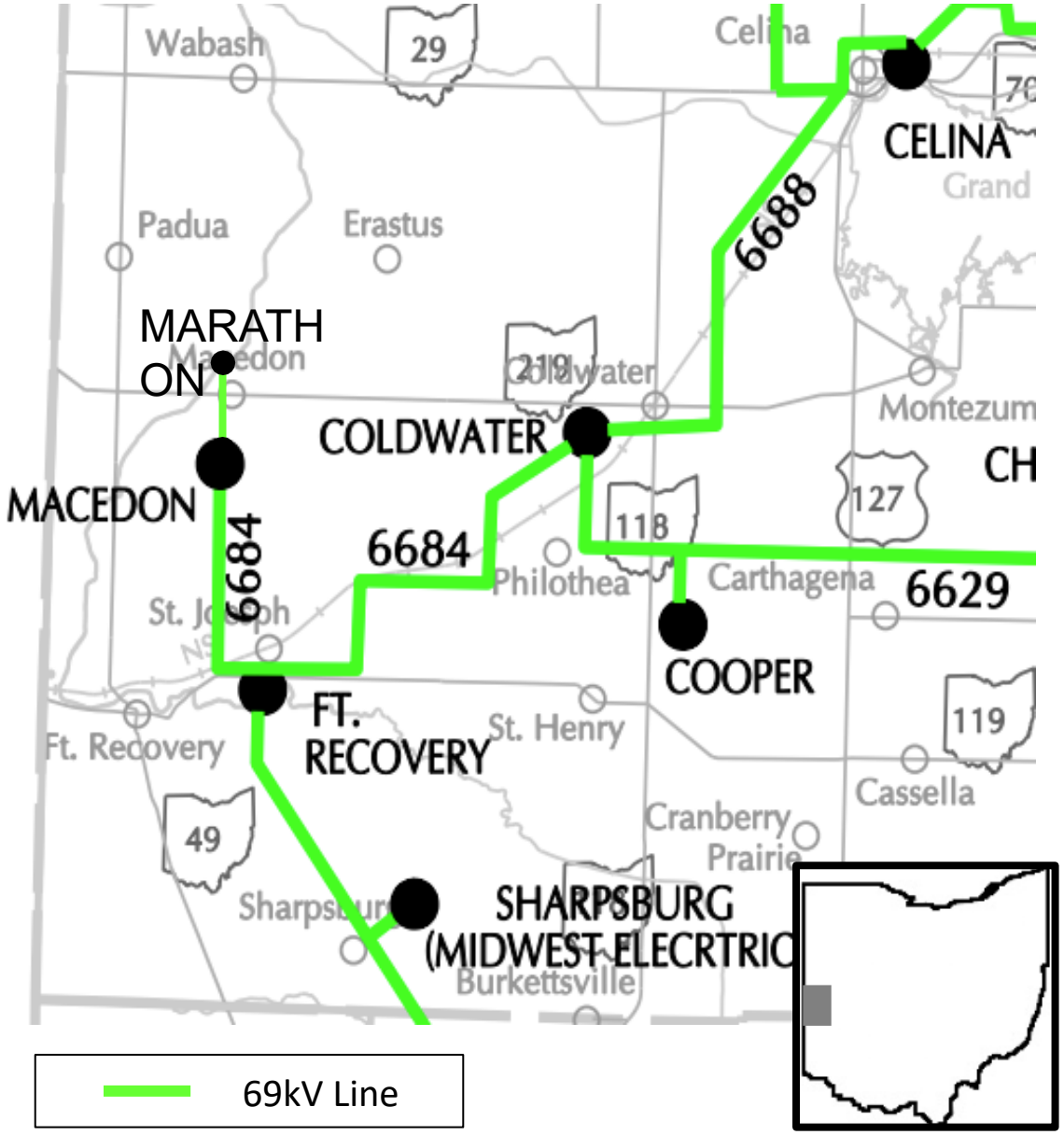
Project Driver: Equipment Material condition, Performance and Risk, Operational Flexibility and Efficiency,

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

Problem Statement:

- Macedon and Marathon substations are served via a jointly owned 7.3-mile radial section of the 6684 transmission line extending from Fort Recovery. Both substations are exposed to a permanent outage resulting from a single contingency on the radial line.
    - Midwest Electric has no ability to backfeed Marathon from other sources in the area and can only backfeed Macedon under ideal circumstances.
- New customer has requested a potential new delivery point connecting into the western part of the AES Ohio system.
- The 6684-transmission circuit is approximately 28 miles long and utilizes wood pole cross arm construction.
    - In the past 5 years, this circuit has experienced 29 outages.
    - This circuit has experienced 9 permanent outages and 20 momentary outages.
- AES Ohio has an existing project (S2521.5) that will help improve the sectionalization along the 6684 circuit and strategically replace some legacy switches. But due to condition of the line we expect reliability to still be a potential issue and given the lack of sources in the area there are minimal switching solutions during outage events.

Model: 2023 RTEP Series, 2028 Summer Case



Need Number: Dayton-2022-005

Process Stage: Solution Meeting, 03/15/2024

Project Driver: Equipment Material condition, Performance and Risk, Operational Flexibility and Efficiency,

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

Selected Solution:

- **Macedon – Mt. Zion 69 kV 69kV Line:** Acquire and rebuild a 69kV line between the new Macedon 69kV Ring bus and the Marathon Delivery Point with 795 ACSR. Establish a new tap for the existing Marathon customer with auto sectionalizing motor operated air brake switches. Construct a new 5.0-mile 69kV single circuit from the new Marathon tap point to the Ohio-Indiana border and the new interconnection point with Wabash Valley Power Authority (WVPA). **Estimated Cost : $30.1M, ISD 6/30/2027**
- **Macedon 69kV Ring Bus:** Install a new 3 breaker Ring bus near the existing Macedon Delivery Point. **Estimated Cost: $9M, ISD 6/30/2027**
- **Ft. Recovery – Macedon 69kV Rebuild:** Rebuild the ~4.8 mile Ft-Recovery-Macedon line from 1/0 AAAC to 795 ACSR and OPGW. **Estimated Cost: $11.5M, ISD 6/30/2028**

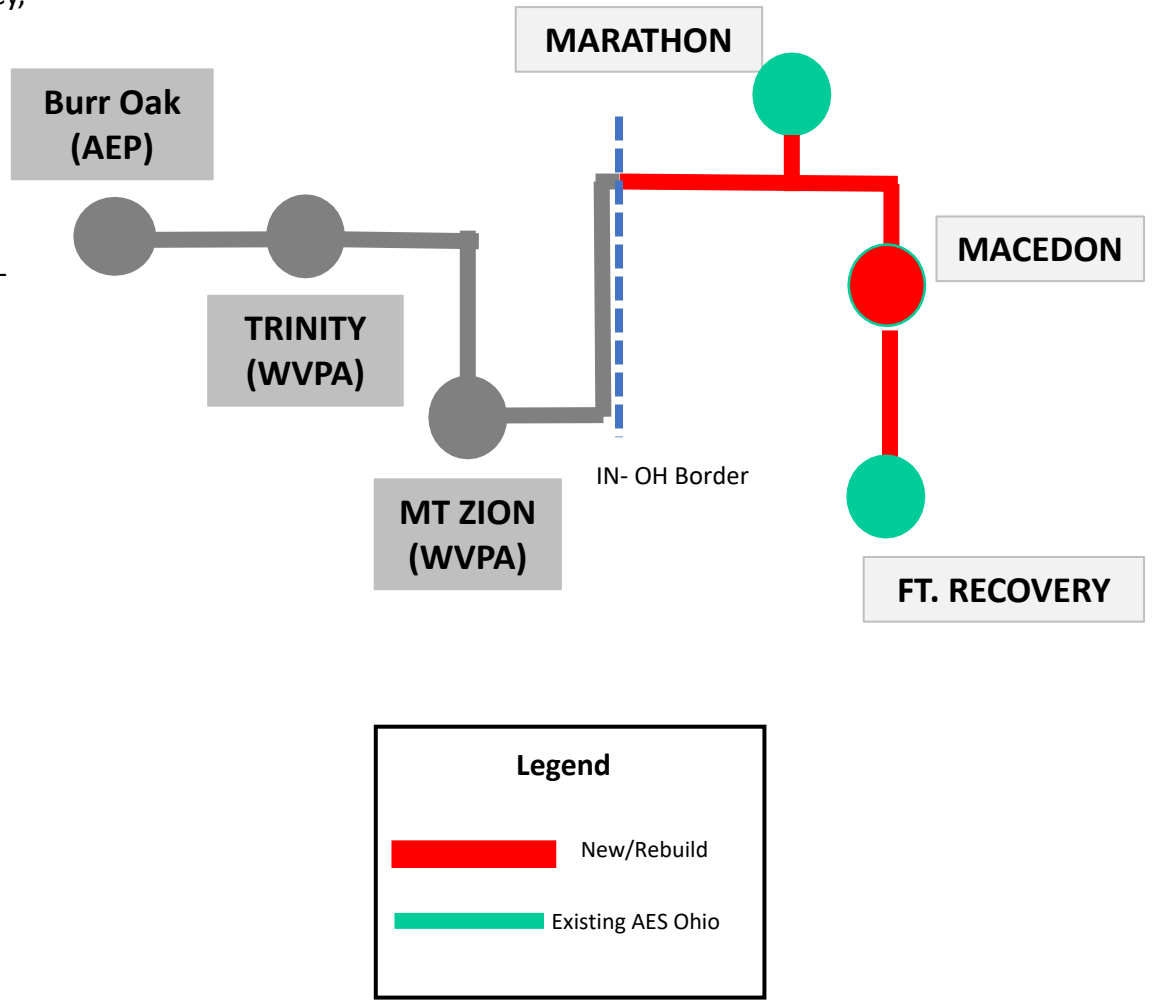
Total Estimated Transmission Cost : $50.6 M

Projected In-Service: 12/31/2027

Alternatives Considered: New 69 kV circuit to Mt Zion via AES Ohio Coldwater – not selected due to distance and projected cost of project

Project Status: Conceptual

Model: 2023 RTEP Series, 2028 Summer Case



Need Number: Dayton-2021-007
Process Stage: Needs Meeting
Date: 5/21/2021

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

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

Problem Statement:

- Buckeye Power on behalf of Pioneer Rural Electric has requested a new delivery point located south of the Sidney – Amsterdam 69kV line.
    - New delivery point is expected to serve approximately 4MVA of load.
- McCartyville Substation
    - The existing substation is comprised of wood construction and is showing significant signs of deterioration.
    - Recent failures of the 69/12kV distribution transformer has led AES Ohio to request for upgrades and/or mitigations for the McCartyville substation condition issues.
    - McCartyville is currently served via a looped configuration with manual inline switches

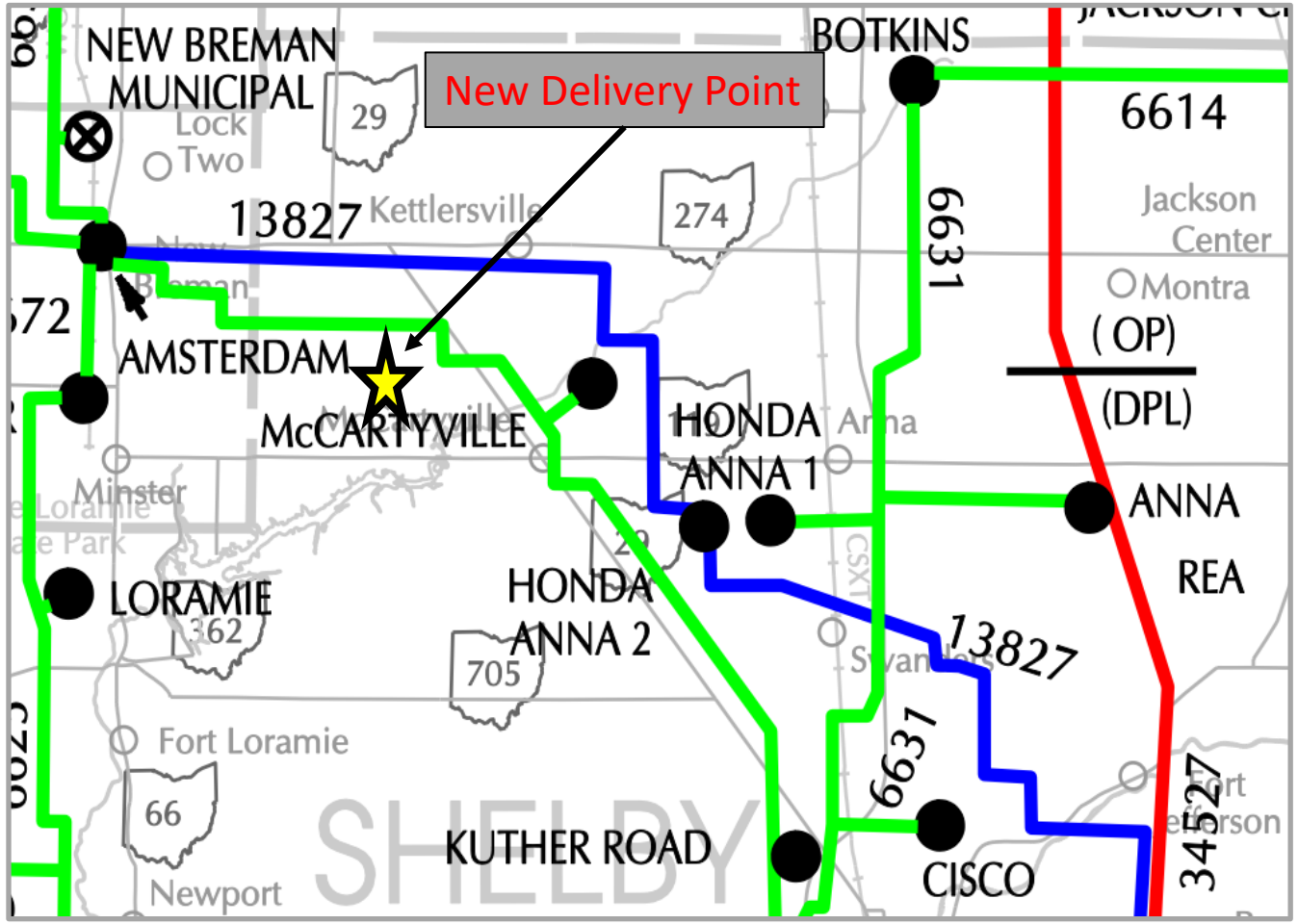
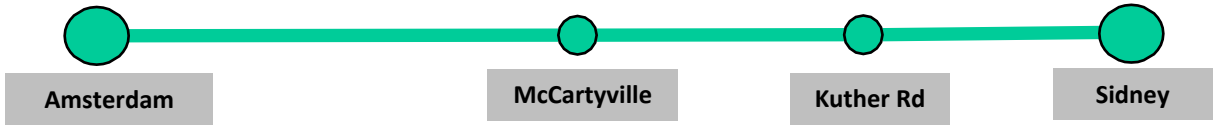


Figure 1 : Area Map



Need Number: Dayton-2021-007

Previously Presented: Need Presented, 5/21/2021

Process Stage: Solution Meeting, 3/15/2024

Project Driver: Customer Service

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

Selected Solution:

- **Roberts Road Delivery Point-** Construct a new 1.3-mile double circuit extension off the Amsterdam – McCartyville 69kV line and install MOAB sectionalizing at the proposed Roberts POI. The new line should be constructed with 1351 conductor and OPGW. **Estimated Cost: $4.8M, ISD 12/31/2025**
- **New Kettlersville Substation:** Install a 4 breaker Ring Bus on the Amsterdam- Franklin 138kV line. **Estimated Cost: $9.5M, ISD 1/31/2027**
- **Retire McCartyville Legacy Substation:** Retire the existing legacy McCartyville Substation. **Estimated Cost: $1.4M, ISD 12/31/2028**

Total Estimated Transmission Cost : $10.36M

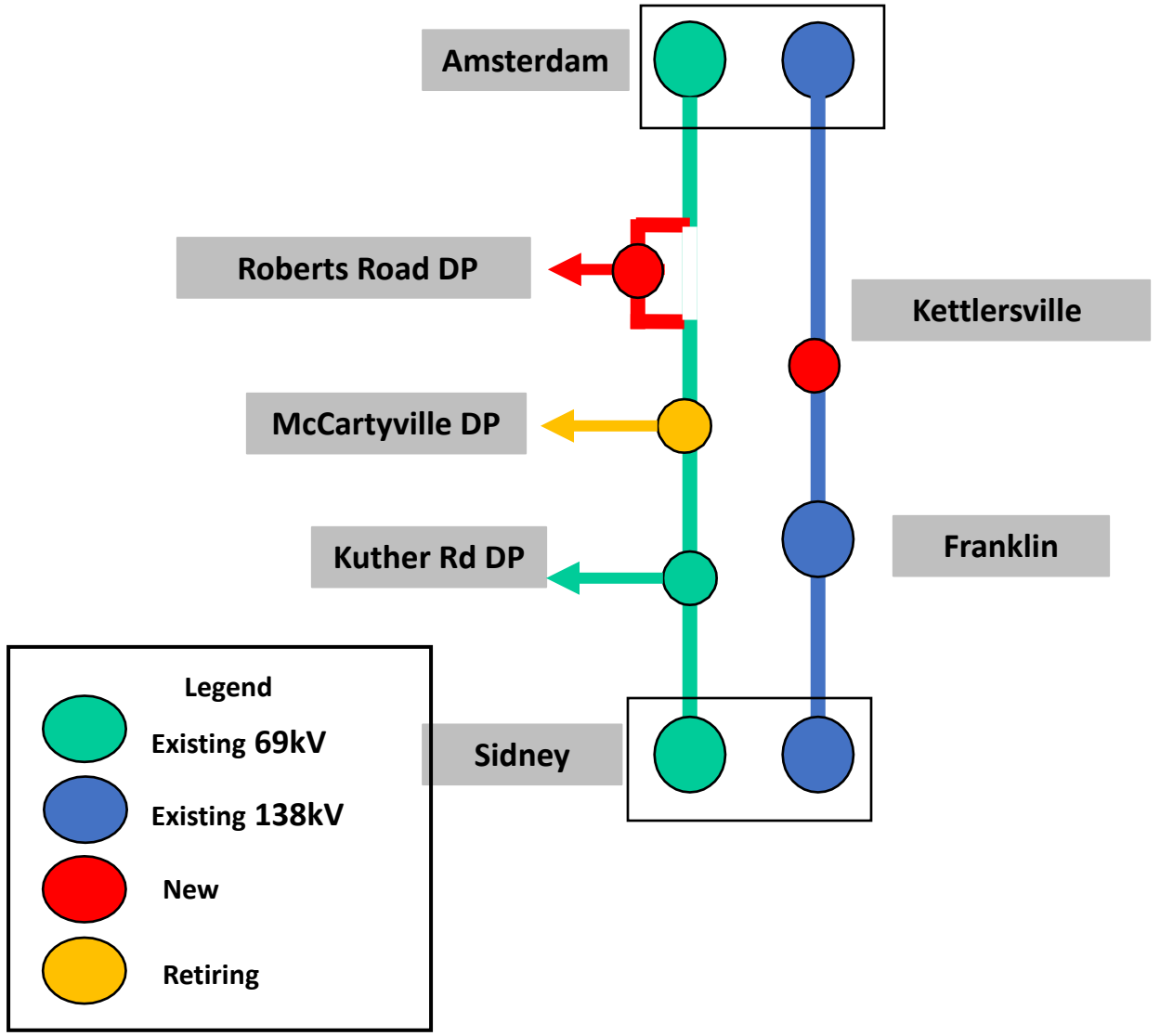
Projected In-Service: 12/31/2028

Alternatives Considered:

- Expanding existing McCartyville Substation to 3 Breaker Ring bus – not feasible due to outage constraints and land availability

Project Status: Conceptual

Model: 2023 RTEP Series, 2028 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

3/5/2024 – V1 – Original version posted to pjm.com

3/15/2024 – V2 – Remove Dayton-2021-003 as requested