

Transmission Expansion Advisory Committee DEOK Supplemental Projects

Feb 14, 2025

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

Need Number: DEOK-2024-003

Process Stage: Solutions Meeting 02/14/2025

Previously Presented: Needs Meeting 02/16/2024

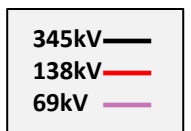
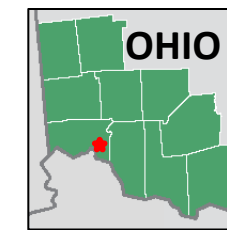
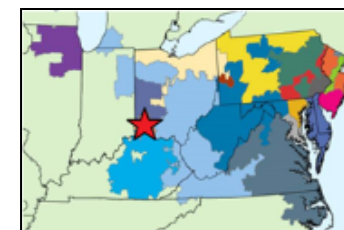
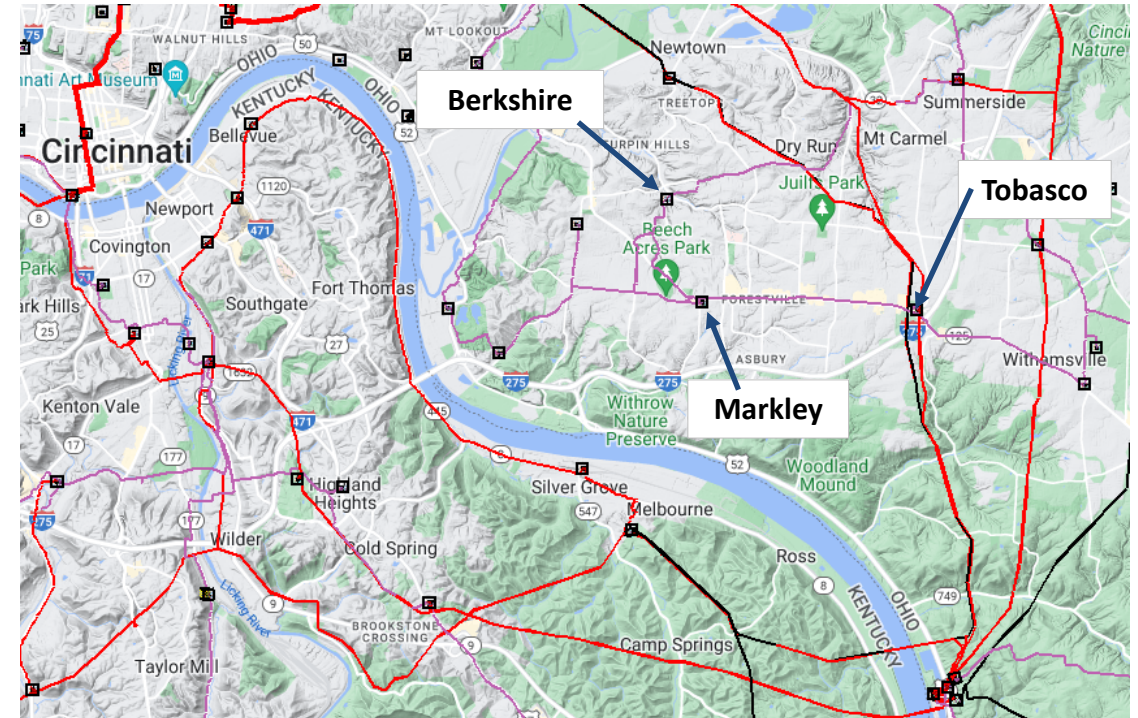
Project Driver: Infrastructure resilience, Equipment condition, performance and risk

Specific Assumption Reference:

Duke Energy Ohio & Kentucky Local Planning Assumptions slides 7-8, 10

Problem Statement:

Markley substation has three 69/13 kV distribution transformers that feed two circuits each. The substation is a straight bus configuration with a switch connected feeder at each end. Restoration time is slower due to not having an automatic throw-over scheme and the lack of bus section isolation. SW 684 at one end is more than twenty years old. The manufacture date is unknown, but the last version of this switch was produced in 2004. It has worn contacts and linkages. Spare parts are difficult to find. 69 kV circuit breakers CB677 and CB684 connect the bus to the high side of transformers TB1 and TB2. The breakers are 45 and 44 years old, oil filled and in declining condition. The mechanisms, linkages, & interrupters of these breakers are worn to the point where proper measurements are difficult to maintain. This can lead to mis-operations jeopardizing reliability. Spare parts for these older oil breakers are becoming difficult to find and are no longer available from the vendor. TB1 is 57 years old and has an arcing in oil tap changer. The tap changer has been problematic requiring several extensive services and expensive repairs. Switchgear 1 is also 57 years old and in declining condition, showing rust on the top and sides. Holes are forming allowing moisture to penetrate the enclosure.





DEOK Transmission Zone M-3 Process Markley

Need Number: DEOK-2024-003

Process Stage: Solutions Meeting 02/14/2025

Previously Presented: Needs Meeting 02/16/2024

Project Driver: Infrastructure resilience, Equipment condition, performance and risk

Specific Assumption Reference:

Duke Energy Ohio & Kentucky Local Planning Assumptions slides 7-8, 10

Potential Solution:

Replace the two end-bus switches with 69 kV, 2000A, motorized switches. Install an automatic throw-over scheme. Replace an existing, and add a second switch to the bus with two 69 kV, 2000A, manually operated switches so that each of the three bus sections and transformers can be isolated. Replace circuit breakers CB677 and CB684 with circuit switchers. Replace TB1 and Switchgear 1.

Estimated Transmission Cost: \$1,080,019

Proposed In-Service Date: 12/11/2026

Project Status: Engineering

Model: 2024 RTEP

**Bubble Diagram Not Applicable
Station Modifications Only**

Need Number: DEOK-2024-004

Process Stage: Solutions Meeting 02/14/2025

Previously Presented: Needs Meeting 03/15/2024

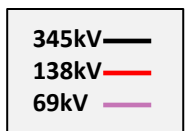
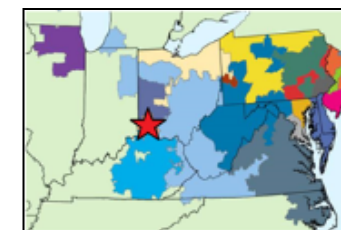
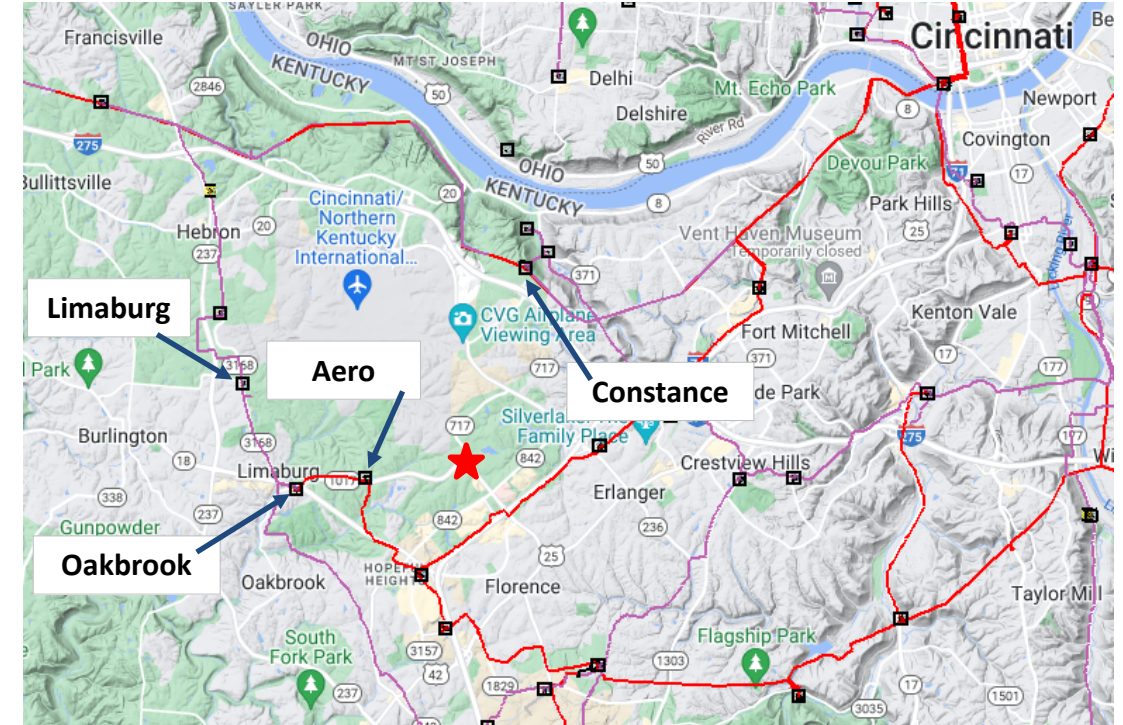
Project Driver: Customer Service

Specific Assumption Reference:

Duke Energy Ohio & Kentucky Local Planning Assumptions slide 6

Problem Statement:

Duke Energy Distribution has asked for a new delivery point near Turfway Road in the Florence, Kentucky area. The distribution system in this area is heavily loaded with a large commercial and industrial customer presence. Feeders at nearby substations Limaburg, Oakbrook, Aero and Constance are expected to see a 30% load increase by 2025 and some will exceed their capacity by 2028.





DEOK Transmission Zone M-3 Process Turfway

Need Number: DEOK-2024-004

Process Stage: Solutions Meeting 02/14/2025

Previously Presented: Needs Meeting 03/15/2024

Project Driver: Customer Service

Specific Assumption Reference:

Duke Energy Ohio & Kentucky Local Planning Assumptions slide 6

Potential Solution:

Build a new substation, Turfway, with a switch connected straight bus configuration, two circuit-switcher connected 138/34 kV, 22.5 MVA transformers with two distribution exits each.

Intercept the Donaldson-Woodspoint 138 kV circuit looping it through Turfway. The total length of new feeder and right-of way is approximately two miles.

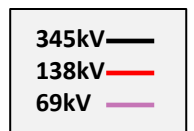
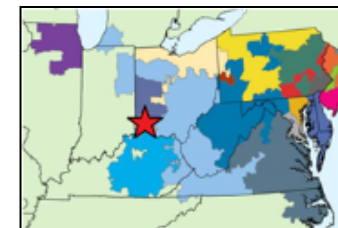
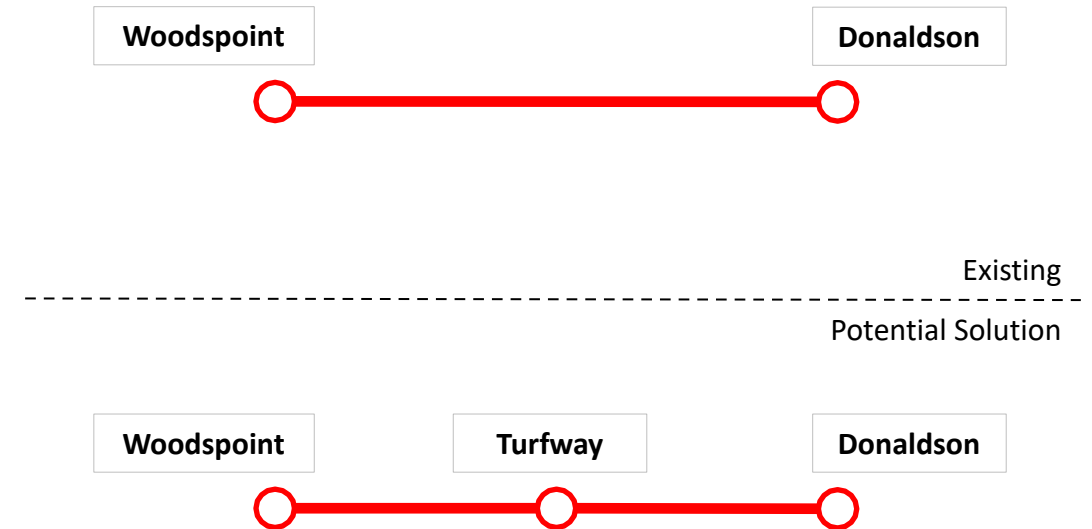
Alternatives: Connect the new substation to the 69 kV system or from Aero 138 kV substation. The route to/from the Donaldson-Woodspoint 138 kV circuit is a shortest and expected to be least cost.

Estimated Transmission Cost: \$13M

Proposed In-Service Date: 07-25-2029

Project Status: Scoping

Model: 2024 RTEP





Need Number: DEOK-2025-001

Process Stage: Solutions Meeting 02/14/2025

Previously Presented: Needs Meeting 01/17/2025

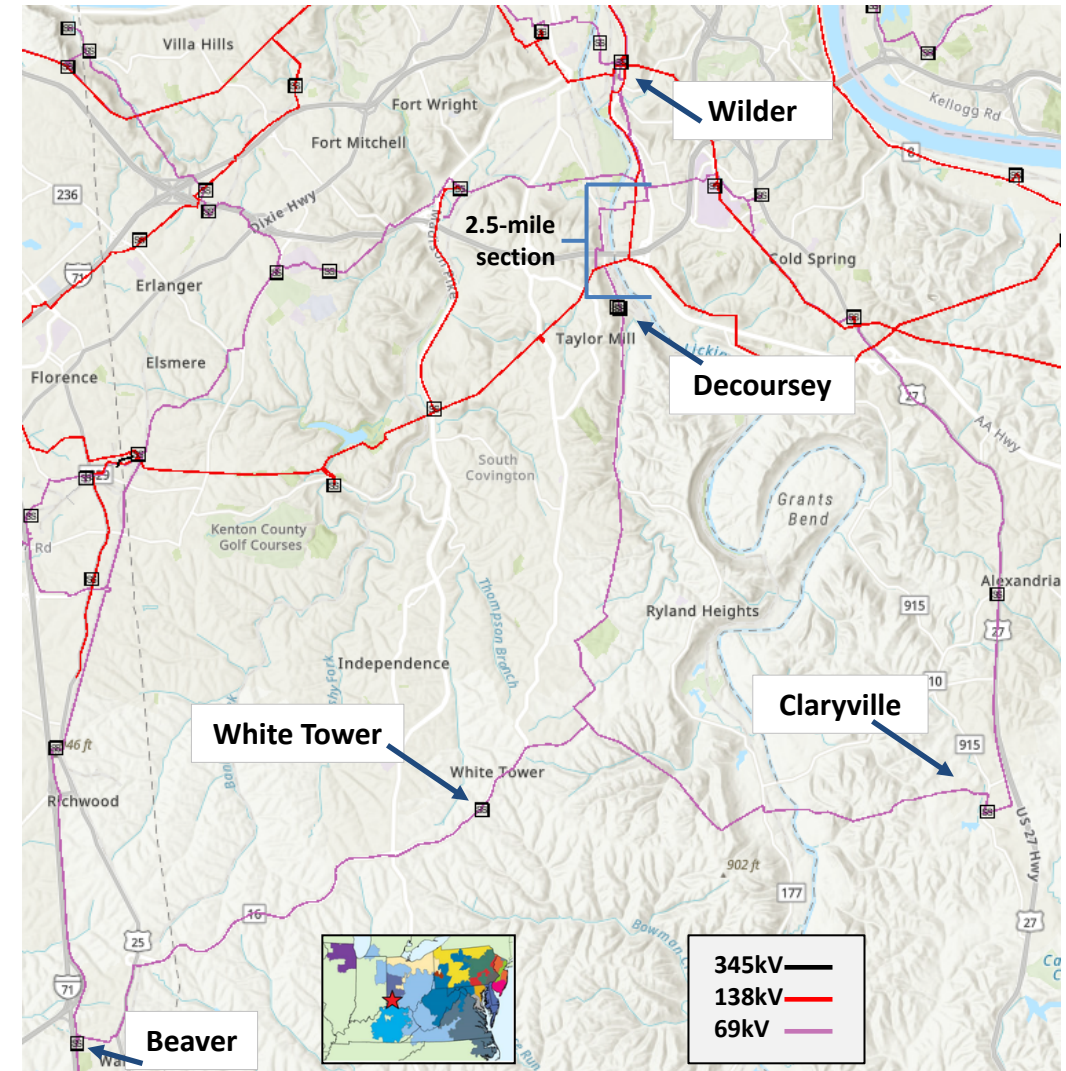
Project Driver: Equipment Condition, Performance and Risk

Specific Assumption Reference:

Duke Energy Ohio & Kentucky Local Planning Assumptions slides 7-8

Problem Statement:

A section of 69 kV circuit from Wilder to Decoursey is in deteriorating condition. This circuit is breaker connected at Wilder and feeds through switch connected buses at Decoursey and White Tower terminating at open switches in Beaver and Claryville. It supports a total of 85 MVA at these substations. The 2.5-mile section was originally constructed in 1965 and includes 69 single wood poles, wooden crossarms, and post insulators supporting 477 ACSR conductor. On inspection 10% of structures were rejected and an additional 25 were found to have defects. In the last five years there have been ten momentary and six permanent outages totaling 51,224 CMI, with the average outage lasting 221 minutes. 13,028 customers are at risk.



Need Number: DEOK-2025-001

Process Stage: Solutions Meeting 02/14/2025

Previously Presented: Needs Meeting 01/17/2025

Project Driver: Equipment Condition, Performance and Risk

Specific Assumption Reference:

Duke Energy Ohio & Kentucky Local Planning Assumptions slides 7-8

Potential Solution:

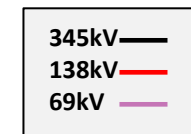
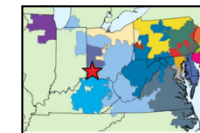
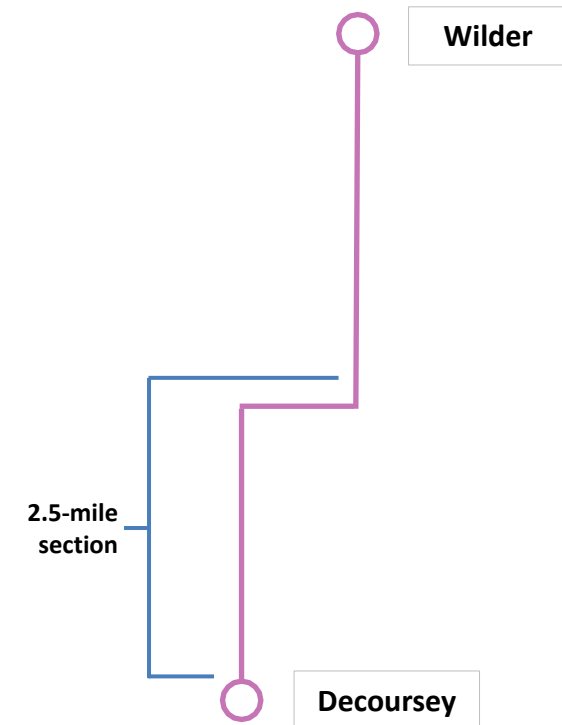
Rebuild the 2.5-mile section 954ACSR conductor, 64 steel poles and two hybrid poles for a river and railroad crossing. The ratings for this section will increase to 150/150/150 MVA summer, 189/189/189 MVA winter.

Estimated Transmission Cost: \$7,210,650

Proposed In-Service Date: 10/19/2027

Project Status: Engineering

Model: 2024 RTEP



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

2/10/2025 – V1 – Original version posted to pjm.com