

# Submission of Supplemental Projects for Inclusion in the Local Plan

# DEOK Transmission Zone M-3 Process Aero/Woodspoint

**Need Number:** DEOK-2018-001

**Process Stage:** Submission of Supplemental Project for Inclusion in the Local Plan 6-27-2019

**Previously Presented:**

Need 11-29-2018

Solution 01-11-2019

**Project Driver:**

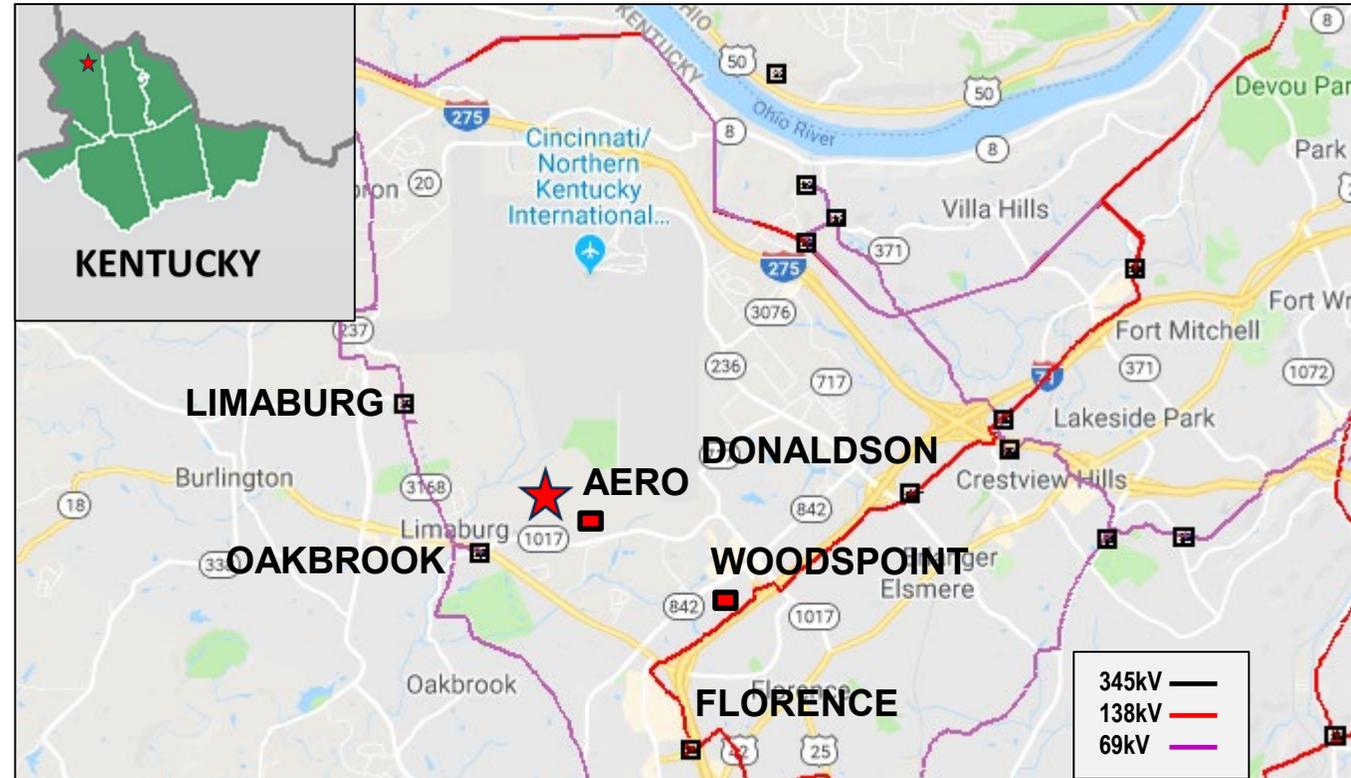
Customer Service

**Specific Assumption Reference:**

Serving new customer load

**Problem Statement:**

Amazon Prime Air has requested distribution service (13 kV) for a new air hub to be located at the Cincinnati/Northern Kentucky International Airport. Initial demand is projected to be 30 MW with phased growth to 80 MW.



# DEOK Transmission Zone M-3 Process Aero/Woodspoint

**Need Number:** DEOK-2018-001

**Process Stage:** Submission of Supplemental Project for Inclusion in the Local Plan 6-27-2019

## Selected Solution:

Install a new 138 kV, 3-breaker ring bus substation, Woodspoint. Install a new 138 kV, 6-breaker ring bus, Aero, near Amazon Prime Hub. Install new 138 kV lines from Woodspoint to Aero, and from Aero to Oakbrook. The lines will be rated at 301 MVA. At Aero install four 138/13 kV, 22 MVA transformers. At Oakbrook install one 138/69 kVA, 150 MVA transformer with high side and low side breakers.

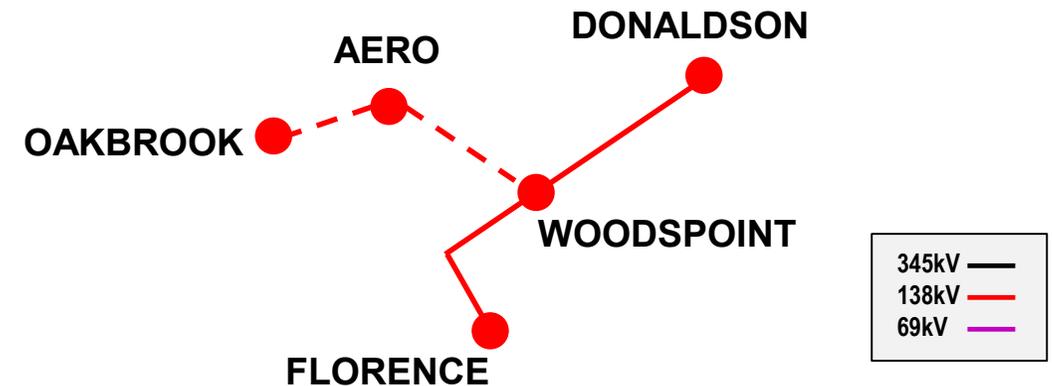
**Estimated Cost:** \$30,159,604

**Projected In-Service:** 12-31-2020

**Supplemental Project ID:** s1782

**Project Status:** Engineering

**Model:** 2022 Summer RTEP 50/50



# DEOK Transmission Zone M-3 Process Garver

**Need Number:** DEOK-2018-002

**Process Stage:** Submission of Supplemental Project for Inclusion in the Local Plan 6-27-2019

**Previously Presented:**

Need 11-29-2018

Solution 01-11-2019

**Project Driver:**

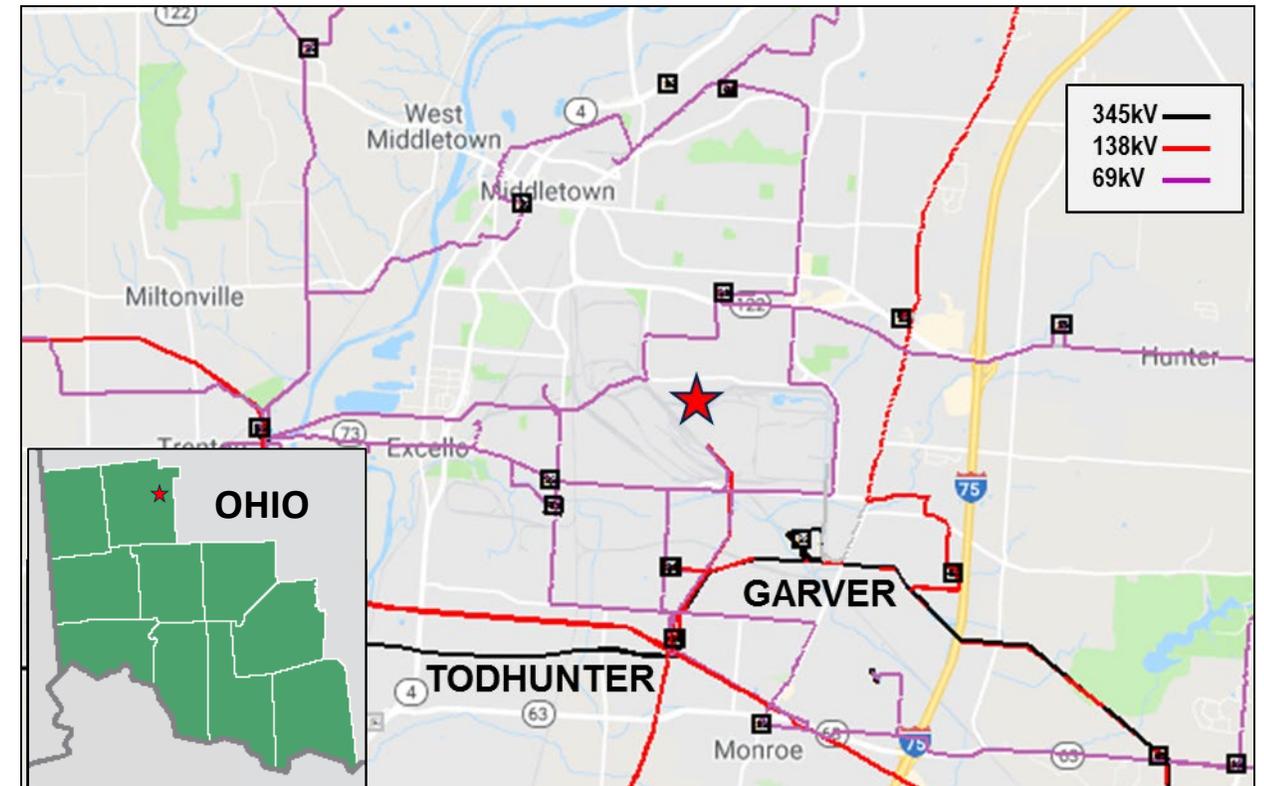
Operational Flexibility and Efficiency, Infrastructure Resilience, Customer Service

**Specific Assumption Reference:**

Operational options for switching, Diversify sources and source paths to load areas

**Problem Statement:**

A large industrial customer (200+ MW) is supplied by two 138 kV circuits. The circuits are fed from Todhunter on shared towers. Planned maintenance work on each circuit will require extended outages. The customer is at risk of complete interruption if the remaining circuit experiences an outage. Customer advises that complete interruption would have grave consequences on customer's processes potentially leading to ceasing operations (closure of plant). Customer also advises that a minimum of 75 MW is required for a safe shutdown of equipment.



# DEOK Transmission Zone M-3 Process Garver

**Need Number:** DEOK-2018-002

**Process Stage:** Submission of Supplemental Project for Inclusion in the Local Plan 6-27-2019

**Selected Solution:**

Install a new 138 kV feeder from Garver substation to the customer. This 3rd feeder will have enough capacity to allow full production or safe shutdown of the plant without the loss of equipment. This third feeder will allow planned maintenance or emergent work to be preformed at Todhunter substation without the need to wait for a plant shutdown, benefitting all customers. Scope: Build 1.2 mile, 138 kV, 301 MVA feeder on an existing Duke right of way to the customer's property. Install two 138 kV breakers and associated equipment at Garver substation.

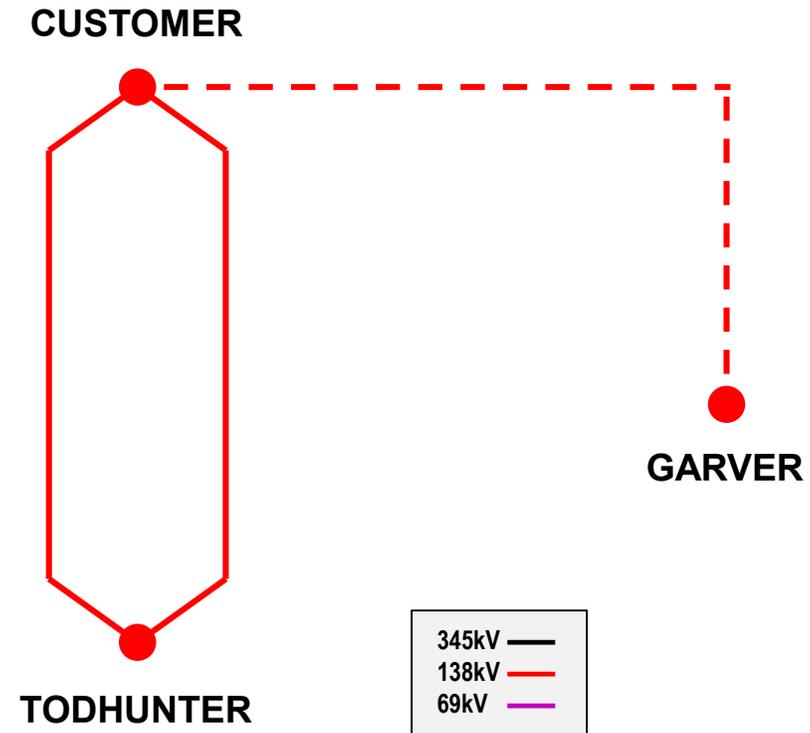
**Estimated Cost:** \$7,560,154

**Projected In-Service:** 12-31-2019

**Supplemental Project ID:** s1783

**Project Status:** Under Construction

**Model:** 2022 Summer RTEP 50/50



**Need Number:** DEOK-2019-002

**Process Stage:** Local Plan Submission 09-11-2019

**Previously Presented:**

Solutions Meeting 04-23-2019

Needs Meeting 02-20-2019

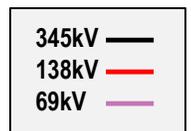
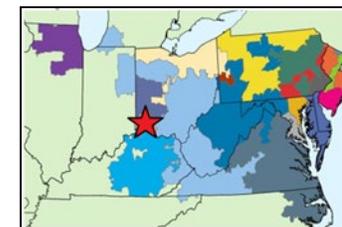
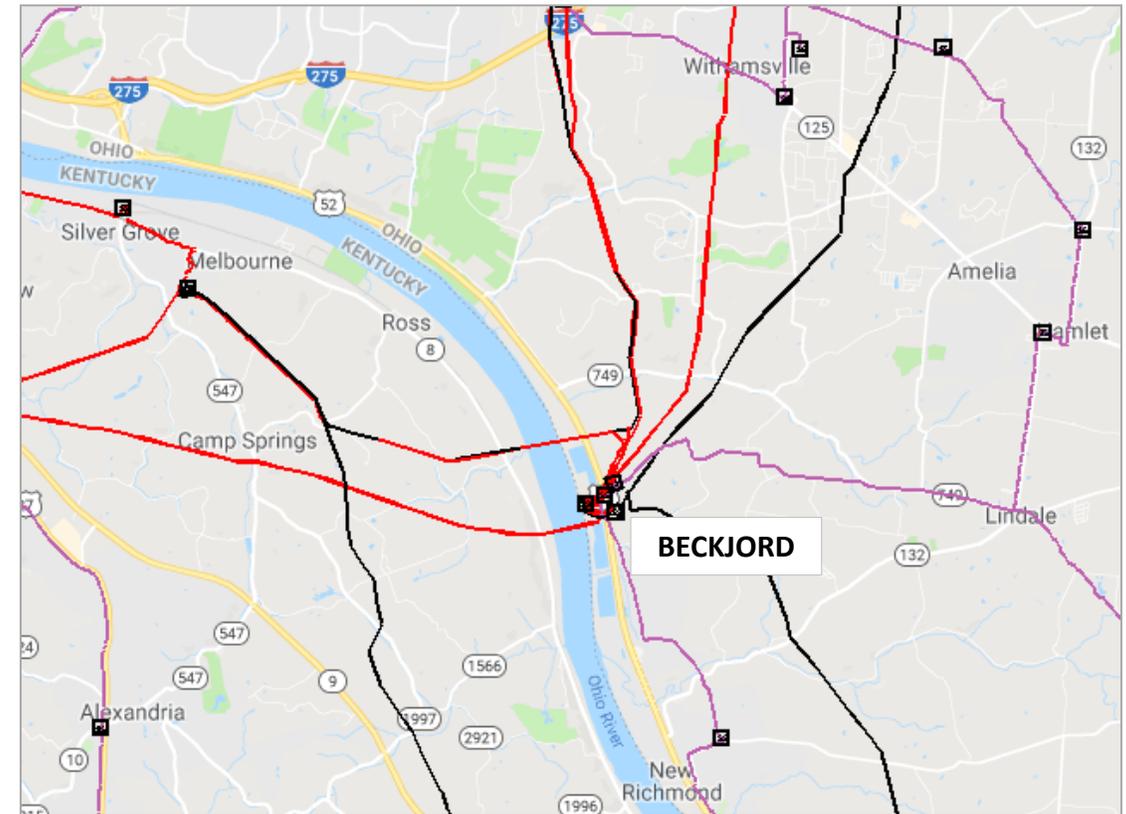
**Project Driver:** Equipment Condition, Performance and Risk

**Specific Assumption Reference:**

Duke Energy Ohio & Kentucky Local Planning Assumptions slides 6 - 7

**Problem Statement:**

Beckjord 138kV buses 3 and 4 are 66 years old, constructed of copper bus with cap and pin insulators, and are in deteriorating condition. The breakers on these busses are oil filled and obsolete. Rebar is showing through the deteriorating structural and equipment foundations.



**Need Number:** DEOK-2019-002

**Process Stage:** Local Plan Submission 09-11-2019

**Selected Solution:**

Replace/repair foundations as necessary. Rebuild buses 3 and 4.  
Retire one oil filled circuit breaker no longer in service. Replace three oil filled circuit breakers.

**Bubble Diagram Not Applicable  
Station Modifications Only**

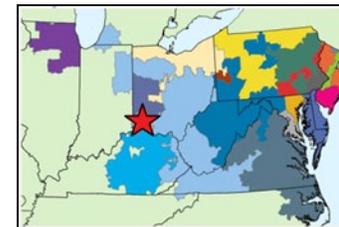
**Estimated Transmission Cost:** \$ 5,552,779

**Projected In-Service:** 12-31-2020

**Supplemental Project ID:** S1926

**Project Status:** Engineering

**Model:** 2018 RTEP Summer



**Need Number:** DEOK-2019-003

**Process Stage:** Local Plan Submission 09-11-2019

**Previously Presented:**

Solutions Meeting 03-25-2019

Needs Meeting 02-20-2019

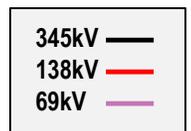
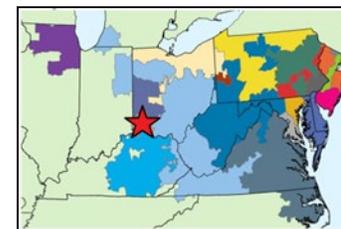
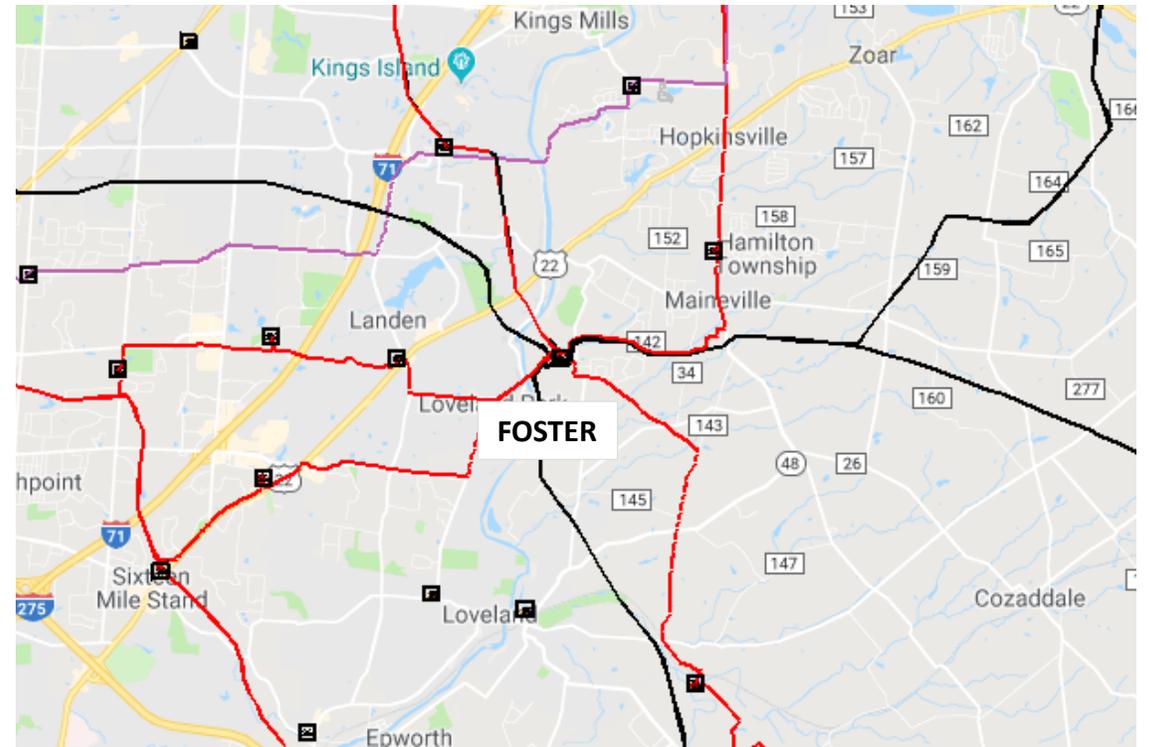
**Project Driver:** Equipment Condition, Performance and Risk

**Specific Assumption Reference:**

Duke Energy Ohio & Kentucky Local Planning Assumptions slides 6 - 7

**Problem Statement:**

Technical Services continues to have problems with the mechanisms on three 345kV breakers at Foster. The manufacturer no longer makes the mechanism for these 1990 vintage breakers. The breakers also have an on-going problem leaking SF6 gas.



**Need Number:** DEOK-2019-003

**Process Stage:** Local Plan Submission 09-11-2019

**Selected Solution:**

Replace the three 2000A breakers with 3000A breakers.

**Estimated Transmission Cost:** \$ 2,716,629

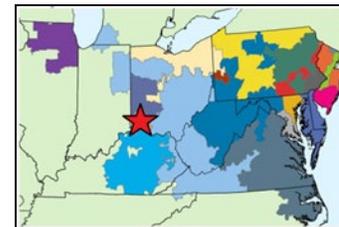
**Projected In-Service:** 12-31-2019

**Supplemental Project ID:** S1927

**Project Status:** Construction

**Model:** 2018 RTEP Summer

**Bubble Diagram Not Applicable  
Station Modifications Only**



**Need Number:** DEOK-2019-006

**Process Stage:** Local Plan Submission 09-11-2019

**Previously Presented:**

Solutions Meeting 05-20-2019

Needs Meeting 03-25-2019

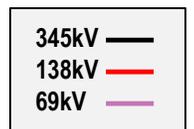
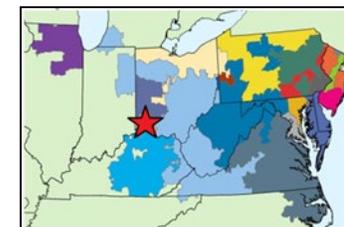
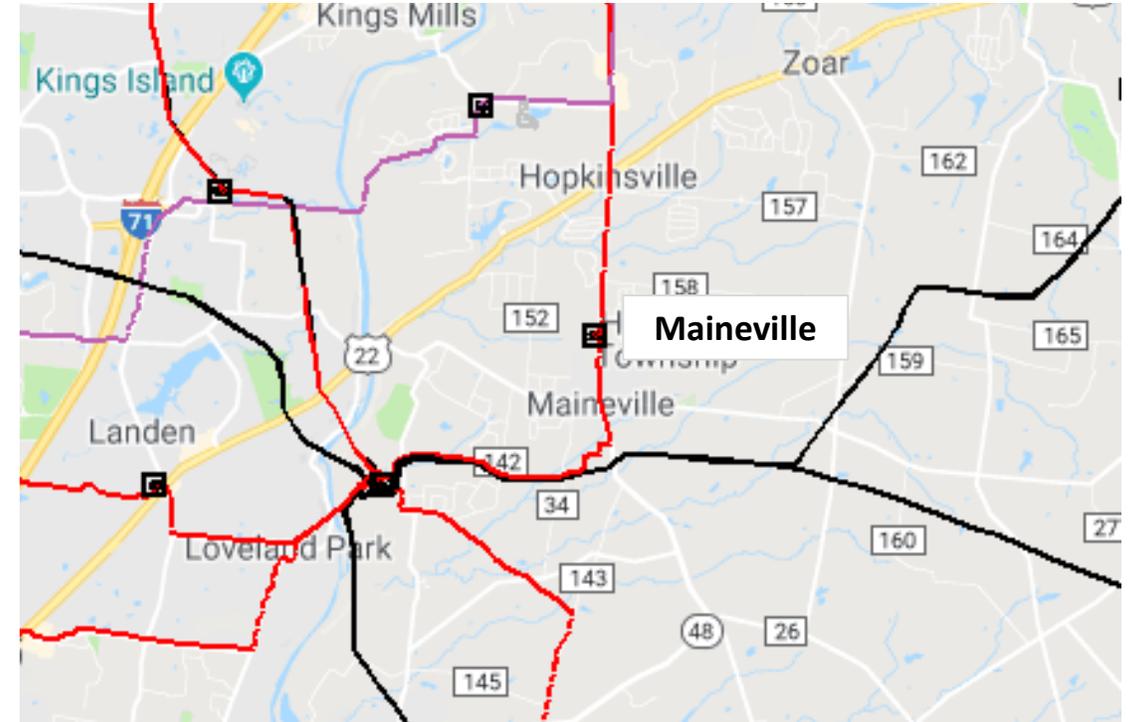
**Project Driver:** Customer Service

**Specific Assumption Reference:**

Duke Energy Ohio & Kentucky Local Planning Assumptions slide 10

**Problem Statement:**

Duke Energy Distribution has requested a new delivery point at Maineville substation. Loading on the single 138/13kV 22MVA transformer at Maineville has reached its nameplate rating.



**Need Number:** DEOK-2019-006

**Process Stage:** Local Plan Submission 09-11-2019

**Selected Solution:**

Expand Maineville substation. Extend the 138kV bus. Add a second 138/13kV 22MVA transformer, 13kV bus work and breakers for two feeder exits. The new transformer will be switch connected to the 138kV bus similar to TB1.

**Bubble Diagram Not Applicable  
Station Modifications Only**

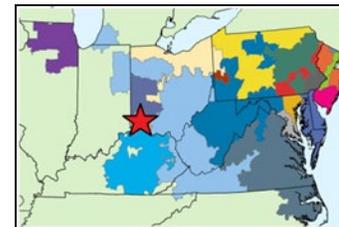
**Transmission Cost Estimate:** \$0

**Projected In-service Date:** 06-01-2020

**Supplemental Project ID:** S1928

**Project Status:** Engineering

**Model:** 2018 RTEP Summer



**Need Number:** DEOK-2019-008

**Process Stage:** Local Plan Submission 09-11-2019

**Previously Presented:**

Solutions Meeting 05-20-2019

Needs Meeting 03-25-2019

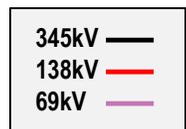
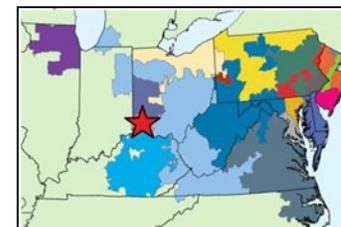
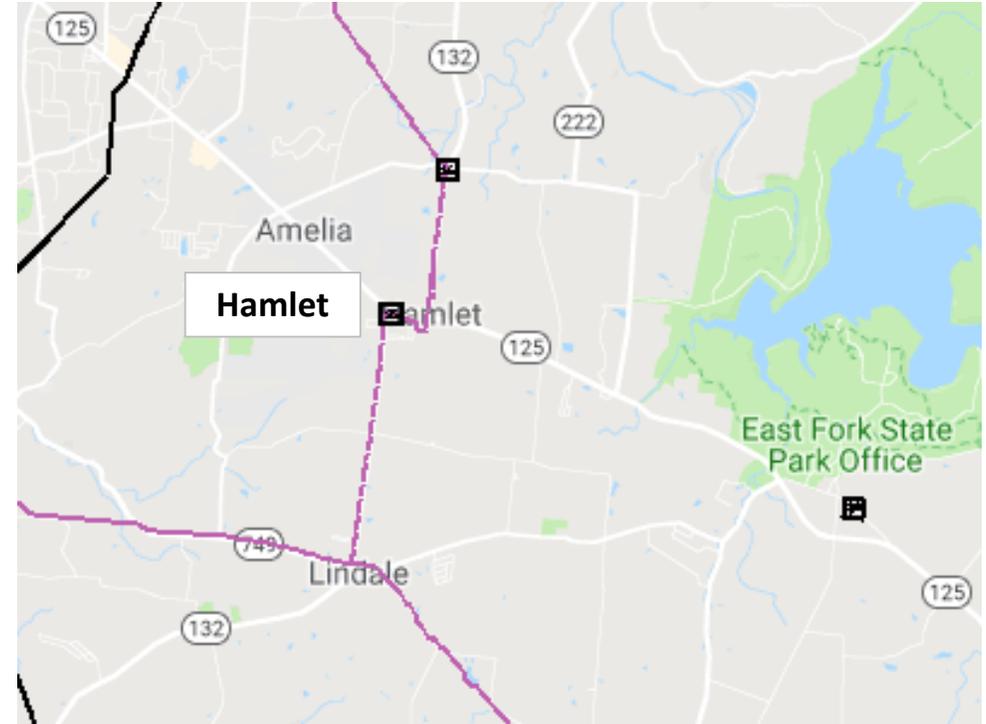
**Project Driver:** Customer Service

**Specific Assumption Reference:**

Duke Energy Ohio & Kentucky Local Planning Assumptions slide 10

**Problem Statement:**

Duke Energy Distribution has requested a new delivery point at Hamlet substation. Winter loading on the single 69/13kV 10.5MVA transformer at Hamlet has reached 96% of its nameplate rating. New residential subdivisions in this area are planned to be completed by 2021. Winter loading is expected to increase 10% since gas service in much of this area is not available.



**Need Number:** DEOK-2019-008

**Process Stage:** Local Plan Submission 09-11-2019

**Selected Solution:**

Extend the 69kV bus. Add a second 69/13kV 10.5MVA transformer, 13kV bus work and breaker for one feeder exit at Hamlet. The new transformer will be switch connected to the 69kV bus similar to TB1.

**Bubble Diagram Not Applicable  
Station Modifications Only**

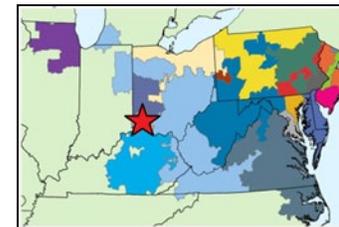
**Transmission Cost Estimate:** \$0

**Projected In-service Date:** 06-01-2020

**Supplemental Project ID:** S1929

**Project Status:** Engineering

**Model:** 2018 RTEP Summer



**Need Number:** DEOK-2019-009

**Process Stage:** Local Plan Submission 09-10-2019

**Previously Presented:**

Solutions Meeting 05-20-2019

Needs Meeting 03-25-2019

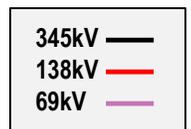
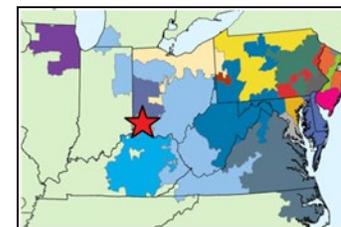
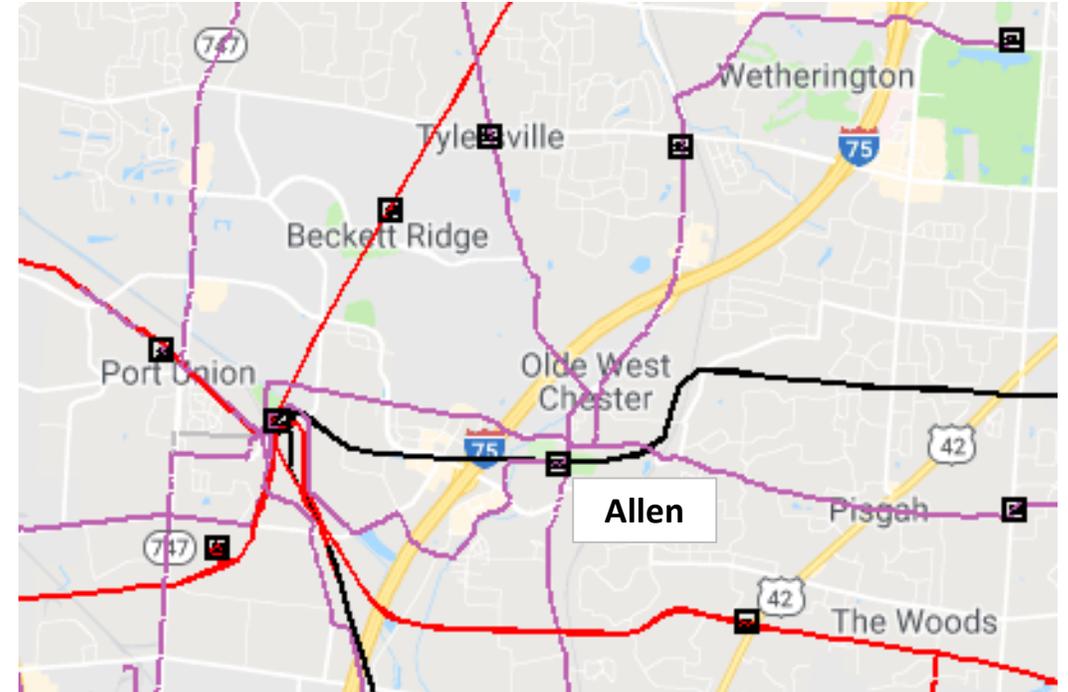
**Project Driver:** Customer Service

**Specific Assumption Reference:**

Duke Energy Ohio & Kentucky Local Planning Assumptions slide 10

**Problem Statement:**

Duke Energy Distribution has requested a new delivery point at Allen substation. Loading on Allen's single 69/13kV 22MVA transformer has reached the nameplate rating.



**Need Number:** DEOK-2019-009

**Process Stage:** Local Plan Submission 09-10-2019

**Selected Solution:**

Extend the 69kV bus. Add a second 69/13kV 22MVA transformer, 13kV bus work and breakers for two feeder exits at Allen. The new transformer will be switch connected to the 69kV bus similar to TB1.

**Bubble Diagram Not Applicable  
Station Modifications Only**

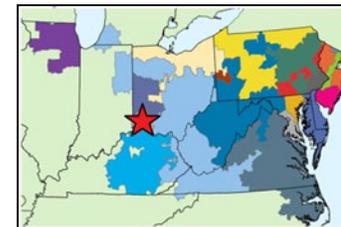
**Transmission Cost Estimate:** \$0

**Projected In-service Date:** 06-01-2020

**Supplemental Project ID:** S1930

**Project Status:** Engineering

**Model:** 2018 RTEP Summer



**Need Number:** DEOK-2019-010

**Process Stage:** Local Plan Submission 09-11-2019

**Previously Presented:**

Solutions Meeting 05-20-2019

Needs Meeting 03-25-2019

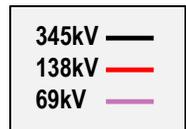
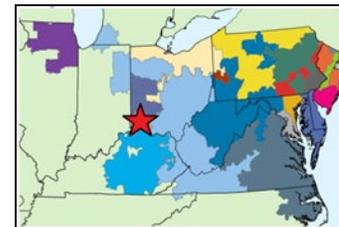
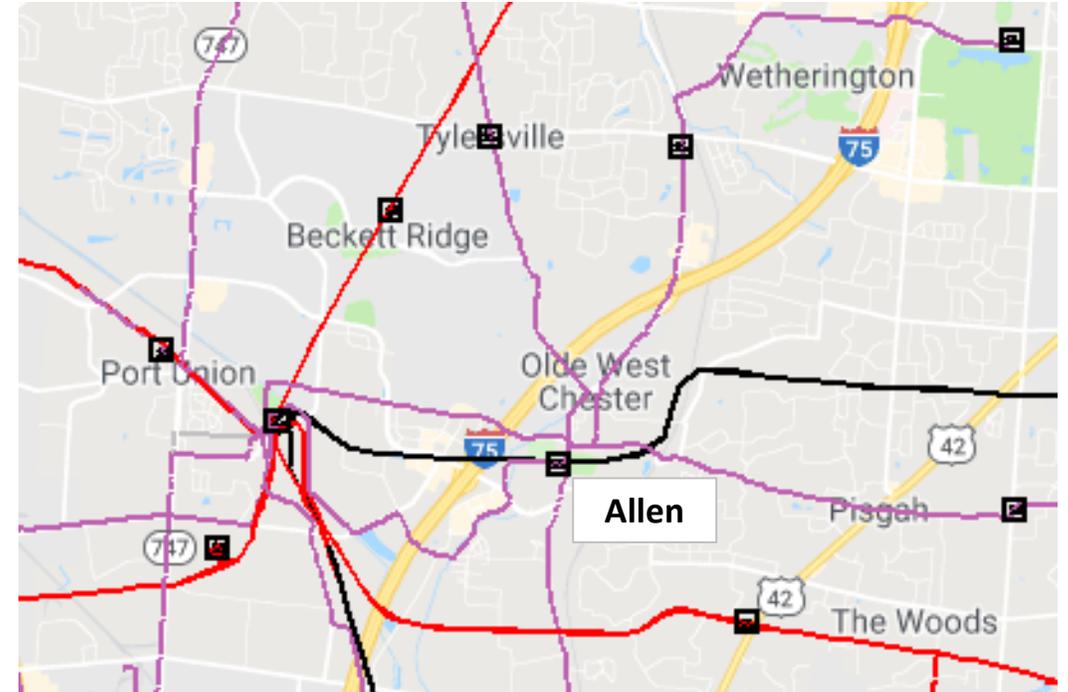
**Project Driver:** Customer Service

**Specific Assumption Reference:**

Duke Energy Ohio & Kentucky Local Planning Assumptions slide 10

**Problem Statement:**

Duke Energy Distribution has requested a new delivery point in the Mason Ohio area. New light industrial load growth requires 7MW of service by 2021 with and additional 15MW expected by 2022.



**Need Number:** DEOK-2019-010

**Process Stage:** Local Plan Submission 09-11-2019

**Selected Solution:**

Build a new 69kV distribution substation, Landen, with two 13kV feeder exits. Loop the 69kV Pisgah-Kings Mills feeder through the substation. Install one 69/13kV 22.4MVA transformer with a high side circuit switcher.

**Bubble Diagram Not Applicable  
Station Modifications Only**

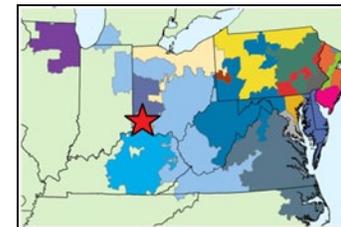
**Estimated Transmission Cost:** \$0

**Projected In-Service:** 12-31-2020

**Supplemental Project ID:** S1931

**Project Status:** Engineering

**Model:** 2018 RTEP Summer



**Need Number:** DEOK-2019-011

**Process Stage:** Local Plan Submission 09-11-2019

**Previously Presented:**

Solutions Meeting 05-20-2019

Needs Meeting 03-25-2019

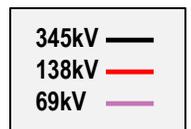
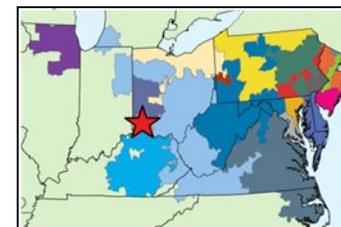
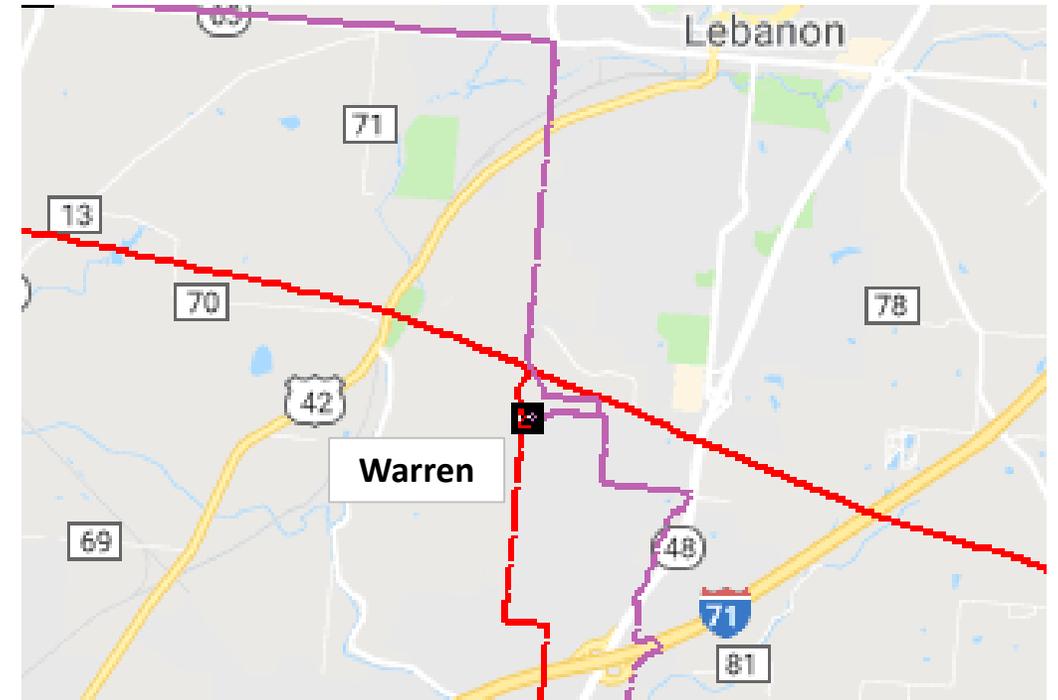
**Project Driver:** Customer Service

**Specific Assumption Reference:**

Duke Energy Ohio & Kentucky Local Planning Assumptions slide 10

**Problem Statement:**

Warren 138/69kV 100MVA TB1 showed a sharp increase in gassing in 2016. Over the past three years the gas levels continue to increase. The main gasses of concern are ethane and ethylene, indicating a potential deterioration of insulation. Indications are trending towards a possible failure. (continued)

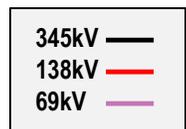
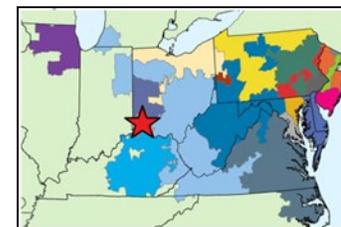
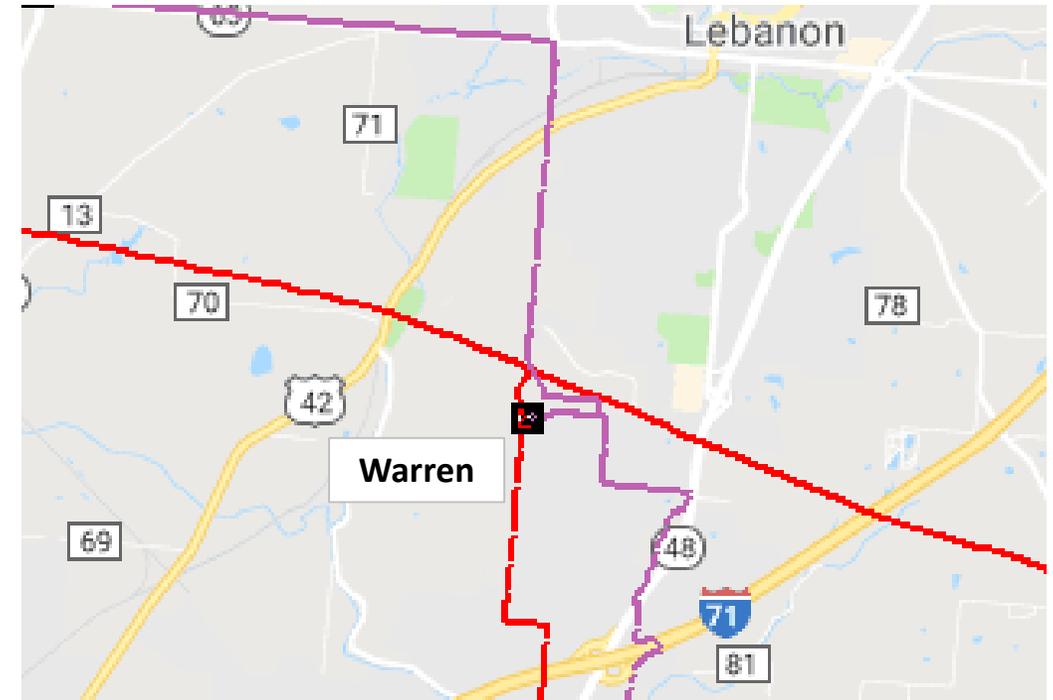


**Need Number:** DEOK-2019-011

**Process Stage:** Local Plan Submission 09-11-2019

**Problem Statement:**

(continued) There has also been an increase in power factor during routine testing indicating the transformer trending towards the end of its useful life. This 62 year old transformer is FOA rated. The capacity of the original cooling equipment has degraded with age. In the event of a failure, it would take an extended amount of time to replace this transformer with a spare (3-4 months). It would require foundation modifications, physical bus modifications, new conduits and control cables. This transformer supplies 69kV service to The City of Lebanon Electric Department.



**Need Number:** DEOK-2019-011

**Process Stage:** Local Plan Submission 09-11-2019

**Selected Solution:**

Replace TB1 with a 138/69kV 150MVA transformer. Replace jumpers to the high side and low side transformer bushings and lightning arrestors. Install new high voltage and low voltage surge arrestors.

**Estimated Transmission Cost:** \$3,493,100

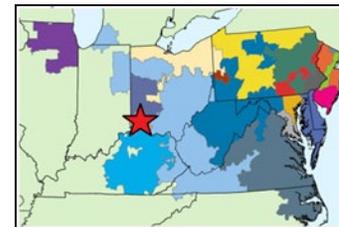
**Projected In-Service:** 12-31-2020

**Supplemental Project ID:** S1932

**Project Status:** Engineering

**Model:** 2018 RTEP Summer

**Bubble Diagram Not Applicable  
Station Modifications Only**





# DEOK Transmission Zone M-3 Process Trenton

**Need Number:** DEOK-2019-012

**Process Stage:** Local Plan Submission 09-11-2019

**Previously Presented:**

Solutions Meeting 05-20-2019

Needs Meeting 04-23-2019

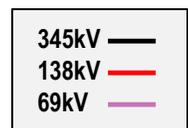
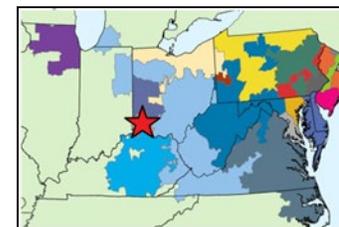
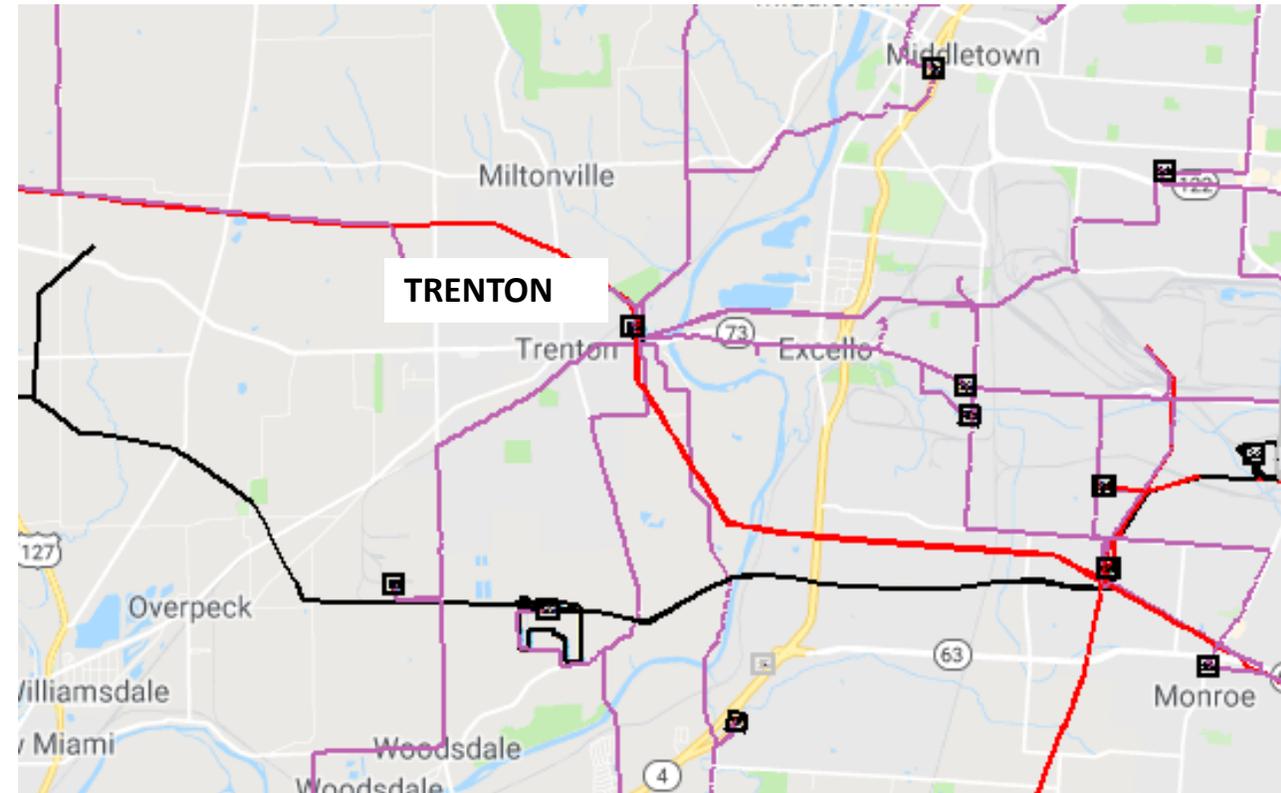
**Project Driver:** Customer Service

**Specific Assumption Reference:**

Duke Energy Ohio & Kentucky Local Planning Assumptions slide 10

**Problem Statement:**

An existing distribution customer is consolidating manufacturing to a facility served from Trenton substation. An additional 5MW of service is required by 01-01-2021. There are two distribution transformers at Trenton, a 22.4MVA experiencing loads near 20MVA and a 33MVA seeing loads at 34MVA.



**Need Number:** DEOK-2019-012

**Process Stage:** Local Plan Submission 09-11-2019

**Selected Solution:**

Install a 69/13kV 22MVA transformer, 13kV bus work and breakers for two feeder exits at Trenton. Reconfigure distribution feeders to balance load across all transformers. The new transformer will be connected to an existing breaker on the 69kV bus.

**Transmission Cost Estimate:** \$0

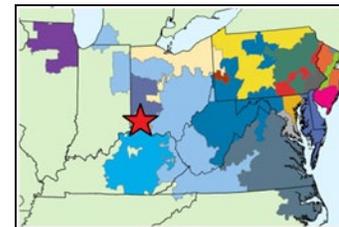
**Projected In-service Date:** 12-31-2020

**Supplemental Project ID:** S1933

**Project Status:** Engineering

**Model:** 2018 RTEP Summer

**Bubble Diagram Not Applicable  
Station Modifications Only**





# DEOK Transmission Zone M-3 Process Verona

**Need Number:** DEOK-2019-014

**Process Stage:** Local Plan Submission 10-02-2019

**Previously Presented:**

Solutions Meeting 06-17-2019

Needs Meeting 05-20-2019

**Supplemental Project Driver:**

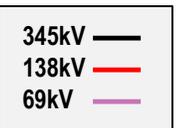
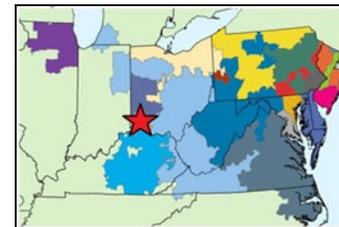
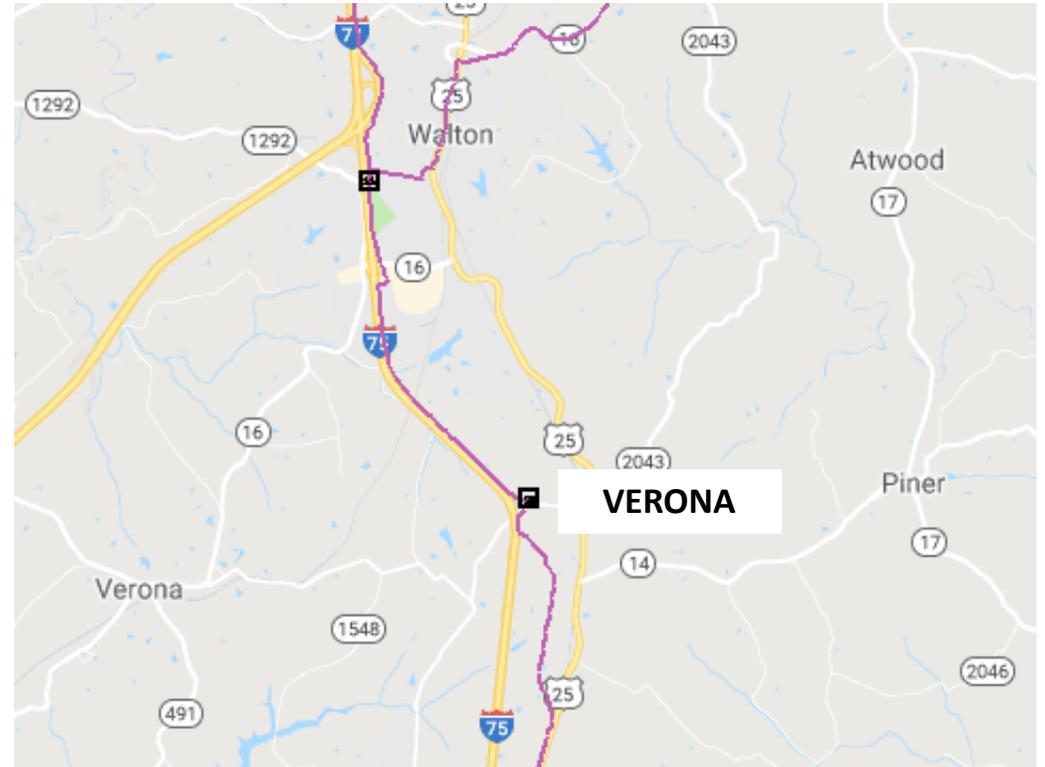
Customer Service

**Specific Assumption References:**

Duke Energy Ohio & Kentucky Local Planning Assumptions slide 10

**Problem Statement:**

Duke Energy Distribution has requested a new delivery point at Verona substation. Verona's single 69/13kV 10.5MVA transformer is seeing loads at 9MVA. An additional 5MWs of commercial and industrial load is expected in 2020.



**Need Number:** DEOK-019-014

**Process Stage:** Local Plan Submission 10-02-2019

**Selected Solution:**

Extend the Verona 69kV bus, install a second 69/13kV 10.5MVA transformer, 13kV bus work and breakers for one feeder exit. The new transformer will be switch connected to the 69kV bus similar to TB1.

**Transmission Cost Estimate:** \$659,542

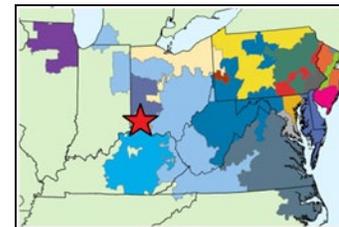
**Projected In-service Date:** 06-01-2020

**Supplemental Project ID:** S1988

**Project Status:** Engineering

**Model:** 2018 RTEP Summer

**Bubble Diagram Not Applicable  
Station Modifications Only**



**Need Number:** DEOK-2019-015

**Process Stage:** Local Plan Submission 10-02-2019

**Previously Presented:**

Solutions Meeting 06-17-2019

Needs Meeting 05-20-2019

**Supplemental Project Driver:**

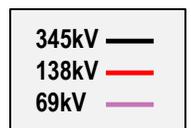
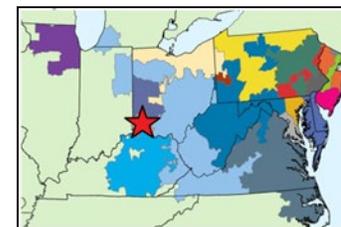
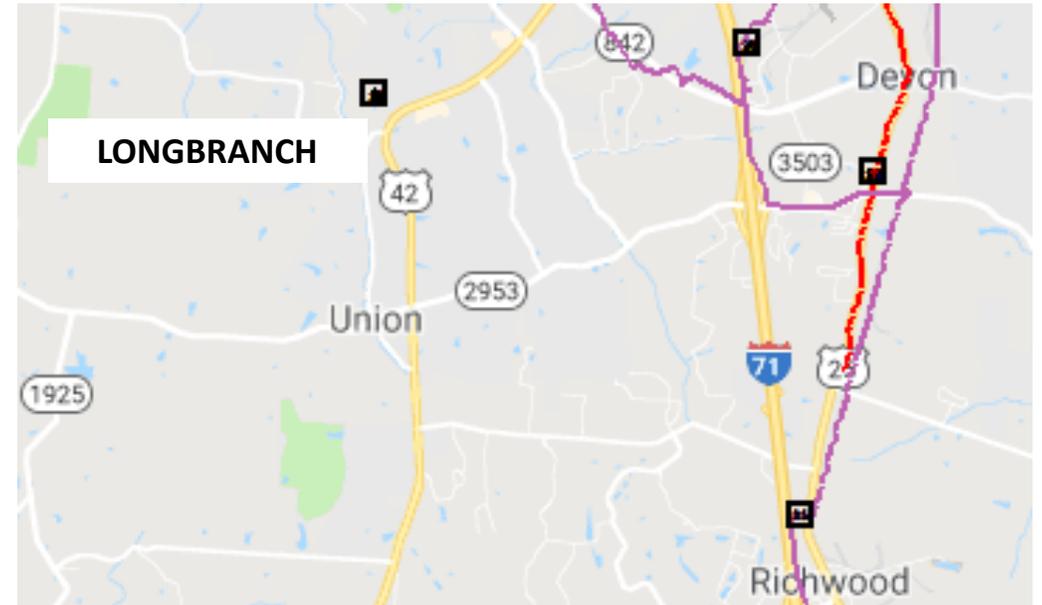
Customer Service

**Specific Assumption References:**

Duke Energy Ohio & Kentucky Local Planning Assumptions slide 10

**Problem Statement:**

Duke Energy Distribution has requested a new delivery point at Longbranch substation. Loading on the single 138/13kV 22MVA transformer has reached the nameplate rating. Commercial and residential development continues in this area. Load growth has been trending at 7% per year.



**Need Number:** DEOK-2019-015

**Process Stage:** Local Plan Submission 10-02-2019

**Selected Solution:**

Expand the substation. Remove and rebuild the box structure. Reroute the 138kV feeder into and out of the substation. Extend the 138kV bus. Add a second 138/13kV 22MVA transformer, 13kV bus work and breakers for two distribution feeder exits. The new transformer will be switch connected to the 138kV bus similar to TB1.

**Transmission Cost Estimate:** \$2,785,399

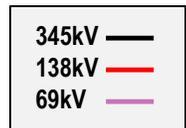
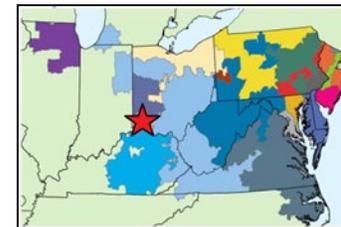
**Projected In-service Date:** 12-31-2020

**Supplemental Project ID:** S1989

**Project Status:** Engineering

**Model:** 2018 RTEP Summer

**Bubble Diagram Not Applicable  
Station Modifications Only**





**Need Number:** DEOK-2019-016

**Process Stage:** Local Plan Submission 10-02-2019

**Previously Presented:**

Solutions Meeting 06-17-2019

Needs Meeting 05-20-2019

**Supplemental Project Driver:**

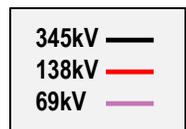
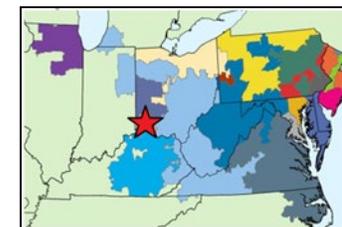
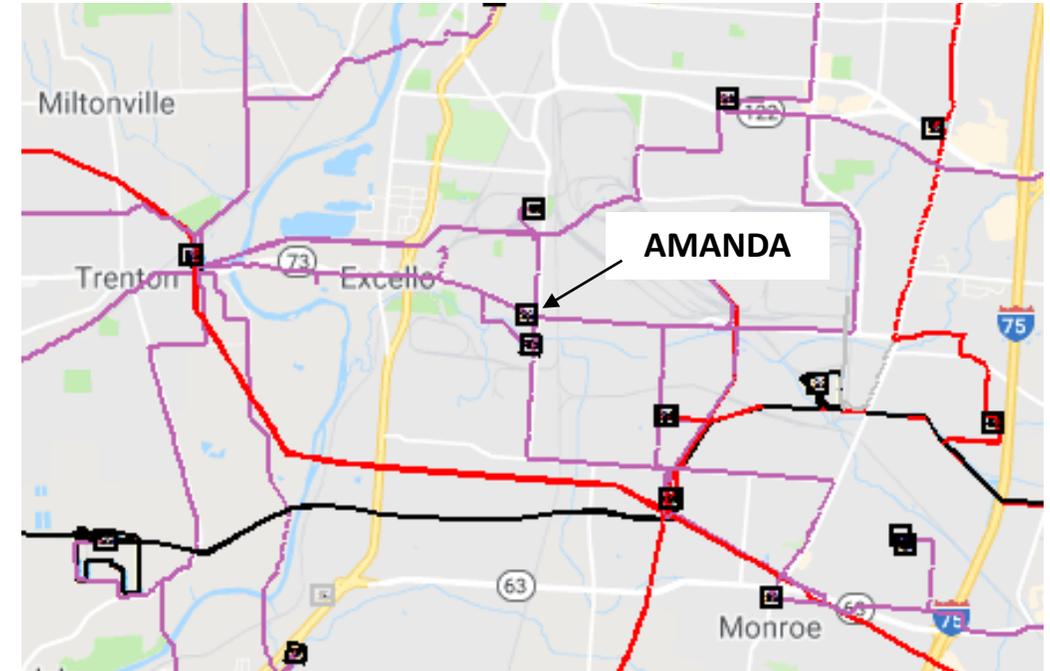
Customer Service

**Specific Assumption References:**

Duke Energy Ohio & Kentucky Local Planning Assumptions slide 10

**Problem Statement:**

Duke Energy Distribution has requested a new delivery point at Amanda substation. Amanda has a single 69/4kV 2.5MVA transformer. A new commercial customer requires 4MW of service by 12-31-2020.



**Need Number:** DEOK-2019-016

**Process Stage:** Local Plan Submission 10-02-2019

**Selected Solution:**

Remove the existing takeoff tower, 69/4kV 2.5MVA transformer and 4kV switchgear. Expand the substation. Install two H-frame structures. Reroute the 69kV feeder into and out of the substation. Install 69kV bus, a 69/13kV 22.4MVA transformer and 13kV breakers for two feeder exits. The transformer will be switch connected to the 69kV bus.

**Transmission Cost Estimate:** \$1,889,751

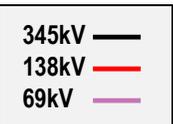
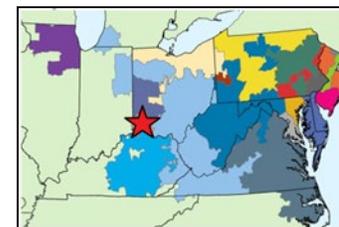
**Projected In-service Date:** 12-31-2020

**Supplemental Project ID:** S1990

**Project Status:** Engineering

**Model:** 2018 RTEP Summer

**Bubble Diagram Not Applicable  
Station Modifications Only**





# DEOK Transmission Zone M-3 Process Trade Port

**Need Number:** DEOK-2019-017

**Process Stage:** Local Plan Submission 10-02-2019

**Previously Presented:**

Solutions Meeting 06-17-2019

Needs Meeting 05-20-2019

**Supplemental Project Driver:**

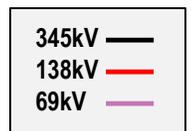
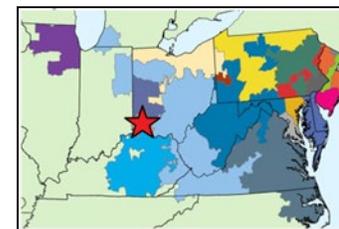
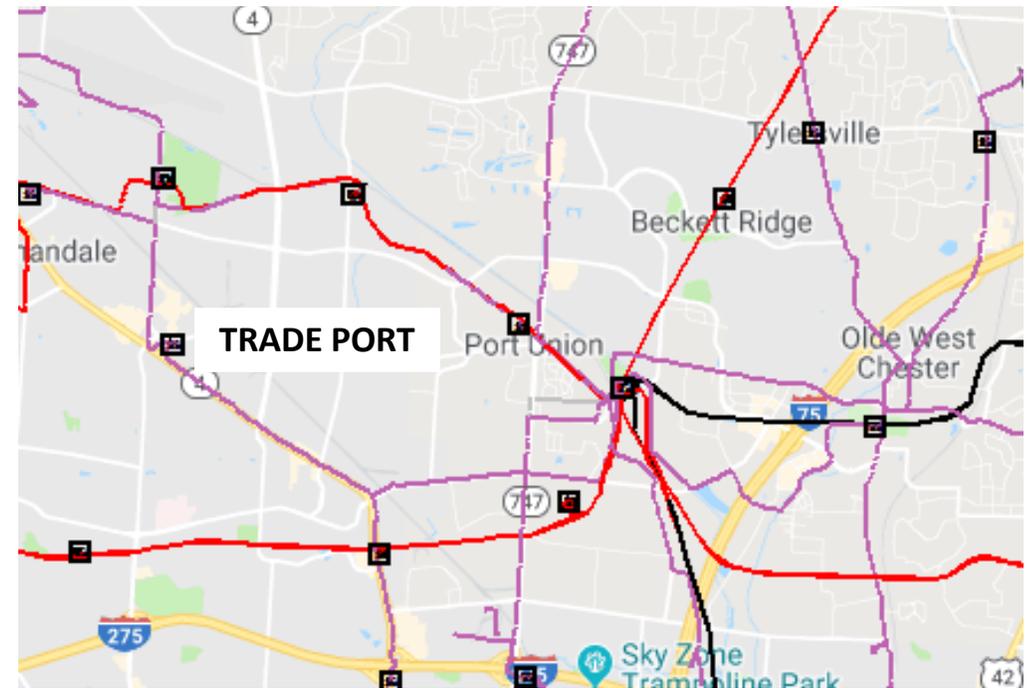
Customer Service

**Specific Assumption References:**

Duke Energy Ohio & Kentucky Local Planning Assumptions slide 10

**Problem Statement:**

Duke Energy Distribution has requested a new delivery point at Trade Port substation. An existing customer is renovating its operation and requires 5.5MWs of additional service by 12-31-2020. Trade Port's single 69/13kV 10.5MVA transformer is seeing loads at 6.5MVA.



**Need Number:** DEOK-2019-017

**Process Stage:** Local Plan Submission 10-02-2019

**Selected Solution:**

Extend the 69kV bus. Install a 69/13kV 22.5MVA transformer and 13kV switchgear for two distribution feeder exits. The new transformer will be switch connected to the 69kV bus similar to TB1.

**Transmission Cost Estimate:** \$700,591

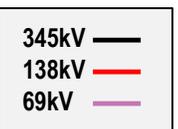
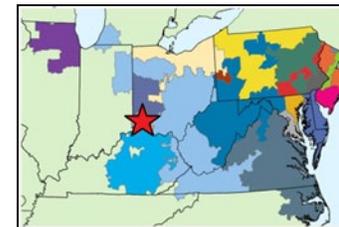
**Projected In-service Date:** 12-31-2020

**Supplemental Project ID:** S1991

**Project Status:** Engineering

**Model:** 2018 RTEP Summer

**Bubble Diagram Not Applicable  
Station Modifications Only**





# DEOK Transmission Zone M-3 Process Port Union - Foster

**Need Number:** DEOK-2019-019

**Process Stage:** Local Plan Submission 10-02-2019

**Previously Presented:**

Solutions Meeting 07-24-2019

Needs Meeting 06-17-2019

**Supplemental Project Driver:**

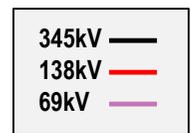
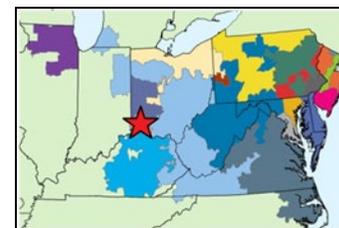
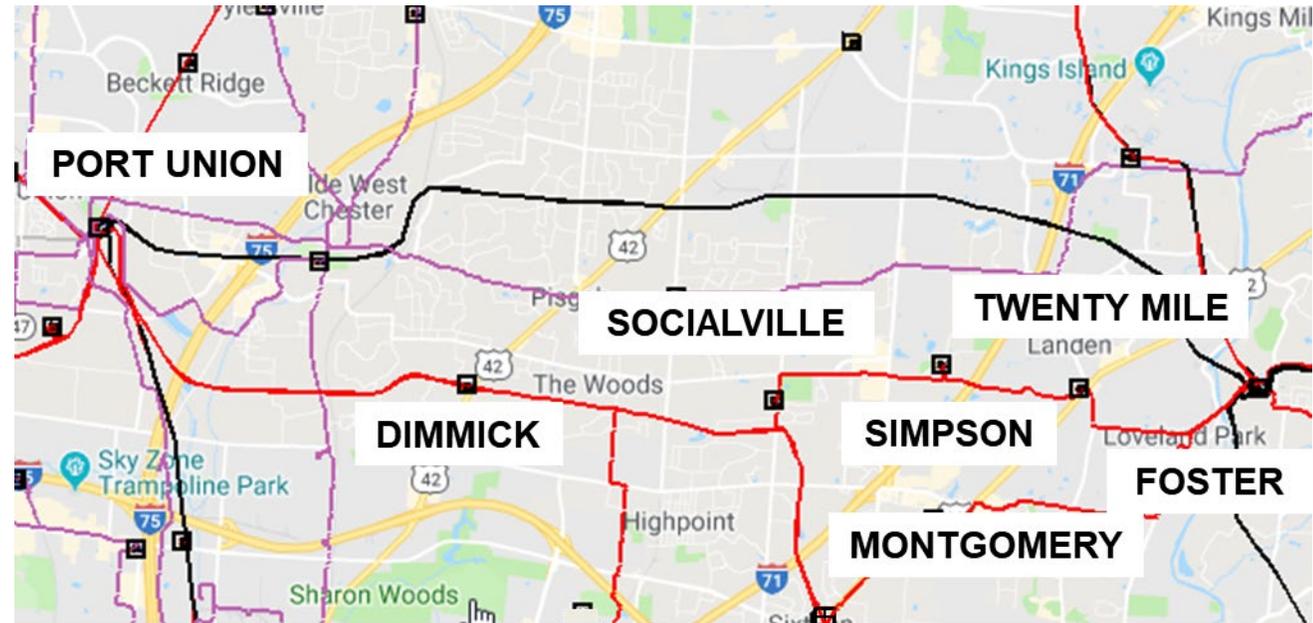
Operational Flexibility, Infrastructure Resilience, Customer Service

**Specific Assumption Reference:**

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

**Problem Statement:**

Nine 138/13kV 22.4MVA transformers are located at four substations in a highly developed commercial and residential area along the feeder from Port Union to Foster (two each at Dimmick, Socialville, Twenty Mile, three at Simpson). Only the feeder terminals at Port Union and Foster are breaker connected. Any disruption to this 12 mile long feeder results in a 150MW load loss. During heavy load periods an automatic restoration scheme at Montgomery must be disabled to eliminate potential overloads.





# DEOK Transmission Zone M-3 Process Port Union - Foster

**Need Number:** DEOK-2019-019

**Process Stage:** Local Plan Submission 10-02-2019

**Selected Solution:** Rebuild Socialville and Simpson into 3-breaker ring buses. Rebuild Montgomery into a 5-breaker ring bus. Extend the Montgomery tap ¼ mile to connect at Socialville. Connect Cornell-Wards Corner that runs through Montgomery, at Montgomery. This configuration limits the 150MW load loss to these maximums: 30MW Port Union-Socialville, 34MW Socialville-Simpson, 48MW Simpson-Foster.

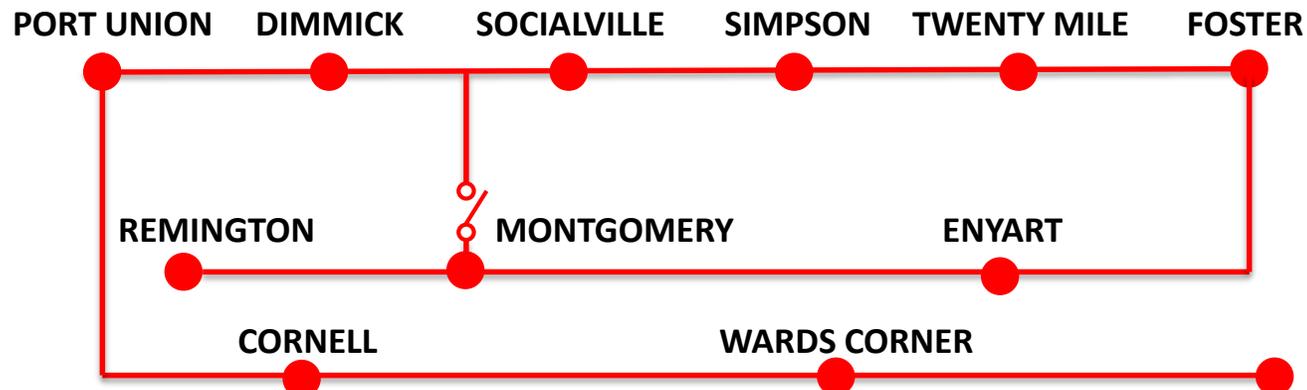
**Transmission Cost Estimate:** \$14,200,000

**Projected In-Service:** 06-01-2023

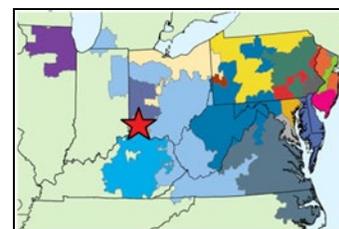
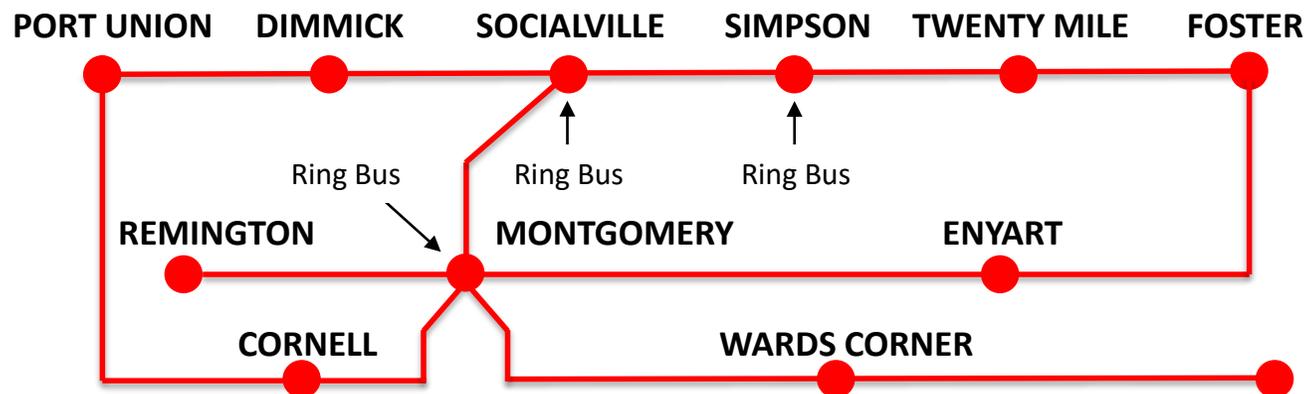
**Supplemental ID:** S1992

**Project Status:** Scoping

**Model:** 2018 RTEP Summer



Existing  
Proposed Plan



345kV	—
138kV	—
69kV	—



# DEOK Transmission Zone M-3 Process Mosteller

**Need Number:** DEOK 2019-013

**Process Stage:** Local Plan Submission 10-02-2019

**Previously Presented:**

Solutions Meeting 05-20-2019

Needs Meeting 04-23-2019

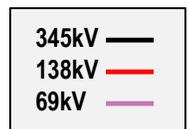
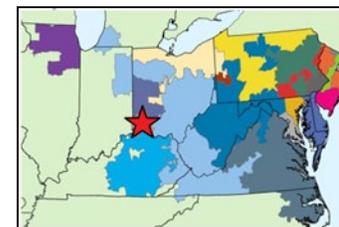
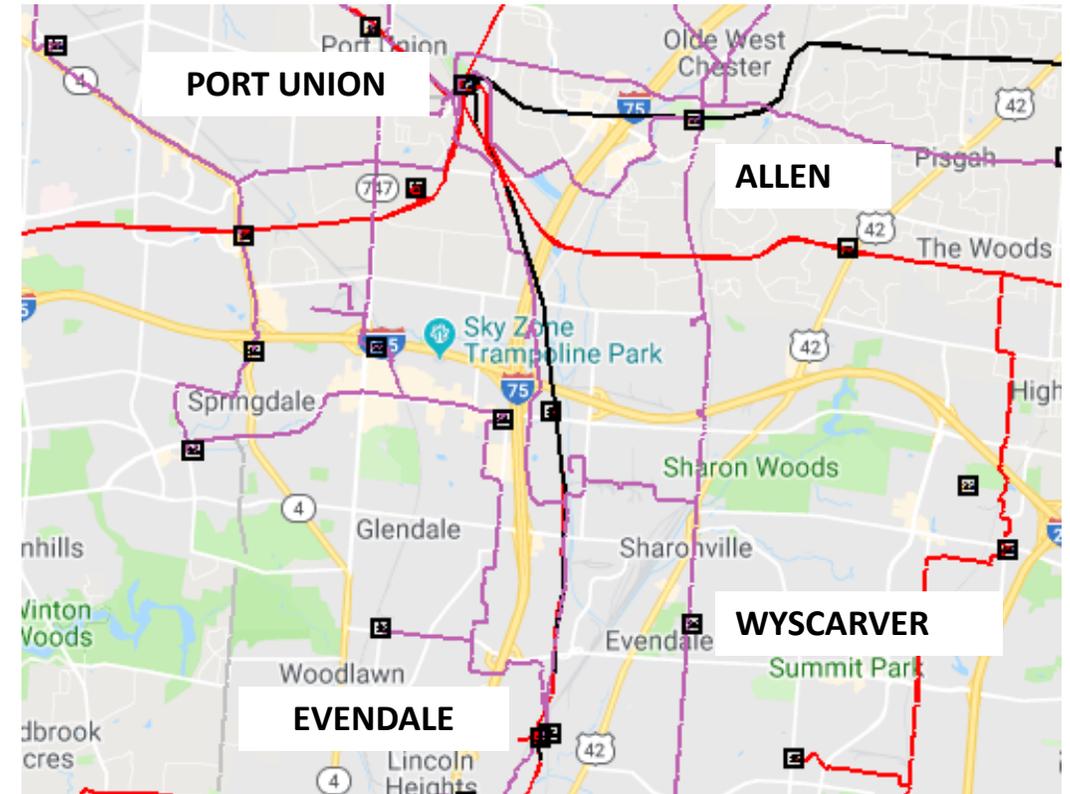
**Project Driver:** Customer Service, Operational Flexibility and Efficiency, Infrastructure Resilience

**Specific Assumption Reference:**

Duke Energy Ohio & Kentucky Local Planning Assumptions slides 8,9, and 10

## Problem Statement:

An automotive manufacturer in Sharonville, Ohio is currently supplied via a tap that extends from the 69kV Evendale - Port Union feeder. This tap is also the source for an adjacent Industrial plant. The Evendale - Port Union feeder is also a source for a distribution transformer at Port Union, which supplies commercial and industrial load in the vicinity of Port Union. The circuit has 7.7 miles of line exposure in a heavily commercialized and industrial area. (continued)

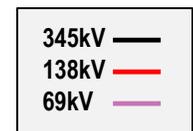
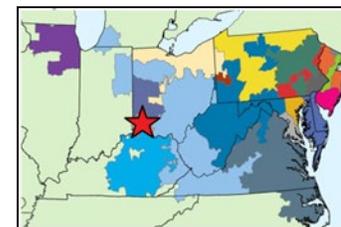
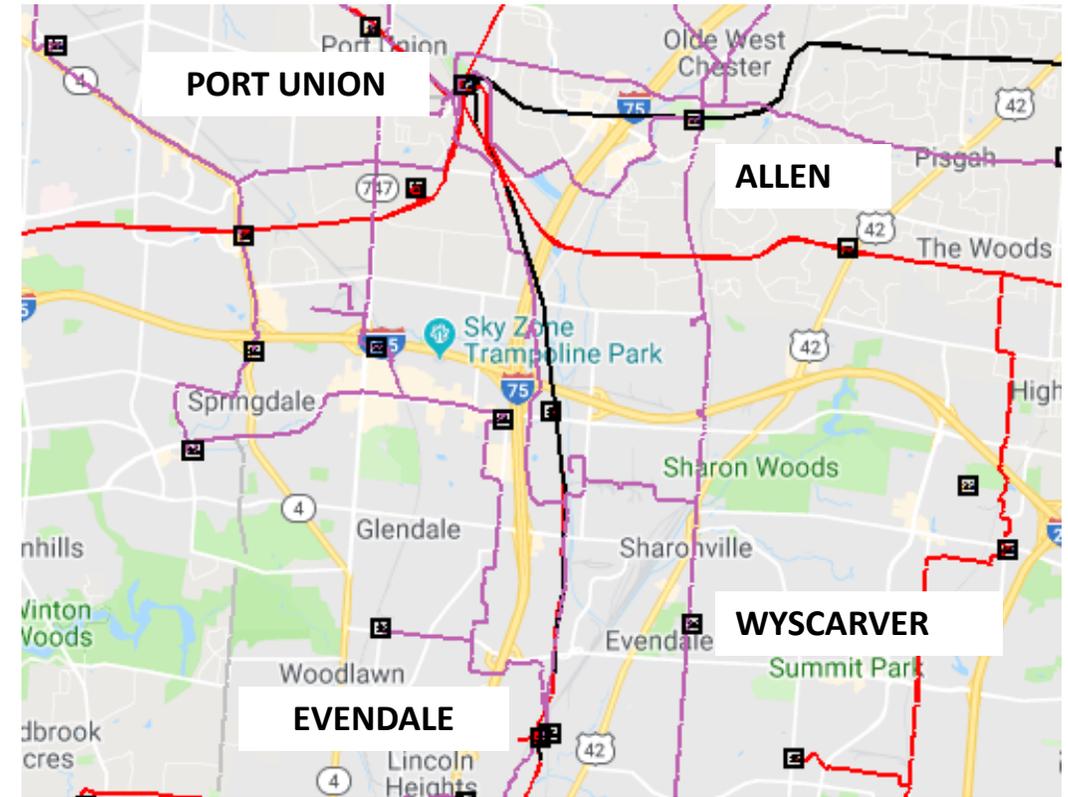


**Need Number:** DEOK 2019-013

**Process Stage:** Local Plan Submission 10-02-2019

**Problem Statement:**

(continued) The primary source for the automotive customer’s substation is the Evendale - Port Union feeder. The substation is also connected normally open to an alternate source from the Allen - Wyscarver feeder. There is an auto throw-over (ATO) scheme to transfer to the alternate source via air break switches. Faults on the primary source lead to momentary outages and outages up to 40 seconds if the primary source fault is permanent and restoration is accomplished via the ATO. This causes significant disruption to their operations. During heavy load or abnormal system conditions, the ATO to the alternate source must be disabled. Under such circumstances, an outage of the primary source would result in an extended outage to the automotive plant. The customer has advised that just a momentary outage causes major disruption to the plant’s production from which it takes up to 24 hours to recover. The disruptions have a ripple effect throughout their national production chain impacting other plants around the county.  
(continued)



**Need Number:** DEOK 2019-013

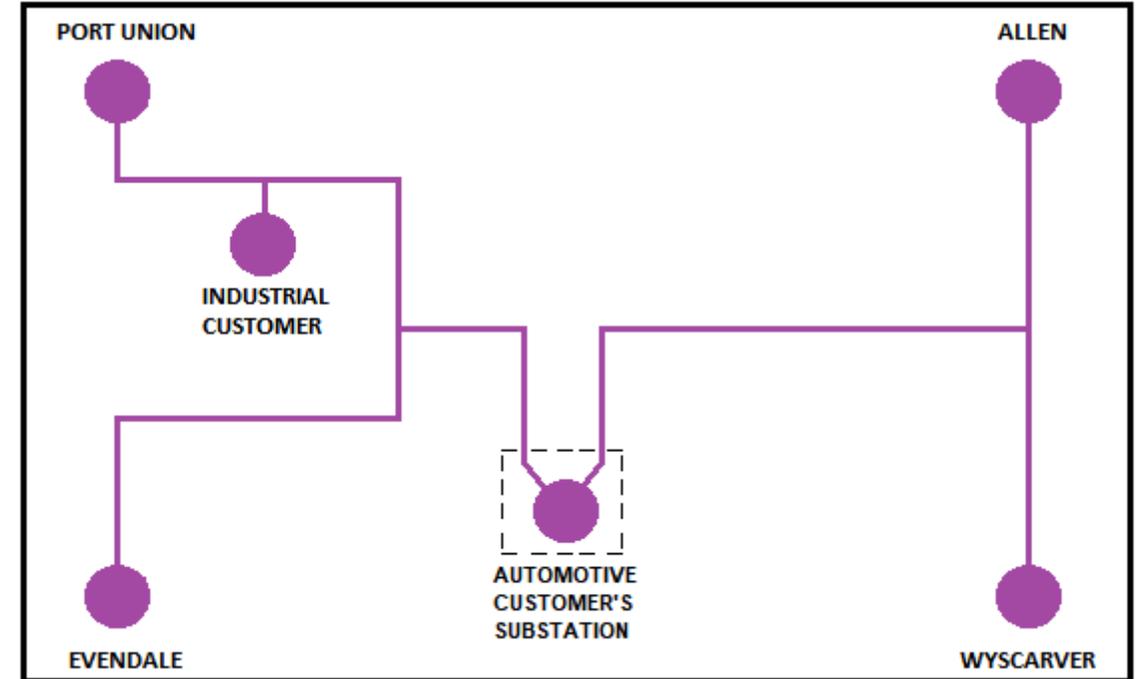
**Process Stage:** Local Plan Submission 10-02-2019

**Problem Statement:**

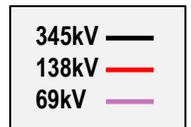
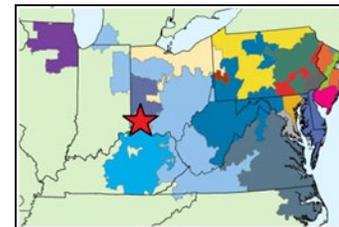
(continued) The adjacent industrial plant is also interrupted for events on the primary feeder. No ATO is available to restore service. Restoration must be performed by manual inspection to determine the problem and repair, and the operation of pole mounted switches to sectionalize the circuit.

Any problem in the automotive customer’s substation results in the interruption of the Evendale - Port Union path. Disrupting supply to the adjacent industrial customer and to the distribution transformer that serves commercial and industrial load near Port Union.

Any work in the automotive customer’s substation must be coordinated, resulting in operational constraints.



existing configuration



**Need Number:** DEOK 2019-019

**Process Stage:** Local Plan Submission 10-02-2019

**Selected Solution:** Build a new 6-position, 69kV ring bus substation adjacent to the automotive customer's substation. Split the Port Union-Evendale feeder into two segments. Connect to the new substation the feeders into the automotive customer's substation, the Port Union feeder, the Evendale feeder, and the feeder to Wyscarver-Allen. Six breakers are required so that the Evendale and Port Union feeders do not share a common breaker, and the automotive customer feeders do not share a common breaker.

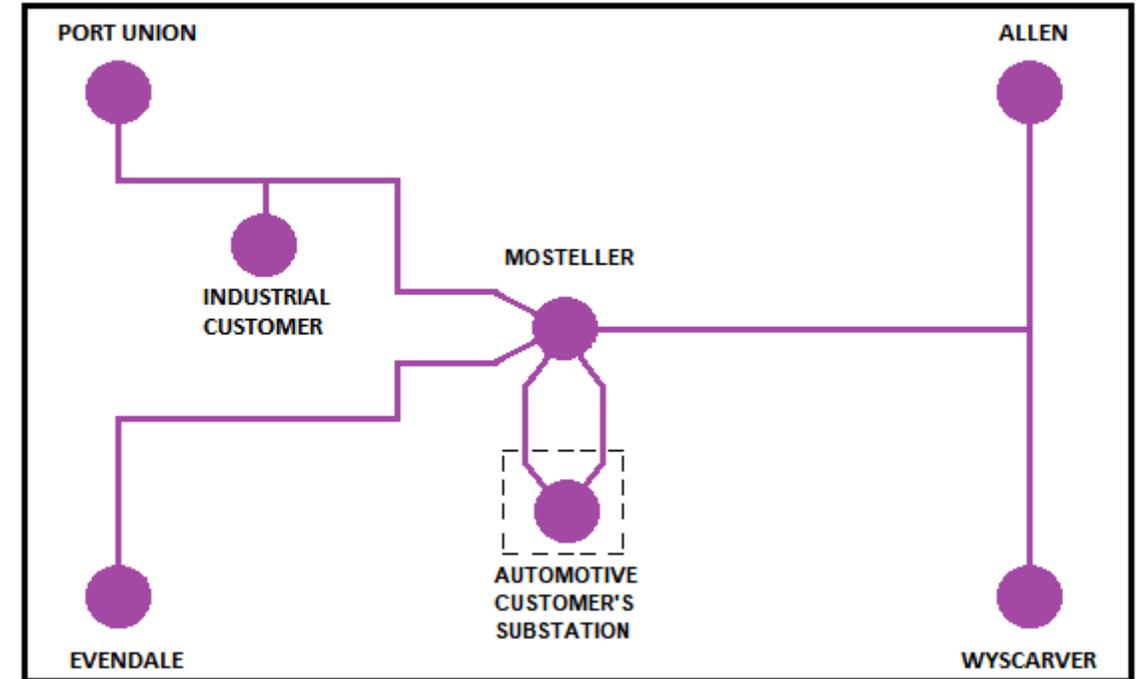
**Transmission Cost Estimate:** \$4,877,031

**Projected In-Service:** 12-31-2020

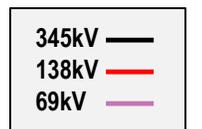
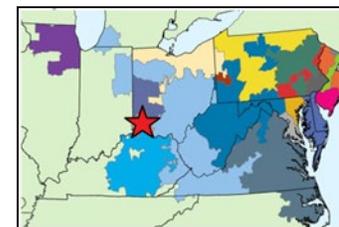
**Supplemental ID:** s1993

**Project Status:** Engineering

**Model:** 2018 RTEP Summer



proposed configuration





# DEOK Transmission Zone M-3 Process Dry Ridge

**Need Number:** DEOK 2019-007

**Process Stage:** Local Plan Submission 12-04-2019

**Previously Presented:**

Solutions Meeting 10-25-2019

Needs Meeting 03-25-2019

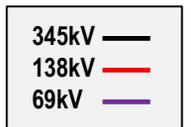
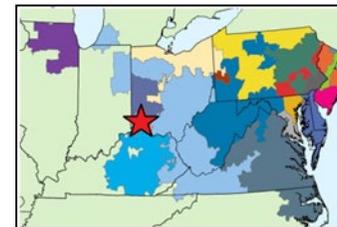
**Supplemental Project Driver:** Customer Service

**Specific Assumption Reference:**

Duke Energy Ohio & Kentucky Local Planning Assumptions slide 10

**Problem Statement:**

Duke Energy Distribution has requested a new delivery point at Dry Ridge substation. Dry Ridge has one 69/13kV 10.5MVA transformer. Grant substation has two 69/13kV 10.5MVA transformers. Due to loading at Dry Ridge and Grant (60% at Dry Ridge, 33% and 36% at Grant), Grant can no longer be tied out to Dry Ridge.



**Need Number:** DEOK 2019-007

**Process Stage:** Local Plan Submission 12-04-2019

**Selected Solution:** Expand Dry Ridge substation. Extend the 69kV bus. Install a switch connected 69/13kV 10.5MVA transformer, 13kV bus work and equipment for one feeder exit. Move one of the two 13kV feeders to the new bus to distribute the substation load.

**Estimated Transmission Cost:** \$3.2M

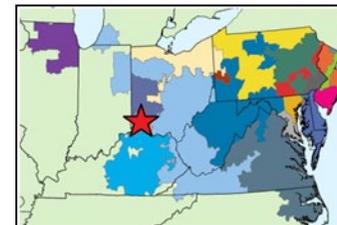
**Projected In-Service Date:** 06-01-2021

**Project Status:** Engineering

**Supplemental ID:** s2081

**Model:** 2018 RTEP Summer

**Ancillary Benefits:** Operational options for switching, reduce recovery time for impacts to distribution system customers.





# DEOK Transmission Zone M-3 Process Oakley

**Need Number:** DEOK 2019-018

**Process Stage:** Local Plan Submission 12-04-2019

**Previously Presented:**

Solutions Meeting 10-25-2019

Needs Meeting 05-20-2019

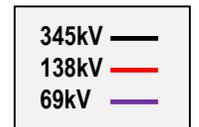
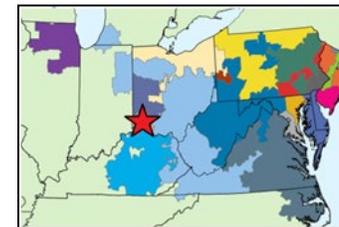
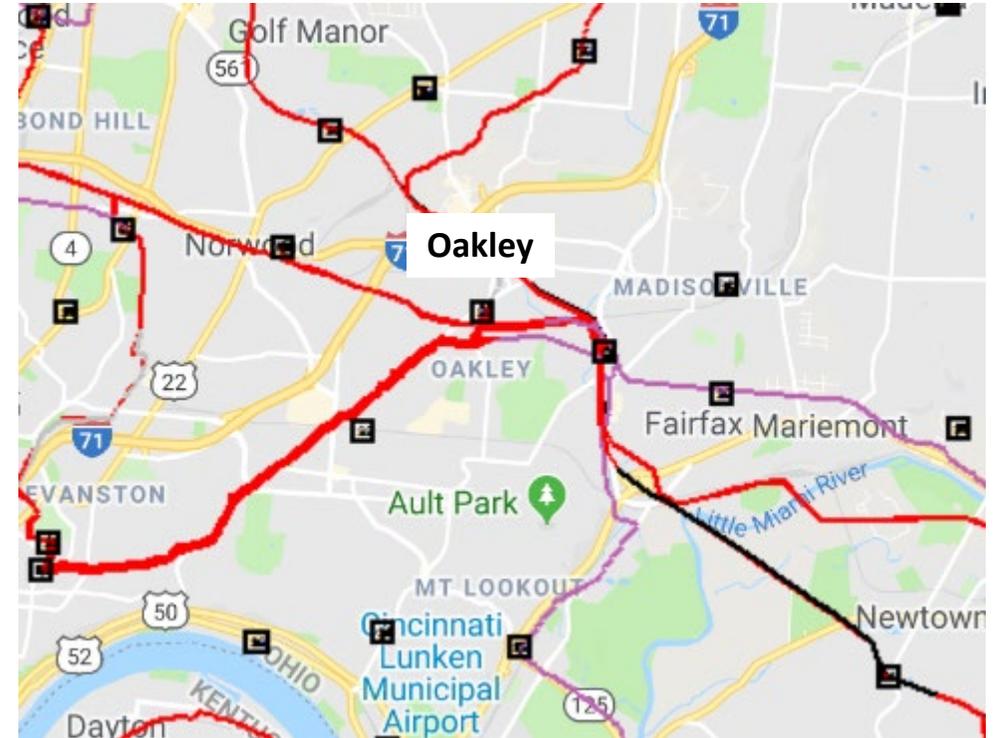
**Supplemental Project Driver:** Other

**Specific Assumption Reference:**

Duke Energy Ohio & Kentucky Local Planning Assumptions slide 11

**Problem Statement:**

Line inspection found a clearance between a distribution feeder and a transmission tower. Duke Energy Distribution is moving loads to others feeders in the area, and retiring the feeder. This feeder was the only load on Oakley 69/34kV 27MVA TB5. Oakley TB5 is 69 years old, is one of the last few of it's design on the system.



**Need Number:** DEOK 2019-018

**Process Stage:** Local Plan Submission 12-04-2019

**Proposed Solution :** Retire and remove Oakley TB5. Remove low side distribution equipment that is no longer in service.

**Estimated Transmission Cost:** \$832,000

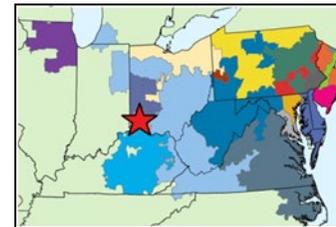
**Projected In-Service Date :** 12-31-2022

**Project Status:** Engineering

**Supplemental ID:** s2082

**Model:** 2018 RTEP Summer

**Bubble Diagram Not Applicable  
Station Modifications Only**





# DEOK Transmission Zone M-3 Process Beckjord

**Need Number:** DEOK 2019-021

**Process Stage:** Local Plan Submission 12-04-2019

**Previously Presented:**

Solutions Meeting 10-25-2019

Needs Meeting 08-29-2019

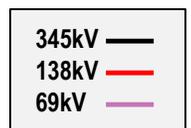
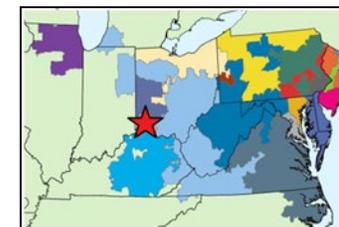
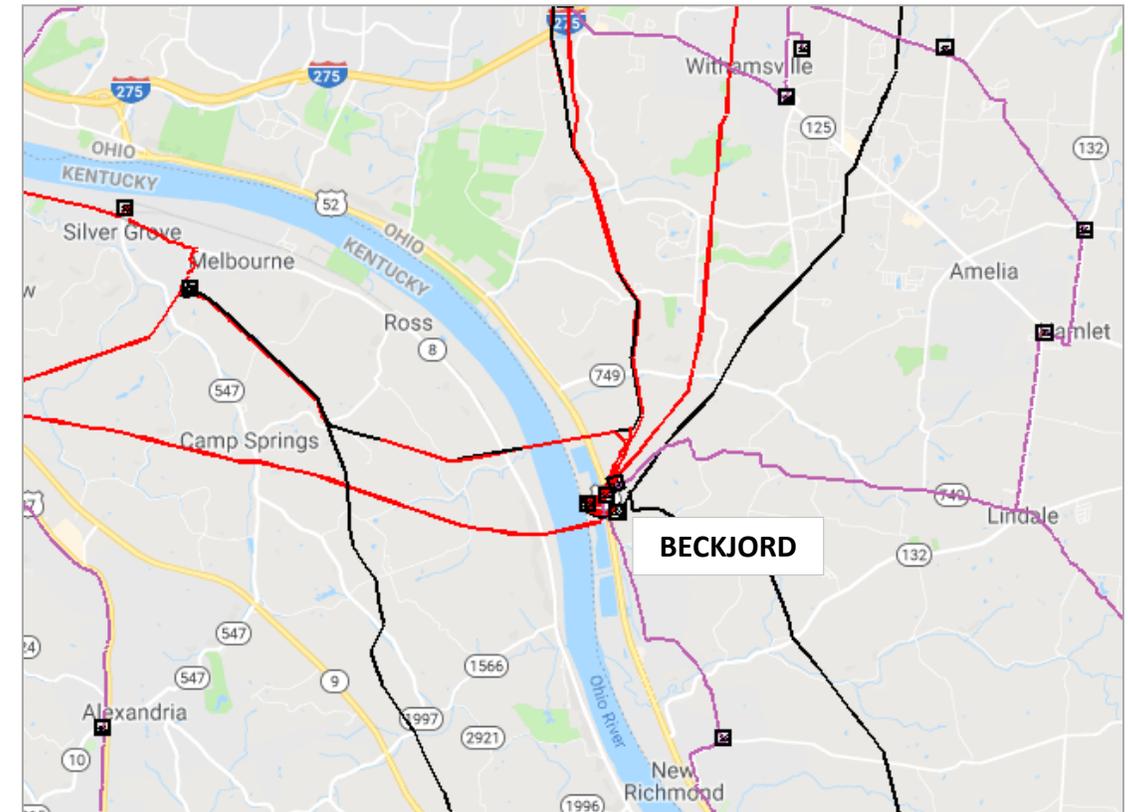
**Supplemental Project Driver:** Equipment Condition, Performance and Risk

**Specific Assumption Reference:**

Duke Energy Ohio & Kentucky Local Planning Assumptions slides 6 - 7

**Problem Statement:**

Beckjord 138kV buses 5 and 6 are in deteriorating condition. Constructed with copper bus and with cap and pin insulators, they were put in service in 1962. Structural steel is rusting. Rebar is showing through the structural and equipment foundations. Three breakers are connect to each bus. These breakers are oil filled and obsolete. The installation dates for these breakers are: 1975, 1991, 1973, 1991, 1969, and 1973.



**Need Number:** DEOK 2019-021

**Process Stage:** Local Plan Submission 12-04-2019

**Proposed Solution :** Remove and replace foundations. Rebuild 138kV buses 5 and 6. Replace six breakers, twelve associated breaker disconnect switches, three wave traps and other ancillary equipment.

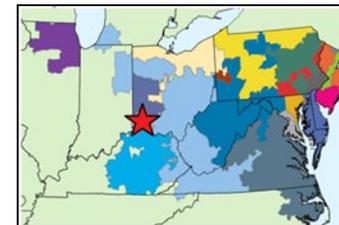
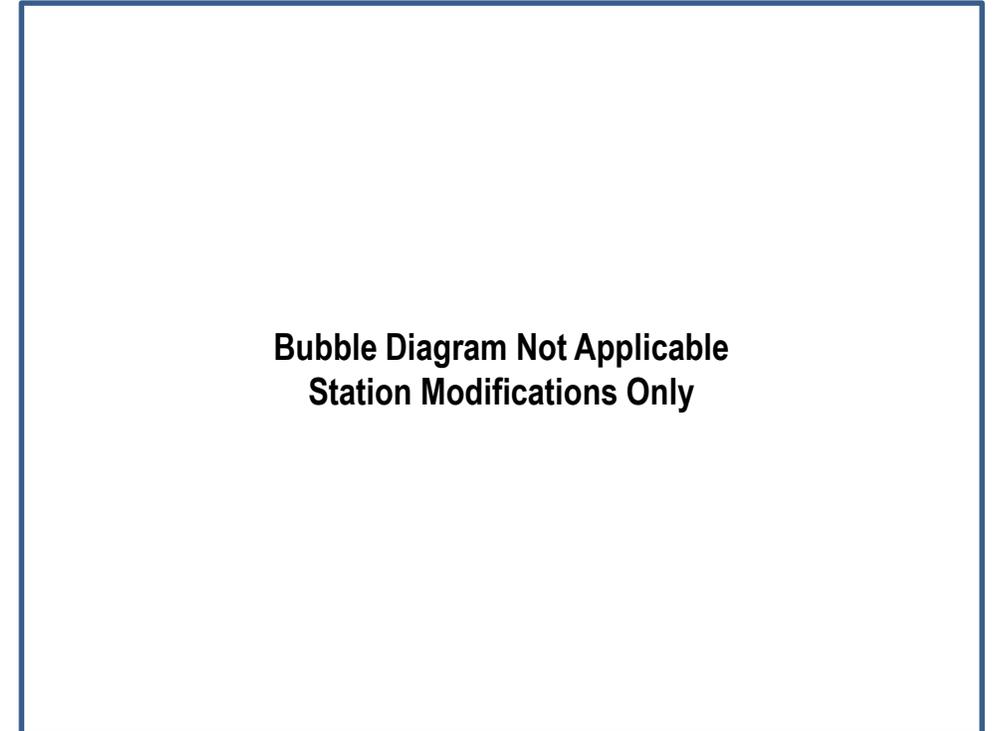
**Estimated Transmission Cost:** \$4.7M

**Projected In-Service Date:** 06-01-2021

**Project Status:** Engineering

**Supplemental ID:** s2083

**Model:** 2018 RTEP Summer





# DEOK Transmission Zone M-3 Process Beckjord

**Need Number:** DEOK 2019-022

**Process Stage:** Local Plan Submission 12-04-2019

**Previously Presented:**

Solutions Meeting 10-25-2019

Needs Meeting 08-29-2019

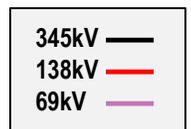
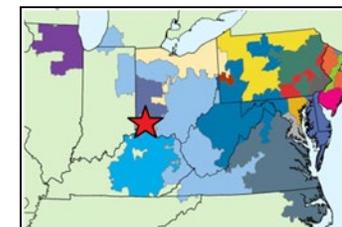
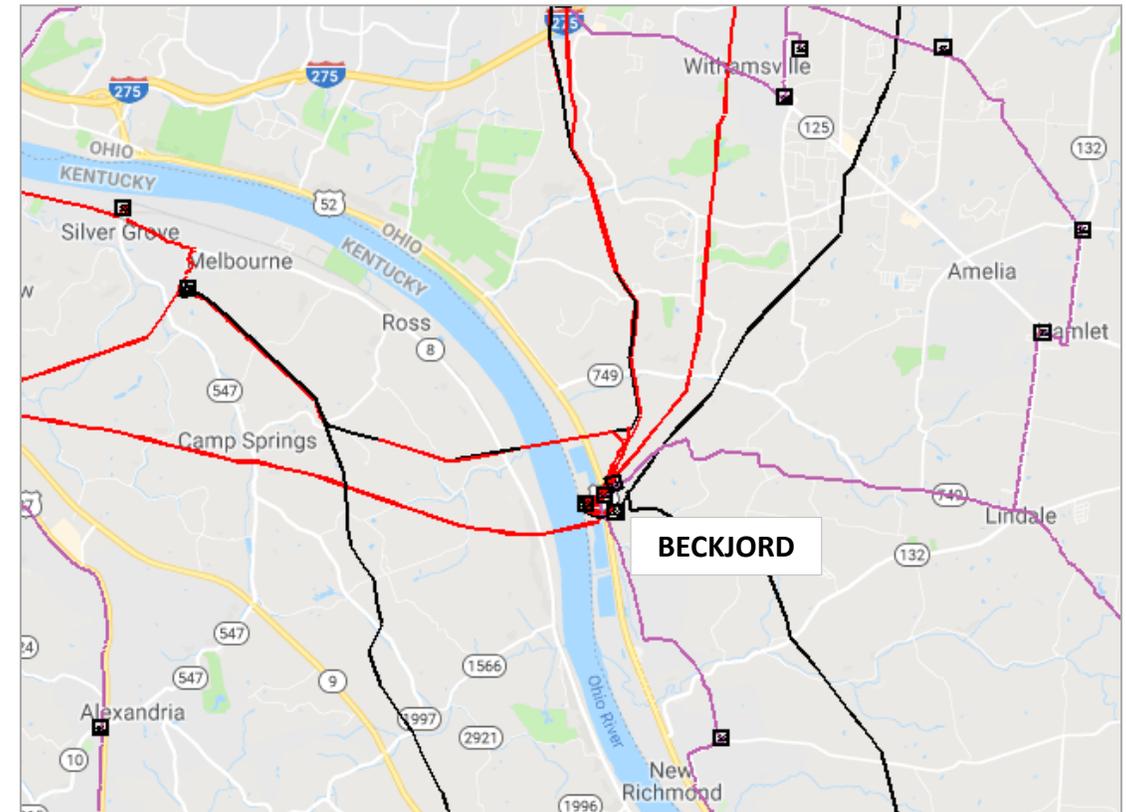
**Supplemental Project Driver:** Equipment Condition, Performance and Risk

**Specific Assumption Reference:**

Duke Energy Ohio & Kentucky Local Planning Assumptions slides 6 - 7

**Problem Statement:**

Beckjord 138kV buses 1 and 2 are in deteriorating condition. Constructed with copper bus and with cap and pin insulators, they were put in service in 1952. Structural steel is rusting. Rebar is showing through the deteriorating structural and equipment foundations. Three breakers are connected at each bus. One, installed in 2004, uses SF6 gas. The five others are oil filled, obsolete and were installed in 1973.



**Need Number:** DEOK 2019-022

**Process Stage:** Local Plan Submission 12-04-2019

**Proposed Solution :** Remove and replace foundations. Rebuild 138kV buses 1 and 2. Reuse one breaker. Replace five 138kV breakers, 10 associated breaker disconnect switches, 3 wave traps and other ancillary equipment.

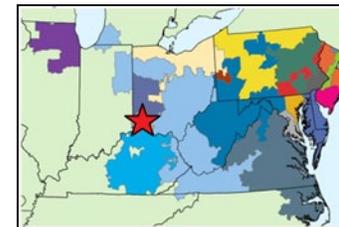
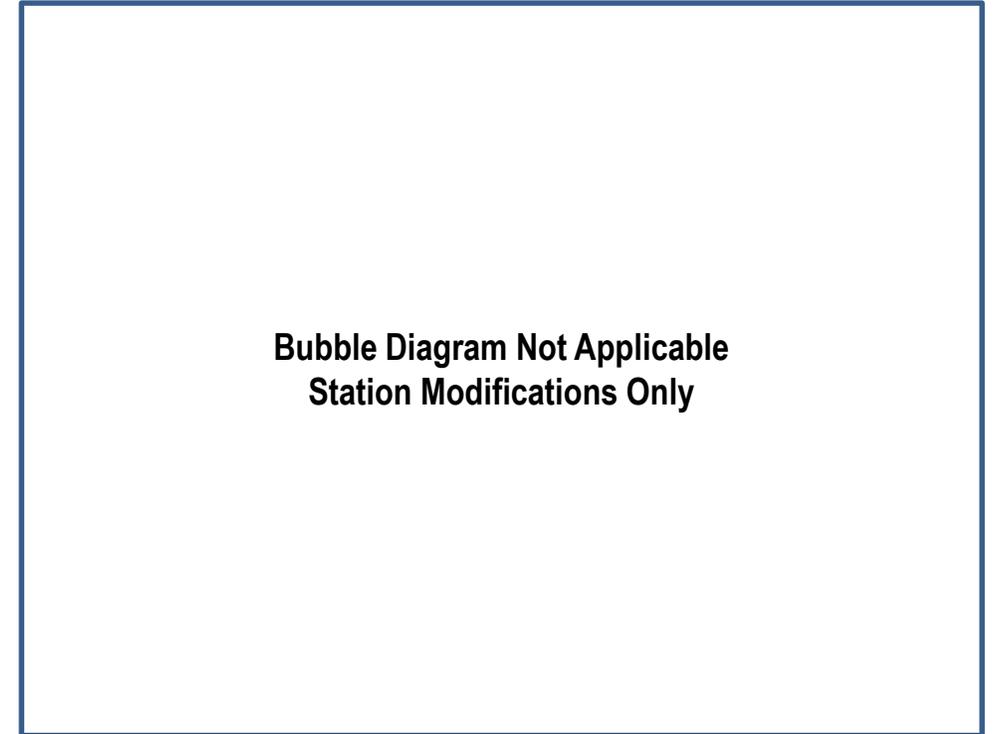
**Estimated Transmission Cost:** \$4.2M

**Projected In-Service Date:** 12-31-2021

**Project Status:** Engineering

**Supplemental ID:** s2084

**Model:** 2018 RTEP Summer



# Revision History

- 6/27/2019 – V1 – Local Plan posted to pjm.com for S1381 – S1382
- 8/2/2019 – V2 – Corrected supplemental IDs to s1782 and s1783
- 9/11/2019 – V3 – Local Plan posted to pjm.com for S1926 – S1933
- 9/13/2019 – V4 – Slides #13 S1929, corrected the project description
- 10/2/2019 – V5 – Local Plan posted to pjm.com for S1988– S1993
- 12/4/2019 – V6 – Local Plan posted to pjm.com for S2081– S2084