Sub Regional RTEP Committee
PJM West

October 26, 2018

- The following definitions explain the basis for excluding flowgates and/or projects from the competitive planning process and designating projects to the incumbent Transmission Owner.
- Flowgates/projects excluded from competition will include the underlined language on the corresponding slide.
  - Immediate Need Exclusion: Due to the immediate need of the violation (3 years or less), the timing required for an RTEP proposal window is infeasible. As a result, the local Transmission Owner will be the Designated Entity. - Operating Agreement, Schedule 6 § 1.5.8(m)
  - Below 200 kV: Due to the lower voltage level of the identified violation(s), the driver(s) for this project are excluded from the competitive proposal window process. As a result, the local Transmission Owner will be the Designated Entity - Operating Agreement, Schedule 6 § 1.5.8(n)
  - FERC 715 (TO Criteria): Due to the violation need of this project resulting solely from FERC 715 TO Reliability Criteria, the driver(s) for this project are excluded from the competitive proposal window process. As a result, the local Transmission Owner will be the Designated Entity - Operating Agreement, Schedule 6 § 1.5.8(o)
  - Substation Equipment: Due to identification of the limiting element(s) as substation equipment, the driver(s) for this project are excluded from the competitive proposal window process. As a result, the local Transmission Owner will be the Designated Entity - Operating Agreement, Schedule 6 § 1.5.8(p)

Immediate Need

APS Transmission Zone: Baseline
West Winchester 138 kV Capacitor

Immediate Need

Problem Statement:

2018 RTEP N-1 Low Voltage Violation/Generation Retirement FE Nuclear

- Low Voltage violations at West Winchester and Redbud 138 kV.

Recommended Solution (B3052):

West Winchester Capacitor

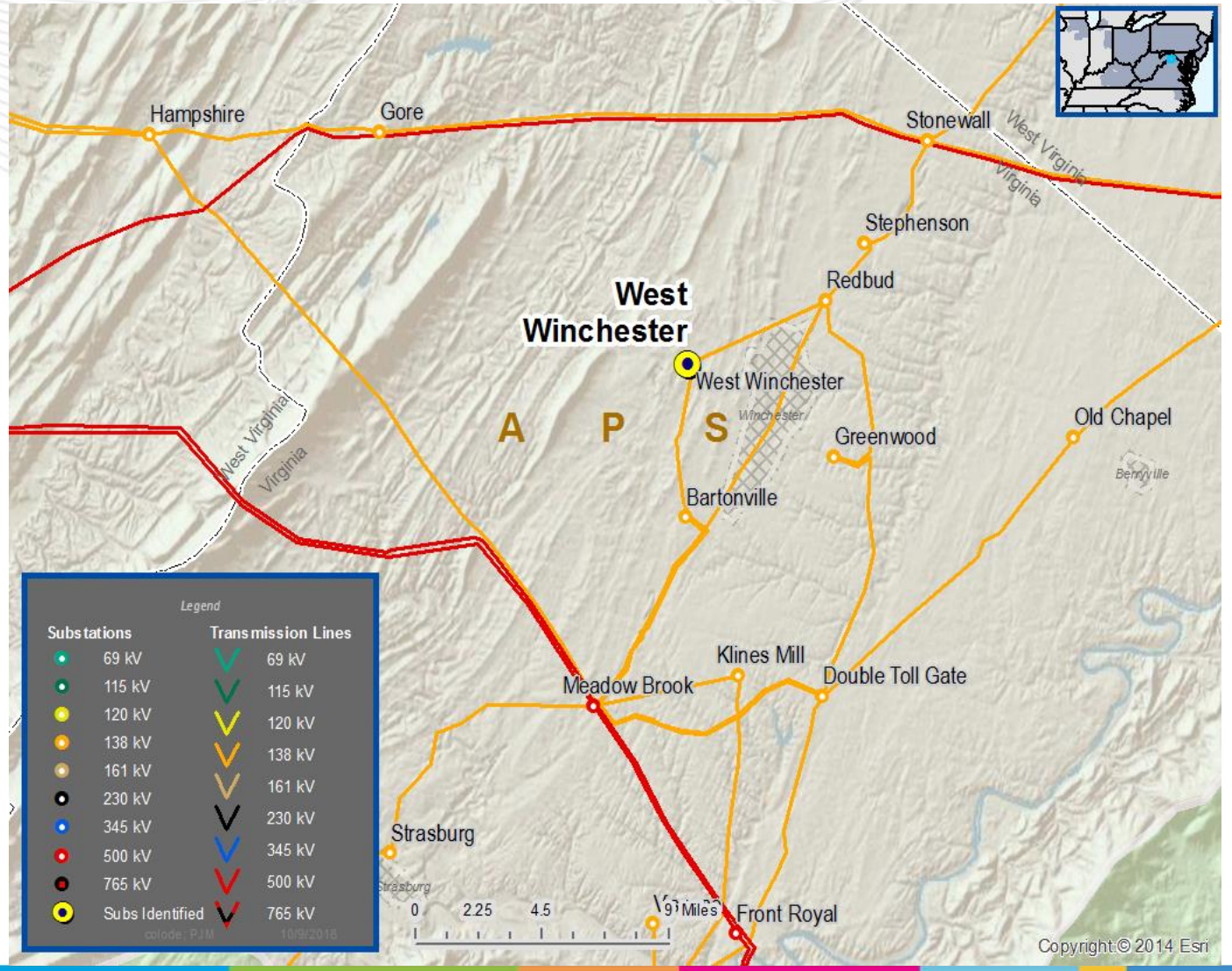
- Install a 138 kV capacitor (29.7 MVAR effective) at West Winchester 138 kV.

Estimated Project Cost: $1.013 M

Required IS Date: Immediate Need

Projected IS Date: 6/1/2021

Status: Scoping



DEOK Transmission Zone: Baseline Todhunter 138kV breakers

Immediate Need

Problem Statement: Short Circuit

- The Todhunter 138kV breakers “937", “941", and “945" are overdutied

Recommended Solution:

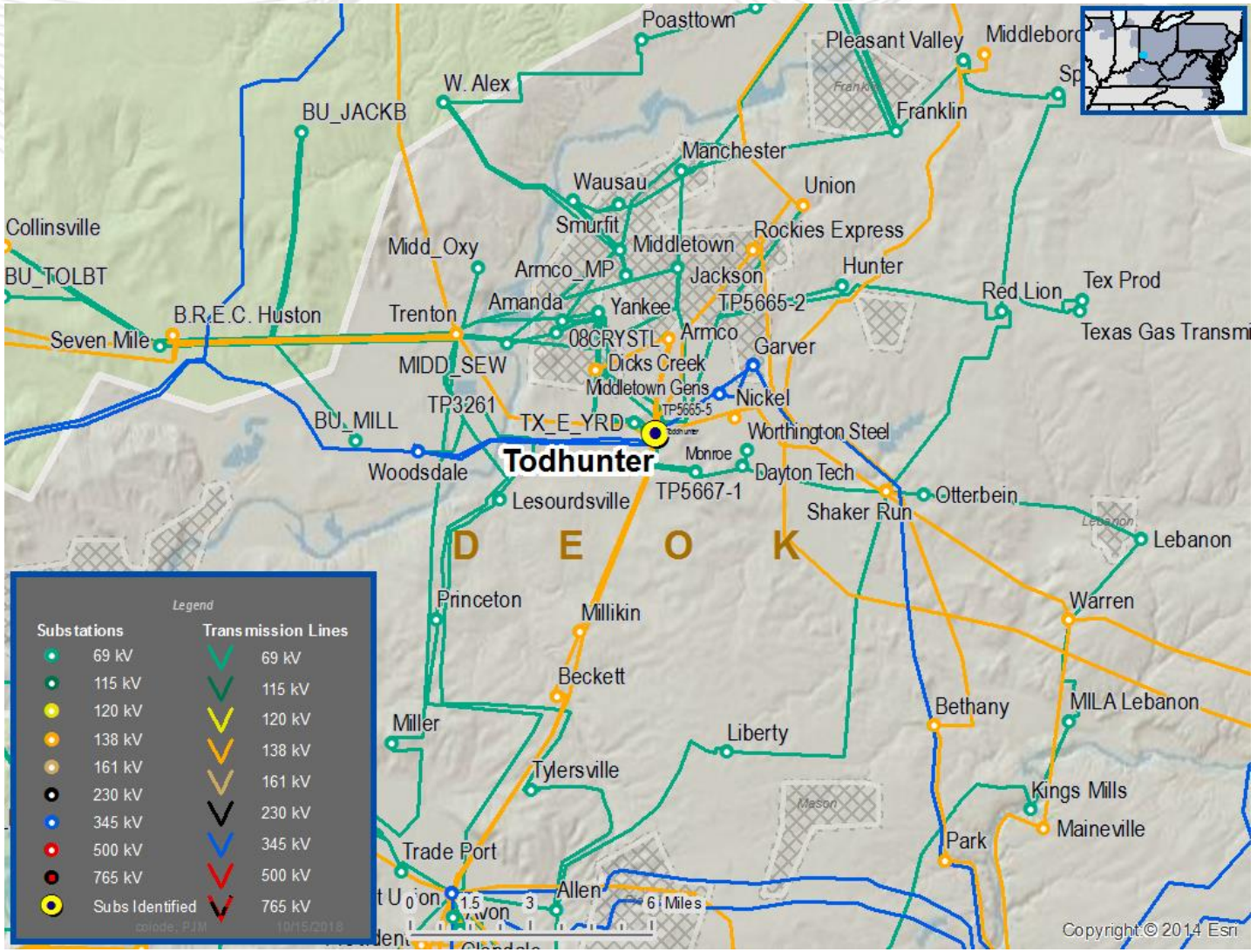
- Replace existing breakers with new breakers with higher short-circuit interrupting capacity (B3048)

Estimated Project Cost: $1.9 M

Required IS Date: 12/31/2020

Projected IS Date: 12/31/2020

Project Status: In construction



Baseline Reliability Projects

Problem Statement:

FERC 715 (TO Criteria)

Sub-transmission facilities in the Findlay and North Baltimore areas have been identified in the 2022 RTEP model.

N-1 Thermal:

Monitored Facility, Contingency, 2022RTEP % Loading, Evaluated MVA Rating

New Liberty – West Melrose 34kV Circuit, North Findlay CB B, 127%, 27 MVA

N-1 Voltage Magnitude:

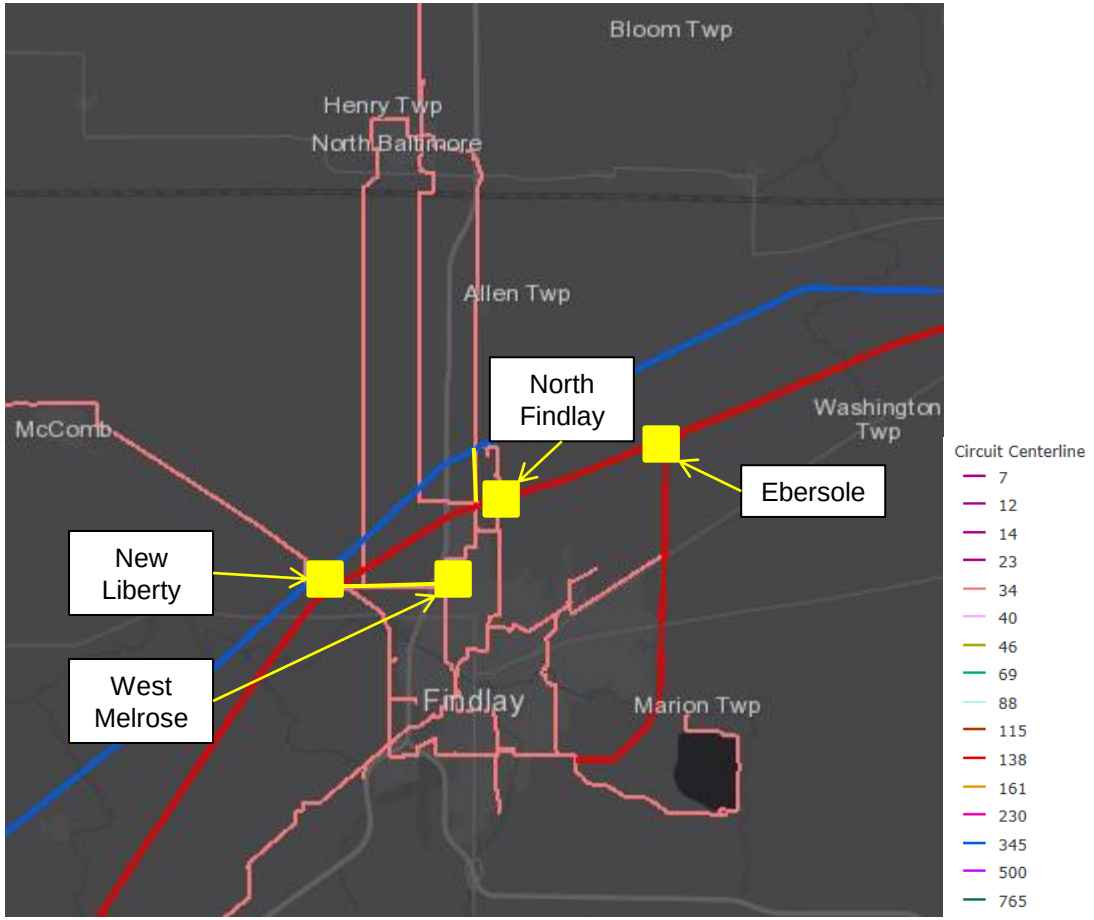
Monitored Bus, Contingency, 2022RTEP pu Voltage

Cygnet-Buckeye 34.5kV, North Findlay CB B, 0.89pu
Hamman Sw 34.5kV, North Findlay CB B, 0.89pu
Mungen 34.5kV, North Findlay CB B, 0.88pu
Portage 34.5kV, North Findlay CB B, 0.88pu

N-1 Voltage Deviation:

Monitored Bus, Contingency, 2022RTEP % Worst Deviation

BP Pumping 34.5kV, North Findlay CB B, 10.8%
Cory 34.5kV, Multiple Contingencies, 12.3%
DTR 34.5kV, Multiple Contingencies, 12.5%
East Mt Cory 34.5kV, Multiple Contingencies, 11.2%
McIntosh 34.5kV, Multiple Contingencies, 12.3%
North Woodcock 34.5kV, Multiple Contingencies, 9.7%
Rawson 34.5kV, Multiple Contingencies, 10.8%
South Mt Cory Sw 34.5kV, Multiple Contingencies, 12.3%
West Melrose 34.5kV, North Findlay CB B, 14.2%
Woodcock Sw 34.5kV, Multiple Contingencies, 12.4%



N-1-1 Thermal:

Monitored Facility, Contingency, 2022RTEP % Loading, Evaluated MVA Rating

New Liberty – West Melrose 34.5kV Circuit, Ebersole – North Findlay 138kV and (North Woodcock T1 or East Lima – North Findlay 138kV circuit), 131%, 27 MVA

Centrex – Findlay 34.5kV Circuit, New Liberty T1 and Findlay Center – South Findlay 34.5kV, 103%, 27 MVA

Centrex – Findlay Refinery 34.5kV Circuit, New Liberty T1 and Findlay Center – South Findlay 34.5kV, 103%, 27 MVA

N-1-1 Voltage Magnitude:

Monitored Bus, Contingency, 2022RTEP pu Voltage

BP Pumping 34.5kV, East Lima – North Findlay 138kV and (New Liberty T1 or T2), 0.90pu

Cory 34.5kV, East Lima – North Findlay 138kV and (New Liberty T1 or T2), 0.89pu

Cygnet-Buckeye 34.5kV, Multiple Contingencies, 0.88pu

DTR 34.5kV, East Lima – North Findlay 138kV and (New Liberty T1 or T2), 0.89pu

East Mt Cory 34.5kV, East Lima – North Findlay 138kV and (New Liberty T1 or T2), 0.89pu

Hamman Sw 34.5kV, Multiple Contingencies, 0.88pu

Henry 34.5kV, Multiple Contingencies, 0.89pu

McIntosh 34.5kV, East Lima – North Findlay 138kV and (New Liberty T1 or T2), 0.89pu

Mungen 34.5kV, Multiple Contingencies, 0.87pu

Portage 34.5kV, Multiple Contingencies, 0.87pu

Rawson 34.5kV, East Lima – North Findlay 138kV and (New Liberty T1 or T2), 0.90pu

South Mt Cory Sw 34.5kV, East Lima – North Findlay 138kV and (New Liberty T1 or T2), 0.89pu

Woodcock Sw 34.5kV, East Lima – North Findlay 138kV and (New Liberty T1 or T2), 0.89pu

Landmark 34.5kV, Findlay Center – Plaza St 34.5kV and Ebersole T1, 0.88pu

Ebersole 34.5kV, Findlay Center – Plaza St 34.5kV and Ebersole T1, 0.88pu

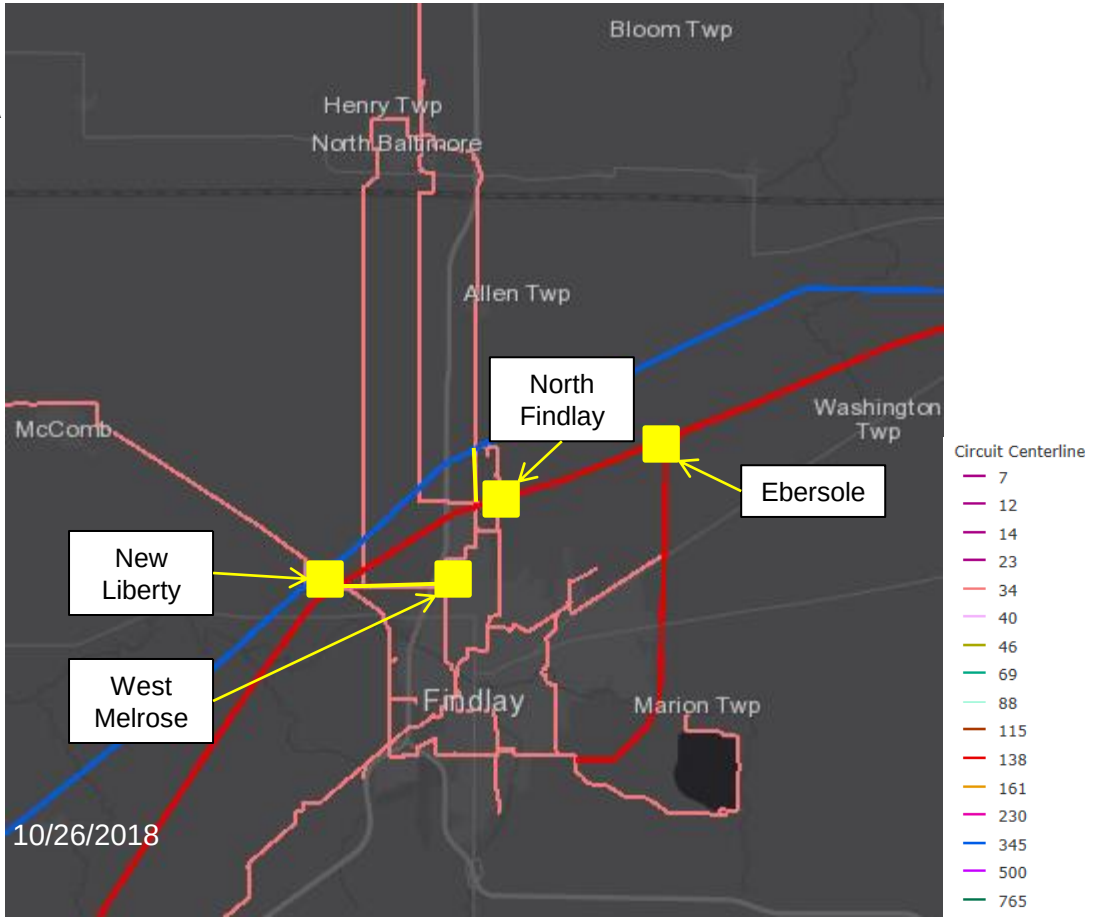
Crestwood 34.5kV, Findlay Center – Plaza St 34.5kV and Ebersole T1, 0.88pu

North Crestwood Sw 34.5kV, Findlay Center – Plaza St 34.5kV and Ebersole T1, 0.88pu

Plaza St 34.5kV, Findlay Center – Plaza St 34.5kV and Ebersole T1, 0.88pu

Harris 34.5kV, Findlay Center – Plaza St 34.5kV and Ebersole T1, 0.88pu

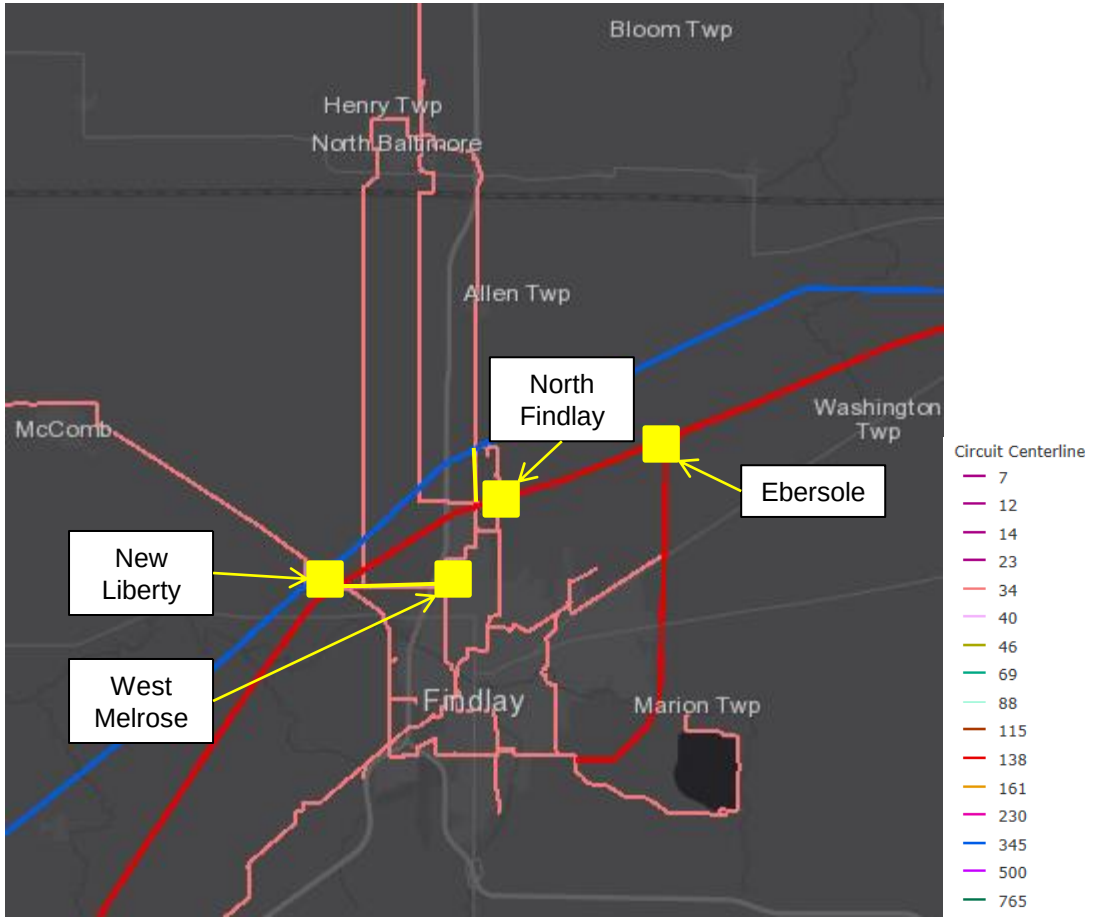
Bernard Sw 34.5kV, Findlay Center – Plaza St 34.5kV and Ebersole T1, 0.89pu



N-1-1 Voltage Deviation:

Monitored Bus, Contingency, 2022RTEP % Worst Deviation

Ash Ave, Findlay – Findlay Center 34kV and (East Lima – North Findlay 138kV or North Woodcock T1), 10.6%
BP Pumping 34.5kV, Multiple Contingencies, 11.5%
Cory 34.5kV, Multiple Contingencies, 13%
Cygnet-Buckeye 34.5kV, Multiple Contingencies, 14%
East Mt Cory 34.5kV, Multiple Contingencies, 11.9%
Hamman Sw 34.5kV, Multiple Contingencies, 14.2%
Henry 34.5kV, Multiple Contingencies, 14%
McIntosh 34.5kV, Multiple Contingencies, 14%
Midland Switch 34.5kV, Combinations involving loss of both North Findlay T1 and T2, 12.8%
Mungen 34.5kV, Multiple Contingencies, 14.4%
Portage 34.5kV, Multiple Contingencies, 14.4%
Rawson 34.5kV, Multiple Contingencies, 11.5%
South Mt Cory Sw 34.5kV, Multiple Contingencies, 13%
West Melrose 34.5kV, Multiple Contingencies, 11.3%
West Findlay, New Liberty T1/T2 and (East Lima – North Findlay 138kV or North Woodcock T1), 8.7%
Woodcock Sw 34.5kV, Multiple Contingencies, 13.1%
Landmark 34.5kV, Findlay Center – Plaza St 34.5kV and Ebersole T1, 11.1%
Ebersole 34.5kV, Findlay Center – Plaza St 34.5kV and Ebersole T1, 12.6%
Crestwood 34.5kV, Findlay Center – Plaza St 34.5kV and Ebersole T1, 10.1%
North Crestwood Sw 34.5kV, Findlay Center – Plaza St 34.5kV and Ebersole T1, 10.1%
Plaza St 34.5kV, Findlay Center – Plaza St 34.5kV and Ebersole T1, 10%
Harris 34.5kV, Findlay Center – Plaza St 34.5kV and Ebersole T1, 10%
Bernard Sw 34.5kV, Findlay Center – Plaza St 34.5kV and Ebersole T1, 9.6%



AEP Transmission Zone: Baseline
Findlay / North Baltimore

In addition to being identified for planning criteria thermal violations the following two line assets have the following age/condition characteristics.

- New Liberty – Findlay 34.5kV: The 1.5 miles section of line identified is 4/0 Copper conductor (circa 1937) and wood structures (ranging from 1940's – 1980's). The line section currently has 0 open A conditions.
- New Liberty – North Baltimore 34.5kV*:* The 0.5 miles of rebuild identified is 336 ACSR conductor (circa 1940) with wood structures (circa 1950's). The line section has 1 open A condition (structure).
- West Melrose – Whirlpool 34.5kV: The 1 mile section of line identified is 4/0 ACSR conductor (circa 1926) and wood structures (ranging from 1920's – 1980's). The line section currently has 8 open A conditions (structure and conductor).

Potential Solution:

Rebuild New Liberty – Findlay 34kV Line Str's 1 – 37 (1.5 miles), utilizing 795 26/7 ACSR conductor (S.N. 64 MVA, S.E. 90 MVA). **Estimated Trans Cost: $3.4M**

Rebuild New Liberty – North Baltimore 34kV Line Str's 1-11 (0.5 miles), utilizing 795 26/7 ACSR conductor (S.N. 64 MVA, S.E. 90 MVA). **Estimated Trans Cost: $1.8M**

Rebuild West Melrose – Whirlpool 34kV Line Str's 55- 80 (1 mile), utilizing 795 26/7 ACSR conductor (S.N. 64 MVA, S.E. 90 MVA). **Estimated Trans Cost: $2.37M**

North Findlay Station: Install (1) Line 138kV CB 3000A 63kA, Low Side T1 34.5kV CB 2000A 40kA, High Side T1 138kV circuit switcher. **Estimated Cost: $1.7M**

Ebersole Station: Install second 90 MVA 138/69/34kV Trf. Install two low side CBs for T1 and T2. 69kV 2000A 40kA.

Estimated Trans Cost: $3.75M

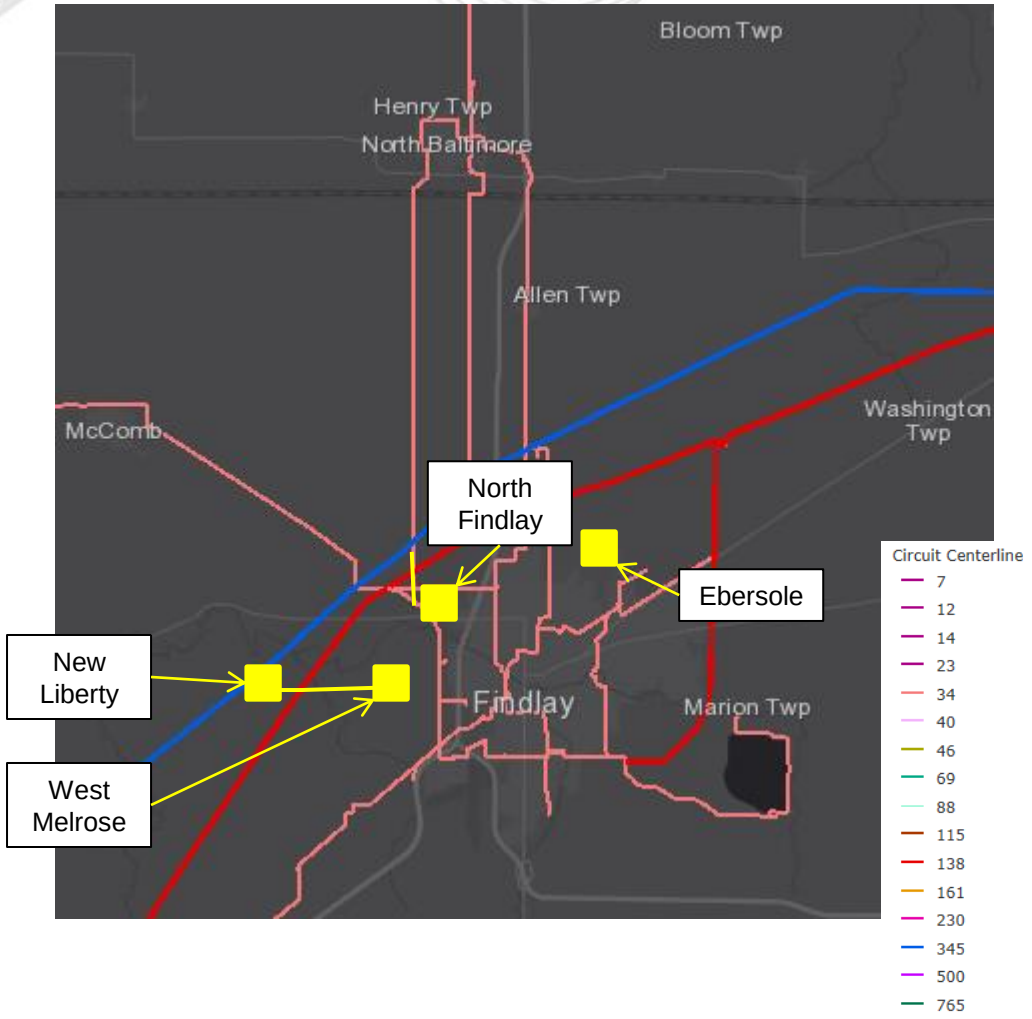
Total Estimated Transmission Cost: $13.02M

Alternatives: No viable cost effective solutions found

Required IS Date: 6/1/2022

Projected IS Date: 12/31/2021

Project Status: Scoping/ Engineering



Supplemental Project
Old Process Transition

ATSI Transmission Zone: Supplemental
E. Springfield 138 kV Breaker

Problem Statement: Short Circuit
The E.Springfield 138kV Breaker B61 becomes overdutied.

Driver:
S1210: Loop the Clark-Urbana 138kV line (~5 miles) and East Springfield-Tangy 138kV line (~3,5 miles) into the existing 69kV Broadview Substation with 336 ASCR conductor; Add two (2) 138/69kV transformers at Broadview substation.

Recommended Solution:
E.Springfield 138kV Breaker B61

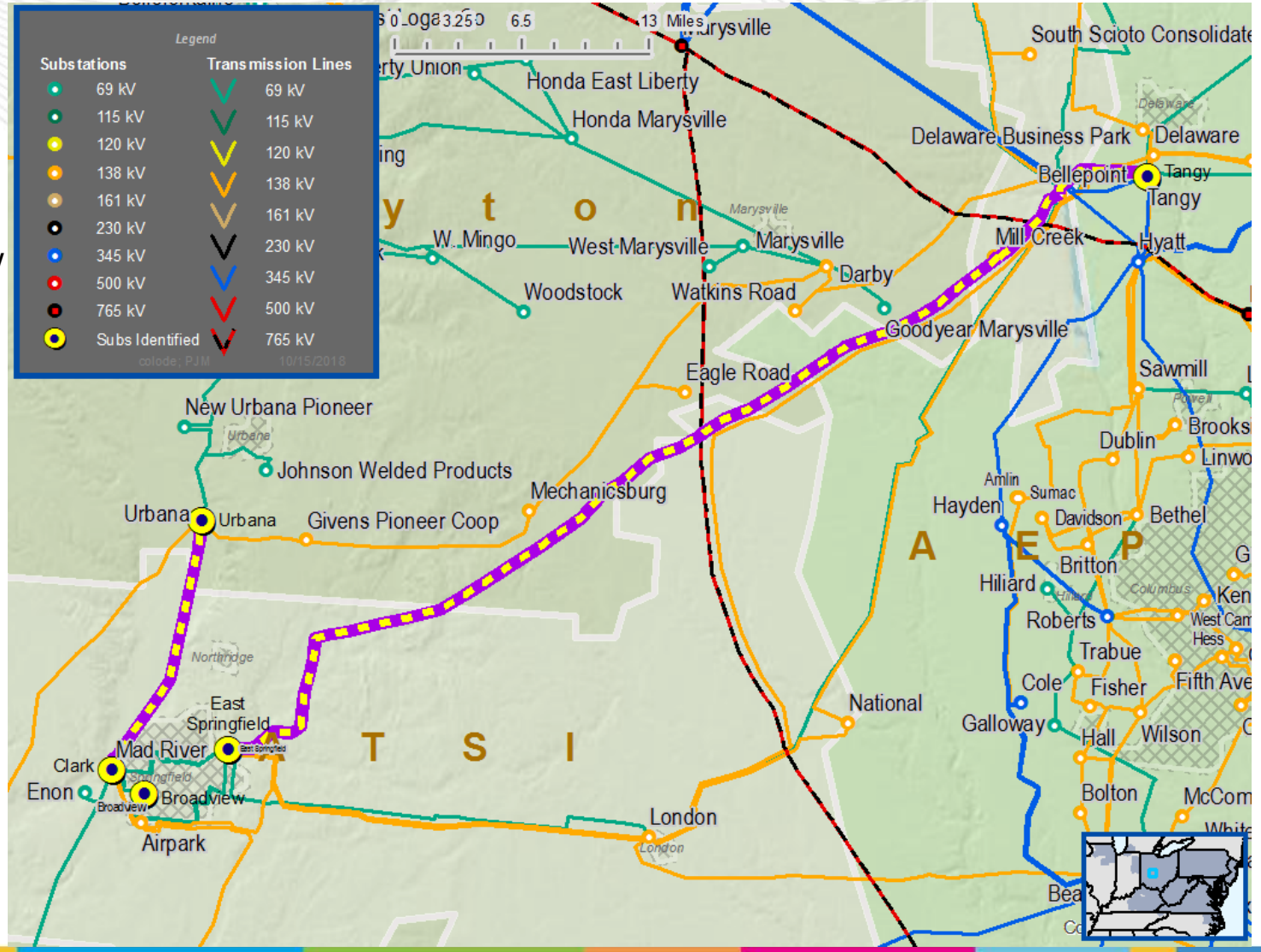
- Replace the E.Springfield 138kV breaker B61 with a 40kA breaker (s1210.2).

Estimated Project Cost: $0.534 M

Required IS Date: 12/31/2019

Projected IS Date: 12/31/2019

Status: Scoping



Next Steps

Upcoming Western SRRTEP Dates

West	Start	End
11/29/2018	12:00	4:00
12/5/2018	12:00	4:00

Questions?

Revision History

10/19/2018 – V1 – Original version posted to pjm.com