Reliability Analysis Update

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Sub Regional RTEP Committee - PJM West
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Recommended Solution

Baseline Reliability Projects

EKPC Transmission Zone: Baseline
Summer Shade-West Columbia 69 kV Rebuild

Process Stage: Recommended Solution

Criteria: EKPC 715 Criteria

Assumption Reference: EKPC Assumptions Presentation Slide 3-10

Model Used for Analysis: EKPC's internal models representing 2024/25 winter peak conditions that were used for EKPC's annual system screening analysis for 2021 planning cycle. Includes Cooper Units 1 and 2 off with replacement generation imported from south of EKPC system.

Proposal Window Exclusion: Below 200 kV Exclusion

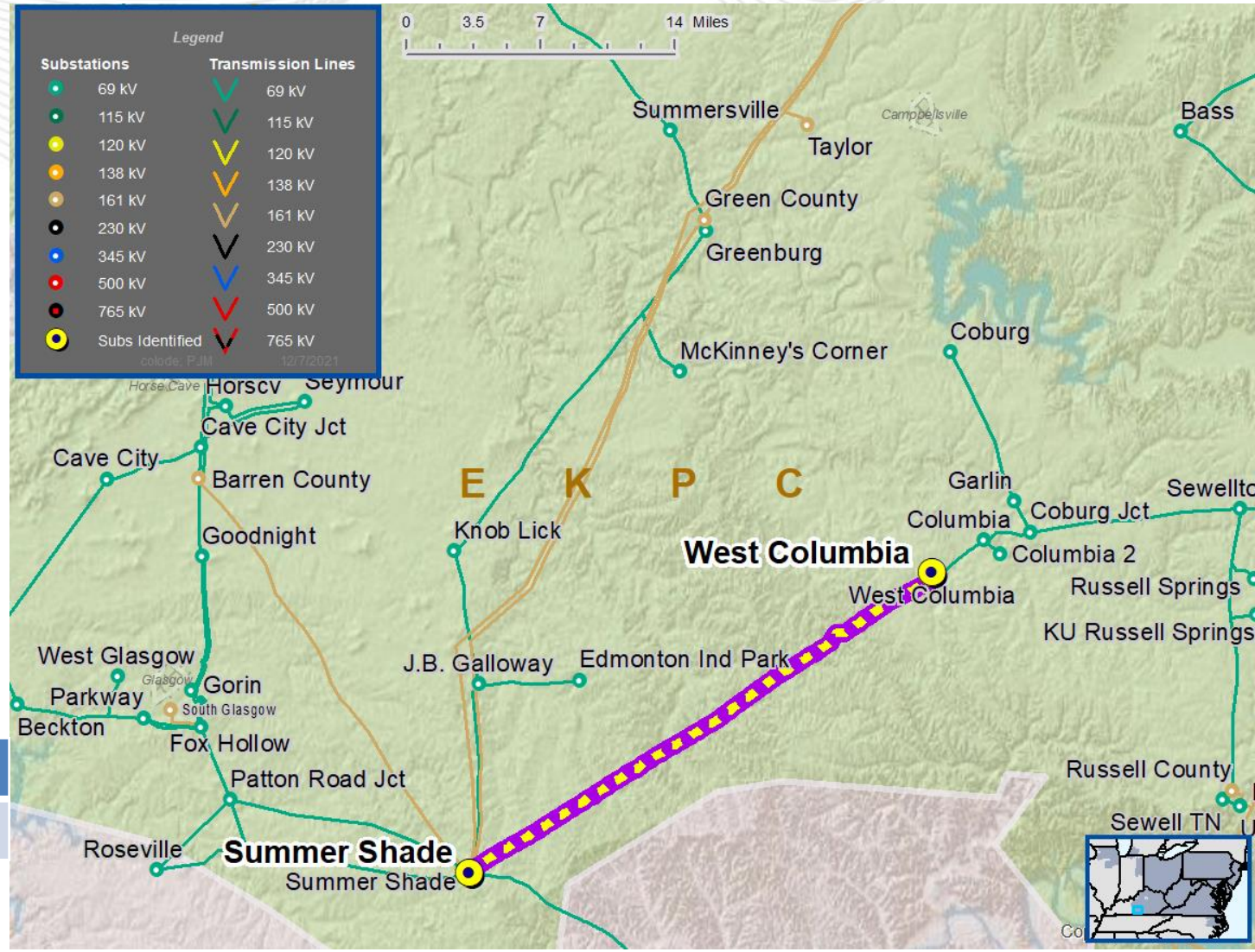
Problem Statement:

FG: EKPC-T1

The Summer Shade-West Columbia 69 kV line section is overloaded for a N-1 outage.

Existing Facility Rating:

Branch	SN/SE/WN/WE (MVA)
2SUMM SHADE-2W COLUMBI T 69 kV	57/63/82/86



EKPC Transmission Zone: Baseline
Summer Shade-West Columbia 69 kV Rebuild

Recommended Solution:

Rebuild the Summer Shade-West Columbia 69 kV 0.19 miles of 266 conductor double circuit to 556 conductor. **(b3709)**

Total Estimated Cost: $0.191 M

Preliminary Facility Rating:

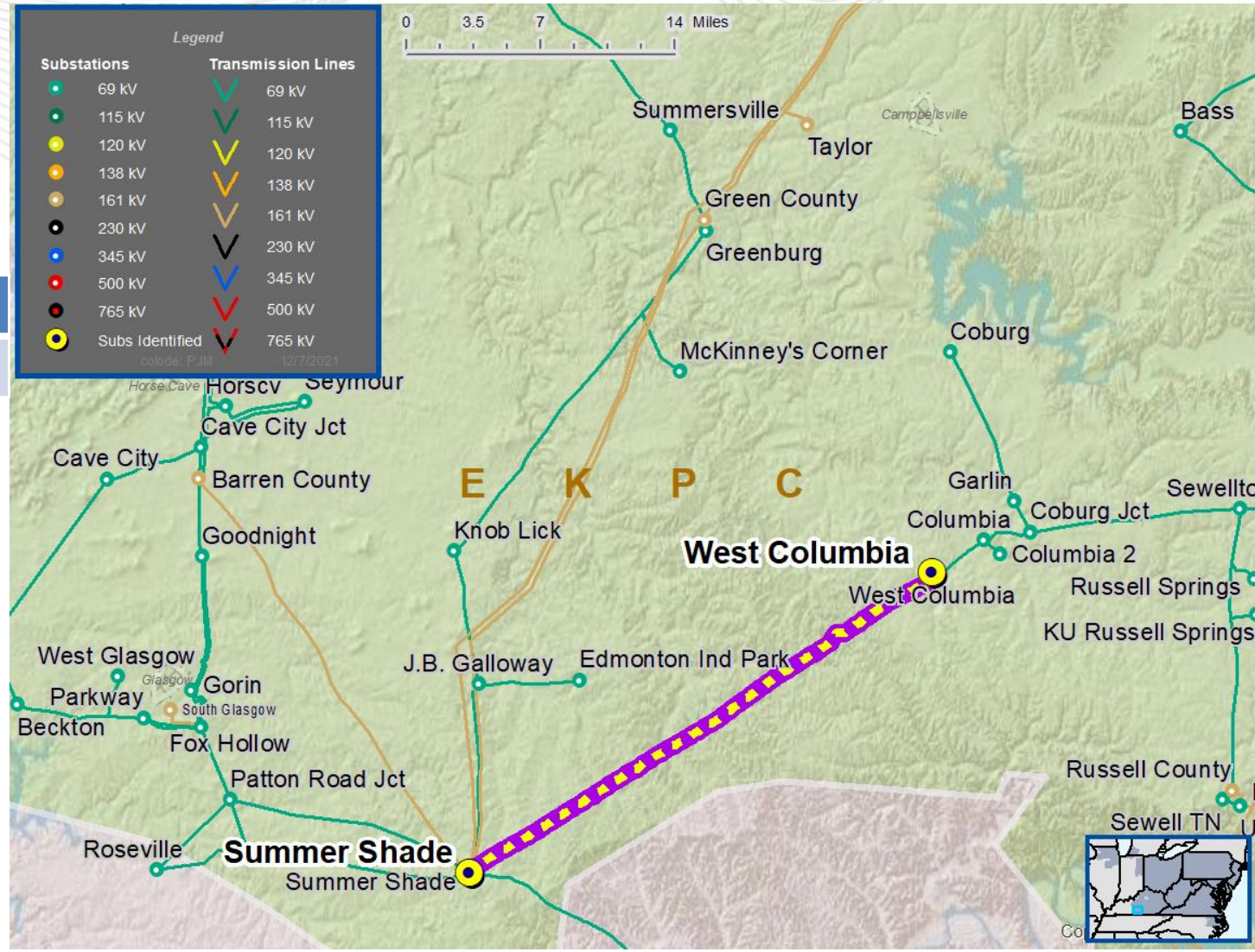
Branch	SN/SE/WN/WE (MVA)
2SUMM SHADE-2W COLUMBI T 69 kV	73/76/86/89

Ancillary Benefits:

Minimizes maintenance costs and increases operational flexibility over a MOT increase.

Required IS date: 12/1/2025

Projected IS date: 12/1/2025



First Review

Baseline Reliability Projects

APS Transmission Zone: Baseline
Yukon to AA2-161 Tap 138 kV

Process Stage: First Review Solution

Criteria: Generation Deliverability

Assumption Reference: 2026 RTEP assumption

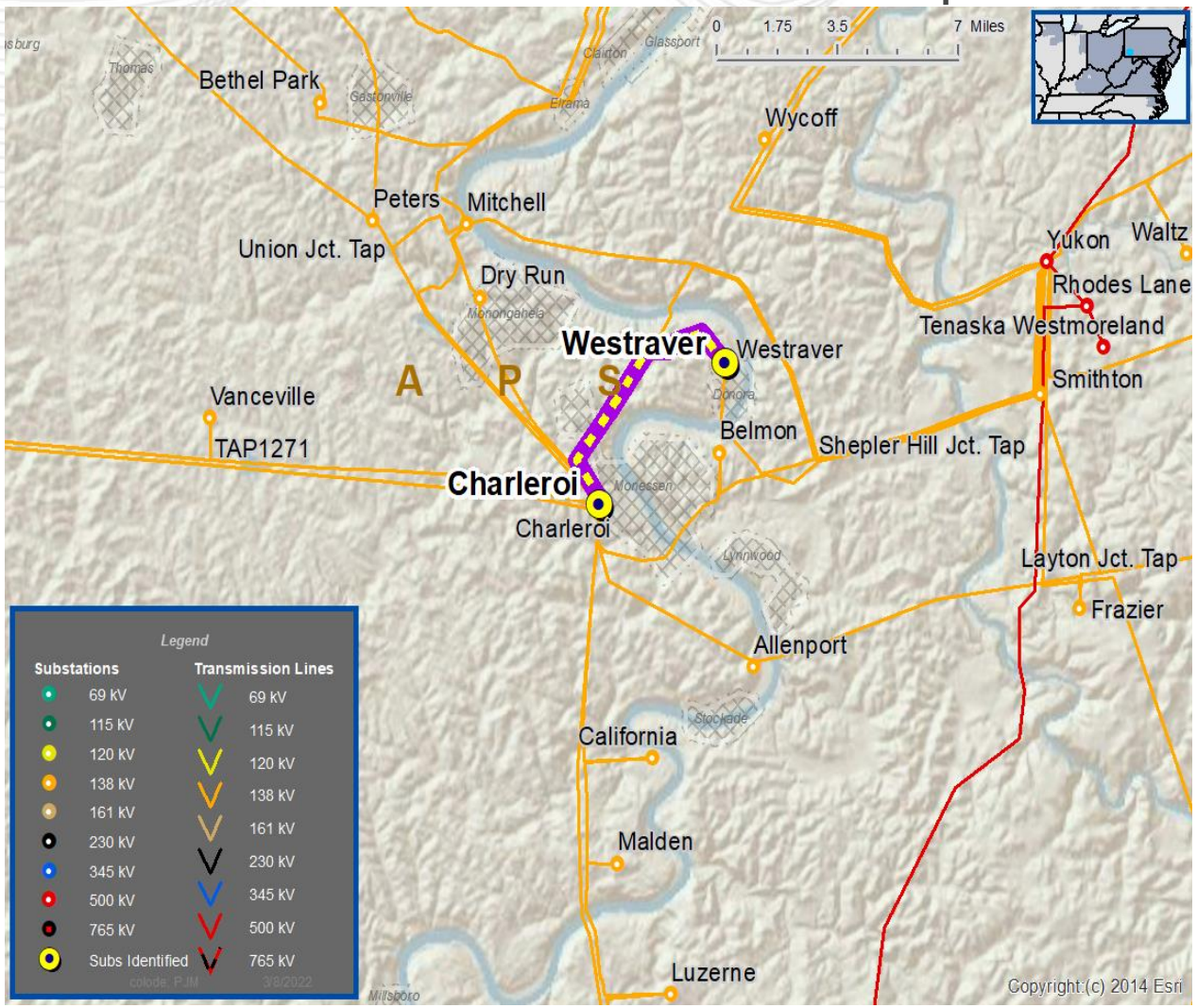
Model Used for Analysis: 2026 Summer RTEP case

Proposal Window Exclusion: Below 200 kV Exclusion

Problem Statement: GD-S24 & GD-S29

In 2026 RTEP Summer case, Yukon to AA2-161 Tap 138 kV lines are overloaded due to single contingencies.

Branch	SN/SE/WN/WE (MVA)
Yukon to Westraver 138 kV	308/376/349/445
Westraver to Charleroi 138 kV	274/342/345/382



APS Transmission Zone: Baseline
Yukon to AA2-161 Tap 138 kV

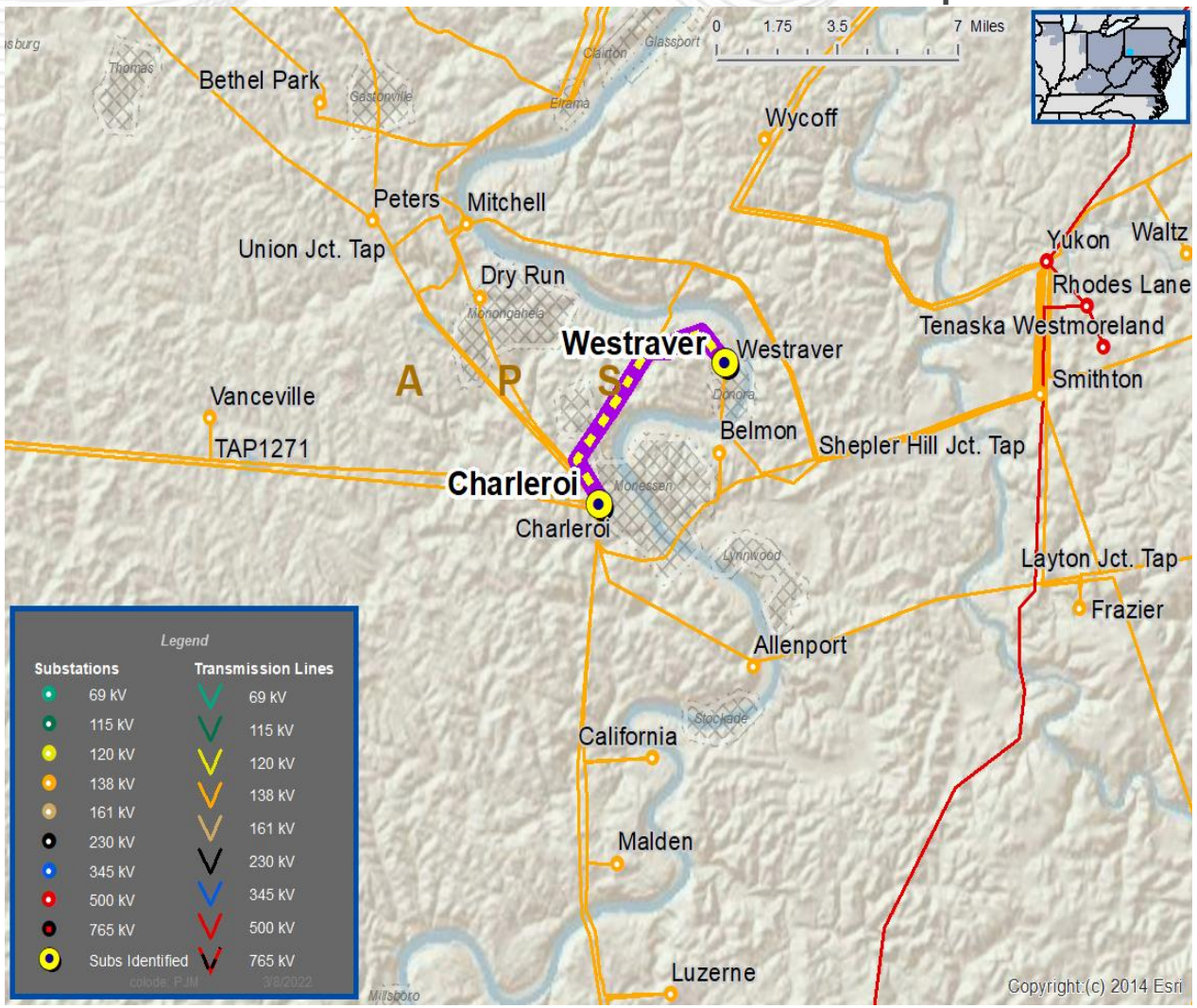
Recommended Solution:

Expand the future AA2-161 138 kV six (6) breaker ring bus into an eleven (11) breaker substation with a breaker-and-a-half layout by constructing five (5) additional breakers and expanding the bus. Loop the Yukon - Charleroi #2 138 kV line into the future AA2-161 substation. Relocate terminals as necessary at AA2-161. Upgrade terminal equipment (wavetrap, substation conductor) and relays at Yukon, Huntingdon, Springdale, Charleroi, and the AA2-161 substation.

Transmission Estimated Cost: $14.37M

Preliminary Facility Rating:

Branch	SN/SE/WN/WE (MVA)
Yukon to Westraver 138 kV	308/376/349/445
Westraver to AA2-161 138 kV	308/376/349/445
AA2-161 to Charleroi 138 kV	297/365/345/441



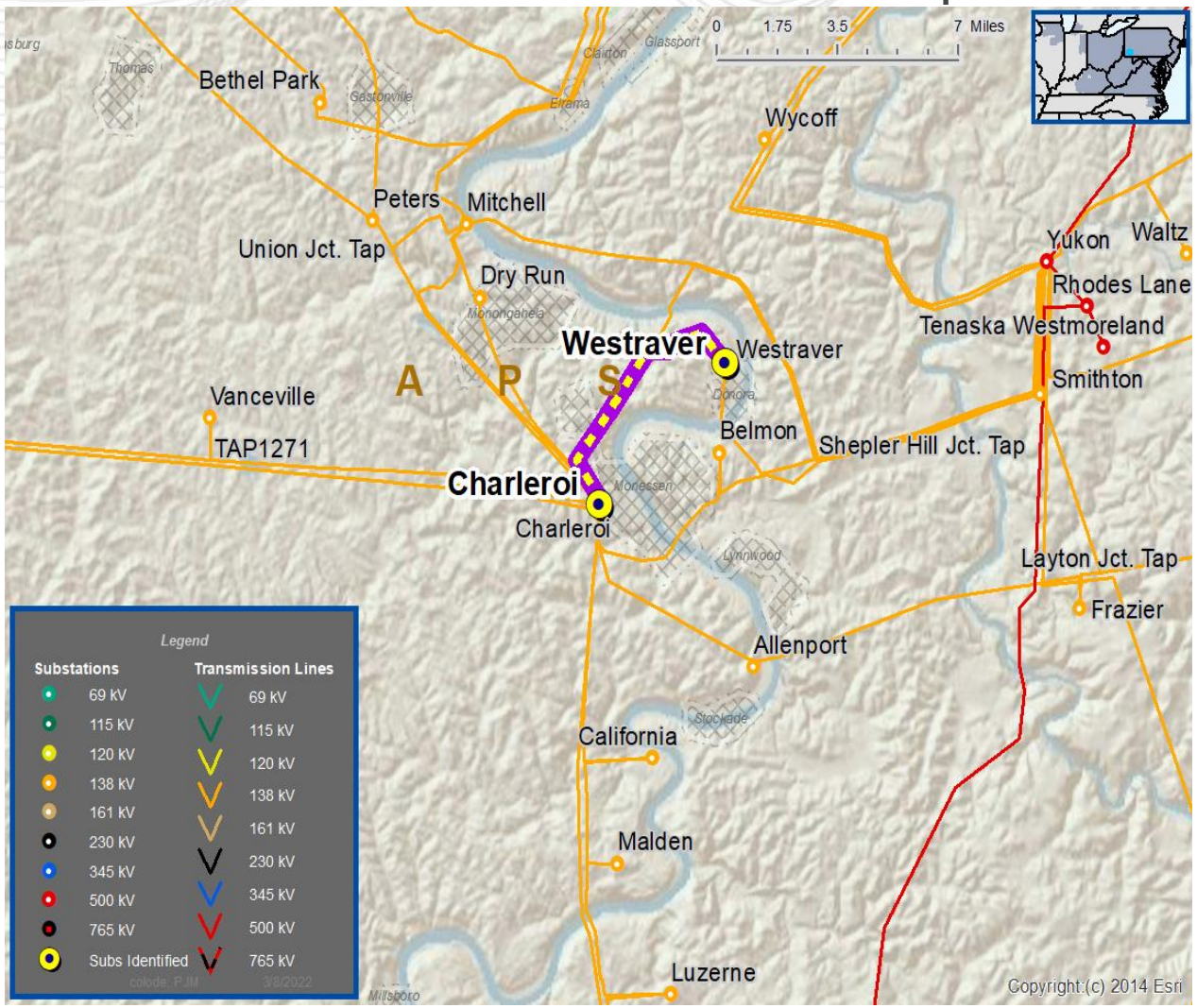
APS Transmission Zone: Baseline Yukon to AA2-161 Tap 138 kV

Alternatives: Reconductor both Yukon - AA2-161 138 kV lines. This alternative would cost $15.1 million.

Ancillary Benefits: Looping the Yukon - Charleroi #2 138 kV line into the future AA2-161 substation would alleviate the thermal overload violations. This project will also provide an additional network path from Yukon to Springdale, which is currently unavailable for multiple P4, P6, & P7 contingencies.

Required IS date: 6/1/2026

Projected IS date: 6/1/2026



EKPC Transmission Zone: Baseline Liberty Junction Cap Bank

Process Stage: First Review

Criteria: EKPC 715 Criteria

Assumption Reference: EKPC Assumptions Presentation Slide 3-10

Model Used for Analysis: EKPC's internal models representing 2022/23 winter peak conditions that were used for EKPC's annual system screening analysis for 2021 planning cycle. Includes Cooper Units 1 and 2 off with replacement generation imported from north of EKPC system.

Proposal Window Exclusion: Immediate Need/Below 200 kV Exclusion

Problem Statement:

FG: EKPC-VM1, EKPC-VM3, EKPC-VM4

Low voltage at Broughtentown, Tommy Gooch and Highland 69 kV for a N-1 outage.

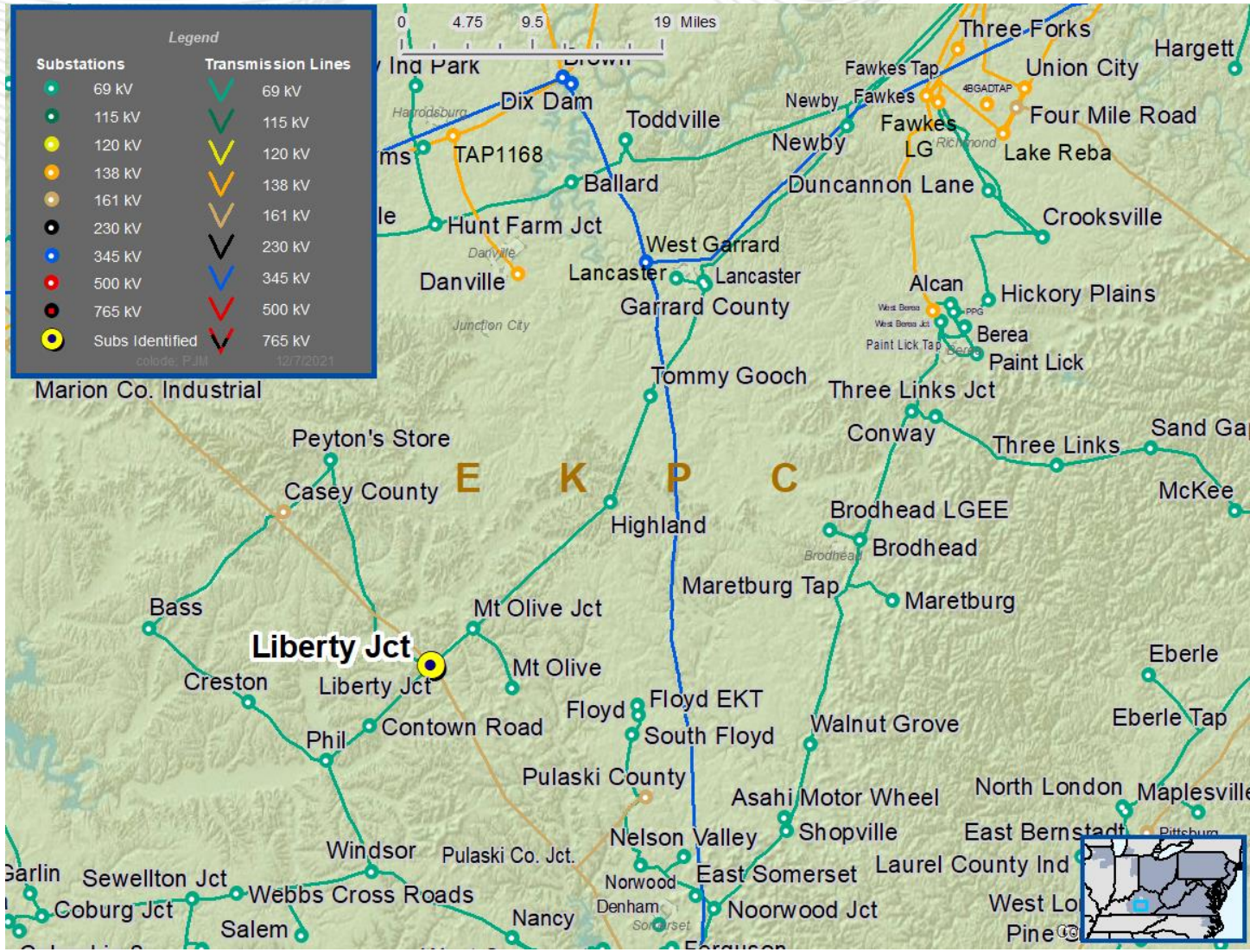
Existing Facility Rating: N/A

Proposed Solution:

Install a 28 MVAR cap bank at Liberty Junction 69 kV.

Total Estimated Cost: $0.542 M

Preliminary Facility Rating: N/A



EKPC Transmission Zone: Baseline Liberty Junction Cap Bank

Alternatives:

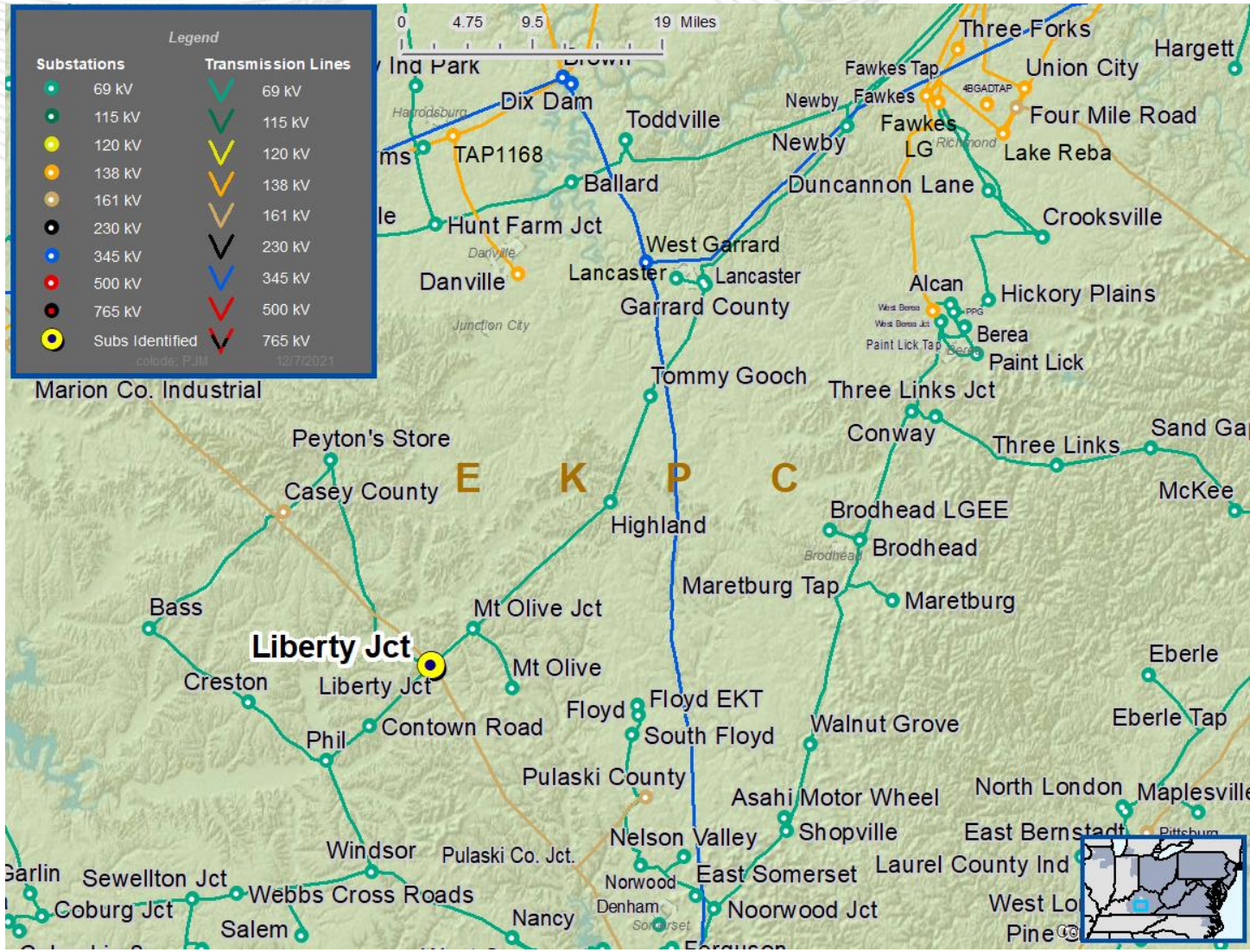
1. Build KU Stanford-Tommy Gooch normally-open connection using 556 ACSR (3.4 miles).
2. Build second line from Garrard Co-Tommy Gooch using 556 ACSR (7.3 miles) with Tommy Gooch served radially.
3. Build Brodhead-Broughtentown normally-open using 556 ACSR (8 miles).
4. Build Three Links Jct-Tommy Gooch normally-closed line using 556 ACSR (16.67 miles).

Ancillary Benefits:

Provides voltage support for the Oakhill area without need for future projects as compared to other alternatives.

Required IS date: 12/1/2022

Projected IS date: 12/1/2022



Contact

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SRRTEP-W Reliability Analysis Update

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Revision History

- V1 – 3/8/2022 – Original slides posted
- V2 – 3/15/2022 – EKPC project b3709 added (slides 3-4), and EKPC immediate need first read project added (slide 9-10)

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