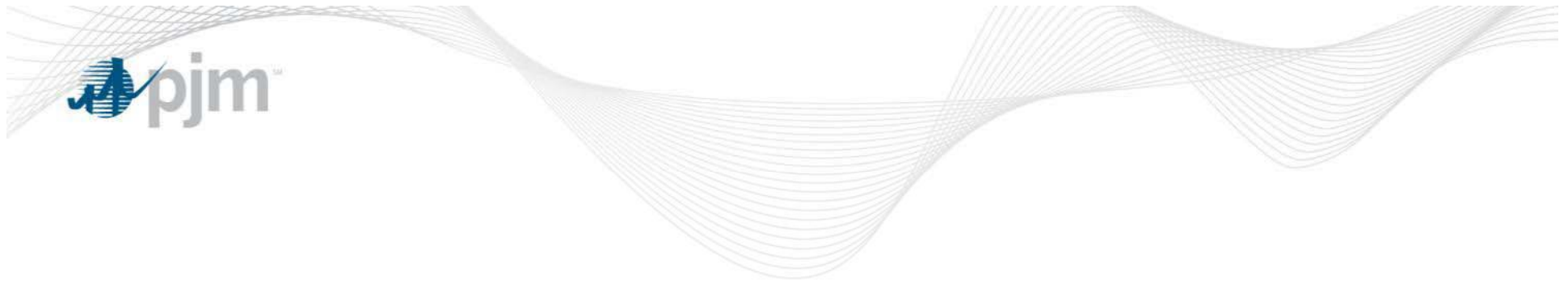


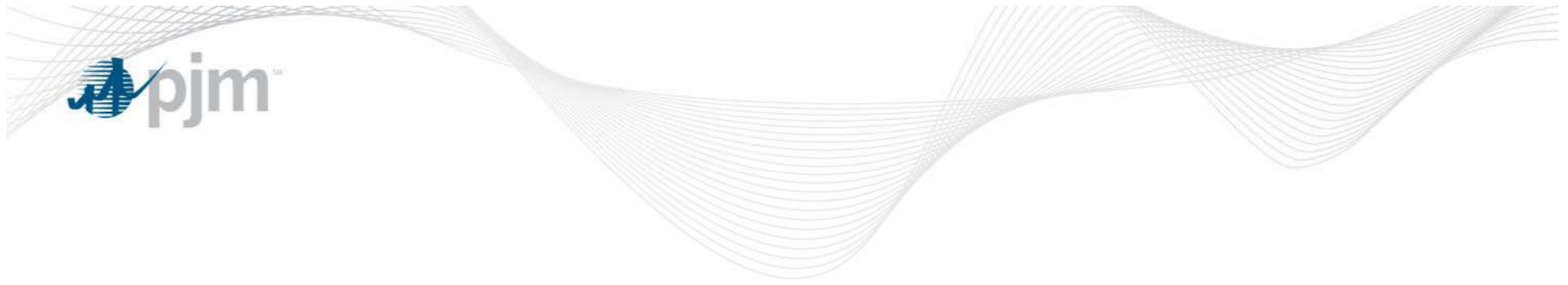


Transmission Expansion Advisory Committee

September 16, 2009



Interregional Planning Update (Brief Discussion)



15 Year Planning Preliminary Results



15 Year Planning Preliminary Result – Single Contingencies

From Name	To Name	CKT	KVs	2014 Loading(%)	2024 Loading(%)	100% Year
Conastone	Graceston	1	230/230	99.11	108.28	2015
Linwood	Chichester	2	230/230	99.74	97.04	2015
Linwood	Chichester	1	230/230	99.38	96.69	2015
Conastone	Mt. Carmel 22	1	230/230	98.53	118.78	2015
Sandy Spring 2314	High Ridge 16	1	230/230	92.08	110.23	2018
Sandy Spring 2334	High Ridge 16	1	230/230	93.33	111.7	2018
Richmond Reactor	Richmond	1	230/230	93.42	112.5	2018
Conowingo	Nottingham	1	230/230	94.33	104.91	2019
Mt. Carmel	Northwest 2326	1	230/230	91.28	110.1	2020
Conastone	Mt. Carmel 10	1	230/230	86.19	103.84	2023
Mt. Storm	Doubs	1	500/500	87.14	103.09	2023
Bear Creek	Altoona	1	230/230	88.78	102.38	2023
OX	Galloway	1	230/230	87.48	102.61	2023
Plesant View	Ashburn	1	230/230	80.5	101.65	2024
S.P. Terminal	Riverside 2339	1	230/230	89.53	100.57	2024
Burtonsville 2334	Sandy Spring 2334	1	230/230	84.41	100.93	2024
Pruntytown	Mt. Storm	1	500/500	82.11	101.6	2024
Churchland	Sewells Point	1	230/230	84.13	101.67	2024



15 Year Planning Preliminary Result – Tower Contingencies

From Name	To Name	CKT	KVs	2014 Loading(%)	2024 Loading(%)	100% Year
Conastone	Graceton	1	230/230	108.23	125.7	2014
Graceton	Bagley	1	230/230	95.42	120.95	2017
Byron R	Wempletown B	1	345/345	97.6	106.83	2017
Elec. Junc. R	Elec. Junc. 3R	1	345/345	96.06	104.38	2018
Oak Grove	Bowie 23045	1	230/230	94.61	103.4	2020
Kittatinny	Newton	1	230/230	94.32	103.94	2020
Oak Grove	Bowie 23042	1	230/230	93.87	102.58	2020
Bowie	Burtonsville 2314	1	230/230	94.61	103.4	2020
Bowie	Burtonsville 2334	1	230/230	93.87	102.58	2020
Doubs	Jefferson	1	230/230	93.96	102.21	2021
Mickleton	Thorofare	1	230/230	93.89	102.04	2022
Conastone	Mt. Carmel	1	230/230	85.95	105.09	2022
Jefferson	Monocacy	1	230/230	93.15	101.28	2023
Bagley	Raphael Road	1	230/230	78.69	101.07	2024
Mt.Carmel	Northwest 2326	1	230/230	82.08	100.5	2024



2014 N-1 Voltage Analysis Preliminary Results



- 2014 N-1 Voltage Study Results:
 - 2014 non-diversified 50/50 load case was used
 - Tested with all contingencies (single, bus, tower, faulted breaker)
 - Does not include violations in radial lines
 - Results were sent to each TO for review

of stations (voltage magnitude / drop)

	PJM500	PN	METED	JCPL	PPL	PECO	PSEG	BGE	PEPCO	AE	DPL	UGI	RECO
115kV	0 / 0	13 / 22	0 / 0	0 / 1	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0
138kV	0 / 0	0 / 0	0 / 0	0 / 0	0 / 13	0 / 0	0 / 4	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0
230kV	0 / 0	0 / 0	0 / 0	1 / 1	1 / 6	6 / 7	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0
345kV	0 / 0	2 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0
765kV	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0
Not Conv.	0 / 0	0 / 20	0 / 0	0 / 8	0 / 0	0 / 1	0 / 4	0 / 19	0 / 1	0 / 0	0 / 0	0 / 0	0 / 0

Voltage Violations in Mid-Atlantic Areas

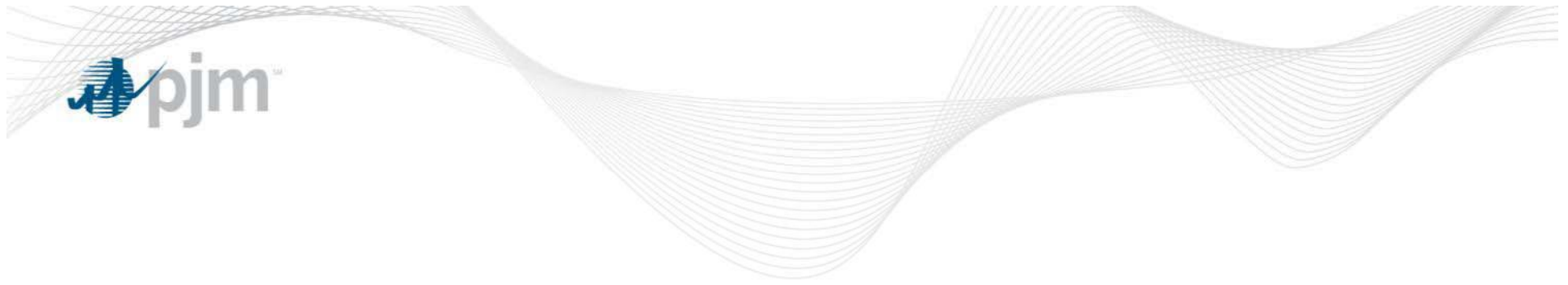


• 2014 N-1 Voltage Study Results:

of stations (voltage magnitude / drop)

	APS	AEP	DAYTON	DLCO	IPRV	ComED	VAP
115kV	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0
138kV	8 / 0	1 / 1	1 / 0	0 / 0	0 / 0	2 / 0	0 / 0
230kV	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0
345kV	0 / 0	0 / 5	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0
765kV	0 / 0	1 / 1	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0
Not Conv.	0 / 2	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0

Voltage Violations in PJM West and VAP



2014 N-1-1 Voltage Analysis Preliminary Results



- 2014 N-1-1 Voltage Study Results:
 - 2014 non-diversified 50/50 load case was used
 - Tested with all single contingencies
 - Does not include violations in radial lines
 - Results were sent to each TO for review

of stations (voltage magnitude / drop)

	PJM500	PN	METED	JCPL	PPL	PECO	PSEG	BGE	PEPCO	AE	DPL	UGI	RECO
115kV	0 / 0	15 / 45	7 / 8	5 / 13	0 / 0	0 / 0	0 / 0	1 / 31	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0
138kV	0 / 0	1 / 1	0 / 0	0 / 0	13 / 13	0 / 9	12 / 33	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0
230kV	0 / 0	3 / 4	2 / 3	7 / 38	5 / 7	0 / 0	3 / 16	0 / 0	2 / 0	0 / 1	0 / 0	0 / 0	0 / 0
345kV	0 / 0	2 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0
500kV	0 / 5	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0
765kV	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0
Not Conv.	0 / 4	0 / 29	0 / 0	0 / 32	0 / 15	0 / 37	0 / 27	0 / 2	0 / 0	0 / 8	0 / 22	0 / 0	0 / 0

Voltage Violations in Mid-Atlantic Areas



• 2014 N-1-1 Voltage Study Results:

of stations (voltage magnitude / drop)

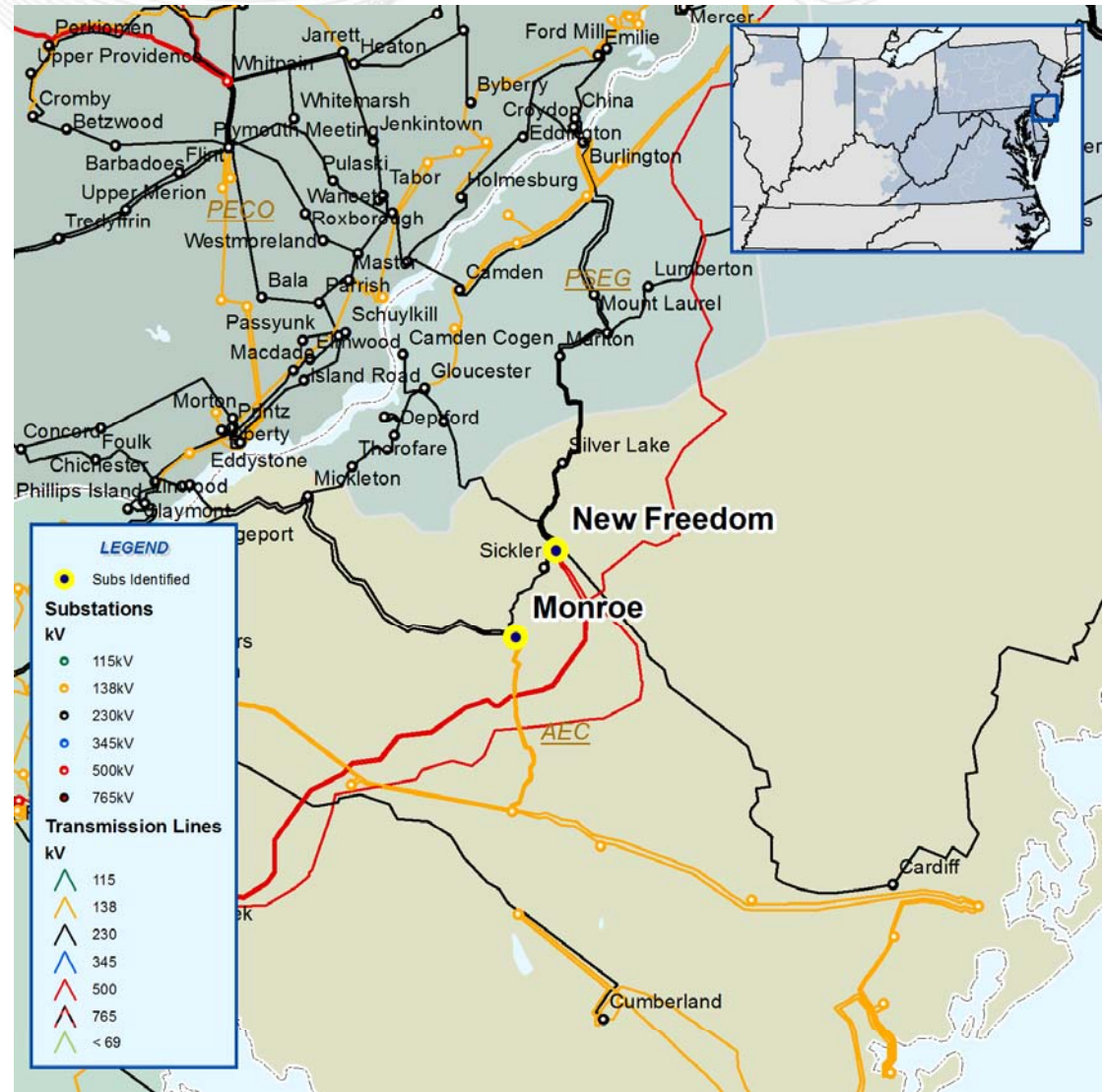
	APS	AEP	DAYTON	DLCO	ComED	VAP
115kV	0 / 1	0 / 0	0 / 0	0 / 0	0 / 0	14 / 0
138kV	38 / 43	50 / 54	12 / 13	0 / 0	24 / 0	0 / 0
230kV	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	3 / 0
345kV	0 / 0	8 / 0	0 / 0	0 / 0	0 / 0	0 / 0
500kV	1 / 3	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0
765kV	0 / 0	6 / 5	0 / 0	0 / 0	0 / 0	0 / 0
Not Conv.	0 / 17	0 / 93	0 / 6	0 / 0	0 / 3	0 / 0

Voltage Violations in PJM West and VAP

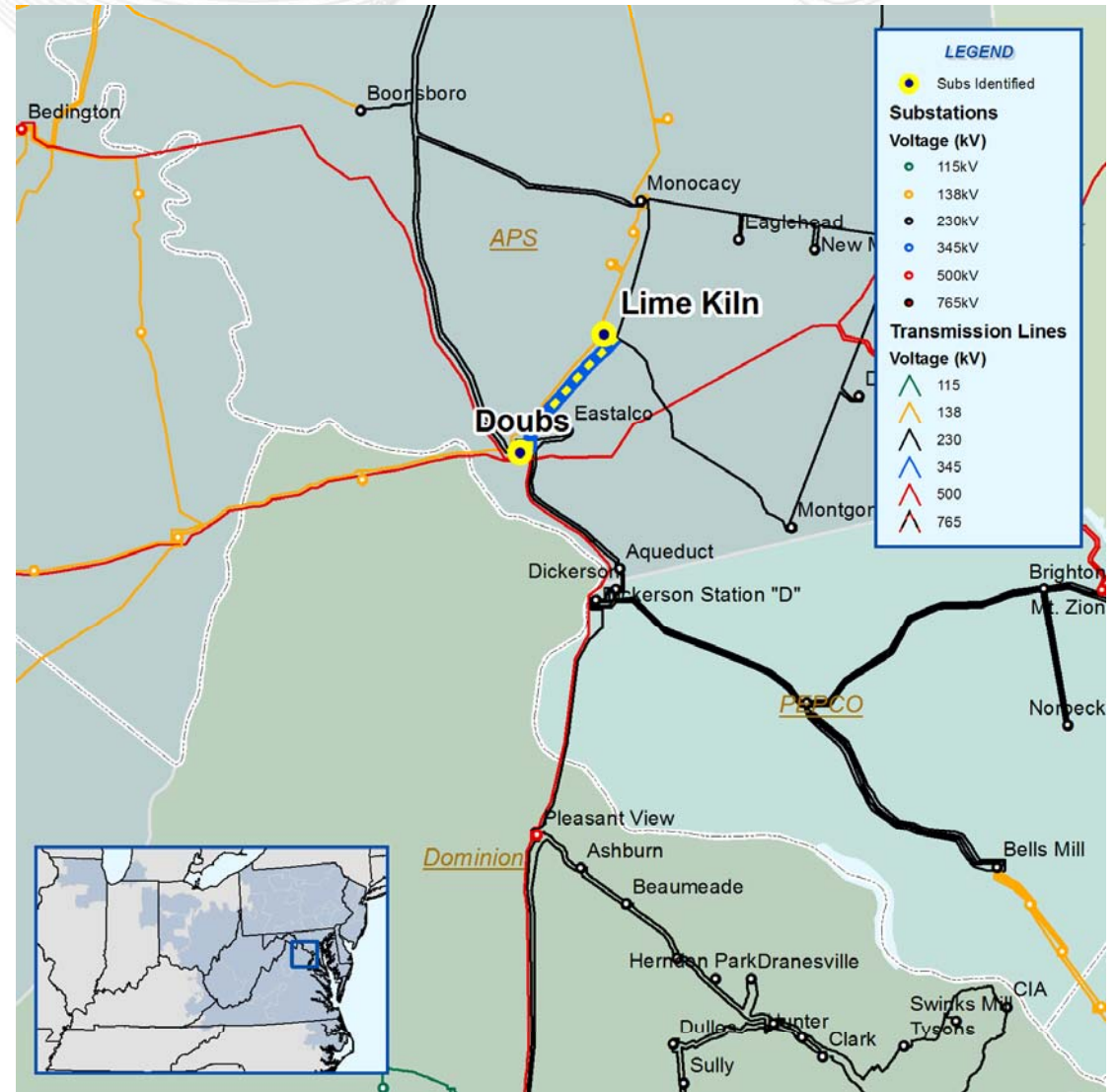


Baseline Reliability Update

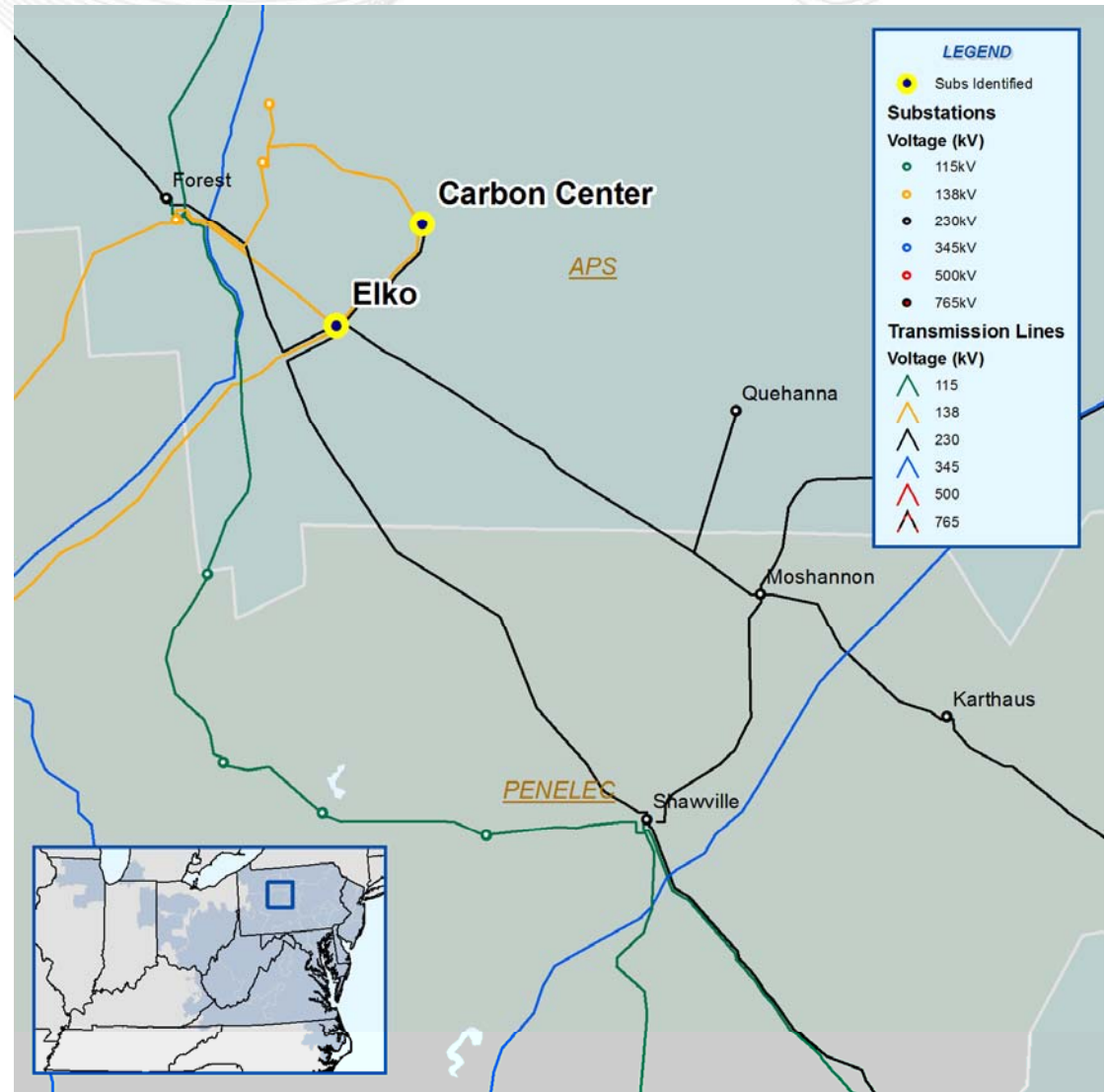
- Load Deliverability Violation:
- The New Freedom – Monroe 230kV is overloaded for AE load deliverability
- Proposed solution: Upgrade New Freedom strand bus (b0431)
- Estimated Projected cost: \$0.1 M
- Expected IS Date: 6/1/2010



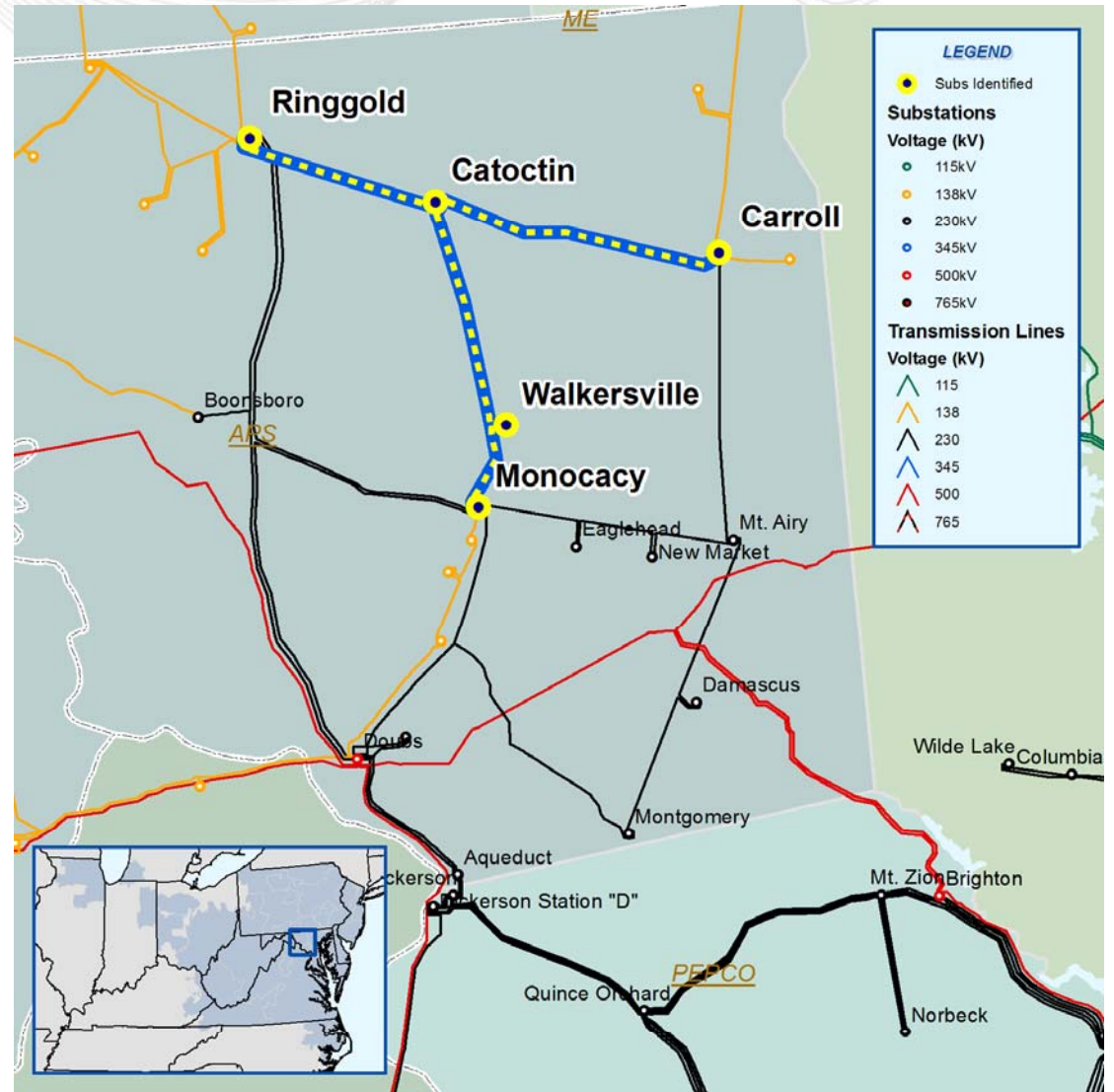
- N-1-1 thermal overload of either Doubs – Lime Kiln 230kV circuit for the loss of the Doubs – Jefferson 230 kV line & the parallel Doubs – Limekiln 230 kV line
- Proposed Solution: Reconductor both Doubs – Lime Kiln 230kV circuits (b0676.1 & b0676.2)
- Estimated Project Cost: \$6.6M
- Required IS Date: 6/01/2013



- N-1-1 thermal overload of Carbon Center Junction – Elko 138kV and Paper City – Ridgeway 138kV for the loss of the following contingency combinations:
 - Paper City – Ridgeway 138kV + Carbon Center – Elko 230kV
 - Carbon Center – Elko 230kV + Carbon Center – Elko 138kV
- Proposed Solution: Rebuild Elko-Carbon Center Junction using 230kV construction (b0673)
- Estimated Project Cost: \$6.5M
- Required IS Date: 6/01/2013



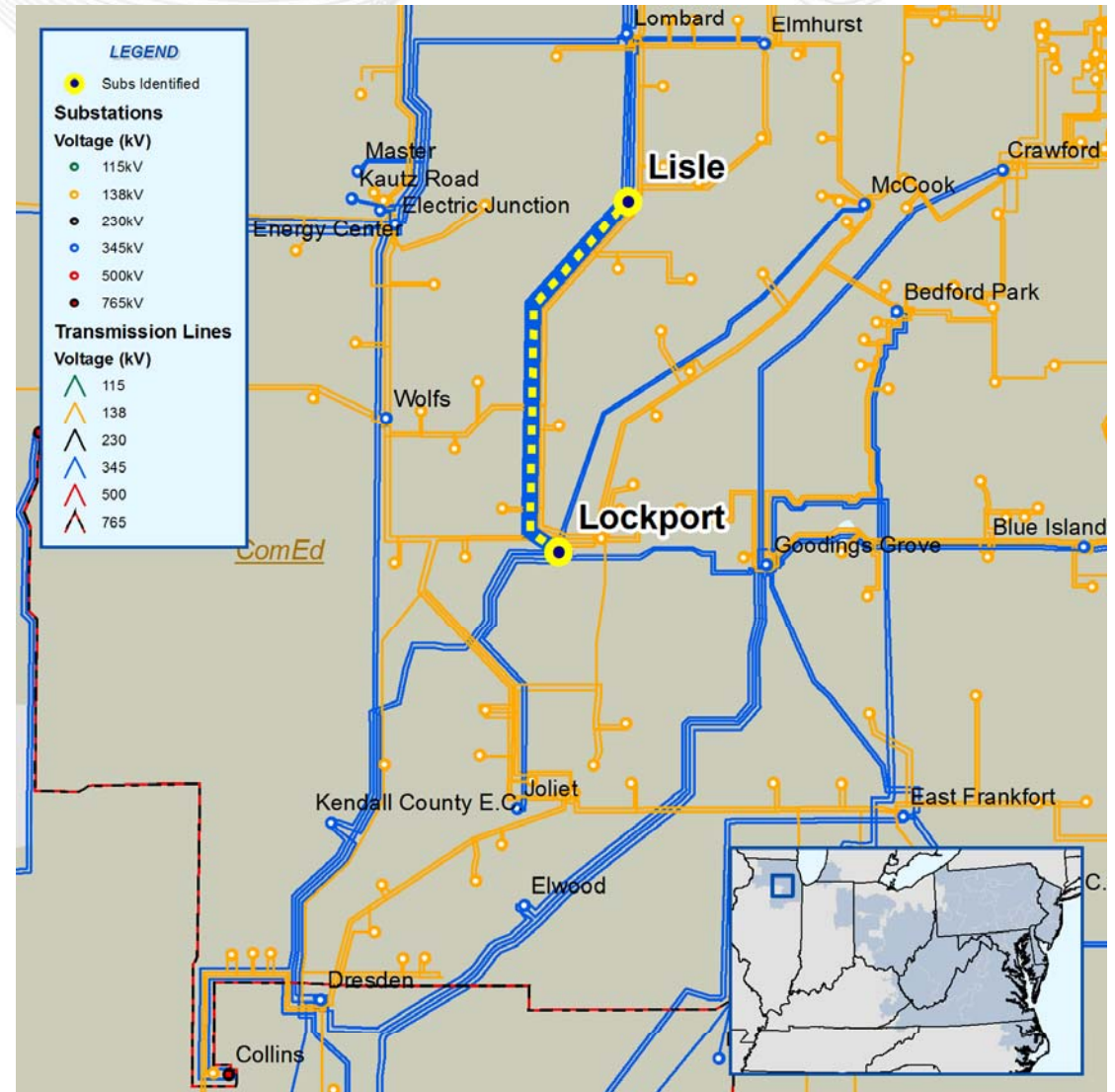
- N-1-1 thermal overload of Carroll – Catoctin – Ringgold 138kV, the Carroll 230/138kV transformer, and Carroll – Mount Airy 230kV for the loss of the following contingency combinations:
 - Lime Kiln – Montgomery 230kV + Eaglehead – New Market 230kV
 - Lime Kiln – Montgomery 230kV + Eaglehead – Monocacy 230kV
- Proposed Solution to convert the following circuits to 230kV operation:
 - Monocacy - Walkersville 138kV (b0675.1)
 - Walkersville - Catoctin 138kV (b0675.2)
 - Ringgold - Catoctin 138kV (b0675.3)
 - Catoctin - Carroll 138kV (b0675.4)
 - portion of Ringgold 138kV Substation (b0675.5)
 - Catoctin 138kV Substation (b0675.6)
 - portion of Carroll 138kV Substation (b0675.7)
 - Monocacy 138kV Substation (b0675.8)
 - Walkersville 138kV Substation (b0675.9)
- Estimated Project Cost: \$55.7M
- Required IS Date: 6/01/2013



- Generation deliverability violation
- The Graceton – Bagley 230kV circuit overloaded for tower contingency that removes the two Conastone – Northwest 230kV circuits 2322 and 2310.
- Proposed Solution:
Rebuild the Graceton – Bagley section as double circuit line using 1590 Kcmil ACSR. Terminate new line at Graceton with a new circuit breaker (b1016)
- Estimated Cost:
\$16.5 M
- Expected IS Date:
6/01/2014

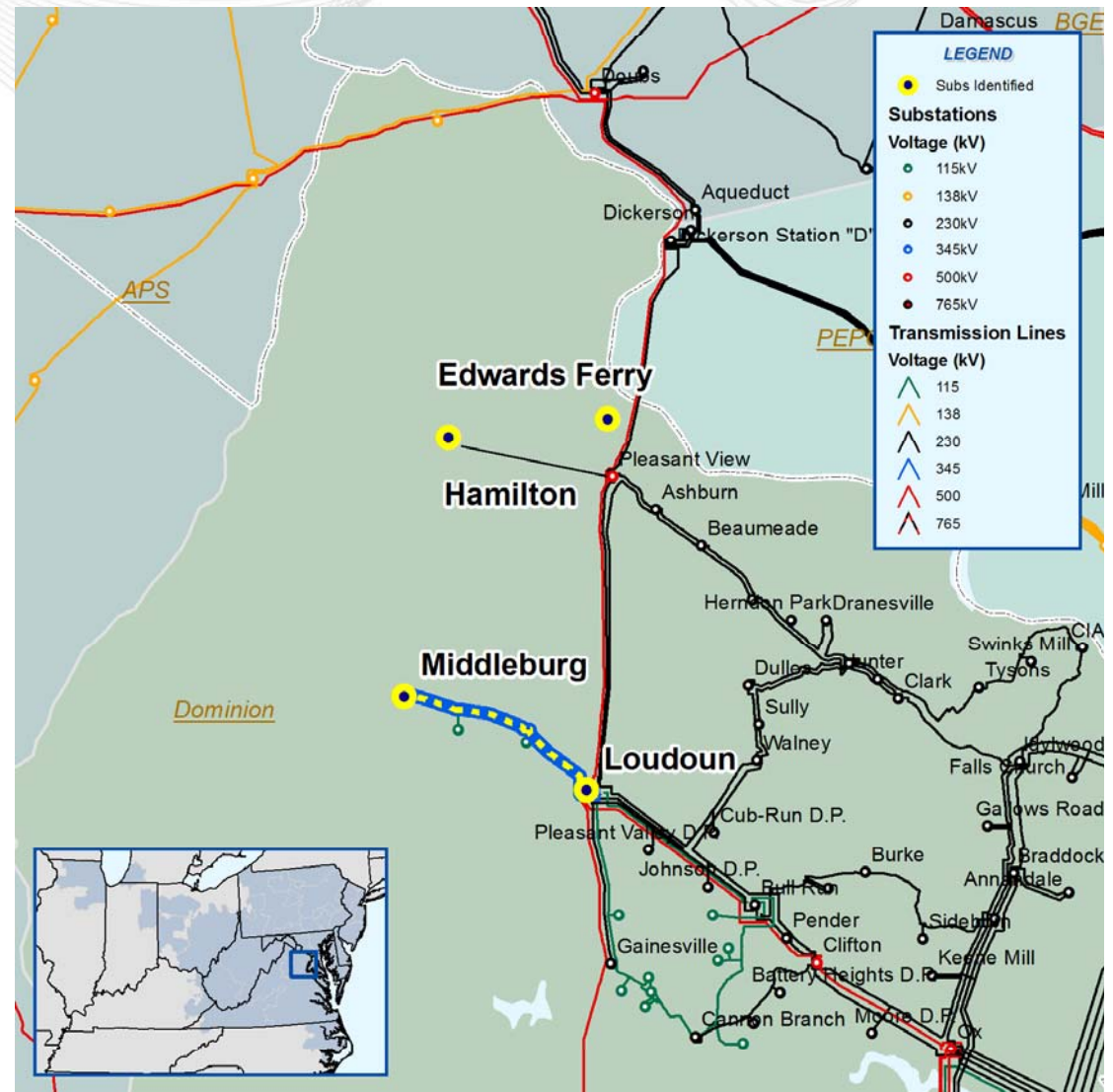


- Generation deliverability violation
- Lockport - Lisle 345kV (Line 10801) is overloaded in 2014 for the single outage of line 10808 Lockport – Lombard 345kV
- Proposed Solution: Replace the 345kV Bus Tie CB 2-3 at Lisle. This CB can be upgraded from 2000A to 3000A with an inspection and new nameplate from the manufacturer for \$10k.
- Estimated Project Cost: \$10k
- Required IS Date: 6/1/2014

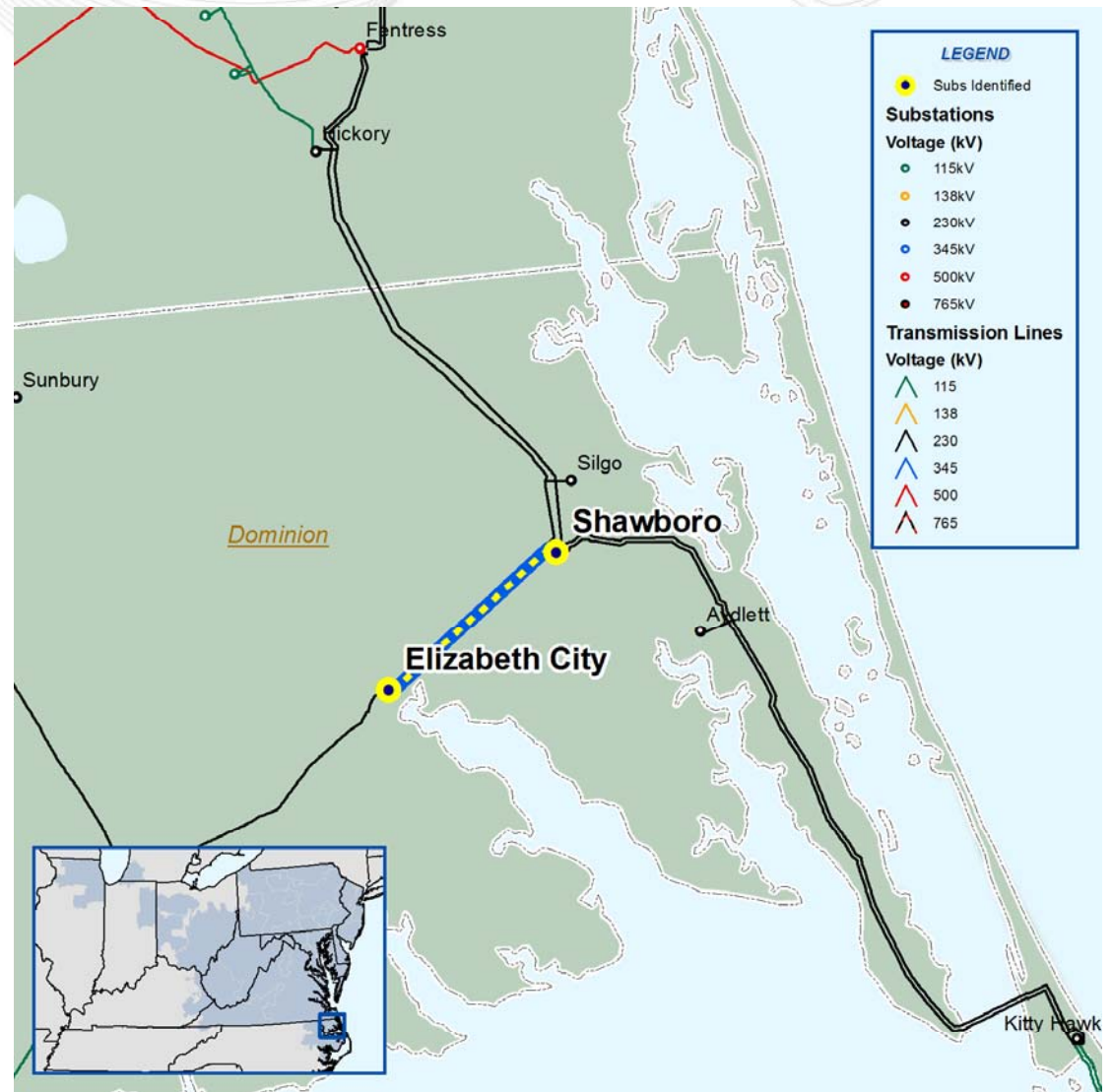


Dominion Transmission Zone

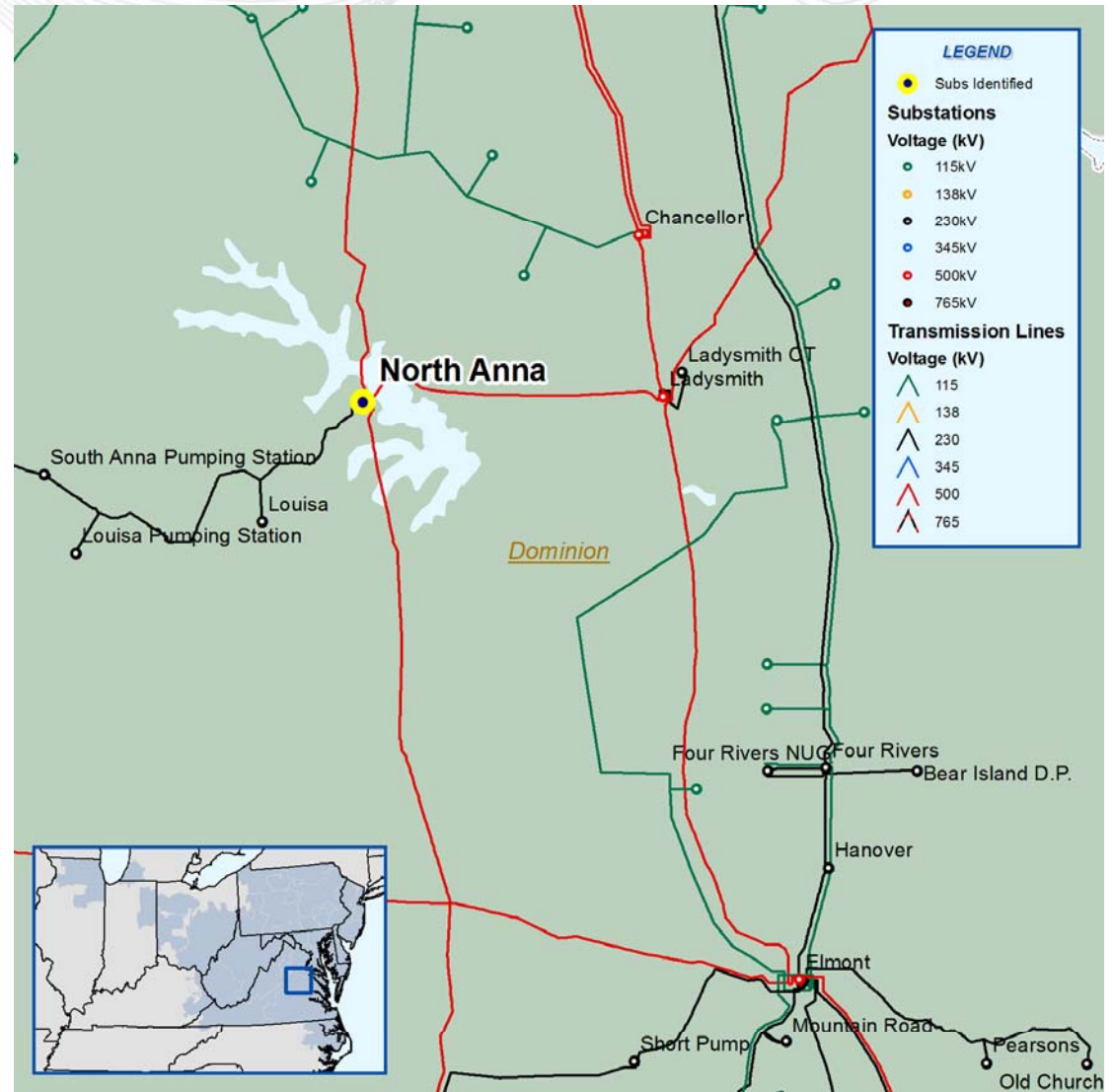
- Baseline b0755: Build a 15-mile long 230kV line from Hamilton to Middleburg and convert Line #49 to 230kV (10 miles).
- Upgrade to resolve a Dominion criteria violation for lines #49 Loudoun to Middleburg 115kV and #2098 Pleasant View to Hamilton 230kV line
- TEAC Est. Cost: \$125M
- Revised Est. Cost: \$400M – significant underground construction
- Proposed new solution: Tap Dickerson to Pleasant View 230kV and build new Edwards Ferry Sub. This reduces loading on Pleasant View to Hamilton 230kV Construct 10 mile double ckt. 230kV tower line from Loudoun to Middleburg . One ckt operating at 115kV initially.
- Estimated cost: \$35M
- Expected service date: May 2013



- Voltage violations in Winfall and Elizabeth City area for the N-2 loss of Shawboro to Elizabeth City 230kV and Suffolk to Winfall 230kV
- Solution: Build second Shawboro to Elizabeth City 230kV line
- Estimated Cost: \$22 M
- Expected IS Date: 6/1/2014



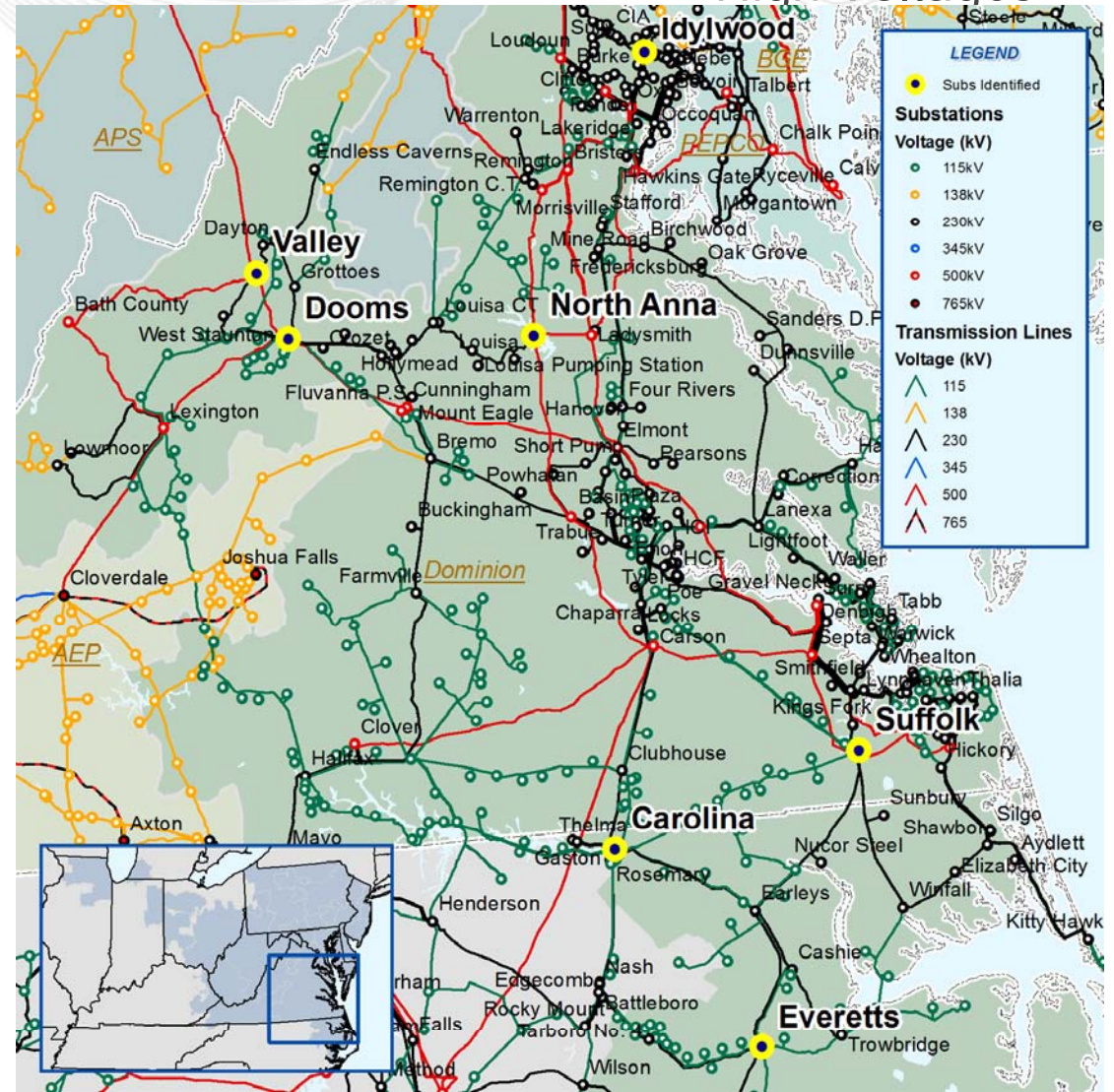
- Dominion Criteria violation on North Anna 500-230kV Tx#2 for the outage of Charlottesville to Gordonsville 230kV and Gordonsville Tx #2
- Solution: Replace existing North Anna 500-230kV Tx with larger unit
- Expected IS Date: June 2014
- Est. Cost \$16 M



- In real-time operation, during light load periods, high voltage conditions are becoming more problematic in many cases exceeding equipment voltage limits.
- Over 80 different substations experienced voltages which exceeded their equipment limits during the March 6th – 8th, 2009 timeframe.
- Operator action such as removing lines from service are no longer effective at mitigating the high voltages.
- Operating the system in this manner can lead to premature equipment fatigue and failures of transmission, distribution and generation equipment.
- These conditions are expected to get worse in the future as additional transmission(EHV projects), including underground transmission, is added to address peak load concerns and as energy efficiency programs develop.

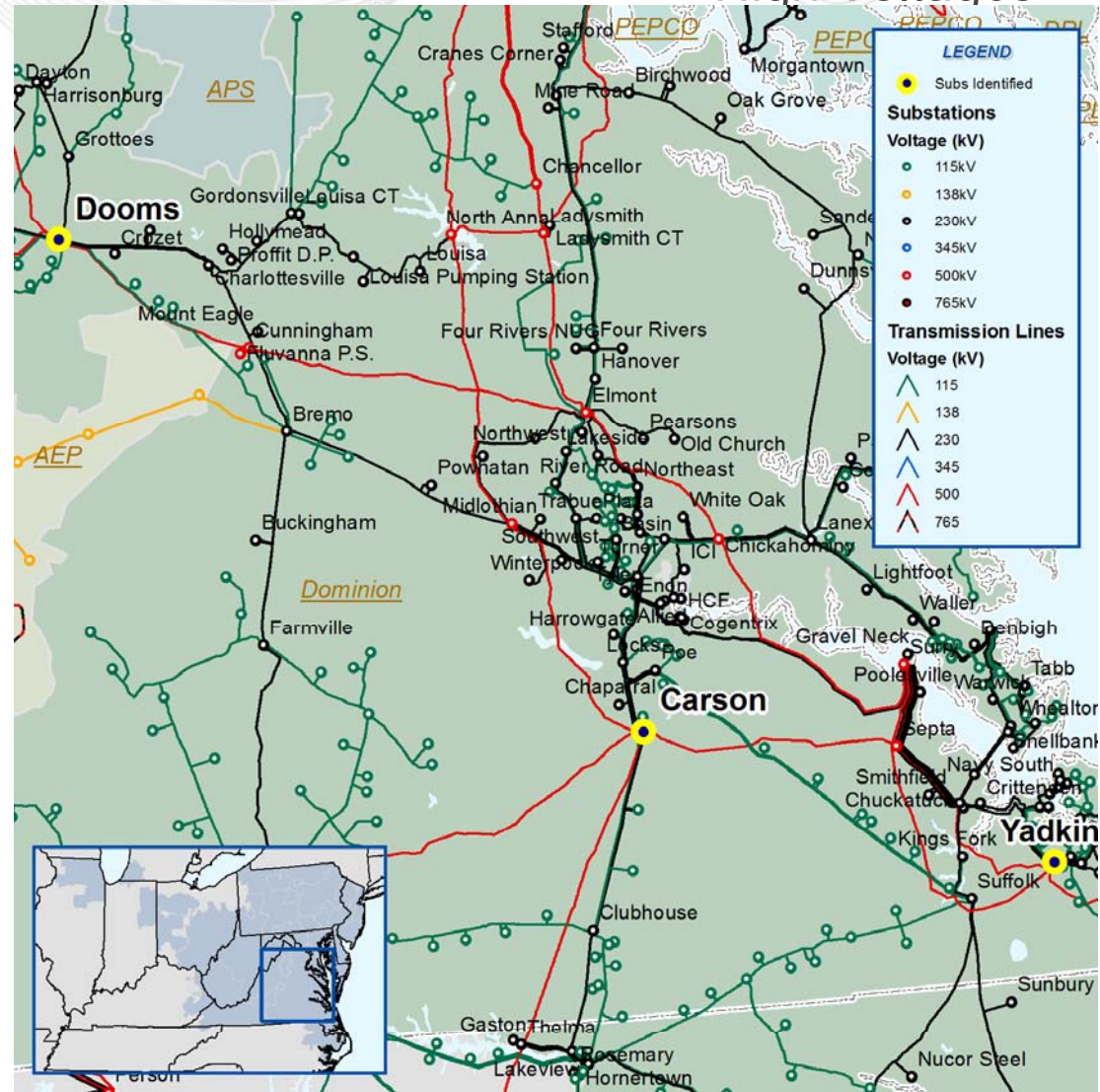
Dominion Transmission Zone High Voltages

- The recommended solution is to install new variable reactors at several substations.
- New reactor banks to be installed at Carolina, Everetts, Idylwood, Northern Alexandria, North Anna, Suffolk, and Valley 230kV (b0928)
- The estimated cost for this work is \$ 48 M
- Projected ISD: December 31, 2011



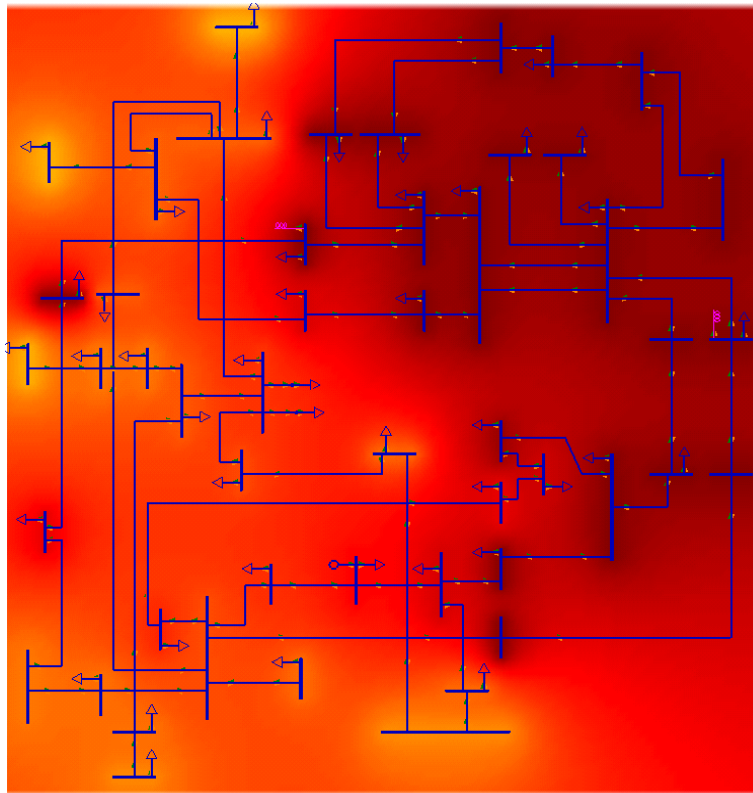
Dominion Transmission Zone High Voltages

- In addition to the new reactors on the previous slide, reactors at Carson, Dooks and Yadkin 230kV will be replaced with larger variable reactors. (b0923, b0924, b0927)
- These reactors need to be replaced in conjunction with transformer replacement projects at those stations (reactors are on the tertiary of the transformers).
- New reactors are also planned for Garrisonville and Hamilton Substations to address high voltage concerns associated with new 230kV underground lines (S0133 & S0124) (b0925, b0926)
- The estimated cost of these reactors is \$ 27.5 M



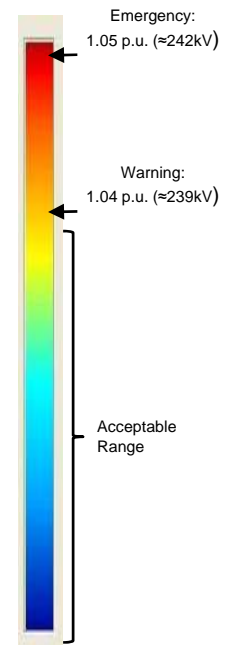
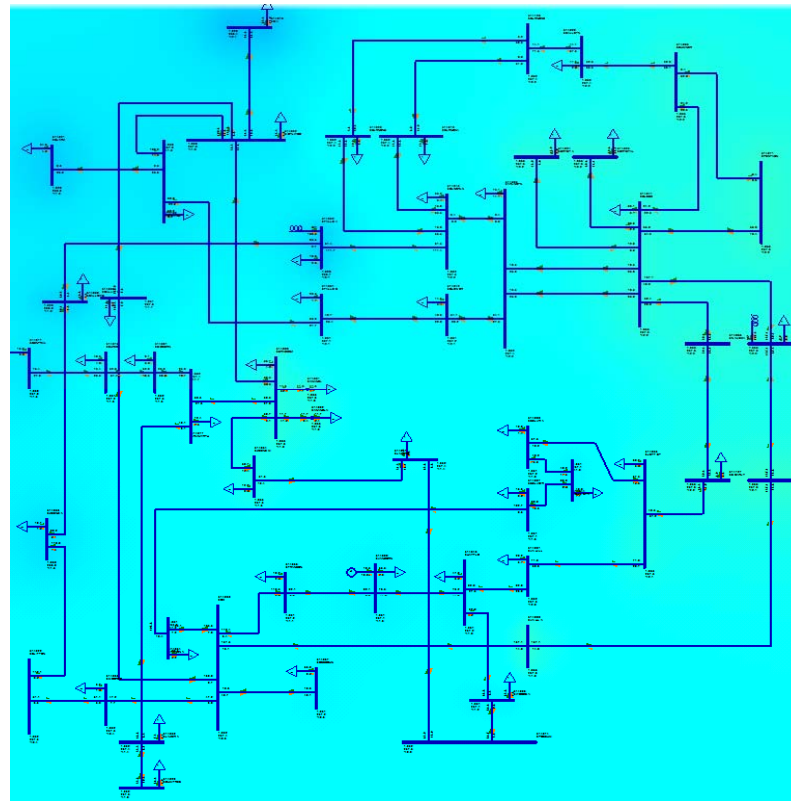
Without Reactors

Northern Virginia Voltage Contour: No Reactors



With Reactors

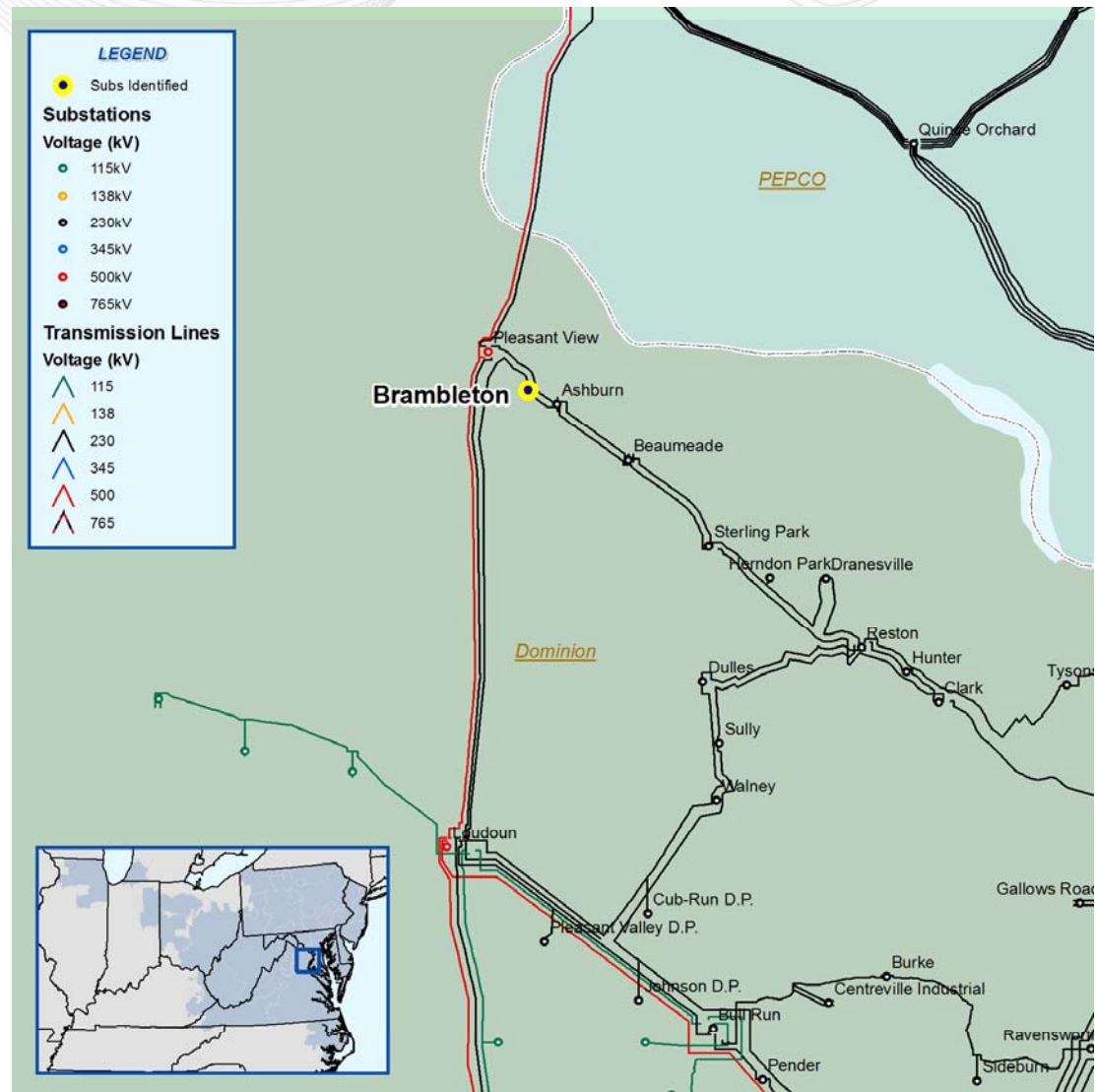
Northern Virginia Voltage Contour: Reactors at N.
Alexandria & Idlywood



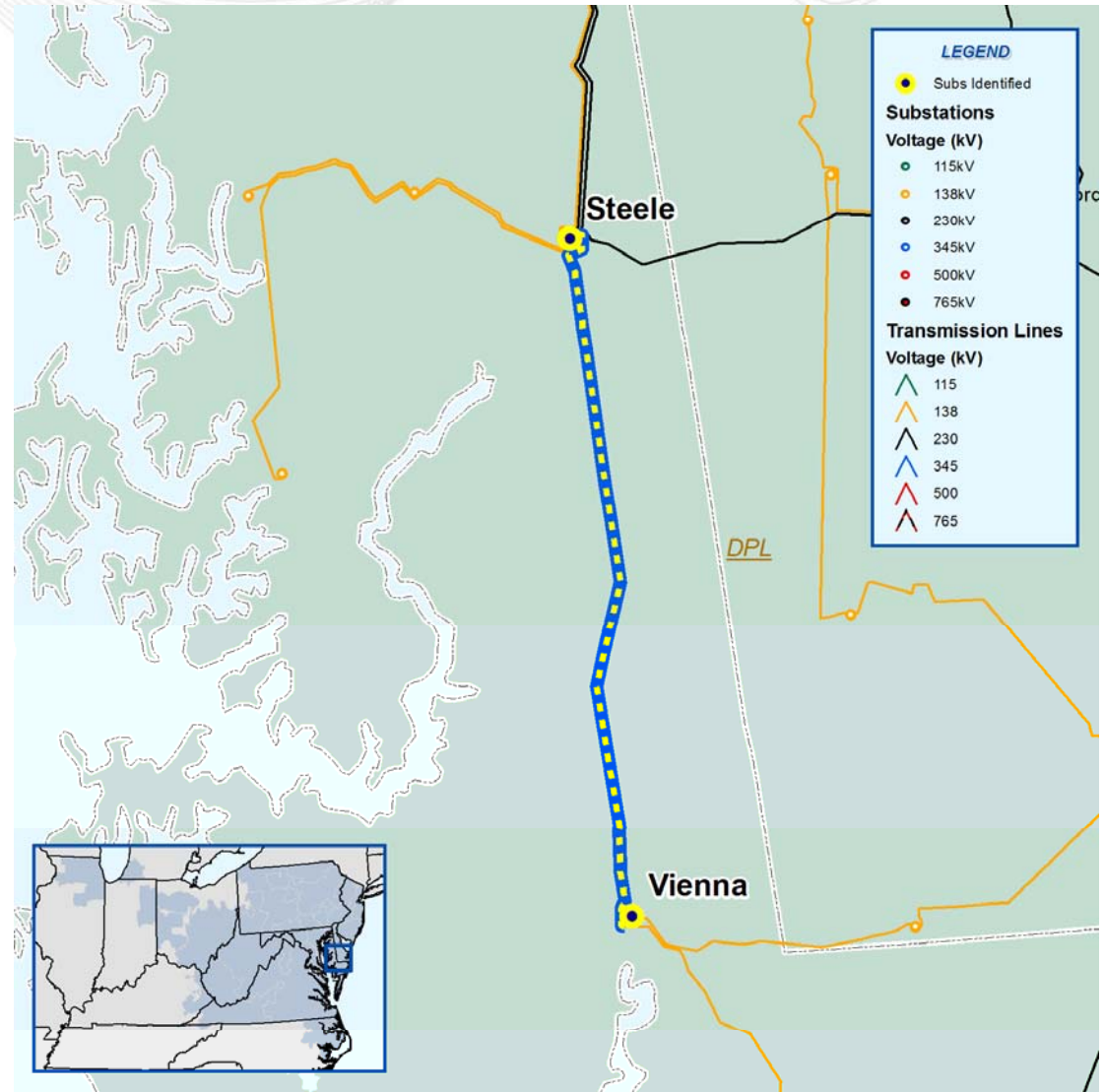
- Tower line outage & Dominion Criteria Violation
 - Tower line outage – Morrisville to Marsh Run overloads 115kV network in the area.
 - Loudoun 500 / 230kV transformer overloads for loss of the other transformer.
- Original Proposed Solution
 - Convert the Remington – Sowego 115kV line to 230kV
 - Add a new 230kV line from Sowego – Gainesville
 - Add a Sowego 230 / 115kV transformer
 - Estimated cost \$30 million
- New Proposed Solution:
 - Convert the Remington – Sowego 115kV line to 230kV (b0453.1)
 - Add a new 230kV line from Sowego Gainesville (b0453.2)
 - Add a Bristers 230kV / 115kV transformer and feed to Sowego (b0453.3)
- Estimated Project Cost: \$30M
- Expected IS Date: 6/01/2012



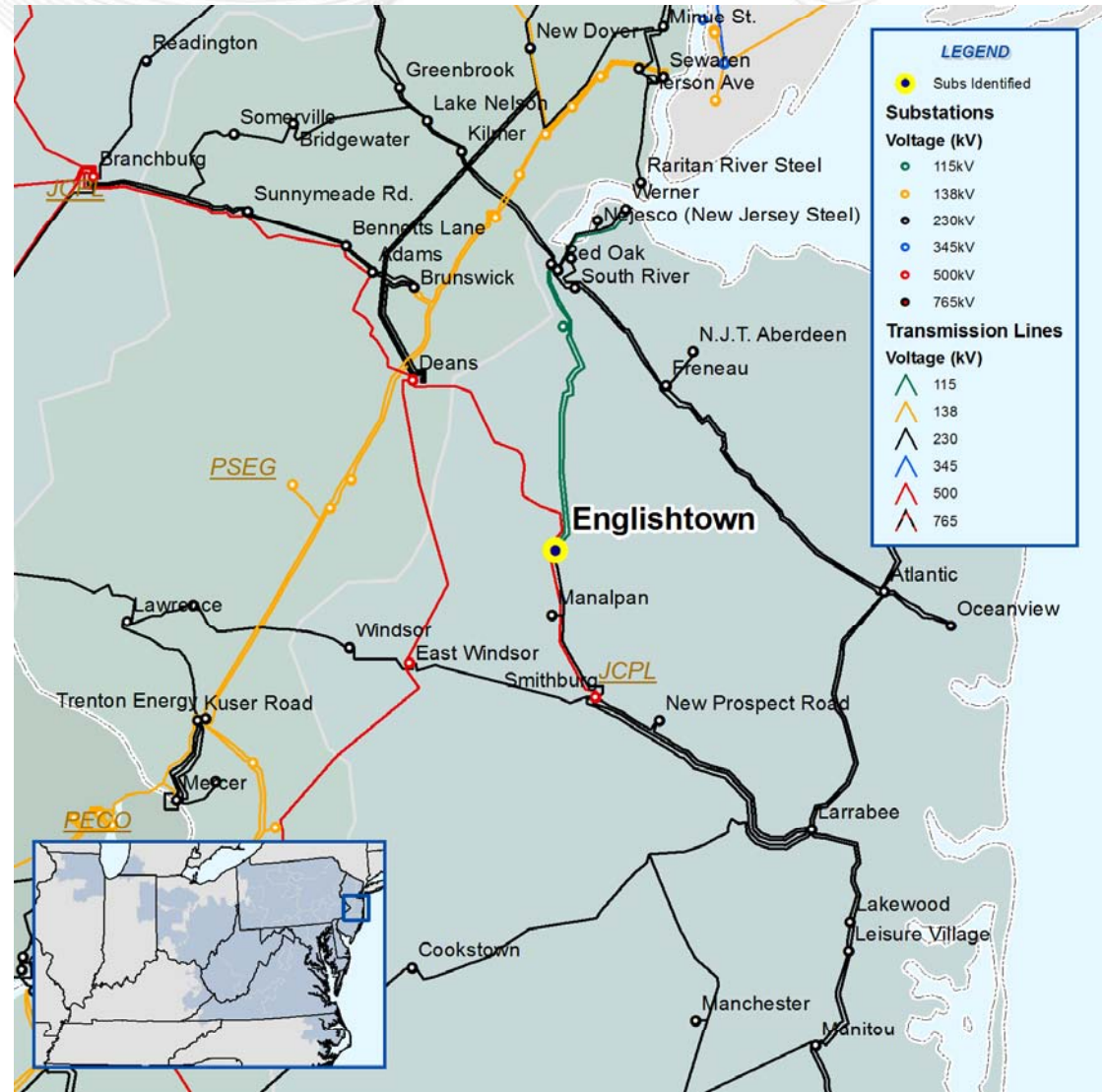
- Generation Deliverability Violation
- Brambleton – Cochran Mill 230kV overloads for the outage of Loudoun – Pleasant View 500kV
- Proposed Solution:
Reconductor Brambleton – Cochran Mill 230kV circuit (b0921)
- Estimated Project Cost: \$2.354M
- Expected IS Date: 6/01/2011



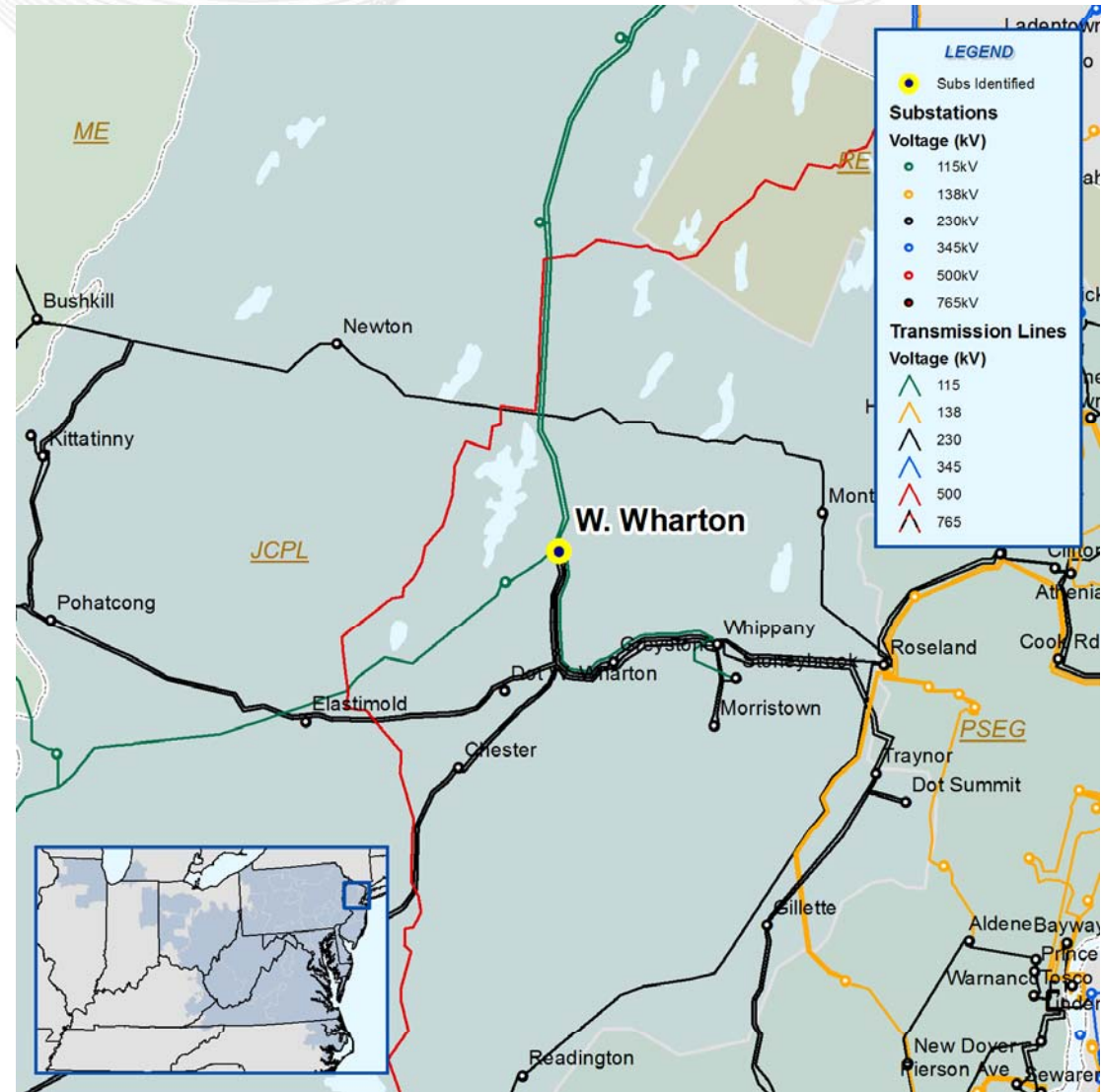
- N-1-1 voltage collapse for the loss of the following contingency combinations:
 - Vienna-Steele 230kV line + Vienna-Loretto 230kV line
 - Vienna-Steele 230kV line + Loretto-Piney Grove 230kV line
 - Vienna-Steele 230kV line + Vienna-Nelson 138kV line
- Proposed Solution:
Build a 2nd Vienna-Steele 230kV line (b0877)
- Estimated Project Cost:
\$44.613M
- Expected IS Date:
6/01/2014



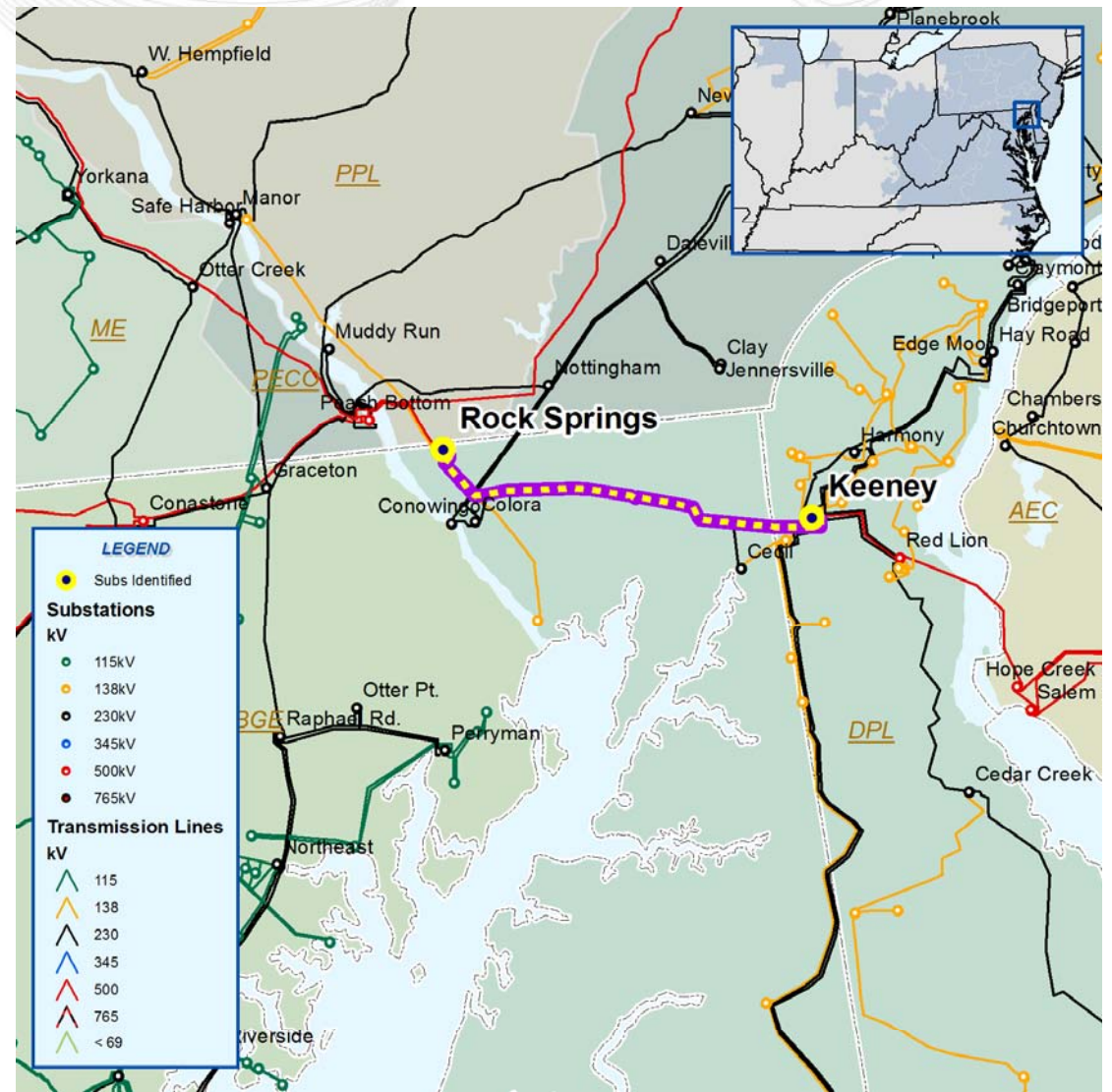
- Generation deliverability violation
- The Englishtown – Manalapan 230kV circuit overloaded for tower contingency that removes the Atlantic – Larrabee and Atlantic – Smithburg 230kV circuits.
- Proposed Solution: Replace a Wave Trap at Englishtown substation (b1020)
- Estimated Project Cost: About \$0.1 M
- Expected IS Date: 6/01/2011



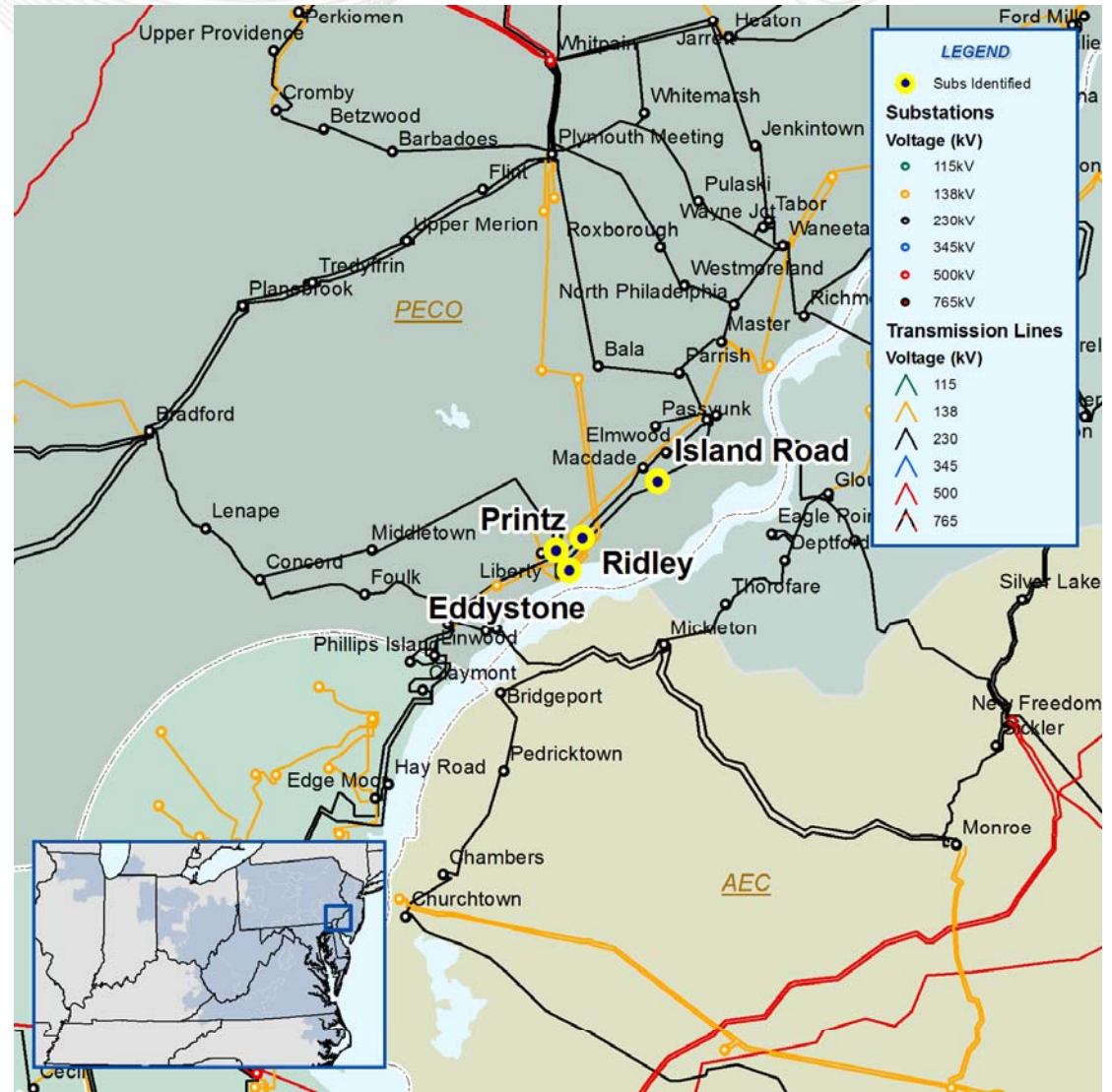
- Voltage collapse for various contingencies under the MAAC load deliverability test
- Proposed Solution: Install additional 130 MVAR capacitor at West Wharton 230kV substation (b0289.1)
- Estimated Project Cost: \$2.361 M
- Expected IS Date: 6/01/2011



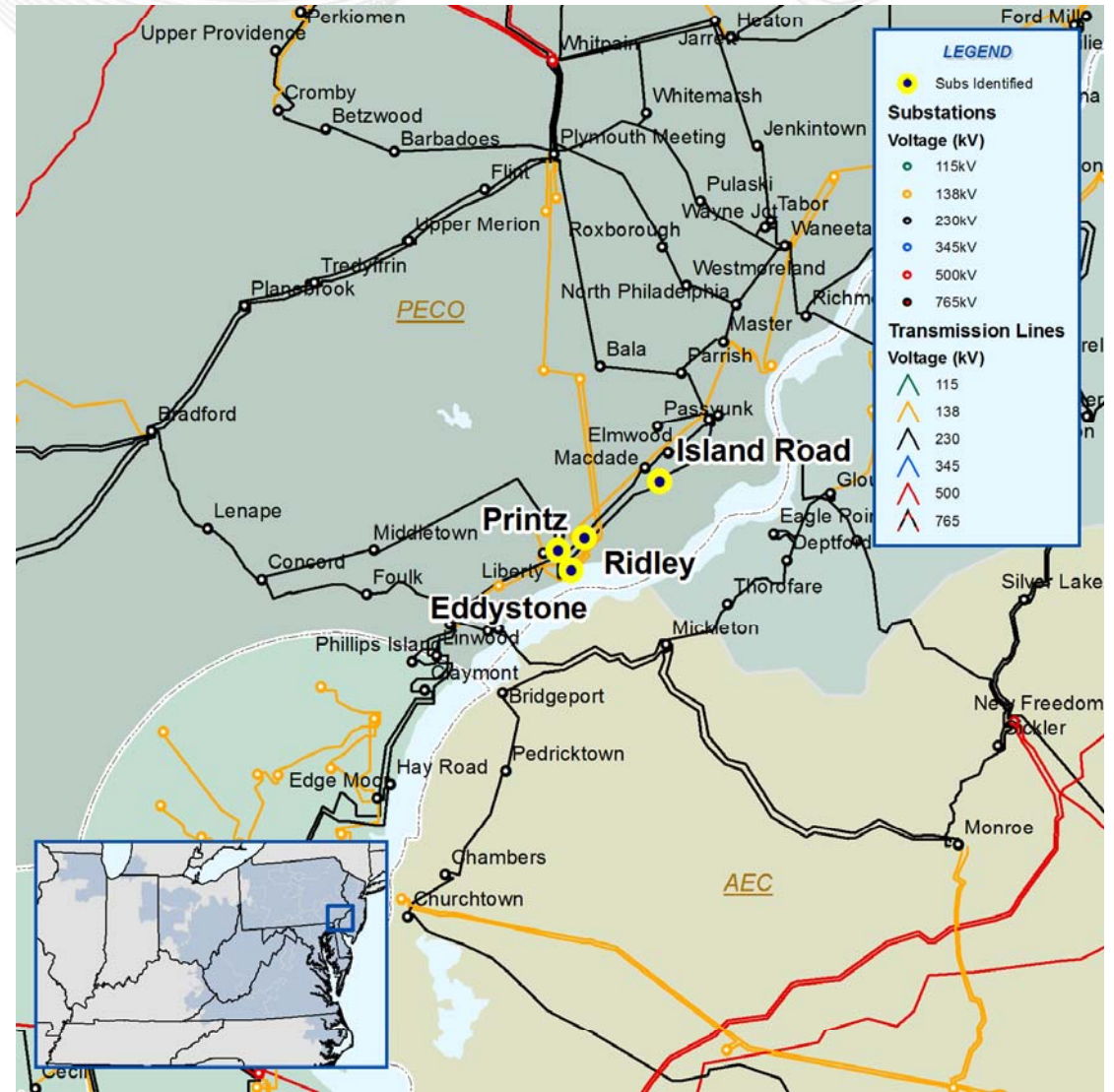
- The 2006 RTEP identified overload on Keeney – Rock Spring 500kV for EMAAC load deliverability in 2010
- Approved solution (B0272.1 and B0272.2) is to replace terminal equipments at Keeney and Rock Springs 500kV substation
- Updated analysis of 2012 using this years RTEP assumptions indicates that upgrade can be deferred to 2013



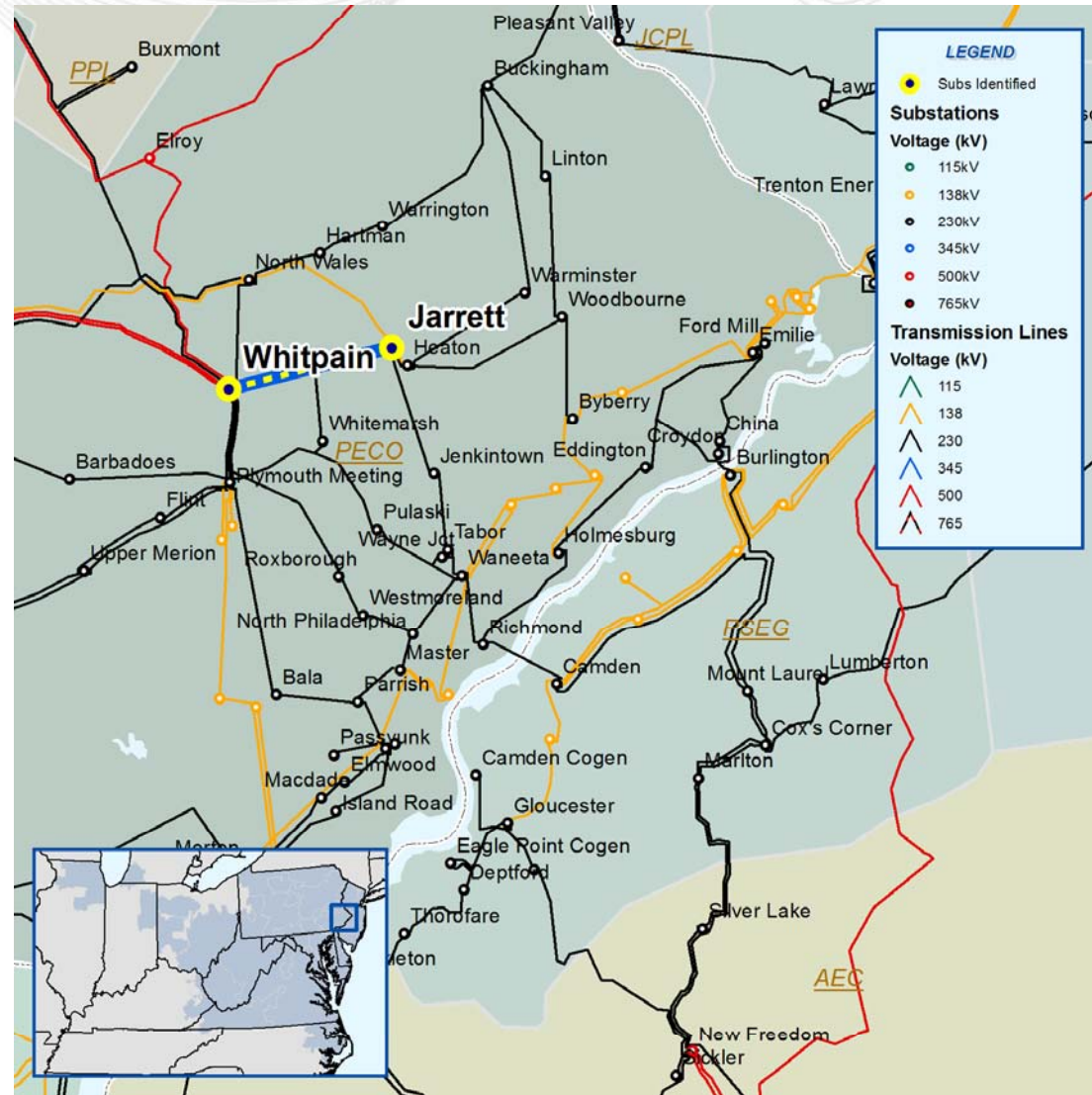
- Generation deliverability violation.
- The Eddystone – Island Rd. 230kV circuit overloaded for a fault on Macdade – Ridley – Morton 230kV circuit and stuck breaker on Morton 565 breaker.
- Proposed Solution:
 Replace Circuit Breaker, Station Cable, CTs and Wave Trap at Eddystone substation (b1014.1)
 Replace Circuit Breaker, Station Cable, CTs, Wave Trap and Disconnect Switch at Island Rd. substation (b1014.2)
- Estimated Project Cost:
 \$2.0 M
- Expected IS Date:
 6/01/2014



- Generation deliverability violation.
- The Printz – Ridley 230kV circuit overloaded for the loss of the Eddystone – Island Rd. 230kV circuit.
- Proposed Solution:
Replace 230kV Circuit Breakers # 115 and # 125 at Printz substation (b1015)
- Estimated Project Cost:
\$1.0 M
- Expected IS Date:
6/01/2014



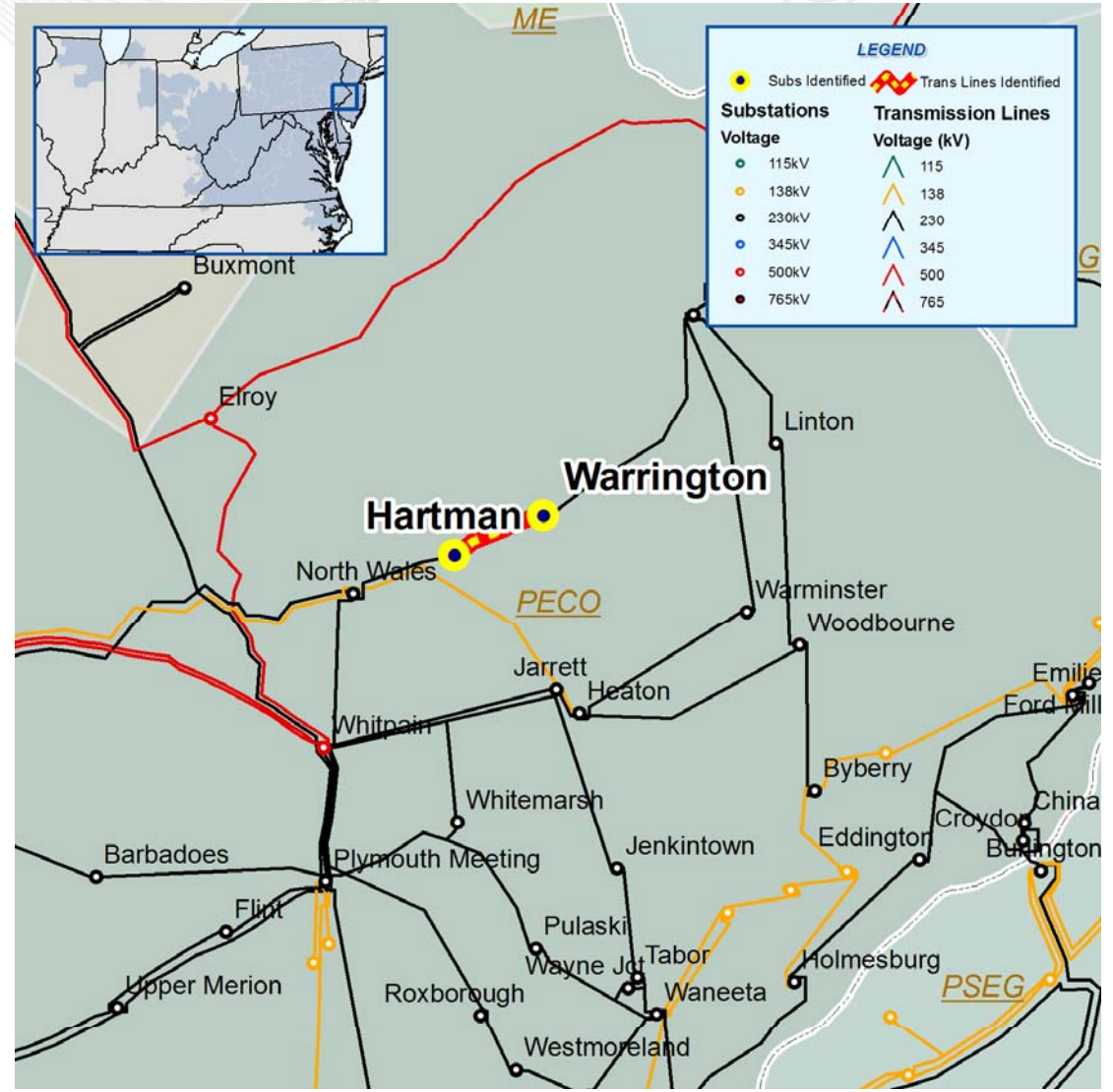
- Normal overload on Whitpain – Jarrett 230kV for loss of North Wales – Hartman 230kV under the N-1-1 test
- Proposed Solution: Replace station cable at Whitpain and Jarrett substations on the Jarrett – Whitpain 230kV circuit (b0920)
- Estimated Project Cost: \$0.7 M
- Expected IS Date: 6/01/2011



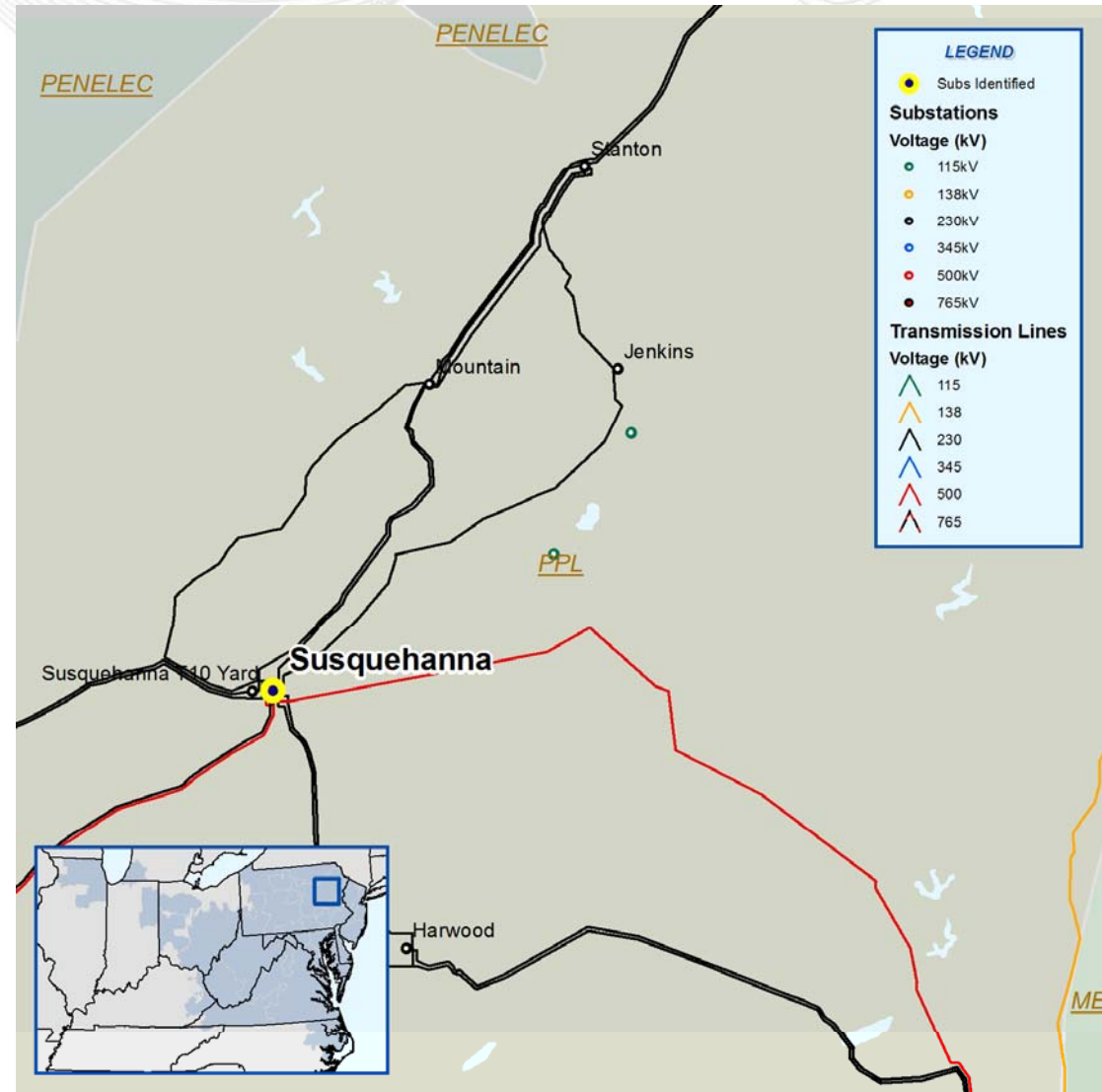
- The 2006 RTEP identified an overload on North Philadelphia – Waneeta 230kV for NERC Category C contingency in 2011
- Approved solution (B0359) is to reconductor North Philadelphia – Waneeta 230kV
- Updated analysis of 2012 using this years RTEP assumptions indicates that upgrade can be deferred to 2013



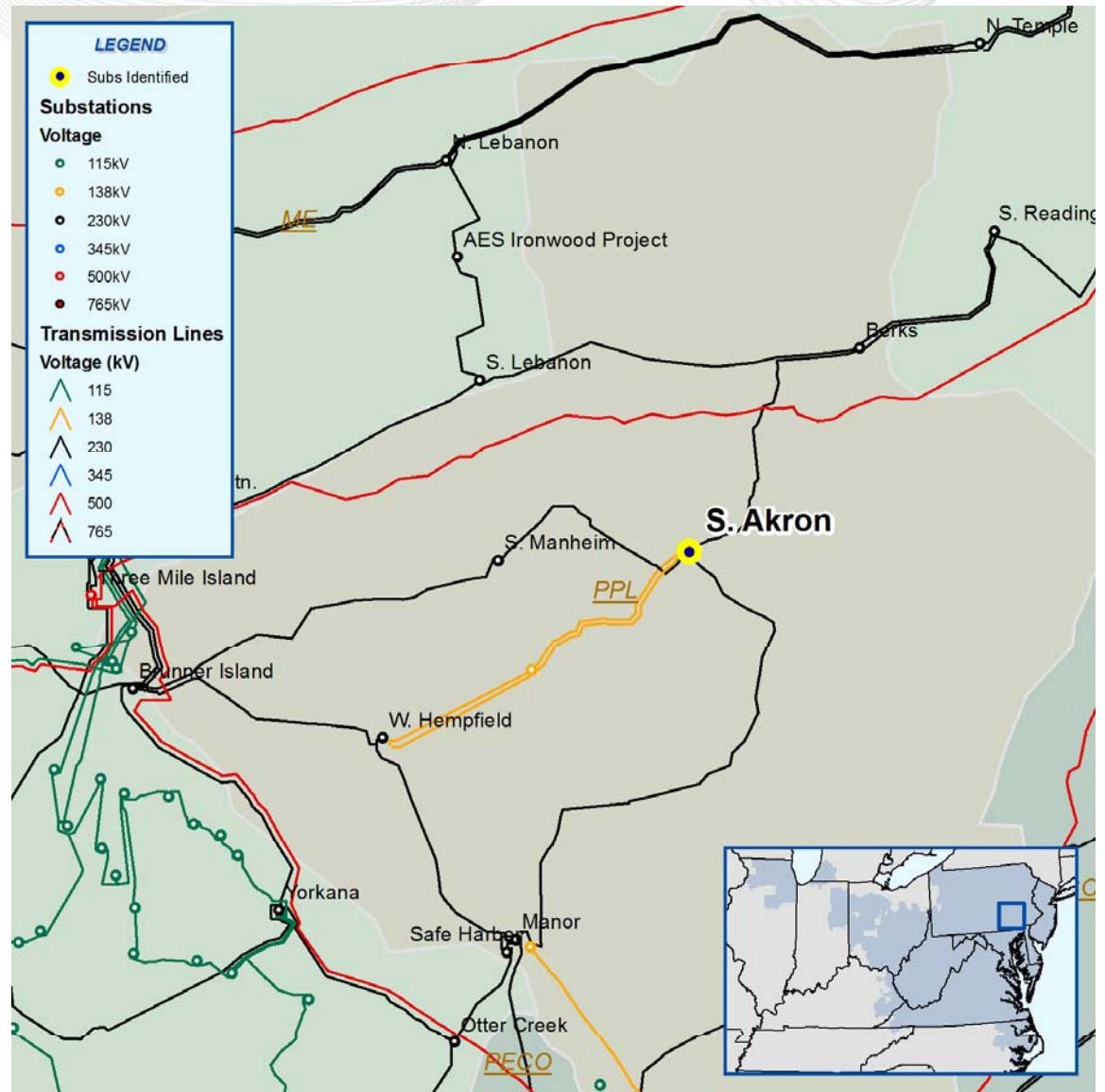
- The 2007 RTEP identified an overload on Warrington - Hartman 230kV for EMAAC Load Deliverability in 2011
- Approved solution (b0508) is to reconductor Warrington – Hartman 230kV
- Updated analysis of 2011 using this years RTEP assumptions indicates that scope of upgrade can be changed to replace terminal equipment only (b0508.1)
- Estimated in-service date: 6/1/2011
- Estimated cost: \$0.24M



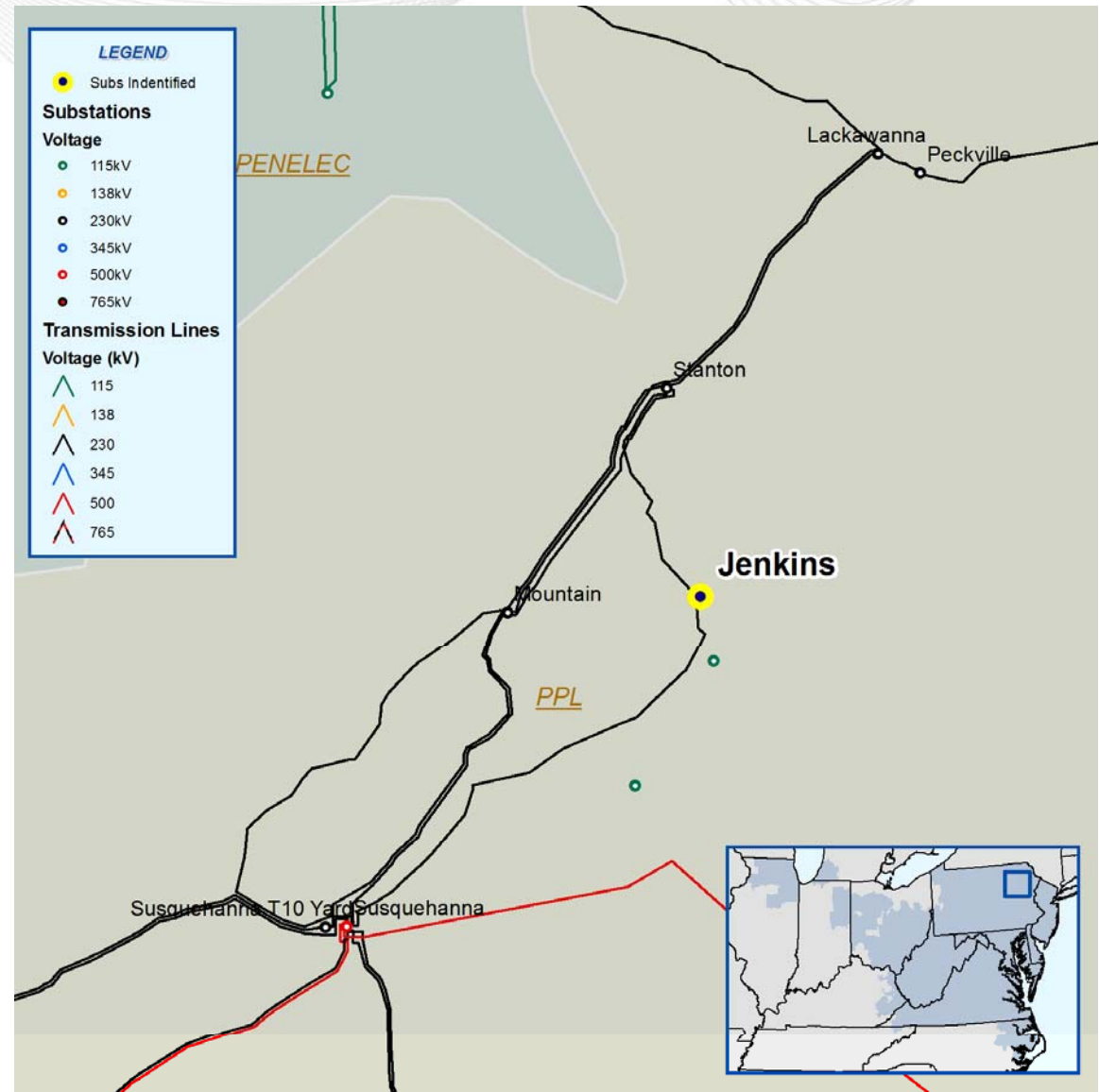
- Susquehanna – Jenkins 230kV circuit overloads for a line fault on the Susquehanna T21 – Susquehanna 230kV circuit coupled with a stuck breaker at Susquehanna 230kV that removes the Susquehanna – Mountain tap 230kV circuit from service
- Proposed Solution:
Install motor operators on the Susquehanna T21 – Susquehanna 230kV line East CB at the Susquehanna 230kV switching station (b0881)
- Estimated Project Cost: \$0.265 M
- Expected IS Date: 6/01/2012



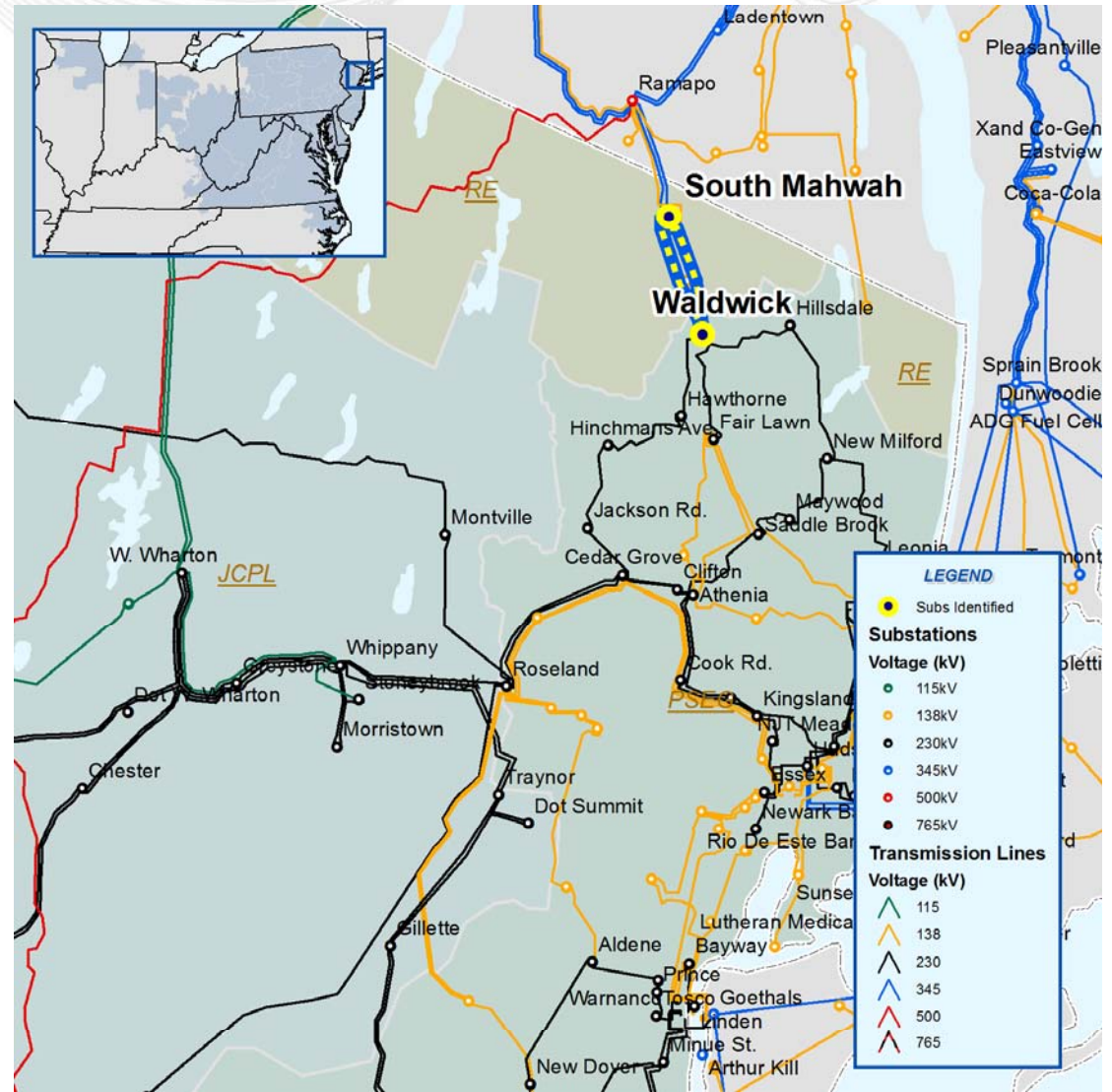
- South Akron 230/69kV transformer #3 / loss of South Akron-South Manheim 230kV line with a stuck breaker at South Akron
- South Akron 230/69kV transformer #4 / loss of South Akron-Millwood 230kV line with a stuck breaker at South Akron
- Recommended Solutions: Install motor operators on disconnects at South Akron (b0908)
- Estimated Project Cost: \$0.365 M
- Expected IS Date: 6/01/2011



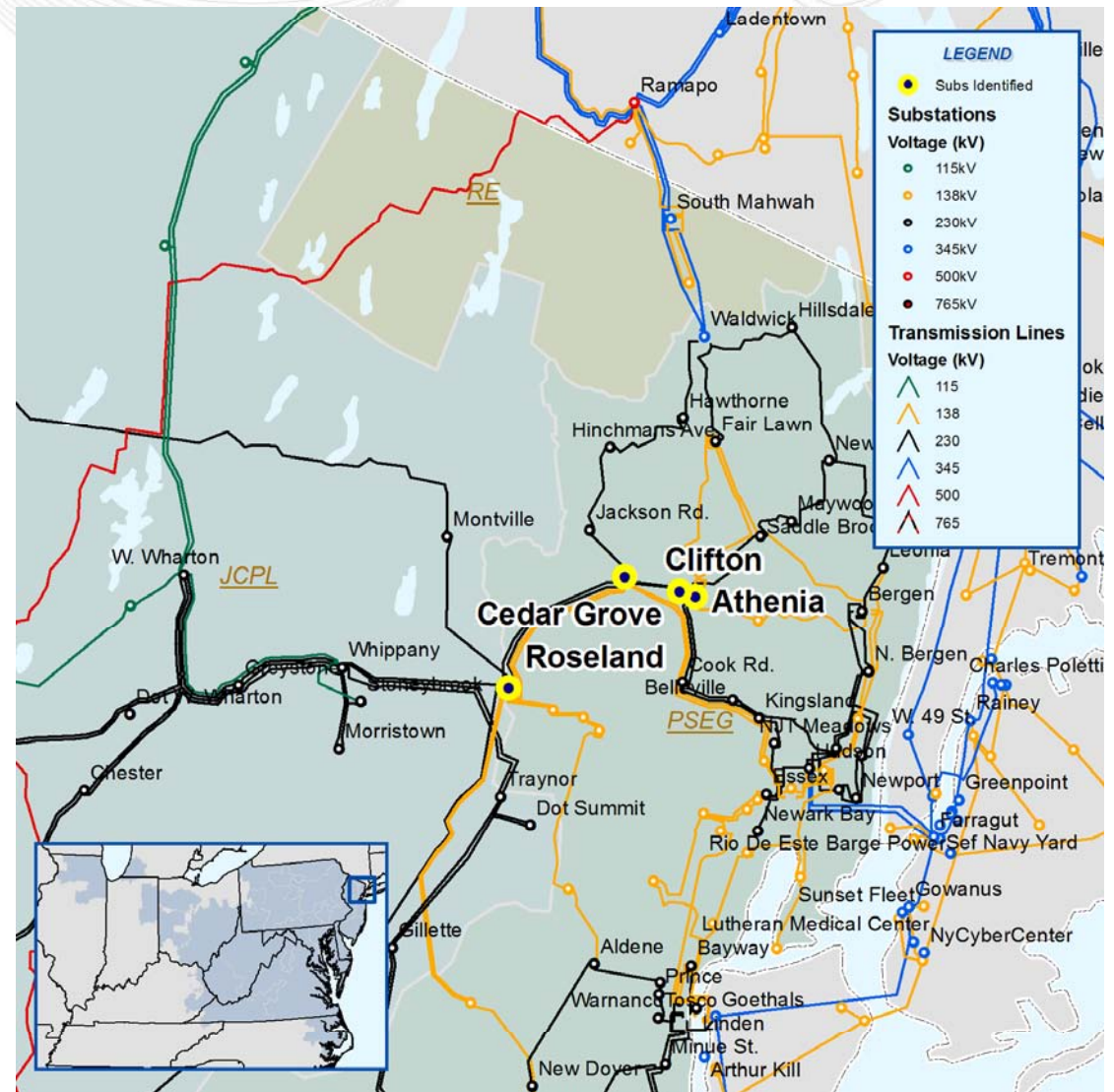
- Voltage violations in the Jenkins area / loss of Jenkins-Stanton 230kV line + loss of Jenkins-Susquehanna 230kV line
- Proposed Solution: Convert Jenkins 230kV yard into a 3-breaker ring bus and Install a 2nd Jenkins-Stanton 230kV line (b0909, b0910)
- Estimated Project Cost: \$7.74 M for the Jenkins substation rearrangement
- Estimated Project Cost: \$3.34 M for the Jenkins – Stanton 230kV line
- Expected IS Date: 6/01/2013



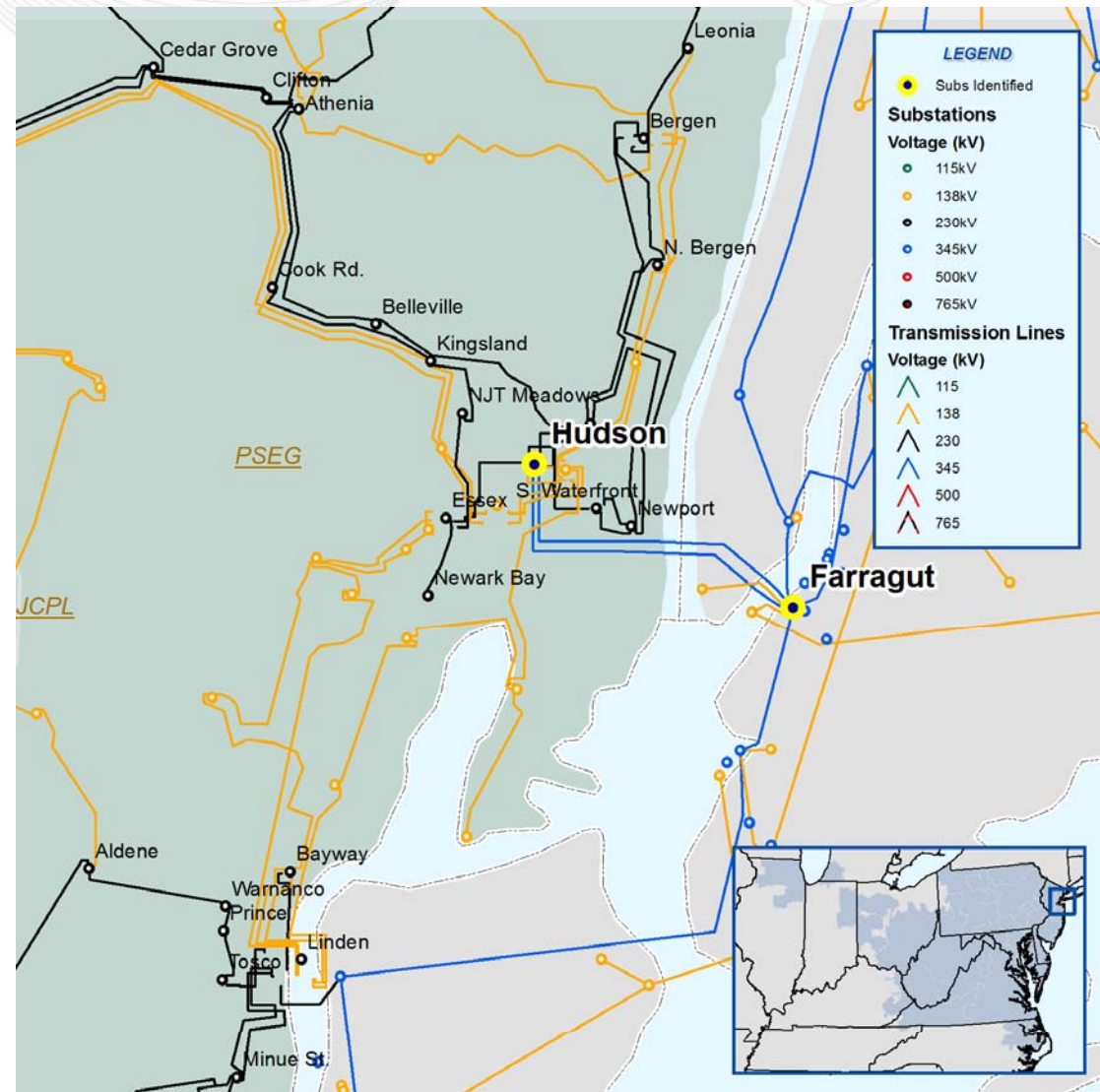
- Generation deliverability violation
- The South Mahwah – Waldwick 345kV J-3410 and K-3411 circuits are overloaded. Loss of either J-3410 or K-3411 circuit overloads the other circuit.
- Proposed Solution:
Reconductor both J-3410 and K3411 circuits and replace terminal equipment (b1017, b1018)
- Estimated Project Cost:
\$TBD M
- Expected IS Date:
6/01/2011



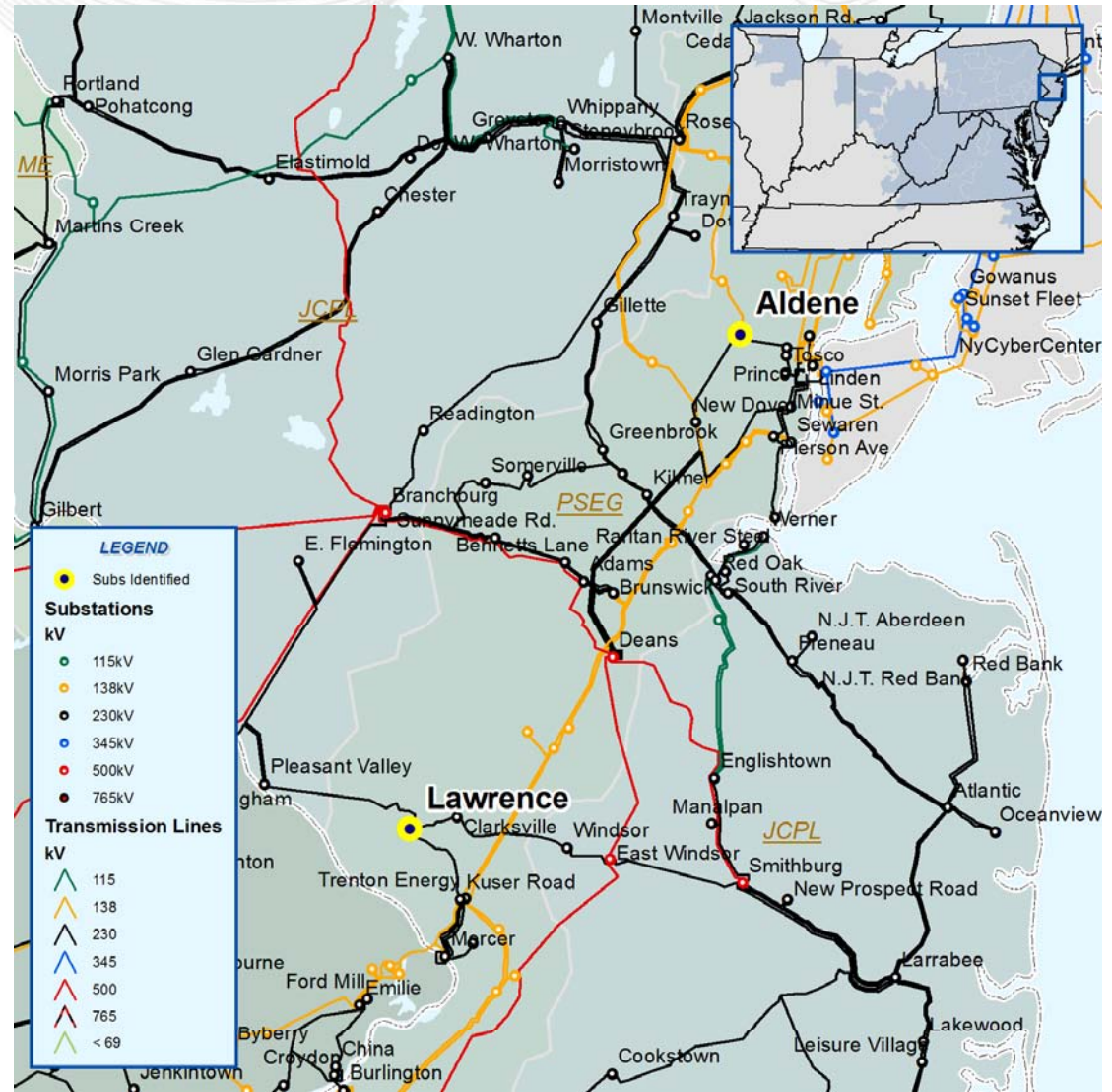
- PS-North load deliverability violation
- The Roseland – Cedar Grove – Clifton – Athenia 230kV F-2206 and B-2228 circuits are overloaded. Loss of either F-2206 or B-2228 circuit overloads the other circuit.
- Proposed Solution:
Replace terminal equipments at Roseland, Cedar Grove, Clifton and Athenia 230kV substations (b1019)
- Estimated Project Cost:
\$3.5 M
- Expected IS Date:
6/01/2011

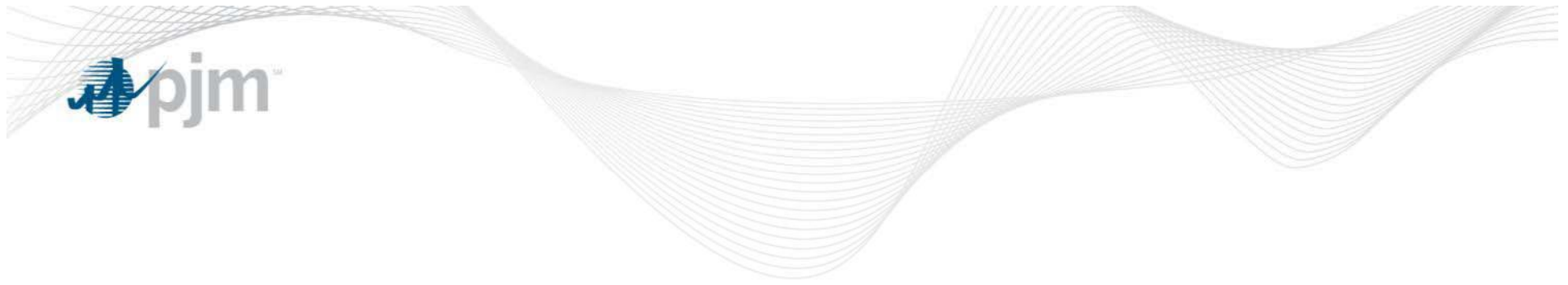


- Unable to maintain ConEd wheel because Farragut PAR angles are limited pre-contingency in the base case
- Proposed Solution:
At Hudson 345kV, add a PAR in series with both Farragut PARs (b0922)
- Estimated Project Cost: \$92M
- Expected IS Date: 6/01/2014



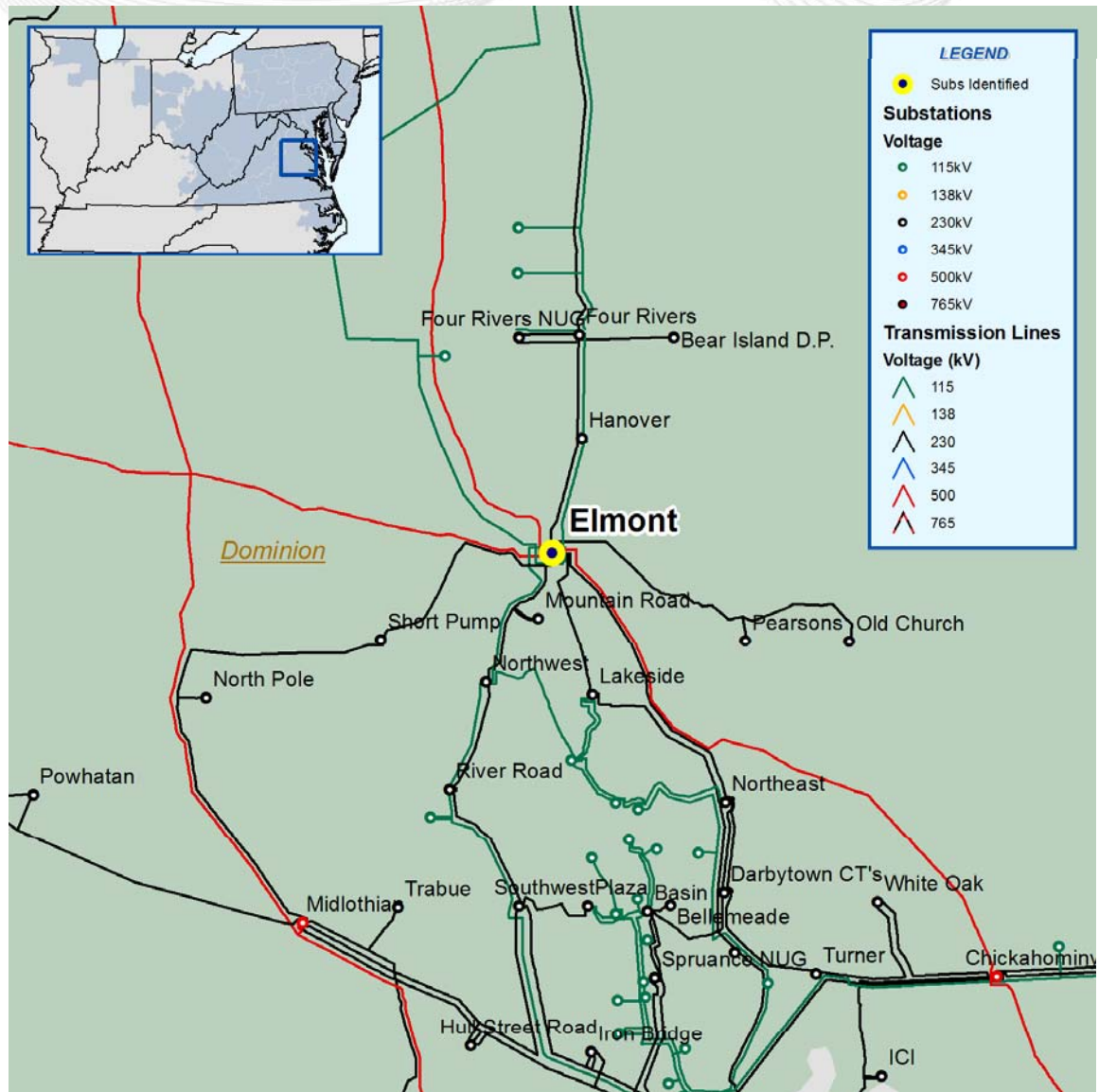
- The 2007 RTEP identified voltage violation in the Lawrence 230kV area
- Approved solution (B0473) is to move the 150 MVAR mobile capacitor from Aldene 230kV to Lawrence 230kV substation
- Updated analysis of 2012 using RTEP assumptions indicates that upgrade can be deferred to 2013





Short Circuit Upgrades

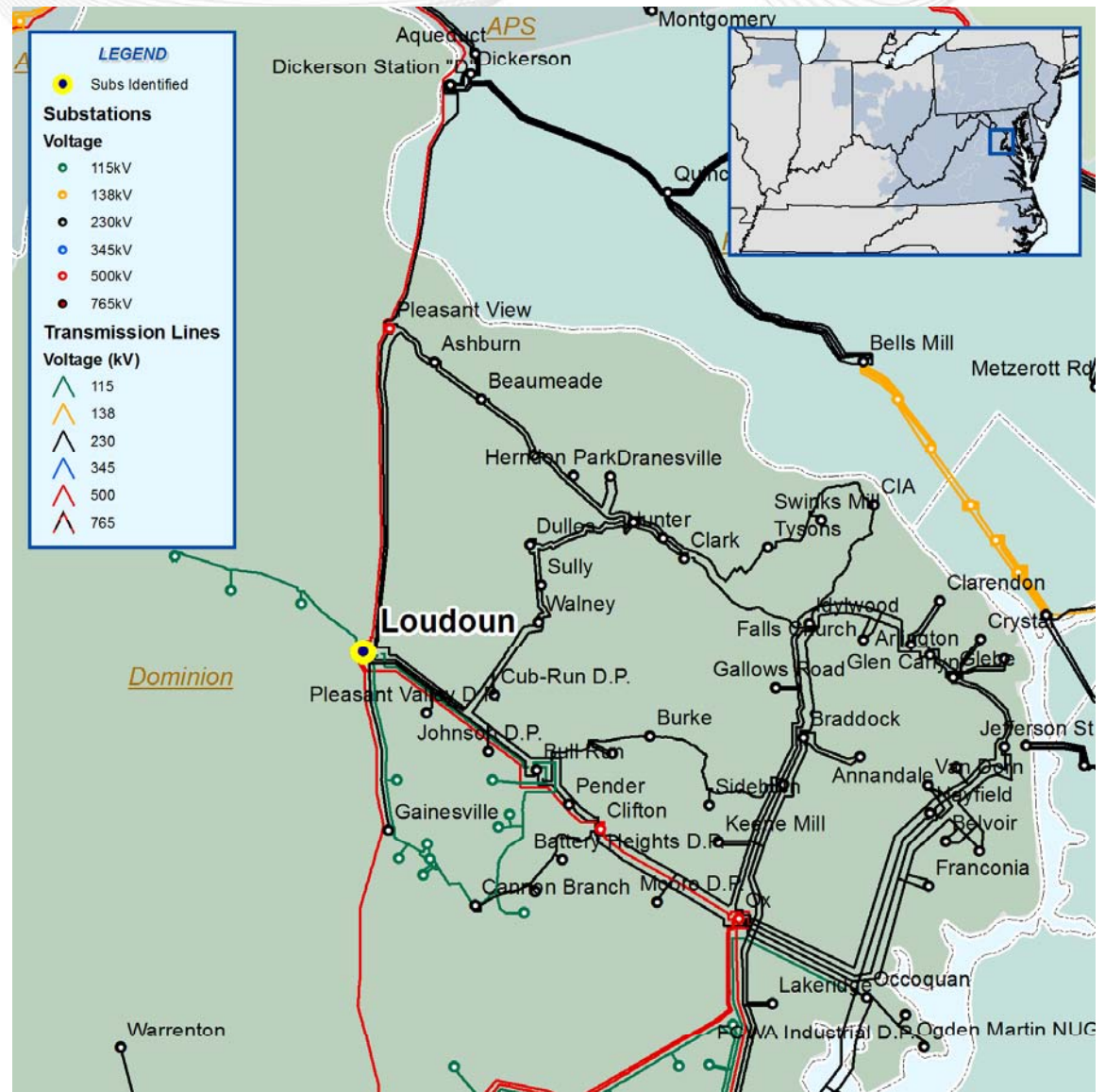
- 2012 Baseline Upgrades:
- Replace Elmont 230kV breaker '22192' (b0815)
- Replace Elmont 230kV breaker '21692' (b0816)
- Replace Elmont 230kV breaker '200992' (b0817)
- Replace Elmont 230kV breaker '2009T2032' (b0818)
- Estimated Project Cost: \$180 K per breaker
- Expected IS Date: 06/01/2012



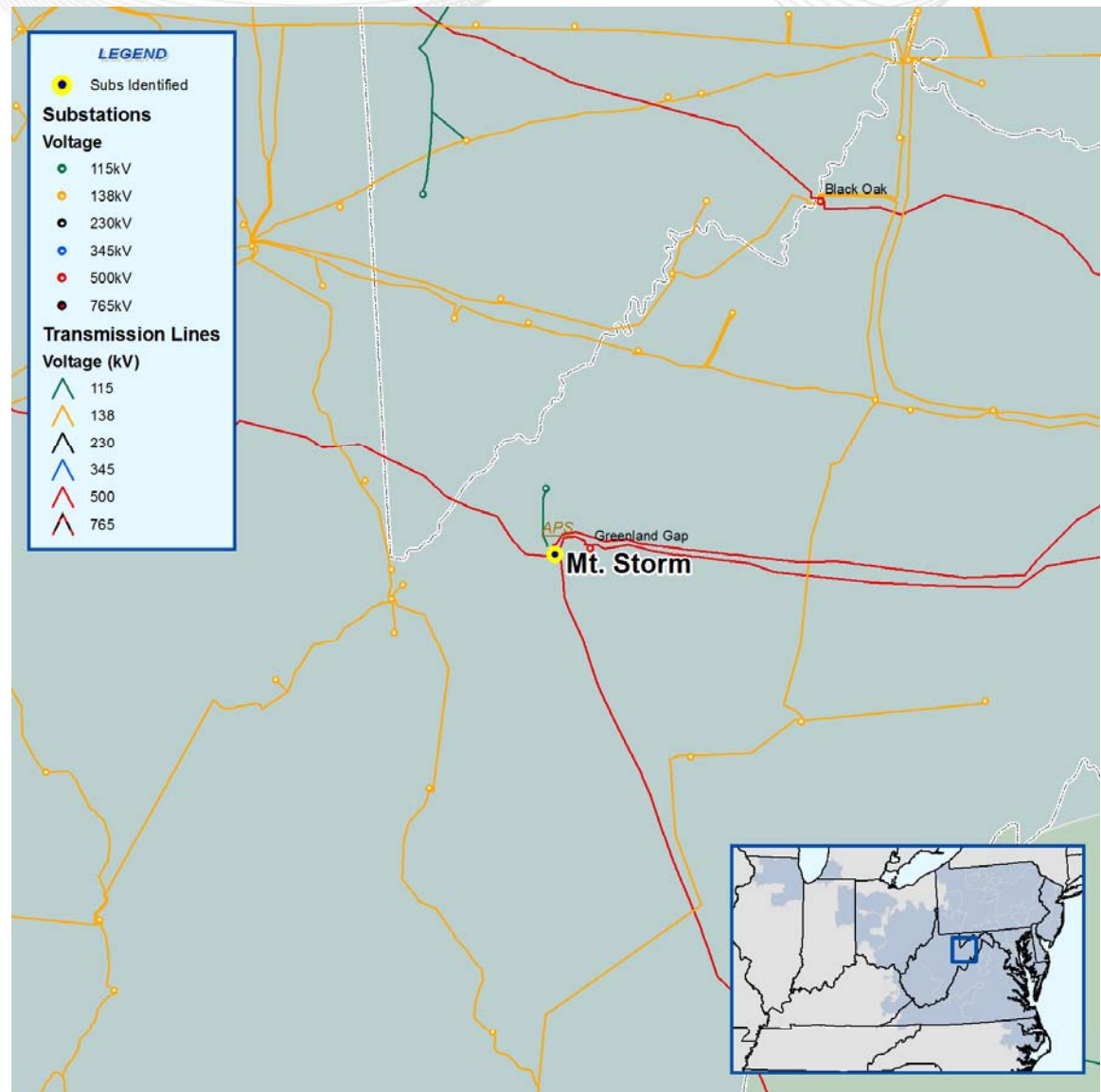


Dominion Transmission Zone

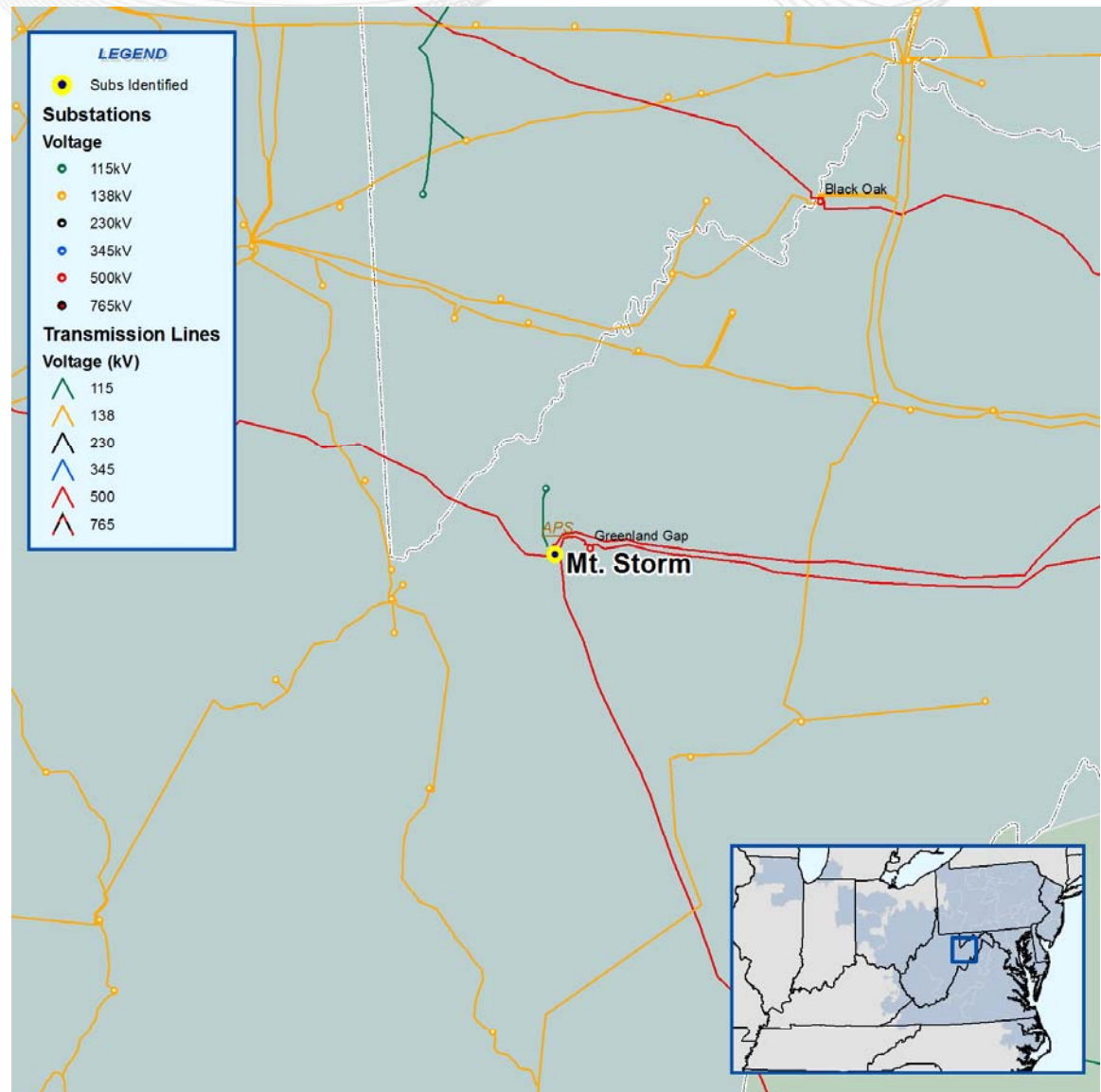
- 2013 Baseline Upgrades:
- Replace Loudoun 230kV Capacitor breaker 'SC352' (b0888)
- Estimated Project Cost: \$250 K
- Expected IS Date: 06/01/2013



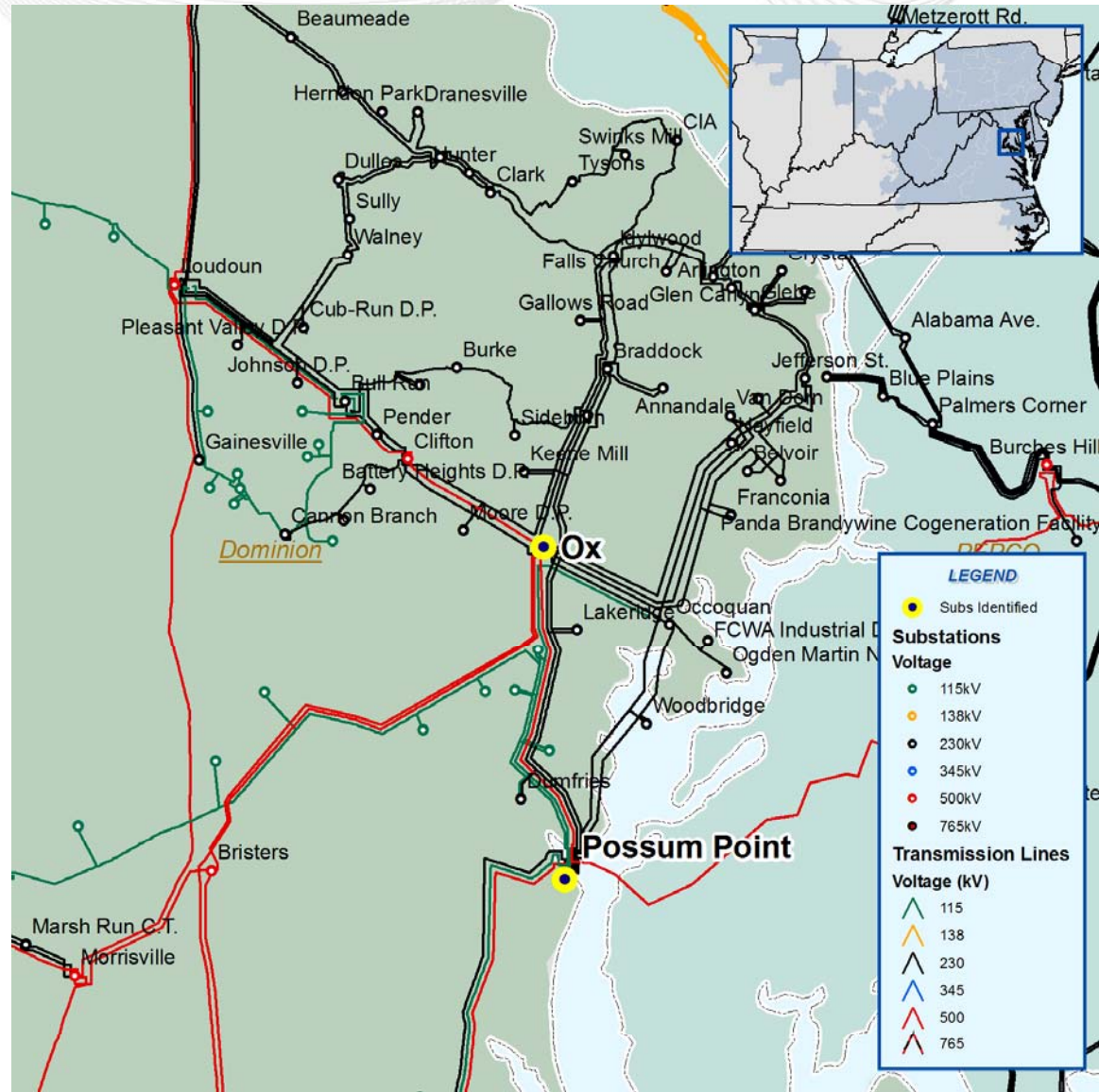
- The following breaker upgrades are driven by the PATH project
- Replace Mount Storm 500kV breaker 'G2T554' (b0492.10)
- Replace Mount Storm 500kV breaker 'G1T551' (b0492.11)
- Replace Mount Storm 500kV breaker '55072' (b0492.6)
- Replace Mount Storm 500kV breaker '55172' (b0492.7)
- Replace Mount Storm 500kV breaker 'H1172-2' (b0492.8)
- Replace Mount Storm 500kV breaker 'G2T550' (b0492.9)
- Estimated Project Cost: \$730 K per breaker
- Expected IS Date: 06/01/2014



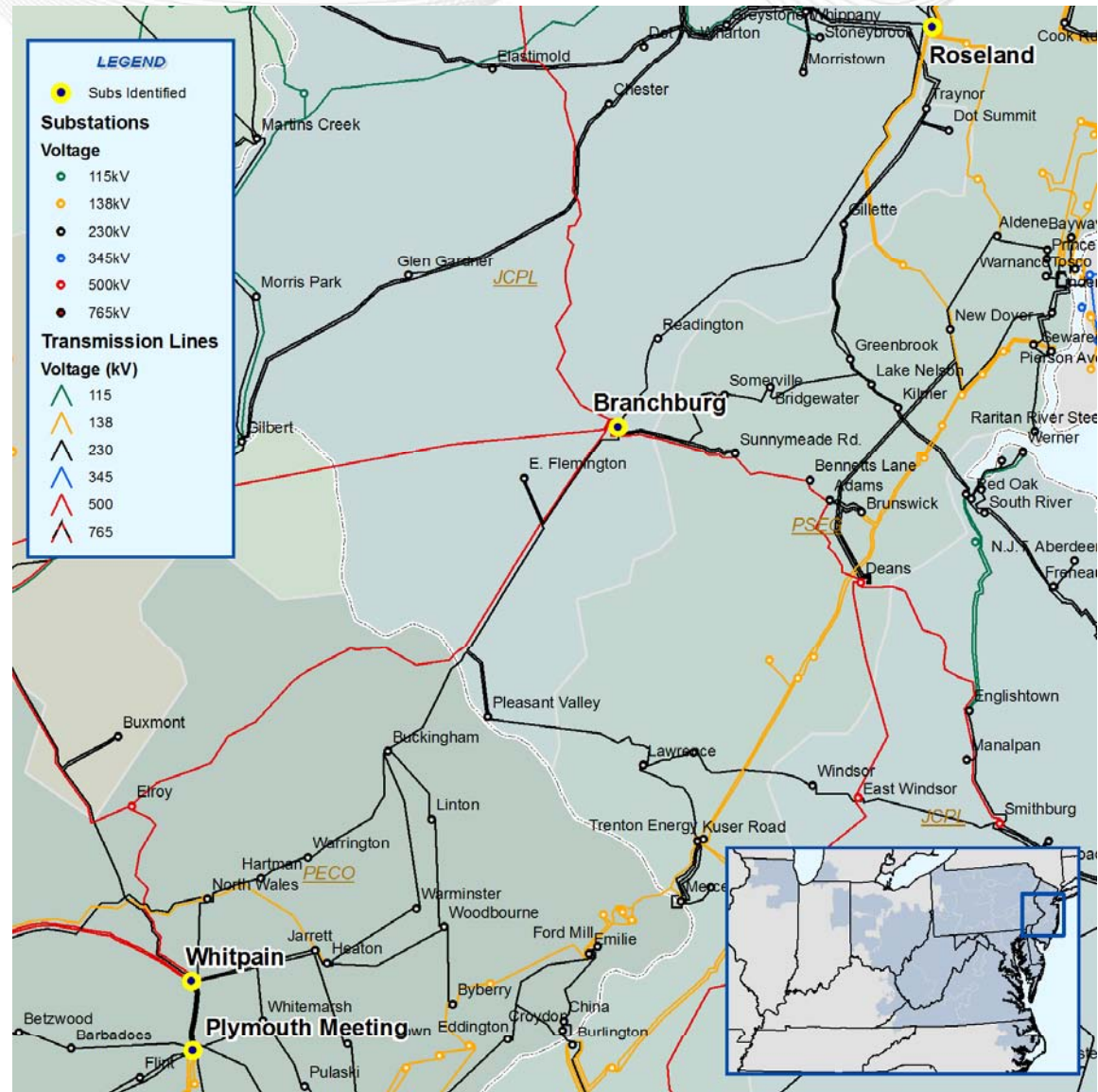
- The following breaker upgrades are driven by the PATH project
- Upgrade the nameplate ratings of the following breakers (b0492.12) :
- Mount Storm 500kV breaker '55472'
- Mount Storm 500kV breaker '57272'
- Mount Storm 500kV breaker 'SX172'
- Mount Storm 500kV breaker 'G3TSX1'
- Mount Storm 500kV breaker 'G1TH11'
- Mount Storm 500kV breaker 'G3T572'
- Mount Storm 500kV breaker 'SX22'
- Estimated Project Cost: \$2 K per breaker
- Expected IS Date: 06/01/2014



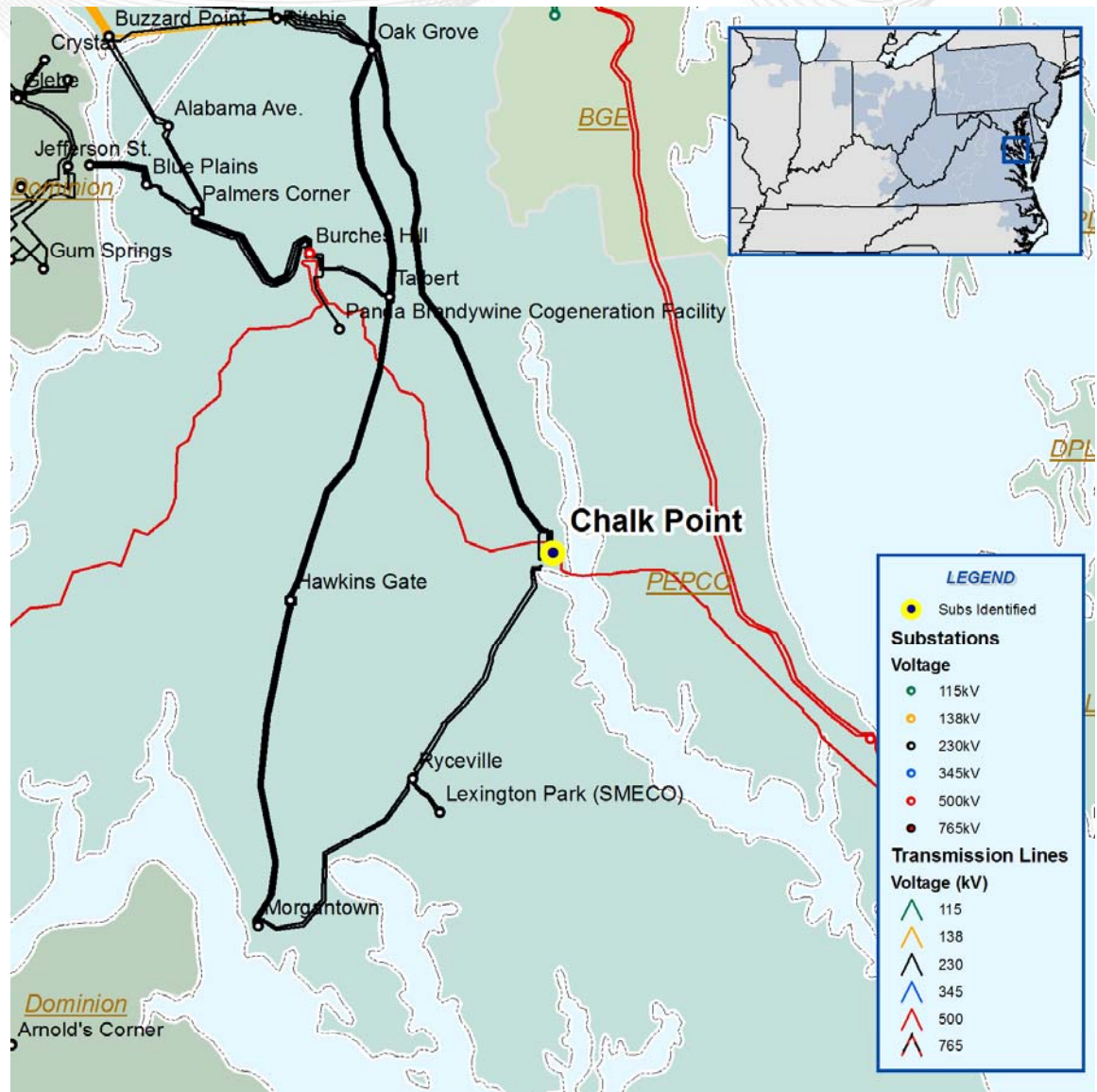
- The following breaker upgrades were originally driven by Q65 (North Anna nuclear unit) and need to be accelerated due to the MAPP project:
- N0716: Replace Ox 230kV breaker 'L242' (b0512.5)
- N0717: Replace Possum Point 230kV breaker 'SC192' (b0512.6)
- Estimated Advancement Cost: \$25 K per breaker
- Expected IS Date: 06/01/2013



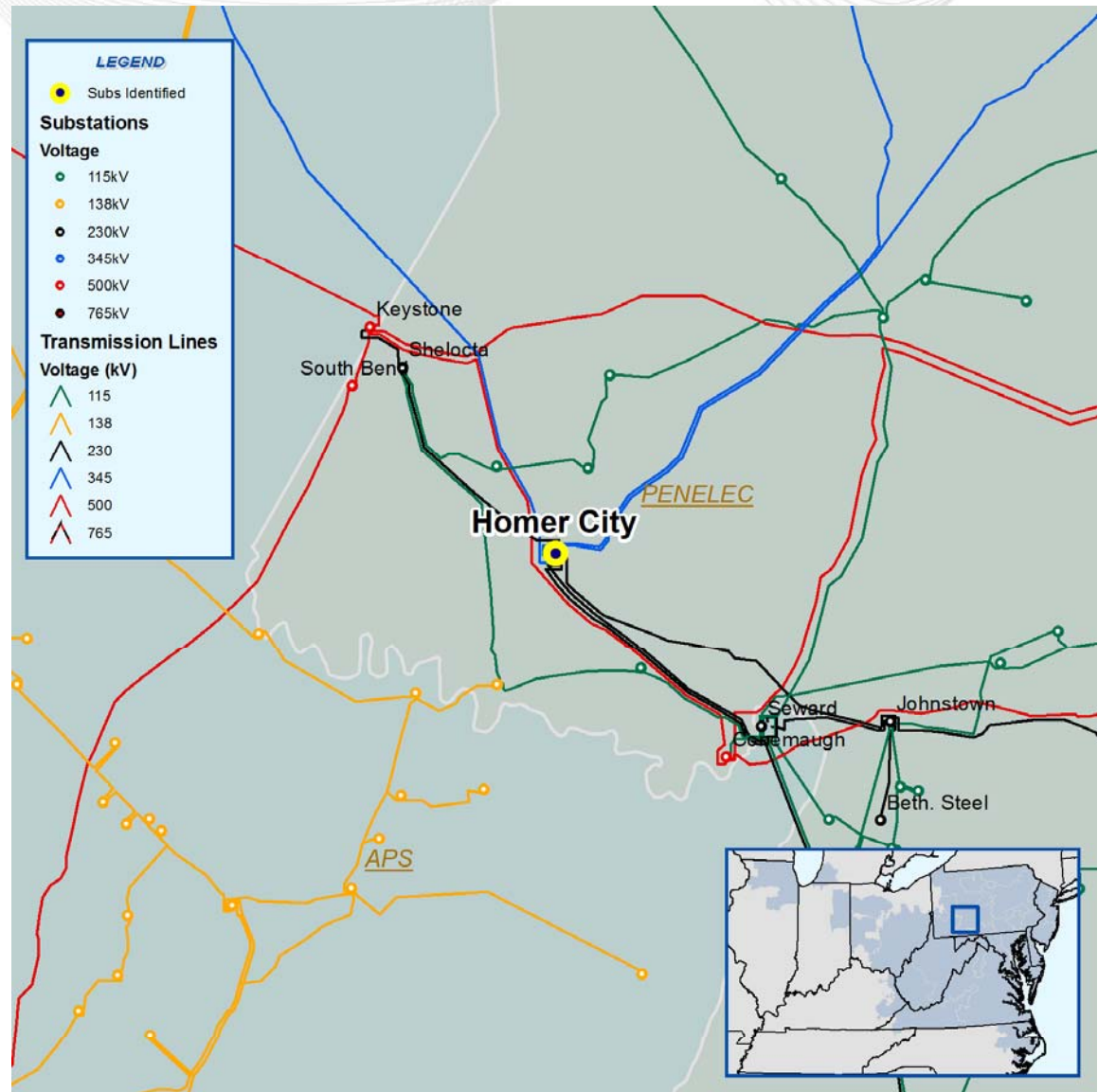
- The following breaker upgrades are driven by the Branchburg-Roseland 500kV line
- Replace Whitpain 230kV breaker '155' (b0829.1)
- Replace Whitpain 230kV breaker '175' (b0829.3)
- Replace Whitpain 230kV breaker '525' (b0829.2)
- Replace Plymouth Meeting 230kV breaker '225' (b0829.4)
- Replace Plymouth Meeting 230kV breaker '335' (b0829.5)
- Estimated Project Cost: \$500 K per breaker
- Expected IS Date: 06/01/2013



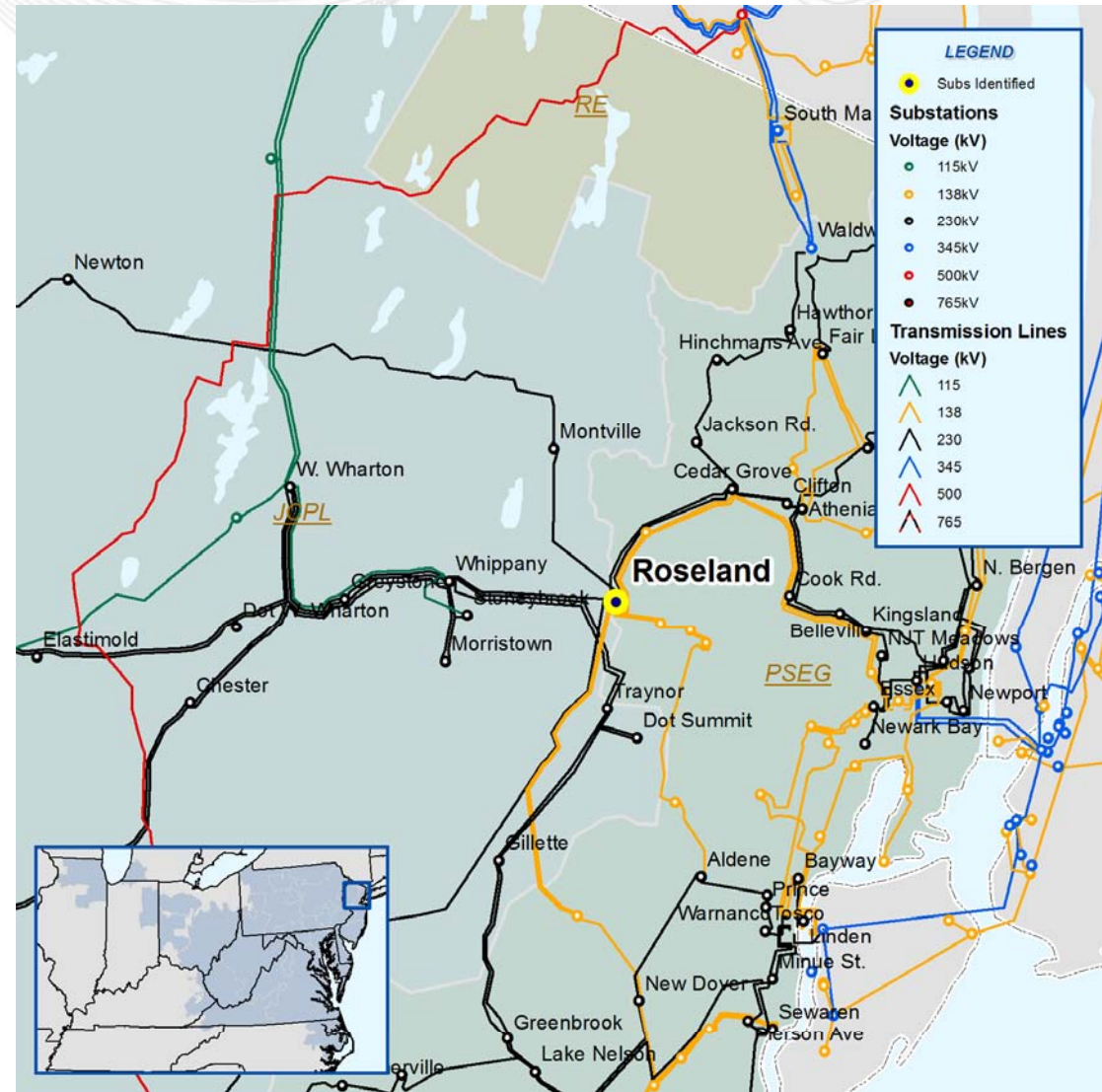
- The following breaker upgrades were originally driven by Q48 (Calvert Cliffs nuclear unit) and need to be accelerated due to the MAPP project:
- All 23 Chalk Point 230kV breakers (b0845-b0867 changed to b0512.10-b0512.29, b0512.7 and b0512.9)
- Estimated Advancement Cost: \$482 K per breaker
- Expected IS Date: 06/01/2013



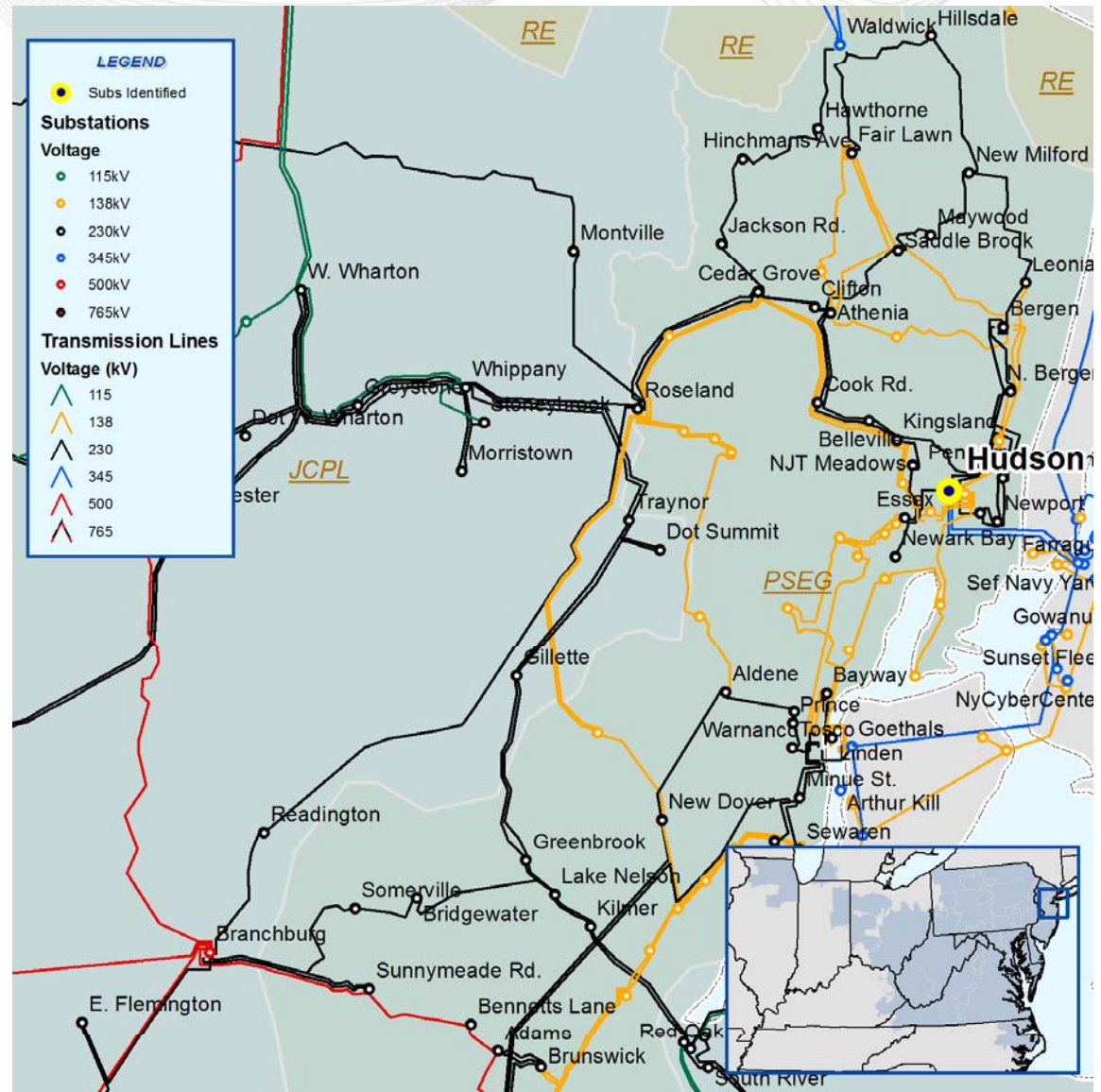
- Upgrade Homer City 230kV breaker 'Pierce Road' (b0794)
- This breaker is owned by NYSEG
- Estimated Project Cost: \$230 K
- Expected IS Date: 06/01/2009



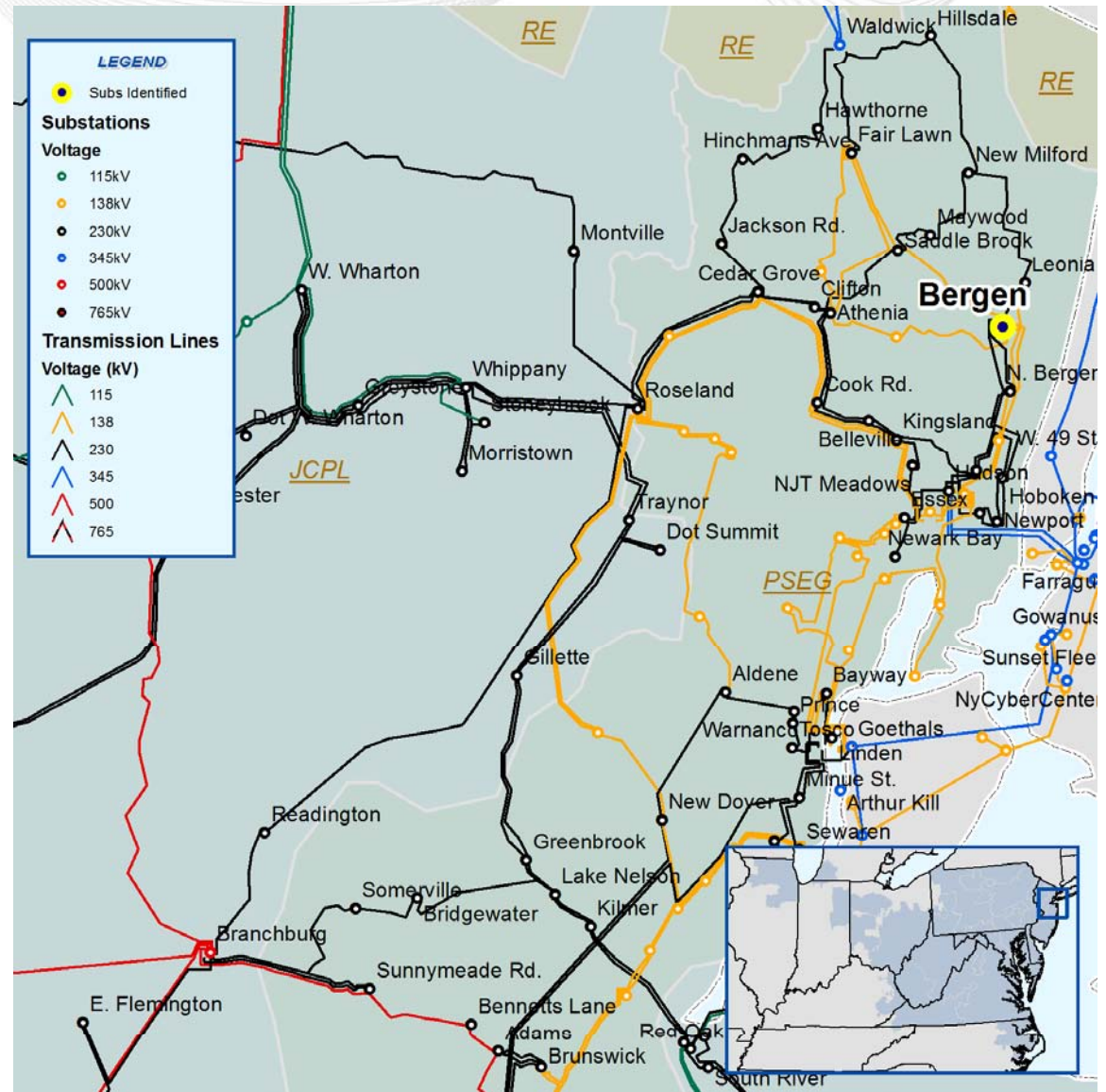
- The following breaker upgrades are driven by the Susquehanna-Roseland 500kV project and the Hudson 500kV project
- Replace Roseland 230kV breaker '11H' with an 80 kA breaker (b0489.9)
- Replace Roseland 230kV breaker '31H' with an 80 kA breaker (b0489.8)
- Replace Roseland 230kV breaker '51H' with an 80 kA breaker (b0489.6)
- Replace Roseland 230kV breaker '71H' with an 80 kA breaker (b0489.7)
- Replace Roseland 230kV breaker '42H' with an 80 kA breaker (b0489.5)
- Replace Roseland 230kV breaker '22H' with an 80 kA breaker (b0830.3)
- Replace Roseland 230kV breaker '82H' with an 80 kA breaker (b0830.1)
- Replace Roseland 230kV breaker '91H' with an 80 kA breaker (b0830.2)
- Estimated Project Cost: \$800 K per breaker
- Expected IS Date: 06/01/2012



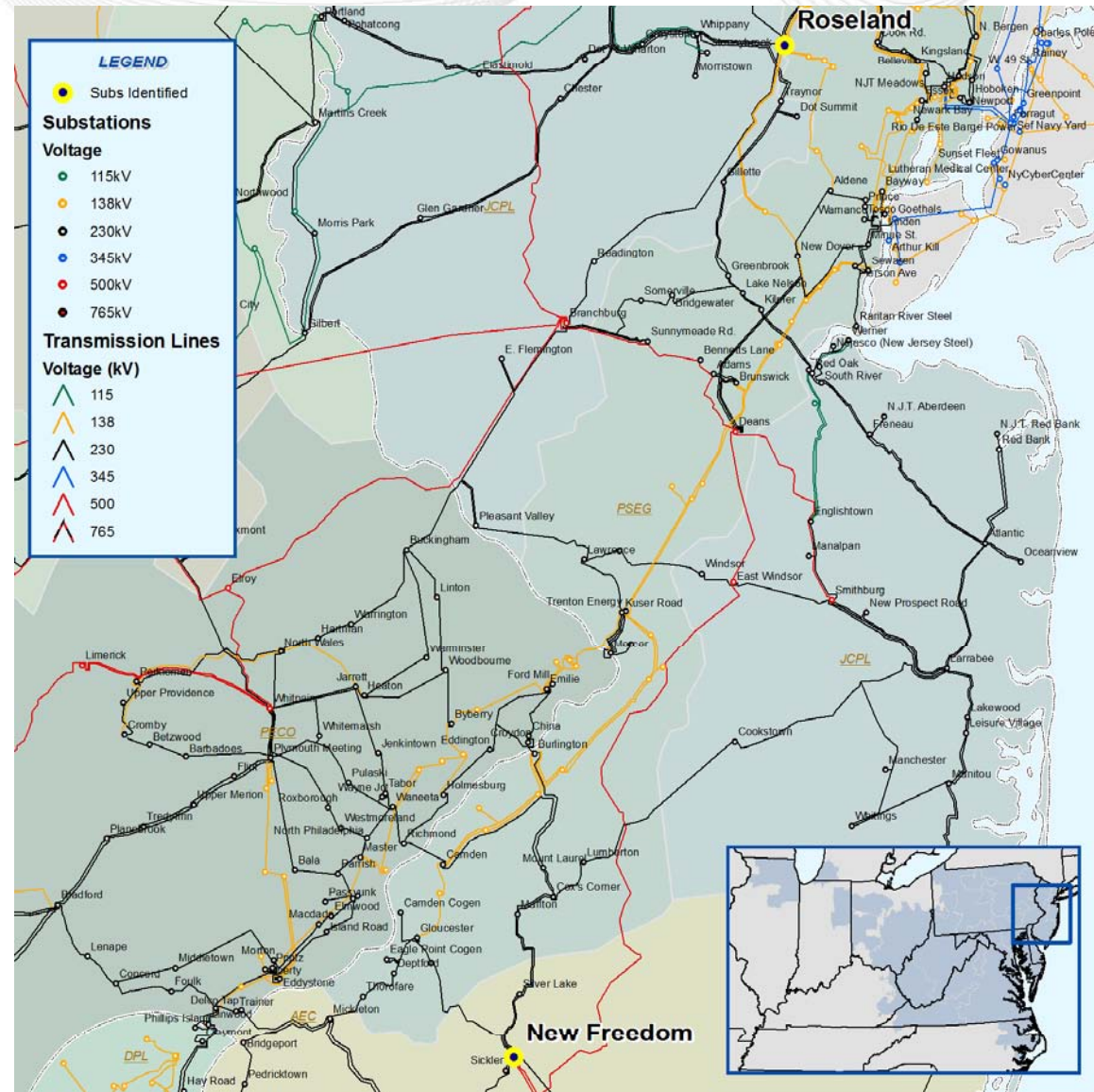
- 2010 Baseline Upgrades:
- Replace Hudson 230kV breaker '1HA' (b0882)
- Replace Hudson 230kV breaker '2HA' (b0883)
- Replace Hudson 230kV breaker '3HB' (b0884)
- Replace Hudson 230kV breaker '4HA' (b0885)
- Replace Hudson 230kV breaker '4HB' (b0886)
- Estimated Project Cost: \$800 K per breaker
- Expected IS Date: 06/01/2010



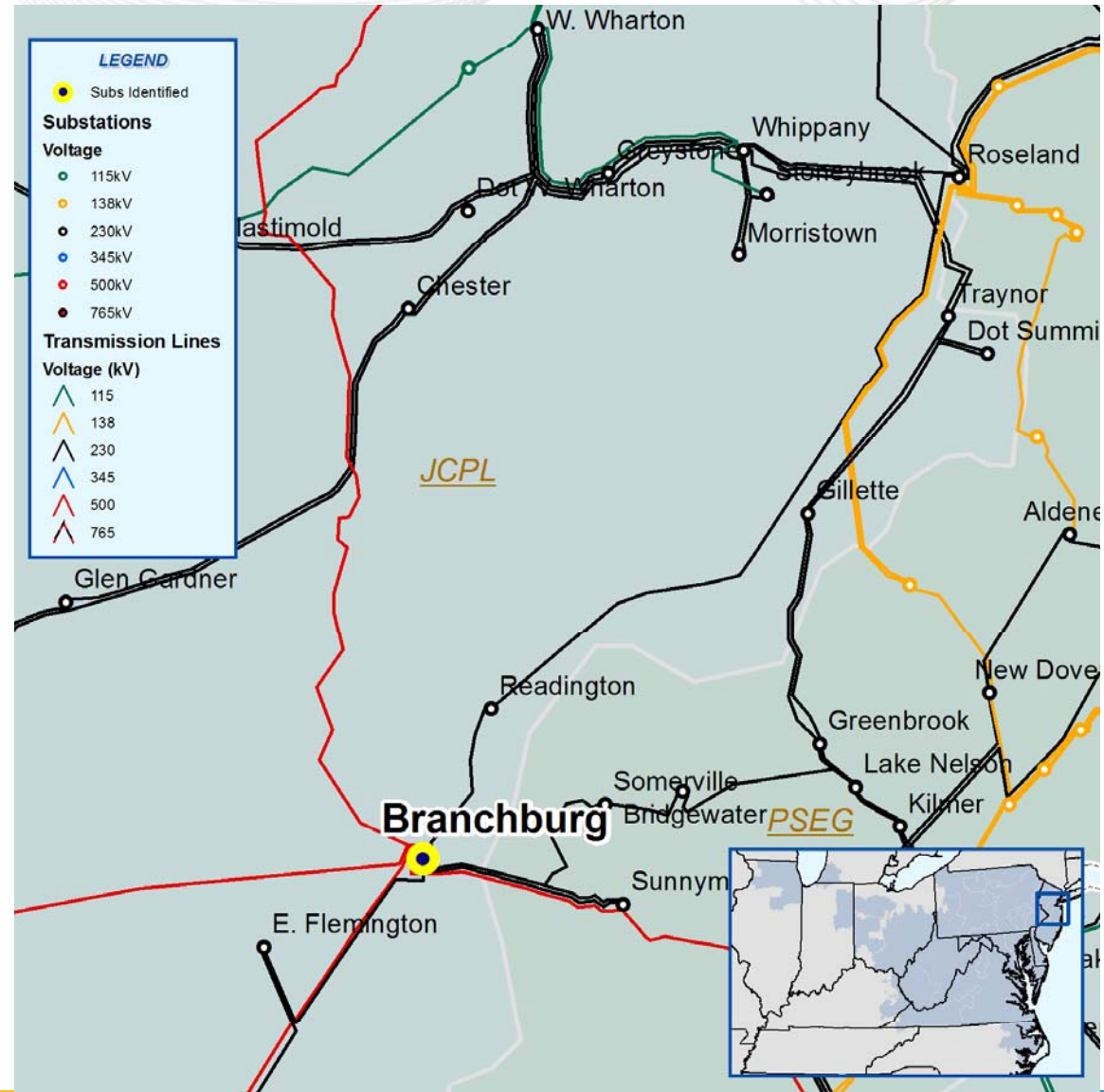
- 2011 Baseline Upgrades:
- Replace Bergen 230kV breaker '21H' (b0889)
- Estimated Project Cost: \$500 K
- Expected IS Date: 06/01/2011

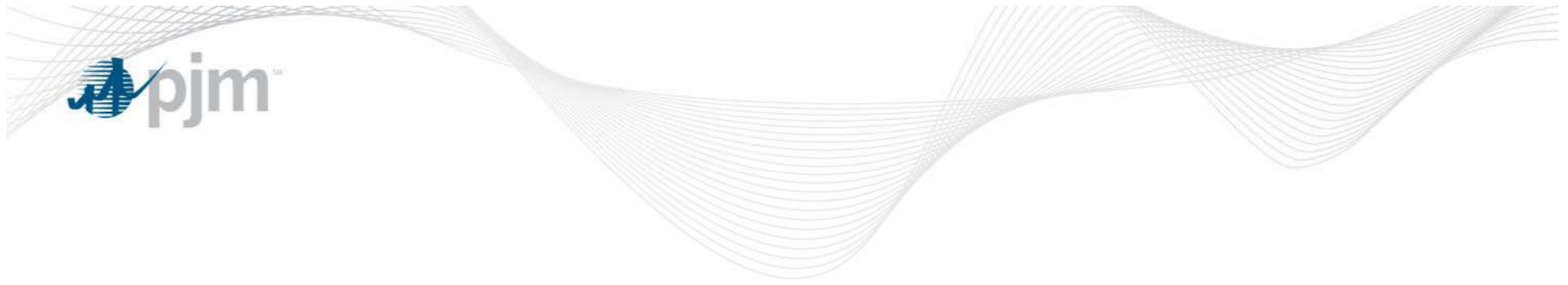


- 2012 Baseline Upgrades:
- Upgrade New Freedom 230kV breaker '21H' (b0890)
- Upgrade New Freedom 230kV breaker '31H' (b0891)
- Upgrade Roseland 230kV breaker '11H' (b0489.9)
- Upgrade Roseland 230kV breaker '31H' (b0489.8)
- Upgrade Roseland 230kV breaker '42H' (b0489.5)
- Upgrade Roseland 230kV breaker '51H' (b0489.6)
- Upgrade Roseland 230kV breaker '71H' (b0489.7)
- Estimated Project Cost: \$100 K per breaker
- Expected IS Date: 06/01/2012



- The following breaker upgrades are driven by the Branchburg-Roseland 500kV line
- Replace Branchburg 500kV breaker '91X' (b0829.6)
- Estimated Project Cost: \$800 K
- Replace Branchburg 230kV breaker '32H' (b0829.11)
- Replace Branchburg 230kV breaker '52H' (b0829.12)
- Replace Branchburg 230kV breaker '102H' (b0829.9)
- Estimated Project Cost: \$500 K per breaker
- Expected IS Date: 06/01/2013





Baseline Cost Allocation



Baseline Network Upgrade Cost Allocation

COST ALLOCATION LEGEND

<u>Short Name</u>	<u>Full Name</u>
PEN	Pennsylvania Electric Company
APS	Allegheny Power
PPL	PPL Electric Utilities Corporation
ME	Metropolitan Edison Company
JC	Jersey Central Power and Light Company
PS	Public Service Electric and Gas Company
AEC	Atlantic City Electric Company
PE	PECO Energy Company
BGE	Baltimore Gas and Electric Company
DPL	Delmarva Power and Light Company
PEP	Potomac Electric Power Company
RE	Rockland Electric Company
CE	Commonwealth Edison Company
AEP	AEP East Zone
DAY	The Dayton Power and Light Company
DL	Duquesne Light Company
DOM	Virginia Electric and Power Company
NEP	Neptune Regional Transmission System, LLC
ECP	East Coast Power, LLC



Baseline Network Upgrade Cost Allocation

Project #	Project Description	TO	Cost (\$M)	AEC	AEP	DAY
b0431	Monroe Upgrade New Freedom strand bus	AEC	0.1	100		
b0871	Install 35 MVAR capacitor at Motts Farm 69kV	AEC	2.8	100		
b0872	Build a new Lincoln-Landis 138kV line	AEC	12.5	100		
b0838	Hazard Area 138kV and 69kV Improvement Projects	AEP	20		100	
b0839	Replace existing 450 MVA transformer at Twin Branch 345 / 138kV with a 675 MVA transformer	AEP	8.5		99.73	0.27
b0840	String a second 138kV circuit on the open tower position between Twin Branch and East Elkhart	AEP	6		100	
b0917	Replace Baileysville 138kV breaker 'P'	AEP	0.4		100	
b0918	Replace Riverview 138kV breaker '634'	AEP	0.4		100	
b0919	Replace Torrey 138kV breaker 'W'	AEP	0.4		100	



Baseline Network Upgrade Cost Allocation

Project #	Project Description	TO	Cost (\$M)	AEC	APS	DPL	JC	ME	NEP	PE	PPL	PS	RE	ECP
b0673	Convert Bear Run and Elko - Carbon Center 138kV to 230kV operation	APS	6.5		100									
b0675.1	Convert Monocacy - Walkersville 138kV to 230kV	APS	4.5	1.02	82.03	0.85	1.75	6.38	0.08	3.09	2.25	2.42	0.09	0.03
b0675.2	Convert Walkersville - Catoctin 138kV to 230kV	APS	11.2	1.02	82.03	0.85	1.75	6.38	0.08	3.09	2.25	2.42	0.09	0.03
b0675.3	Convert Ringgold - Catoctin 138kV to 230kV	APS	7.4	1.02	82.03	0.85	1.75	6.38	0.08	3.09	2.25	2.42	0.09	0.03
b0675.4	Convert Catoctin - Carroll 138kV to 230kV	APS	9.8	1.02	82.03	0.85	1.75	6.38	0.08	3.09	2.25	2.42	0.09	0.03
b0675.5	Convert portion of Ringgold Substation from 138kV to 230kV	APS	1.8	1.02	82.03	0.85	1.75	6.38	0.08	3.09	2.25	2.42	0.09	0.03
b0675.6	Convert Catoctin Substation from 138kV to 230kV	APS	7.5	1.02	82.03	0.85	1.75	6.38	0.08	3.09	2.25	2.42	0.09	0.03
b0675.7	Convert portion of Carroll Substation from 138kV to 230kV	APS	4.7	1.02	82.03	0.85	1.75	6.38	0.08	3.09	2.25	2.42	0.09	0.03
b0675.8	Convert Monocacy Substation from 138kV to 230kV	APS	3.8	1.02	82.03	0.85	1.75	6.38	0.08	3.09	2.25	2.42	0.09	0.03



Baseline Network Upgrade Cost Allocation

Project #	Project Description	TO	Cost (\$M)	AEC	APS	DPL	JC	ME	NEP	PE	PEN	PPL	PS	RE	ECP
b0675.9	Convert Walkersville Substation from 138kV to 230kV	APS	5	1.02	82.03	0.85	1.75	6.38	0.08	3.09		2.25	2.42	0.09	0.03
b0676.1	Reconductor Doubs - Lime Kiln (#207) 230kV	APS	3.5	0.64	86.82	0.53	1.93	4.05	0.09	1.93	0.93		2.93	0.11	0.04
b0676.2	Reconductor Doubs - Lime Kiln (#231) 230kV	APS	3.1	0.64	86.82	0.53	1.93	4.05	0.09	1.93	0.93		2.93	0.11	0.04
b0678	Reconductor Glen Falls - Oak Mound 138kV with 954 ACSR	APS	1.989619		100										
b0941	Replace Opequon 138kV breaker 'BUSTIE'	APS	0.142		100										
b0942	Replace Butler 138kV breaker '#1 BANK'	APS	0.142		100										
b0943	Replace Butler 138kV breaker '#2 BANK'	APS	0.142		100										
b0944	Replace Yukon 138kV breaker 'Y-8'	APS	0.203		100										
b0945	Replace Yukon 138kV breaker 'Y-3'	APS	0.203		100										



Baseline Network Upgrade Cost Allocation

Project #	Project Description	TO	Cost (\$M)	APS
b0946	Replace Yukon 138kV breaker 'Y-1'	APS	0.203	100
b0947	Replace Yukon 138kV breaker 'Y-5'	APS	0.203	100
b0948	Replace Yukon 138kV breaker 'Y-2'	APS	0.203	100
b0949	Replace Yukon 138kV breaker 'Y-19'	APS	0.203	100
b0950	Replace Yukon 138kV breaker 'Y-4'	APS	0.203	100
b0951	Replace Yukon 138kV breaker 'Y-9'	APS	0.203	100
b0952	Replace Yukon 138kV breaker 'Y-11'	APS	0.203	100
b0953	Replace Yukon 138kV breaker 'Y-13'	APS	0.203	100
b0954	Replace Charleroi 138kV breaker '#1 XFMR BANK'	APS	0.168	100

Project #	Project Description	TO	Cost (\$M)	APS
b0955	Replace Yukon 138kV breaker 'Y-7'	APS	0.203	100
b0956	Replace Pruntytown 138kV breaker 'P-9'	APS	0.203	100
b0957	Replace Pruntytown 138kV breaker 'P-12'	APS	0.203	100
b0958	Replace Pruntytown 138kV breaker 'P-15'	APS	0.203	100
b0959	Replace Charleroi 138kV breaker '#2 XFMR BANK'	APS	0.168	100
b0960	Replace Pruntytown 138kV breaker 'P-2'	APS	0.203	100
b0961	Replace Pruntytown 138kV breaker 'P-5'	APS	0.203	100
b0962	Replace Yukon 138kV breaker 'Y-18'	APS	0.203	100
b0963	Replace Yukon 138kV breaker 'Y-10'	APS	0.203	100



Baseline Network Upgrade Cost Allocation

Project #	Project Description	TO	Cost (\$M)	APS
b0964	Replace Pruntytown 138kV breaker 'P-11'	APS	0.203	100
b0965	Replace Springdale 138kV breaker '138E'	APS	0.203	100
b0966	Replace Pruntytown 138kV breaker 'P-8'	APS	0.203	100
b0967	Replace Pruntytown 138kV breaker 'P-14'	APS	0.203	100
b0968	Replace Ringgold 138kV breaker '#3 XFMR BANK'	APS	0.142	100
b0969	Replace Springdale 138kV breaker '138C'	APS	0.203	100
b0970	Replace Rivesville 138kV breaker '#8 XFMR BANK'	APS	0.142	100
b0971	Replace Springdale 138kV breaker '138F'	APS	0.203	100
b0972	Replace Belmont 138kV breaker 'B-16'	APS	0.203	100

Project #	Project Description	TO	Cost (\$M)	APS
b0973	Replace Springdale 138kV breaker '138G'	APS	0.203	100
b0974	Replace Springdale 138kV breaker '138V'	APS	0.203	100
b0975	Replace Armstrong 138kV breaker 'BROOKVILLE'	APS	0.142	100
b0976	Replace Springdale 138kV breaker '138P'	APS	0.203	100
b0977	Replace Belmont 138kV breaker 'B-17'	APS	0.203	100
b0978	Replace Springdale 138kV breaker '138U'	APS	0.203	100
b0979	Replace Springdale 138kV breaker '138D'	APS	0.203	100
b0980	Replace Springdale 138kV breaker '138R'	APS	0.203	100
b0981	Replace Yukon 138kV breaker 'Y-12'	APS	0.203	100



Baseline Network Upgrade Cost Allocation

Project #	Project Description	TO	Cost (\$M)	APS
b0982	Replace Yukon 138kV breaker 'Y-17'	APS	0.203	100
b0983	Replace Yukon 138kV breaker 'Y-14'	APS	0.203	100
b0984	Replace Rivesville 138kV breaker '#10 XFMR BANK'	APS	0.142	100
b0985	Replace Belmont 138kV breaker 'B-14'	APS	0.203	100
b0986	Replace Armstrong 138kV breaker 'RESERVE BUS'	APS	0.142	100
b0987	Replace Yukon 138kV breaker 'Y-16'	APS	0.203	100
b0988	Replace Springdale 138kV breaker '138T'	APS	0.203	100
b0989	Replace Edgelawn 138kV breaker 'GOFF RUN #632'	APS	0.142	100
b0990	Change reclosing on Cabot 138kV breaker 'C-9'	APS	0.001	100

Project #	Project Description	TO	Cost (\$M)	APS
b0991	Change reclosing on Belmont 138kV breaker 'B-7'	APS	0.001	100
b0992	Change reclosing on Belmont 138kV breaker 'B-12'	APS	0.001	100
b0993	Change reclosing on Belmont 138kV breaker 'B-9'	APS	0.001	100
b0994	Change reclosing on Belmont 138kV breaker 'B-19'	APS	0.001	100
b0995	Change reclosing on Belmont 138kV breaker 'B-21'	APS	0.001	100
b0996	Change reclosing on Willow Island 138kV breaker 'FAIRVIEW #84'	APS	0.001	100
b0997	Change reclosing on Cabot 138kV breaker 'C-4'	APS	0.001	100
b0998	Change reclosing on Cabot 138kV breaker 'C-1'	APS	0.001	100
b0999	Replace Redbud 138kV breaker 'BUS TIE'	APS	0.142	100



Baseline Network Upgrade Cost Allocation

Project #	Project Description	TO	Cost (\$M)	APS	DAY	DL
b0906	Increase contact parting time on Wagner 115kV breaker 32-3/2	BGE	0	100		
b0907	Increase contact parting time on Wagner 115kV breaker 34-1/3	BGE	0	100		
b0901	Replace Greene 138kV breaker GJ-D	DAY	0.185		100	
b0902	Replace Greene 138kV breaker GJ-E	DAY	0.185		100	
b0903	Replace Greene 138kV breaker GJ-F	DAY	0.185		100	
b0904	Replace Greene 138kV breaker GJ-H	DAY	0.185		100	
b0905	Replace Greene 138kV breaker GJ-I	DAY	0.185		100	
b0929	Replace Universal 138kV breaker 'Z-152'	DL	0.3			100

Project #	Project Description	TO	Cost (\$M)	DL
b0930	Replace Universal 138kV breaker 'Z-78'	DL	0.3	100
b0931	Replace Universal 138kV breaker 'NO 1-3'	DL	0.3	100
b0932	Replace Brunot Island 138kV breaker 'GEN2 69 XFMR'	DL	0.3	100
b0933	Replace Dravosburg 138kV breaker 'Z-91'	DL	0.309	100
b0934	Replace Dravosburg 138kV breaker 'Z-87'	DL	0.309	100
b0935	Replace Dravosburg 138kV breaker 'Z-76'	DL	0.309	100
b0936	Replace Dravosburg 138kV breaker 'Z-77'	DL	0.309	100
b0937	Replace Dravosburg 138kV breaker 'Z-74'	DL	0.318	100
b0938	Replace Elrama 138kV breaker '#3 SYN B'	DL	0.318	100



Baseline Network Upgrade Cost Allocation

Project #	Project Description	TO	Cost (\$M)	AEC	AEP	APS	BGE	CE	DAY	DL	DPL	DOM	JC	ME	NEP	PE	PEN	PEP	PPL	PS	RE	ECP
b0939	Replace Elrama 138kV breaker '#4 SYN REA'	DL	0.318							100												
b0940	Replace Cheswick 138kV breaker '2a/2B CAP'	DL	0.318							100												
b0492.10	Replace Mount Storm 500kV breaker G2T554	DOM	0.73	1.89	17.30	6.02	4.95	14.97	2.50	2.02	2.85	13.61	4.50	2.18	0.49	6.31	2.06	4.82	5.37	7.61	0.31	0.24
b0492.11	Replace Mount Storm 500kV breaker G1T551	DOM	0.73	1.89	17.30	6.02	4.95	14.97	2.50	2.02	2.85	13.61	4.50	2.18	0.49	6.31	2.06	4.82	5.37	7.61	0.31	0.24
b0492.12	Upgrade nameplate rating of Mount Storm 500kV breakers 55472, 57272, SX172, G3TSX1, G1TH11, G3T572, and SX22	DOM	0.014	1.89	17.30	6.02	4.95	14.97	2.50	2.02	2.85	13.61	4.50	2.18	0.49	6.31	2.06	4.82	5.37	7.61	0.31	0.24
b0492.6	Replace Mount Storm 500kV breaker 55072	DOM	0.73	1.89	17.30	6.02	4.95	14.97	2.50	2.02	2.85	13.61	4.50	2.18	0.49	6.31	2.06	4.82	5.37	7.61	0.31	0.24
b0492.7	Replace Mount Storm 500kV breaker 55172	DOM	0.73	1.89	17.30	6.02	4.95	14.97	2.50	2.02	2.85	13.61	4.50	2.18	0.49	6.31	2.06	4.82	5.37	7.61	0.31	0.24
b0492.8	Replace Mount Storm 500kV breaker H1172-2	DOM	0.73	1.89	17.30	6.02	4.95	14.97	2.50	2.02	2.85	13.61	4.50	2.18	0.49	6.31	2.06	4.82	5.37	7.61	0.31	0.24
b0492.9	Replace Mount Storm 500kV breaker G2T550	DOM	0.73	1.89	17.30	6.02	4.95	14.97	2.50	2.02	2.85	13.61	4.50	2.18	0.49	6.31	2.06	4.82	5.37	7.61	0.31	0.24



Baseline Network Upgrade Cost Allocation

Project #	Project Description	TO	Cost (\$M)	AEC	AEP	APS	BGE	CE	DAY	DL	DPL	DOM	JC	ME	NEP	PE	PEN	PEP	PPL	PS	RE	ECP
b0512.5	Advance n0716 (Ox - Replace 230kV breaker L242)	DOM	0.025	1.89	17.30	6.02	4.95	14.97	2.50	2.02	2.85	13.61	4.50	2.18	0.49	6.31	2.06	4.82	5.37	7.61	0.31	0.24
b0512.6	Advance n0717 (Possum Point - Replace 230kV breaker SC192)	DOM	0.025	1.89	17.30	6.02	4.95	14.97	2.50	2.02	2.85	13.61	4.50	2.18	0.49	6.31	2.06	4.82	5.37	7.61	0.31	0.24
b0583	Install dual primary protection schemes on Gosport lines 62 and 51 at the remote terminals (Chesapeake on the 62 line and Reeves Ave on the 51 line)	DOM	0.46									100										
b0815	Replace Elmont 230kV breaker '22192'	DOM	0.18									100										
b0816	Replace Elmont 230kV breaker '21692'	DOM	0.18									100										
b0817	Replace Elmont 230kV breaker '200992'	DOM	0.18									100										
b0818	Replace Elmont 230kV breaker '2009T2032'	DOM	0.18									100										
b0888	Replace Loudoun 230kV Cap breaker 'SC352'	DOM	0.25									100										
b0892	Replace Chesapeake 115kV breaker SX522	DOM	0.2									100										



Baseline Network Upgrade Cost Allocation

Project #	Project Description	TO	Cost (\$M)	DOM
b0893	Replace Chesapeake 115kV breaker T202	DOM	0.2	100
b0894	Replace Possum Point 115kV breaker SX-32	DOM	0.2	100
b0895	Replace Possum Point 115kV breaker L92-1	DOM	0.2	100
b0896	Replace Possum Point 115kV breaker L92-2	DOM	0.2	100
b0897	Replace Suffolk 115kV breaker T202	DOM	0.2	100
b0898	Replace Peninsula 115kV breaker SC202	DOM	0.2	100
b0921	Reconductor Brambleton - Cochran Mill 230kV line with 201 Yukon conductor	DOM	2.354	100
b0923	Install 50-100 MVAR variable reactor banks at Carson 230kV	DOM	5.5	100
b0924	Install 50-100 MVAR variable reactor banks at Dooms 230kV	DOM	5.5	100

Project #	Project Description	TO	Cost (\$M)	DPL	DOM	JC
b0925	Install 50-100 MVAR variable reactor banks at Garrisonville 230kV	DOM	5.5		100	
b0926	Install 50-100 MVAR variable reactor banks at Hamilton 230kV	DOM	5.5		100	
b0927	Install 50-100 MVAR variable reactor banks at Yadkin 230kV	DOM	5.5		100	
b0928	Install 50-100 MVAR variable reactor banks at Carolina, Dooms, Everetts, Idylwood, N. Alexandria, N. Anna, Suffolk and Valley 230kV substations	DOM	48		100	
b0873	Build 2nd Glasgow-Mt Pleasant 138kV line	DPL	16.3	100		
b0874	Reconfigure Branywine substation	DPL	10.55	100		
b0876	Install 50 MVAR SVC at 138th St 138kV	DPL	8.65	100		
b0877	Build a 2nd Vienna-Steele 230kV line	DPL	44.613	100		
b0289.1	Install additional 130 MVAR capacitor at West Wharton 230kV substation	JC	2.361			100



Baseline Network Upgrade Cost Allocation

Project #	Project Description	TO	Cost (\$M)	AE C	AEP	APS	BGE	CE	DAY	DL	DPL	DOM	JC	ME	NEP	PE	PEN	PEP	PPL	PS	RE	ECP
b1020	Replace wave trap at Englishtown on the Englishtown - Manalapan circuit	JC	0.065										100									
b1000	Replace Portland 115kV breaker '95312'	ME	0.225											100								
b1001	Replace Portland 115kV breaker '92712'	ME	0.225											100								
b1002	Replace Hunterstown 115kV breaker '96392'	ME	0.225											100								
b1003	Replace Hunterstown 115kV breaker '96292'	ME	0.225											100								
b1004	Replace Hunterstown 115kV breaker '99192'	ME	0.225											100								
b0508.1	Replace station cable at Hartman on the Warrington - Hartman 230kV circuit	PE	0.24													100						
b0829.1	Replace Whitpain 230kV breaker '155'	PE	0.5	1.89	17.30	6.02	4.95	14.97	2.50	2.02	2.85	13.61	4.50	2.18	0.49	6.31	2.06	4.82	5.37	7.61	0.31	0.24
b0829.2	Replace Whitpain 230kV breaker '525'	PE	0.5	1.89	17.30	6.02	4.95	14.97	2.50	2.02	2.85	13.61	4.50	2.18	0.49	6.31	2.06	4.82	5.37	7.61	0.31	0.24



Baseline Network Upgrade Cost Allocation

Project #	Project Description	TO	Cost (\$M)	AEC	AEP	APS	BGE	CE	DAY	DL	DPL	DOM	JC	ME	NEP	PE	PEN	PEP	PPL	PS	RE	ECP
b0829.3	Replace Whitpain 230kV breaker '175'	PE	0.5	1.89	17.30	6.02	4.95	14.97	2.50	2.02	2.85	13.61	4.50	2.18	0.49	6.31	2.06	4.82	5.37	7.61	0.31	0.24
b0829.4	Replace Plymouth Meeting 230kV breaker '225'	PE	0.5	1.89	17.30	6.02	4.95	14.97	2.50	2.02	2.85	13.61	4.50	2.18	0.49	6.31	2.06	4.82	5.37	7.61	0.31	0.24
b0829.5	Replace Plymouth Meeting 230kV breaker '335'	PE	0.5	1.89	17.30	6.02	4.95	14.97	2.50	2.02	2.85	13.61	4.50	2.18	0.49	6.31	2.06	4.82	5.37	7.61	0.31	0.24
b0841	Move the connection points for the 2nd Plymouth Meeting 230/138kV XFMR	PE	3													100						
b0842	Install a 2nd 230/138kV XFMR and 35 MVAR CAP at Heaton 138kV bus	PE	6.4													100						
b0843	Install a 75 MVAR CAP at Llanerch 138kV bus	PE	2.6													100						
b0844	Move the connection point for the Llanerch 138/69kV XFMR	PE	0.5													100						
b0887	Replace Richmond-Tacony 69kV line	PE	5.2													100						
b0920	Replace station cable at Whitpain and Jarrett substations on the Jarrett - Whitpain 230kV circuit	PE	0.7													100						



Baseline Network Upgrade Cost Allocation

Project #	Project Description	TO	Cost (\$M)	PE	PEN
b1014.1	Replace Circuit breaker, Station Cable, CTs and Wave Trap at Eddystone 230kV	PE	1	100	
b1014.2	Replace Circuit breaker, Station Cable, CTs Disconnect Switch and Wave Trap at Island Rd. 230kV	PE	1	100	
b1015	Replace Breakers #115 and #125 at Printz 230kV substation	PE	1	100	
b0794	Upgrade the Homer City 230kV breaker 'Pierce Road'	PEN	0.23		100
b1005	Replace Glory 115kV breaker '#7 XFMR'	PEN	0.225		100
b1006	Replace Shawville 115kV breaker 'NO.14 XFMR'	PEN	0.225		100
b1007	Replace Shawville 115kV breaker 'NO.15 XFMR'	PEN	0.225		100
b1008	Replace Shawville 115kV breaker '#1B XFMR'	PEN	0.225		100
b1009	Replace Shawville 115kV breaker '#2B XFMR'	PEN	0.225		100



Baseline Network Upgrade Cost Allocation

Project #	Project Description	TO	Cost (\$M)	AEC	AEP	APS	BGE	CE	DAY	DL	DPL	DOM	JC	ME	NEP	PE	PEN	PEP	PPL	PS	RE	ECP
b1010	Replace Shawville 115kV breaker 'Dubois'	PEN	0.225														100					
b1011	Replace Shawville 115kV breaker 'Philipsburg'	PEN	0.225														100					
b1012	Replace Shawville 115kV breaker 'Garman'	PEN	0.225														100					
b0512.10	Advance n0775 (Replace Chalk Point 230kV breaker (2B) with 80 Ka breaker)	PEP	0.482	1.89	17.30	6.02	4.95	14.97	2.50	2.02	2.85	13.61	4.50	2.18	0.49	6.31	2.06	4.82	5.37	7.61	0.31	0.24
b0512.11	Advance n0776 (Replace Chalk Point 230kV breaker (2C) with 80 Ka breaker)	PEP	0.482	1.89	17.30	6.02	4.95	14.97	2.50	2.02	2.85	13.61	4.50	2.18	0.49	6.31	2.06	4.82	5.37	7.61	0.31	0.24
b0512.12	Advance n0777 (Replace Chalk Point 230kV breaker (3A) with 80 Ka breaker)	PEP	0.482	1.89	17.30	6.02	4.95	14.97	2.50	2.02	2.85	13.61	4.50	2.18	0.49	6.31	2.06	4.82	5.37	7.61	0.31	0.24
b0512.13	Advance n0778 (Replace Chalk Point 230kV breaker (3B) with 80 Ka breaker)	PEP	0.482	1.89	17.30	6.02	4.95	14.97	2.50	2.02	2.85	13.61	4.50	2.18	0.49	6.31	2.06	4.82	5.37	7.61	0.31	0.24
b0512.14	Advance n0779 (Replace Chalk Point 230kV breaker (3C) with 80 Ka breaker)	PEP	0.482	1.89	17.30	6.02	4.95	14.97	2.50	2.02	2.85	13.61	4.50	2.18	0.49	6.31	2.06	4.82	5.37	7.61	0.31	0.24
b0512.15	Advance n0780 (Replace Chalk Point 230kV breaker (4A) with 80 Ka breaker)	PEP	0.482	1.89	17.30	6.02	4.95	14.97	2.50	2.02	2.85	13.61	4.50	2.18	0.49	6.31	2.06	4.82	5.37	7.61	0.31	0.24



Baseline Network Upgrade Cost Allocation

Project #	Project Description	TO	Cost (\$M)	AEC	AEP	APS	BGE	CE	DAY	DL	DPL	DOM	JC	ME	NEP	PE	PEN	PEP	PPL	PS	RE	ECP
b0512.16	Advance n0781 (Replace Chalk Point 230kV breaker (4B) with 80 Ka breaker)	PEP	0.482	1.89	17.30	6.02	4.95	14.97	2.50	2.02	2.85	13.61	4.50	2.18	0.49	6.31	2.06	4.82	5.37	7.61	0.31	0.24
b0512.17	Advance n0782 (Replace Chalk Point 230kV breaker (5A) with 80 Ka breaker)	PEP	0.482	1.89	17.30	6.02	4.95	14.97	2.50	2.02	2.85	13.61	4.50	2.18	0.49	6.31	2.06	4.82	5.37	7.61	0.31	0.24
b0512.18	Advance n0783 (Replace Chalk Point 230kV breaker (5B) with 80 Ka breaker)	PEP	0.482	1.89	17.30	6.02	4.95	14.97	2.50	2.02	2.85	13.61	4.50	2.18	0.49	6.31	2.06	4.82	5.37	7.61	0.31	0.24
b0512.19	Advance n0784 (Replace Chalk Point 230kV breaker (6A) with 80 Ka breaker)	PEP	0.482	1.89	17.30	6.02	4.95	14.97	2.50	2.02	2.85	13.61	4.50	2.18	0.49	6.31	2.06	4.82	5.37	7.61	0.31	0.24
b0512.20	Advance n0785 (Replace Chalk Point 230kV breaker (6B) with 80 Ka breaker)	PEP	0.482	1.89	17.30	6.02	4.95	14.97	2.50	2.02	2.85	13.61	4.50	2.18	0.49	6.31	2.06	4.82	5.37	7.61	0.31	0.24
b0512.21	Advance n0786 (Replace Chalk Point 230kV breaker (7B) with 80 Ka breaker)	PEP	0.482	1.89	17.30	6.02	4.95	14.97	2.50	2.02	2.85	13.61	4.50	2.18	0.49	6.31	2.06	4.82	5.37	7.61	0.31	0.24
b0512.22	Advance n0787 (Replace Chalk Point 230kV breaker (8A) with 80 Ka breaker)	PEP	0.482	1.89	17.30	6.02	4.95	14.97	2.50	2.02	2.85	13.61	4.50	2.18	0.49	6.31	2.06	4.82	5.37	7.61	0.31	0.24
b0512.23	Advance n0788 (Replace Chalk Point 230kV breaker (8B) with 80 Ka breaker)	PEP	0.482	1.89	17.30	6.02	4.95	14.97	2.50	2.02	2.85	13.61	4.50	2.18	0.49	6.31	2.06	4.82	5.37	7.61	0.31	0.24
b0512.24	Advance n0789 (Replace Chalk Point 230kV breaker (7A) with 80 Ka breaker)	PEP	0.482	1.89	17.30	6.02	4.95	14.97	2.50	2.02	2.85	13.61	4.50	2.18	0.49	6.31	2.06	4.82	5.37	7.61	0.31	0.24



Baseline Network Upgrade Cost Allocation

Project #	Project Description	TO	Cost (\$M)	AEC	AEP	APS	BGE	CE	DAY	DL	DPL	DOM	JC	ME	NEP	PE	PEN	PEP	PPL	PS	RE	ECP
b0512.25	Advance n0790 (Replace Chalk Point 230kV breaker (1C) with 80 Ka breaker)	PEP	0.482	1.89	17.30	6.02	4.95	14.97	2.50	2.02	2.85	13.61	4.50	2.18	0.49	6.31	2.06	4.82	5.37	7.61	0.31	0.24
b0512.26	Advance n0791 (Replace Chalk Point 230kV breaker (4C) with 80 Ka breaker)	PEP	0.482	1.89	17.30	6.02	4.95	14.97	2.50	2.02	2.85	13.61	4.50	2.18	0.49	6.31	2.06	4.82	5.37	7.61	0.31	0.24
b0512.27	Advance n0792 (Replace Chalk Point 230kV breaker (5C) with 80 Ka breaker)	PEP	0.482	1.89	17.30	6.02	4.95	14.97	2.50	2.02	2.85	13.61	4.50	2.18	0.49	6.31	2.06	4.82	5.37	7.61	0.31	0.24
b0512.28	Advance n0793 (Replace Chalk Point 230kV breaker (6C) with 80 Ka breaker)	PEP	0.482	1.89	17.30	6.02	4.95	14.97	2.50	2.02	2.85	13.61	4.50	2.18	0.49	6.31	2.06	4.82	5.37	7.61	0.31	0.24
b0512.29	Advance n0794 (Replace Chalk Point 230kV breaker (7C) with 80 Ka breaker)	PEP	0.482	1.89	17.30	6.02	4.95	14.97	2.50	2.02	2.85	13.61	4.50	2.18	0.49	6.31	2.06	4.82	5.37	7.61	0.31	0.24
b0512.7	Advance n0772 (Replace Chalk Point 230kV breaker (1A) with 80 kA breaker)	PEP	0.482	1.89	17.30	6.02	4.95	14.97	2.50	2.02	2.85	13.61	4.50	2.18	0.49	6.31	2.06	4.82	5.37	7.61	0.31	0.24
b0512.8	Advance n0773 (Replace Chalk Point 230kV breaker (1B) with 80 kA breaker)	PEP	0.482	1.89	17.30	6.02	4.95	14.97	2.50	2.02	2.85	13.61	4.50	2.18	0.49	6.31	2.06	4.82	5.37	7.61	0.31	0.24
b0512.9	Advance n0774 (Replace Chalk Point 230kV breaker (2A) with 80 Ka breaker)	PEP	0.482	1.89	17.30	6.02	4.95	14.97	2.50	2.02	2.85	13.61	4.50	2.18	0.49	6.31	2.06	4.82	5.37	7.61	0.31	0.24
b0881	Install motor operators on Susquehanna T21 - Susquehanna 230kV line East CB at Susquehanna 230kV switching station	PPL	0.265																			



Baseline Network Upgrade Cost Allocation

Project #	Project Description	TO	Cost (\$M)	PPL
b0908	Install motor operators at South Akron 230kV	PPL	0.365	100
b0909	Convert Jenkins 230kV yard into a 3-breaker ring bus	PPL	7.74	100
b0910	Install a second 230kV line between Jenkins and Stanton	PPL	3.34	100
b0911	Install motor operators at Frackville 230kV	PPL	0.444	100
b0912	Install 2, 10.8 MVAR capacitor banks at Scranton 69kV	PPL	1.74	100
b0913	Extend Cando Tap to the Harwood-Jenkins #2 69kV line	PPL	0.799	100
b0914	Build a 3rd 69kV line from Harwood to Valmont Taps	PPL	2.442	100
b0915	Replace Walnut-Center City 69kV cable	PPL	1.73	100
b0916	Reconductor Sunbury-Dalmatia 69kV line	PPL	9.1	100



Baseline Network Upgrade Cost Allocation

Project #	Project Description	TO	Cost (\$M)	AEC	AEP	APS	BGE	CE	DAY	DL	DPL	DOM	JC	ME	NEP	PE	PEN	PEP	PPL	PS	RE	ECP
b0489.5	Replace Roseland 230kV breaker '42H' with 80 kA	PSEG	0.8	1.89	17.30	6.02	4.95	14.97	2.50	2.02	2.85	13.61	4.50	2.18	0.49	6.31	2.06	4.82	5.37	7.61	0.31	0.24
b0489.6	Replace Roseland 230kV breaker '51H' with 80 kA	PSEG	0.8	1.89	17.30	6.02	4.95	14.97	2.50	2.02	2.85	13.61	4.50	2.18	0.49	6.31	2.06	4.82	5.37	7.61	0.31	0.24
b0489.7	Replace Roseland 230kV breaker '71H' with 80 kA	PSEG	0.8	1.89	17.30	6.02	4.95	14.97	2.50	2.02	2.85	13.61	4.50	2.18	0.49	6.31	2.06	4.82	5.37	7.61	0.31	0.24
b0489.8	Replace Roseland 230kV breaker '31H' with 80 kA	PSEG	0.8	1.89	17.30	6.02	4.95	14.97	2.50	2.02	2.85	13.61	4.50	2.18	0.49	6.31	2.06	4.82	5.37	7.61	0.31	0.24
b0489.9	Replace Roseland 230kV breaker '11H' with 80 kA	PSEG	0.8	1.89	17.30	6.02	4.95	14.97	2.50	2.02	2.85	13.61	4.50	2.18	0.49	6.31	2.06	4.82	5.37	7.61	0.31	0.24
b0814.1	Replace Kearny 138kV breaker '1-SHT' with 80 kA breaker	PSEG	1										23.69		0.81		5.41			67.57	2.52	
b0814.10	Replace Essex 138kV breaker '1BT' with 63 Ka breaker and 2.5 cycle contact parting time	PSEG	0.5										23.69		0.81		5.41			67.57	2.52	
b0814.11	Replace Essex 138kV breaker '2PM' with 63 Ka breaker and 2.5 cycle contact parting time	PSEG	0.5										23.69		0.81		5.41			67.57	2.52	
b0814.12	Replace Marion 138kV breaker '2HM' with 63 Ka breaker	PSEG	0.5										23.69		0.81		5.41			67.57	2.52	



Baseline Network Upgrade Cost Allocation

Project #	Project Description	TO	Cost (\$M)	JC	NEP	PEN	PS	RE
b0814.13	Replace Marion 138kV breaker '2LM' with 63 Ka breaker	PSEG	0.5	23.69	0.81	5.41	67.57	2.52
b0814.14	Replace Marion 138kV breaker '1LM' with 63 Ka breaker	PSEG	0.5	23.69	0.81	5.41	67.57	2.52
b0814.15	Replace Marion 138kV breaker '6PM' with 63 Ka breaker	PSEG	0.5	23.69	0.81	5.41	67.57	2.52
b0814.16	Replace Marion 138kV breaker '3PM' with 63 Ka breaker	PSEG	0.5	23.69	0.81	5.41	67.57	2.52
b0814.17	Replace Marion 138kV breaker '4LM' with 63 Ka breaker	PSEG	0.5	23.69	0.81	5.41	67.57	2.52
b0814.18	Replace Marion 138kV breaker '3LM' with 63 Ka breaker	PSEG	0.5	23.69	0.81	5.41	67.57	2.52
b0814.19	Replace Marion 138kV breaker '1HM' with 63 Ka breaker	PSEG	0.5	23.69	0.81	5.41	67.57	2.52
b0814.2	Replace Kearny 138kV breaker '15HF' with 80 Ka breaker	PSEG	1	23.69	0.81	5.41	67.57	2.52
b0814.20	Replace Marion 138kV breaker '2PM3' with 63 Ka breaker	PSEG	0.5	23.69	0.81	5.41	67.57	2.52



Baseline Network Upgrade Cost Allocation

Project #	Project Description	TO	Cost (\$M)	JC	NEP	PEN	PS	RE
b0814.21	Replace Marion 138kV breaker '2PM1' with 63 Ka breaker	PSEG	0.5	23.69	0.81	5.41	67.57	2.52
b0814.22	Replace ECRR 138kV breaker '903'	PSEG	0.5	23.69	0.81	5.41	67.57	2.52
b0814.23	Replace Foundry 138kV breaker '21P'	PSEG	0.5	23.69	0.81	5.41	67.57	2.52
b0814.24	Change the contact parting time on Essex 138kV breaker '3LM' to 2.5 cycles	PSEG	0	23.69	0.81	5.41	67.57	2.52
b0814.25	Change the contact parting time on Essex 138kV breaker '2BM' to 2.5 cycles	PSEG	0	23.69	0.81	5.41	67.57	2.52
b0814.26	Change the contact parting time on Essex 138kV breaker '1BM' to 2.5 cycles	PSEG	0	23.69	0.81	5.41	67.57	2.52
b0814.27	Change the contact parting time on Essex 138kV breaker '3PM' to 2.5 cycles	PSEG	0	23.69	0.81	5.41	67.57	2.52
b0814.28	Change the contact parting time on Essex 138kV breaker '4LM' to 2.5 cycles	PSEG	0	23.69	0.81	5.41	67.57	2.52
b0814.29	Change the contact parting time on Essex 138kV breaker '1PM' to 2.5 cycles	PSEG	0	23.69	0.81	5.41	67.57	2.52



Baseline Network Upgrade Cost Allocation

Project #	Project Description	TO	Cost (\$M)	AEC	AEP	APS	BGE	CE	DAY	DL	DPL	DOM	JC	ME	NEP	PE	PEN	PEP	PPL	PS	RE	ECP
b0814.3	Replace Kearny 138kV breaker '14HF' with 80 Ka breaker	PSEG	1										23.69		0.81		5.41			67.57	2.52	
b0814.30	Change the contact parting time on Essex 138kV breaker '1LM' to 2.5 cycles	PSEG	0										23.69		0.81		5.41			67.57	2.52	
b0814.4	Replace Kearny 138kV breaker '10HF' with 80 Ka breaker	PSEG	1										23.69		0.81		5.41			67.57	2.52	
b0814.5	Replace Kearny 138kV breaker '2HT' with 80 Ka breaker	PSEG	1										23.69		0.81		5.41			67.57	2.52	
b0814.6	Replace Kearny 138kV breaker '22HF' with 80 Ka breaker	PSEG	1										23.69		0.81		5.41			67.57	2.52	
b0814.7	Replace Kearny 138kV breaker '4HT' with 80 Ka breaker	PSEG	1										23.69		0.81		5.41			67.57	2.52	
b0814.8	Replace Kearny 138kV breaker '25HF' with 80 Ka breaker	PSEG	1										23.69		0.81		5.41			67.57	2.52	
b0814.9	Replace Essex 138kV breaker '2LM' with 63 Ka breaker and 2.5 cycle contact parting time	PSEG	0.5										23.69		0.81		5.41			67.57	2.52	
b0829.11	Replace Branchburg 230kV breaker 32H	PSEG	0.5	1.89	17.30	6.02	4.95	14.97	2.50	2.02	2.85	13.61	4.50	2.18	0.49	6.31	2.06	4.82	5.37	7.61	0.31	0.24



Baseline Network Upgrade Cost Allocation

Project #	Project Description	TO	Cost (\$M)	AEC	AEP	APS	BGE	CE	DAY	DL	DPL	DOM	JC	ME	NEP	PE	PEN	PEP	PPL	PS	RE	ECP	
b0829.12	Replace Branchburg 230kV breaker 52H	PSEG	0.5	1.89	17.30	6.02	4.95	14.97	2.50	2.02	2.85	13.61	4.50	2.18	0.49	6.31	2.06	4.82	5.37	7.61	0.31	0.24	
b0829.6	Replace Branchburg 500kV breaker 91X	PSEG	0.8	1.89	17.30	6.02	4.95	14.97	2.50	2.02	2.85	13.61	4.50	2.18	0.49	6.31	2.06	4.82	5.37	7.61	0.31	0.24	
b0829.9	Replace Branchburg 230kV breaker 102H	PSEG	0.5	1.89	17.30	6.02	4.95	14.97	2.50	2.02	2.85	13.61	4.50	2.18	0.49	6.31	2.06	4.82	5.37	7.61	0.31	0.24	
b0830.1	Replace Roseland 230kV breaker '82H' with 80 kA	PSEG	0.8	1.89	17.30	6.02	4.95	14.97	2.50	2.02	2.85	13.61	4.50	2.18	0.49	6.31	2.06	4.82	5.37	7.61	0.31	0.24	
b0830.2	Replace Roseland 230kV breaker '91H' with 80 kA	PSEG	0.8	1.89	17.30	6.02	4.95	14.97	2.50	2.02	2.85	13.61	4.50	2.18	0.49	6.31	2.06	4.82	5.37	7.61	0.31	0.24	
b0830.3	Replace Roseland 230kV breaker '22H' with 80 kA	PSEG	0.8	1.89	17.30	6.02	4.95	14.97	2.50	2.02	2.85	13.61	4.50	2.18	0.49	6.31	2.06	4.82	5.37	7.61	0.31	0.24	
b0882	Replace Hudson 230kV breaker 1HA with 80 kA	PSEG	0.8																			100	
b0883	Replace Hudson 230kV breaker 2HA with 80 kA	PSEG	0.8																				100
b0884	Replace Hudson 230kV breaker 3HB with 80 Ka	PSEG	0.8																				100



Baseline Network Upgrade Cost Allocation

Project #	Project Description	TO	Cost (\$M)	PS
b0885	Replace Hudson 230kV breaker 4HA with 80 Ka	PSEG	0.8	100
b0886	Replace Hudson 230kV breaker 4HB with 80 Ka	PSEG	0.8	100
b0889	Replace Bergen 230kV breaker '21H'	PSEG	0.5	100
b0890	Upgrade New Freedom 230kV breaker '21H'	PSEG	0.1	100
b0891	Upgrade New Freedom 230kV breaker '31H'	PSEG	0.1	100
b0899	Replace ECRR 138kV breaker 901	PSEG	0.5	100
b0900	Replace ECRR 138kV breaker 902	PSEG	0.5	100
b0922	At Hudson 345kV, add a PAR in series with both Farragut PARs	PSEG	92	100

Project #	Project Description	TO	Cost (\$M)	PS
b1019.1	Replace wave trap, line disconnect and ground switch at Roseland on the F-2206 circuit	PSEG	0.35	100
b1019.10	Replace wave trap, line, ground 230kV breaker disconnect and 230kV main bus disconnects at Athenia on the K-2263 circuit	PSEG	0.35	100
b1019.2	Replace wave trap, line disconnect and ground switch at Roseland on the B-2258 circuit	PSEG	0.35	100
b1019.3	Replace 1-2 and 2-3 section disconnect and ground switches at Cedar Grove on the F-2206 circuit	PSEG	0.35	100
b1019.4	Replace 1-2 and 2-3 section disconnect and ground switches at Cedar Grove on the B-2258 circuit	PSEG	0.35	100
b1019.5	Replace wave trap, line disconnect and ground switch at Cedar Grove on the F-2206 circuit	PSEG	0.35	100
b1019.6	Replace line disconnect and ground switch at Cedar Grove on the K-2263 circuit	PSEG	0.35	100



Baseline Network Upgrade Cost Allocation

Project #	Project Description	TO	Cost (\$M)	PS
b1019.7	Replace 2-4 and 4-5 section disconnect and ground switches at Clifton on the B-2258 circuit	PSEG	0.35	100
b1019.8	Replace 1-2 and 2-3 section disconnect and ground switches at Clifton on the K-2263 circuit	PSEG	0.35	100
b1019.9	Replace line, ground, 230kV main bus disconnects at Athenia on the B-2258 circuit	PSEG	0.35	100



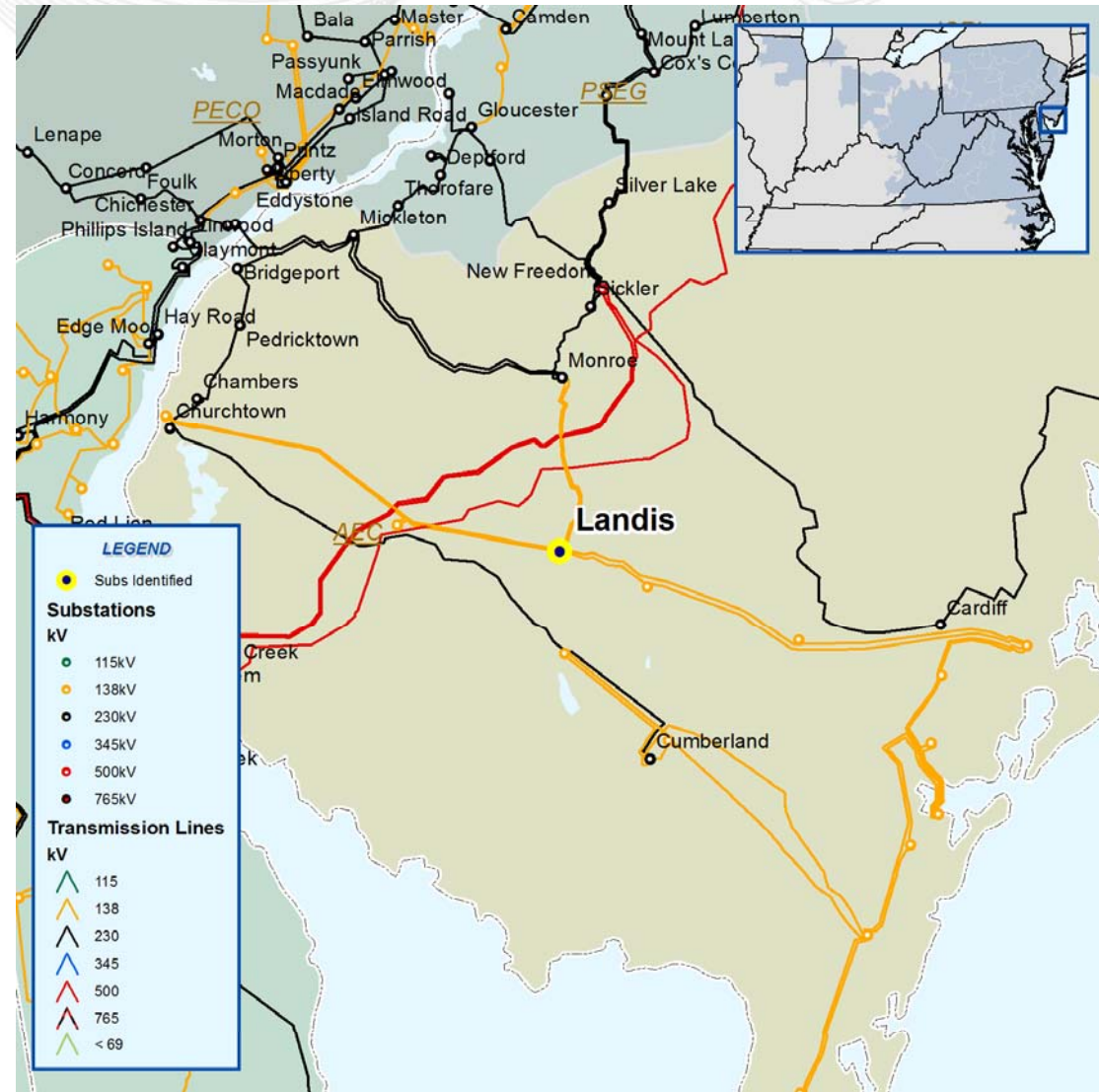
Transmission Expansion Advisory Committee Sub-Regional RTEP Projects

September 16, 2009

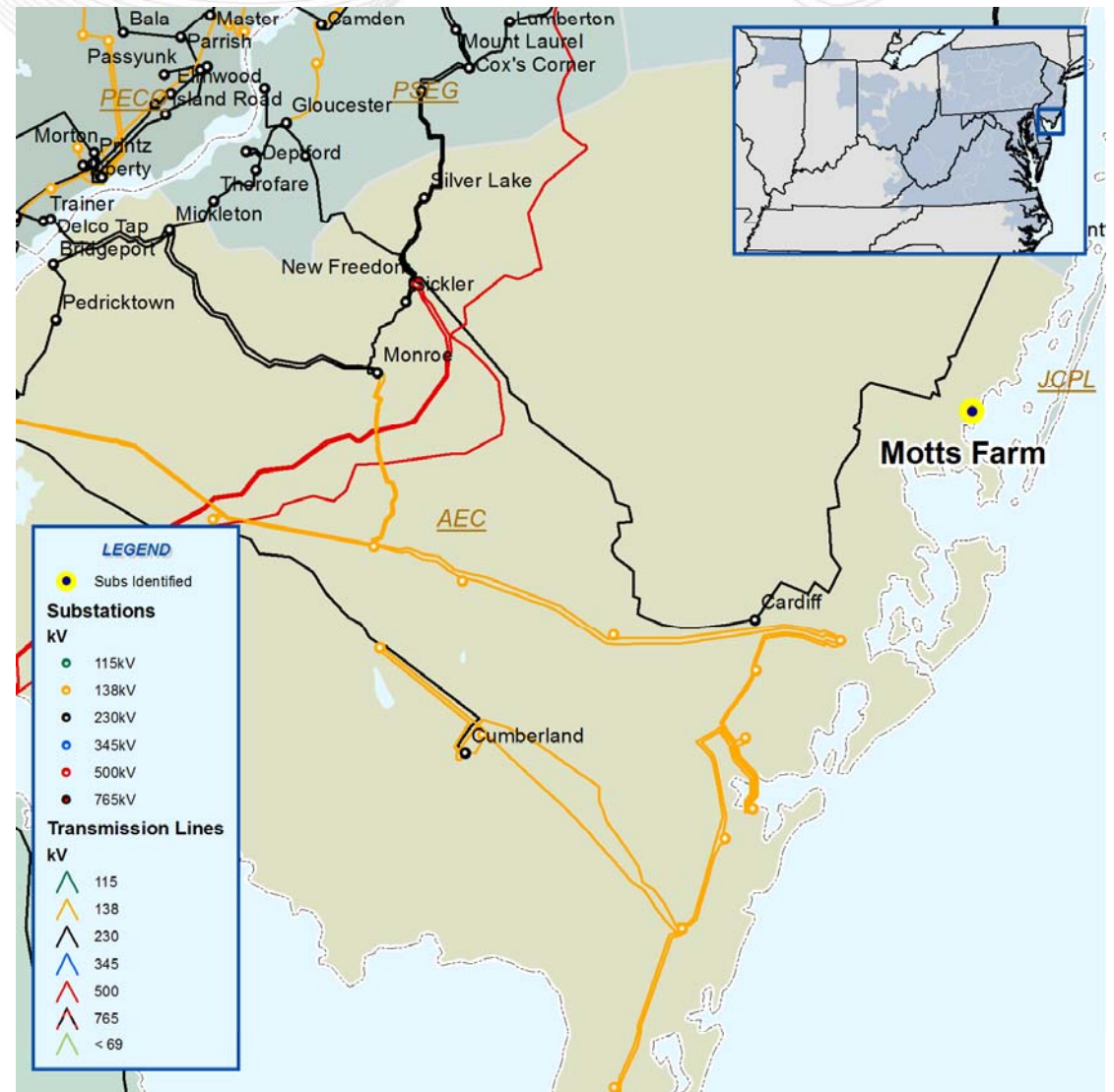


Baseline Reliability Update

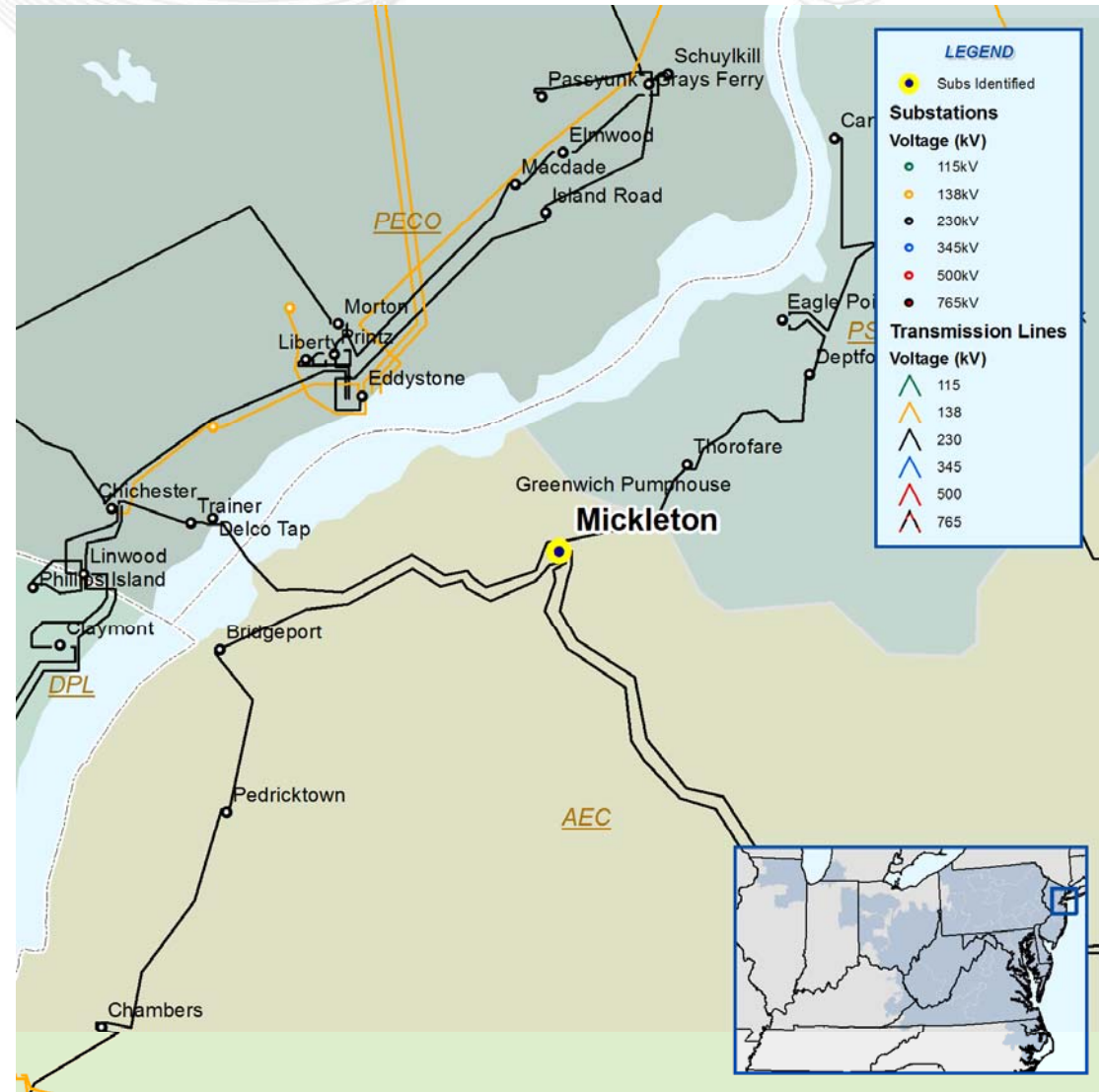
- Low voltage magnitude and voltage drop violations in the Lincoln, Landis, and Sherman areas for several N-1-1 138kV line contingency combinations.
- Build a new Lincoln-Landis 138kV line
- Estimated Project Cost: \$12.5 M
- Required IS Date: 6/1/2013



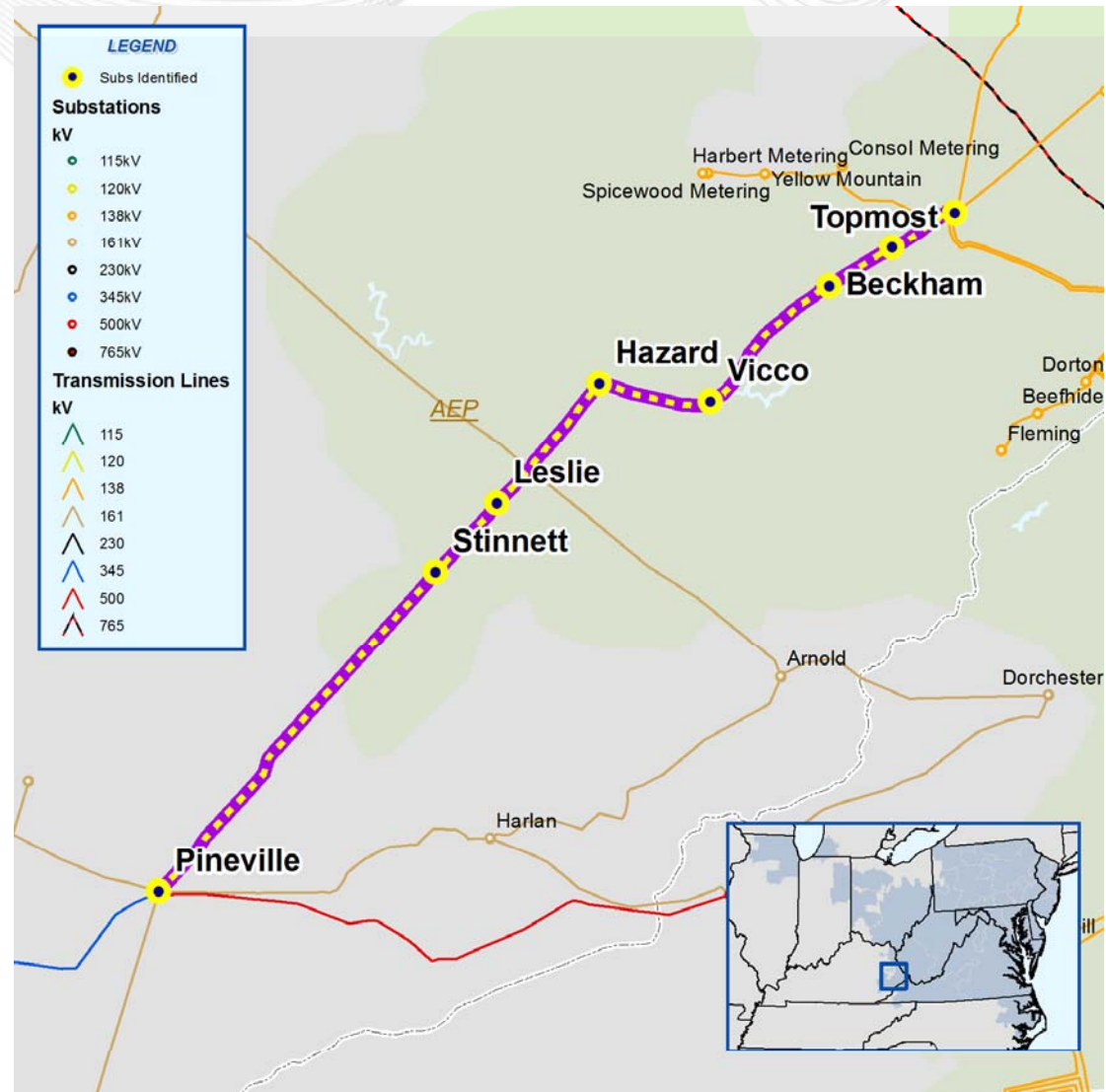
- Low voltage magnitude violations in the Motts Farm area for several N-1-1 contingency combinations.
- Install a 35 MVAR capacitor at the Motts Farm 69kV bus
- Estimated Project Cost: \$2.8 M
- Required IS Date: 6/1/2013



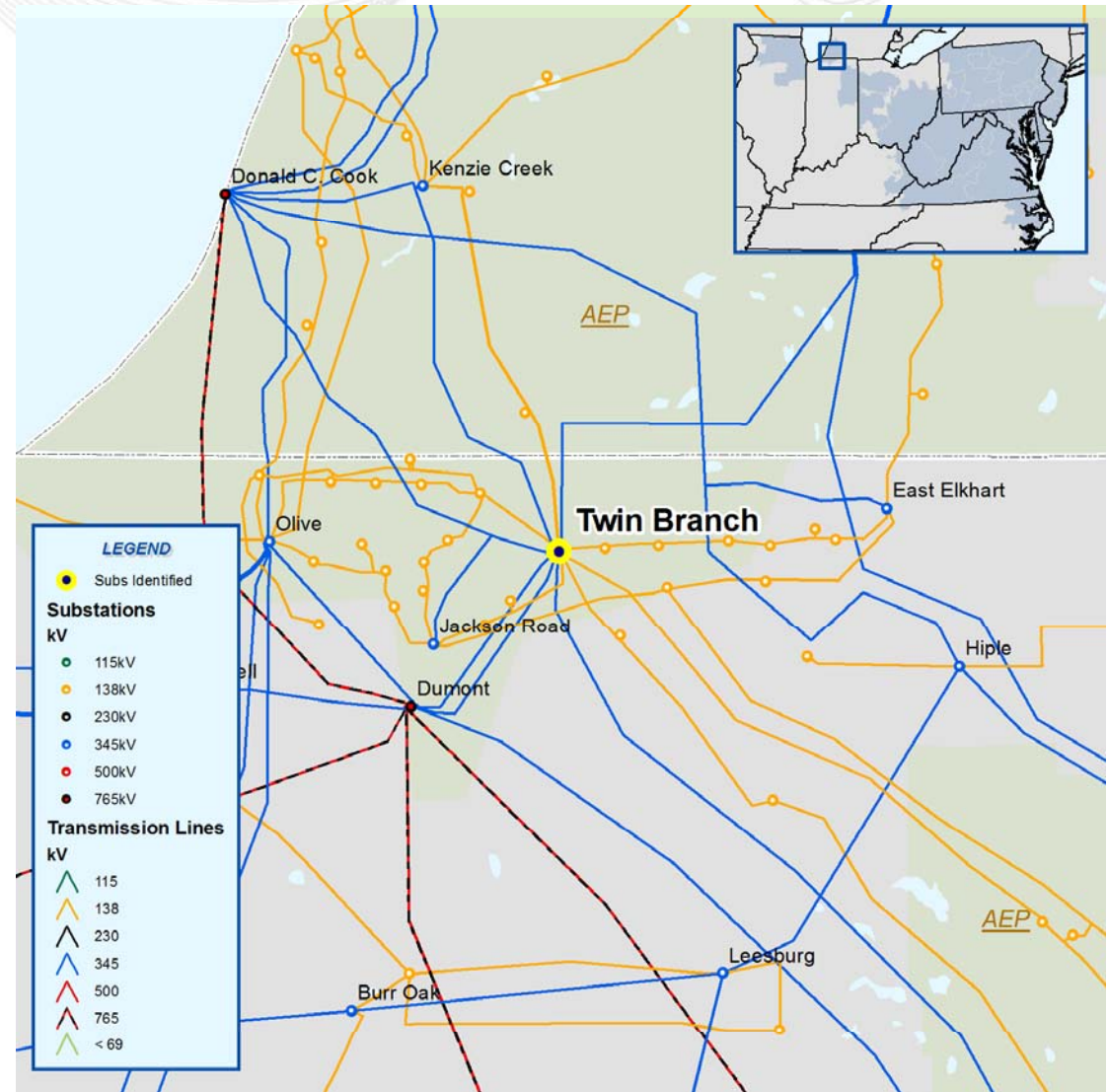
- Mickleton 230/69kV transformer T4 / loss of Mickleton 230/69kV transformer T1
- Original Proposed Solution:
Move a Monroe substation transformer to replace Mickleton 230/69kV transformer T4
- New Proposed Solution:
Replace Mickleton 230/69kV transformer T4 with a new transformer (b0576)
- Estimated Project Cost: \$6.875 M
- Expected IS Date: 6/01/2013



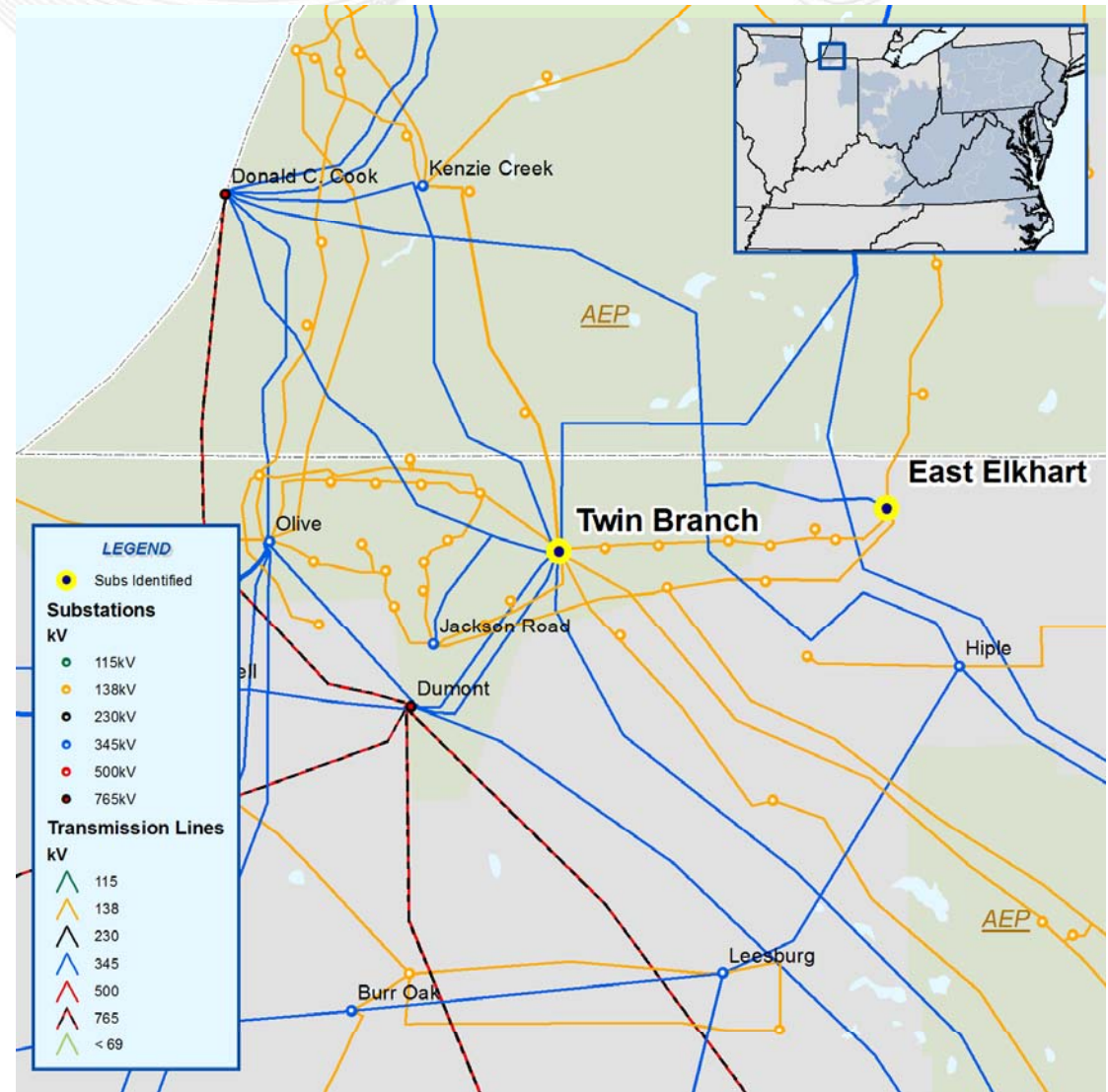
- N-1-1 thermal overload of Beaver Creek 138kV – Topmost 138kV, Beckham – Vicco 138kV, and Hazard – Wooten 138kV for the loss of 161kV sources into the Hazard area of Eastern Kentucky
- Proposed Solution:
Hazard area improvement projects that will include possible new interconnection points with EKPC, rebuilding of existing 69kV facilities, and the establishment of a new 138kV source into the Hazard area.
- Estimated Project Cost: \$44M
- Required IS Date: 6/1/2013



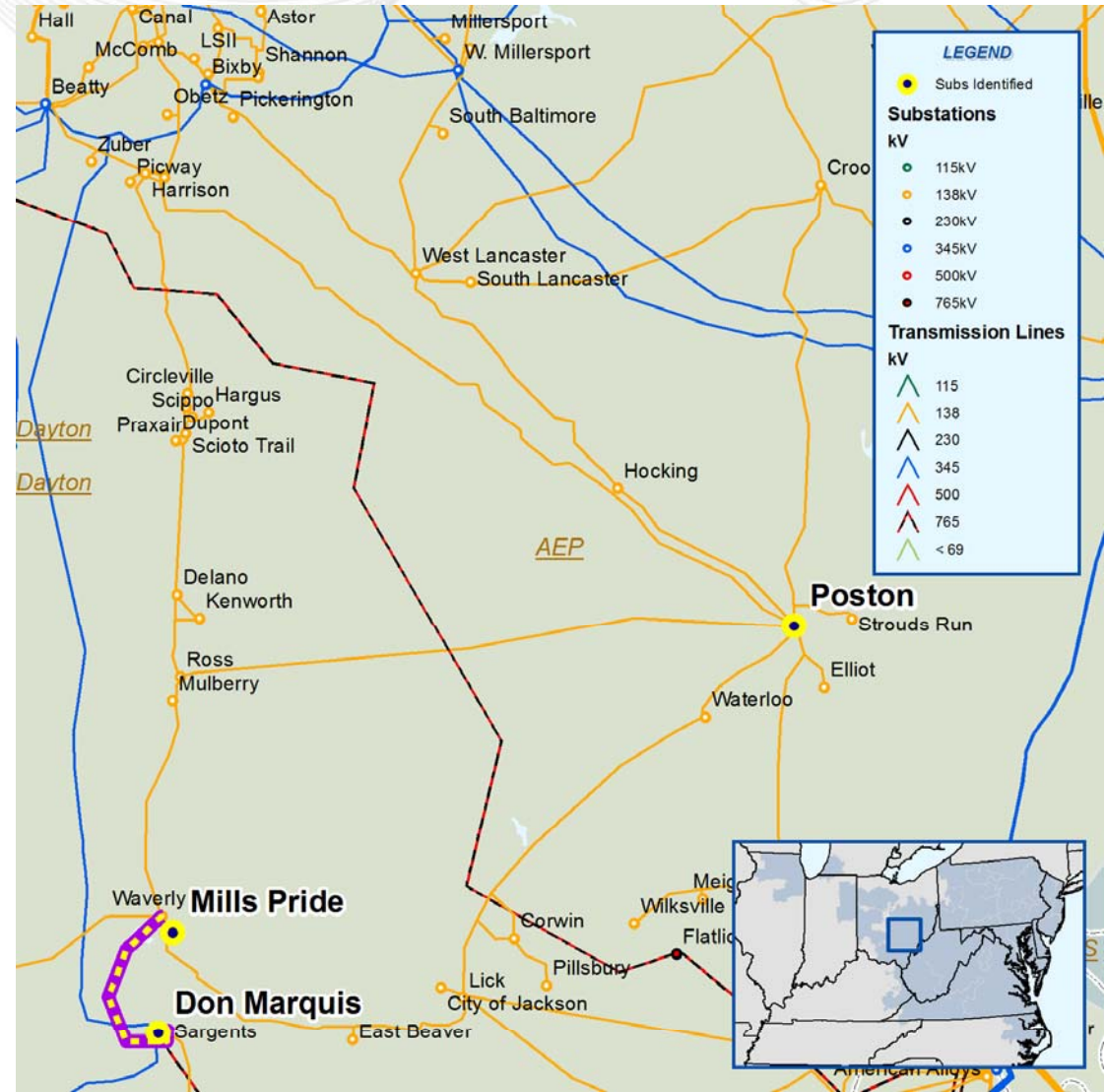
- N-1-1 thermal overload of the Twin Branch 345/138kV transformer for the loss of the following contingency combinations:
 - Cook - Benton Harbor 345kV + Benton Harbor - Palisades 345kV
 - Benton Harbor 345/138kV transformers + Jackson Road 345/138kV transformer
- Proposed Solution: Replace existing 450 MVA transformer at Twin Branch 345/138kV with a 675 MVA transformer
- Estimated Project Cost: \$8.5M
- Required IS Date: 6/1/2013



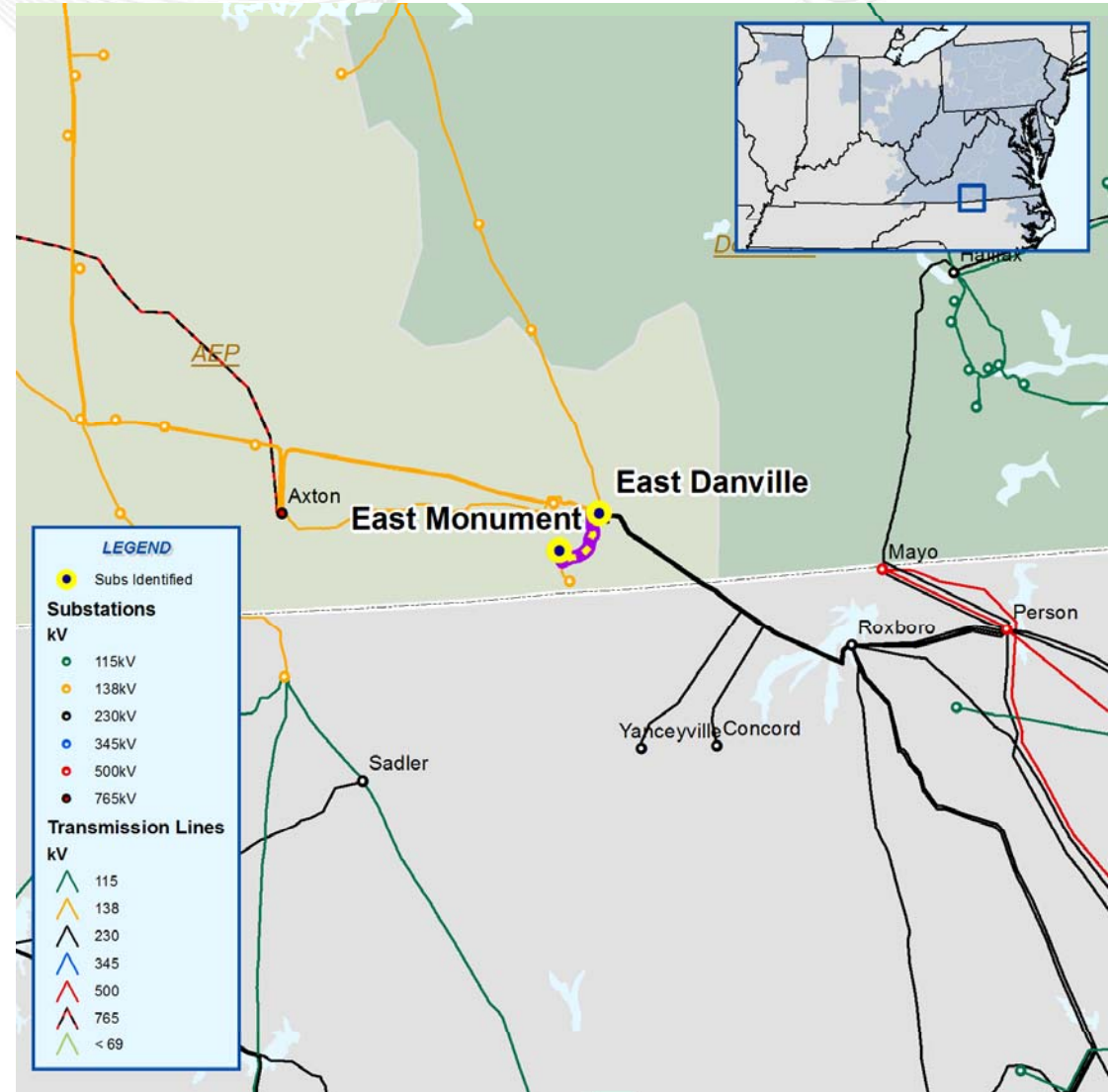
- N-1 thermal overload of the Twin Branch – Beech Road – Cleveland 138kV circuit following the loss of the East Elkhart 345/138kV transformer
- Proposed Solution: String a second 138kV circuit on the open tower position between Twin Branch and East Elkhart
- Estimated Project Cost: \$6M
- Required IS Date: 6/1/2013



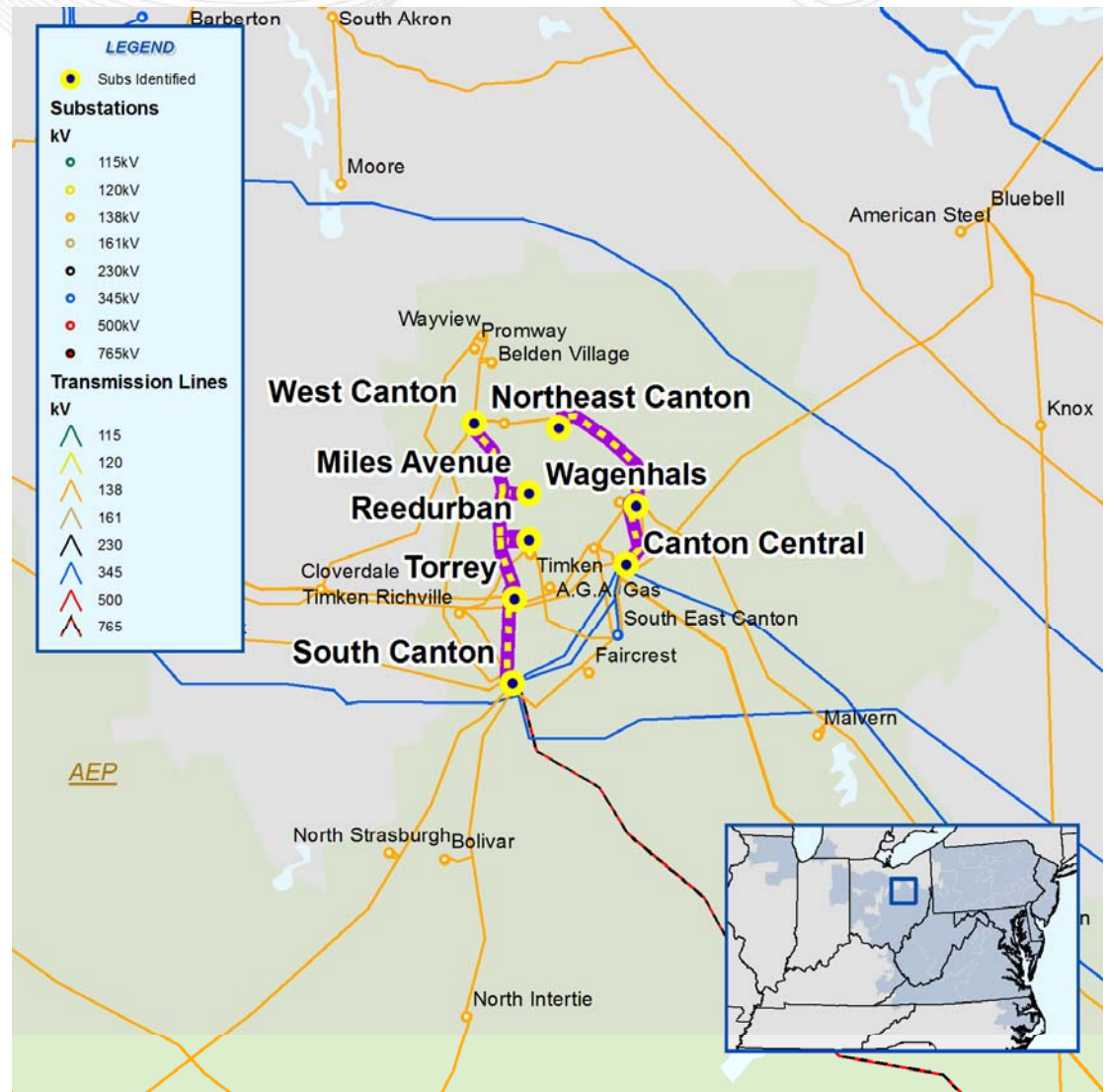
- N-1 thermal overload of Don Marquis – Mills Pride 138kV line and the Mills Pride – Waverly 138kV line for the loss of Don Marquis – Waverly 138kV. AEP studies have also indicated low voltage conditions during double 138kV line outages affecting the Chillicothe area.
- Proposed Solution:
 - Construct a new 345/138kV station on the Marquis-Bixby 345kV line near the intersection with Ross - Highland 69kV
 - Construct two 138kV outlets to Delano 138kV station and to Camp Sherman station
 - Convert Ross - Circleville 69kV to 138kV
 - Install 138/69kV transformer at new station and connect in the Ross - Highland 69kV line
- Estimated Project Cost: \$50M
- Required IS Date: 6/1/2014



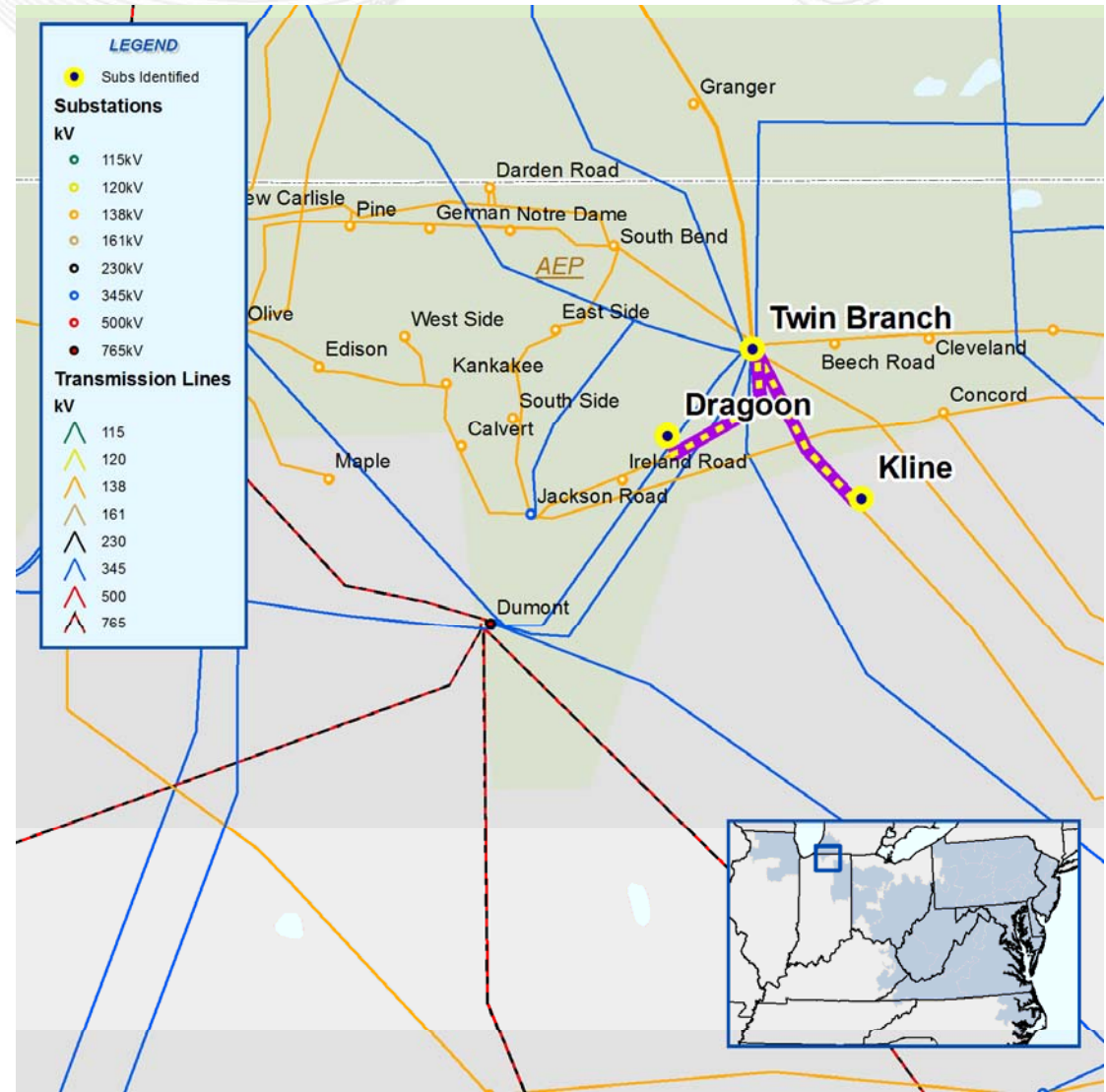
- N-1 thermal overload of East Monument – East Danville 138kV for the loss of Danville - Riverside 138kV
- Proposed Solution: Add a third delivery point from AEP’s East Danville Station to the City of Danville.
- Estimated Project Cost: \$1.6M
- Required IS Date: 6/01/2014



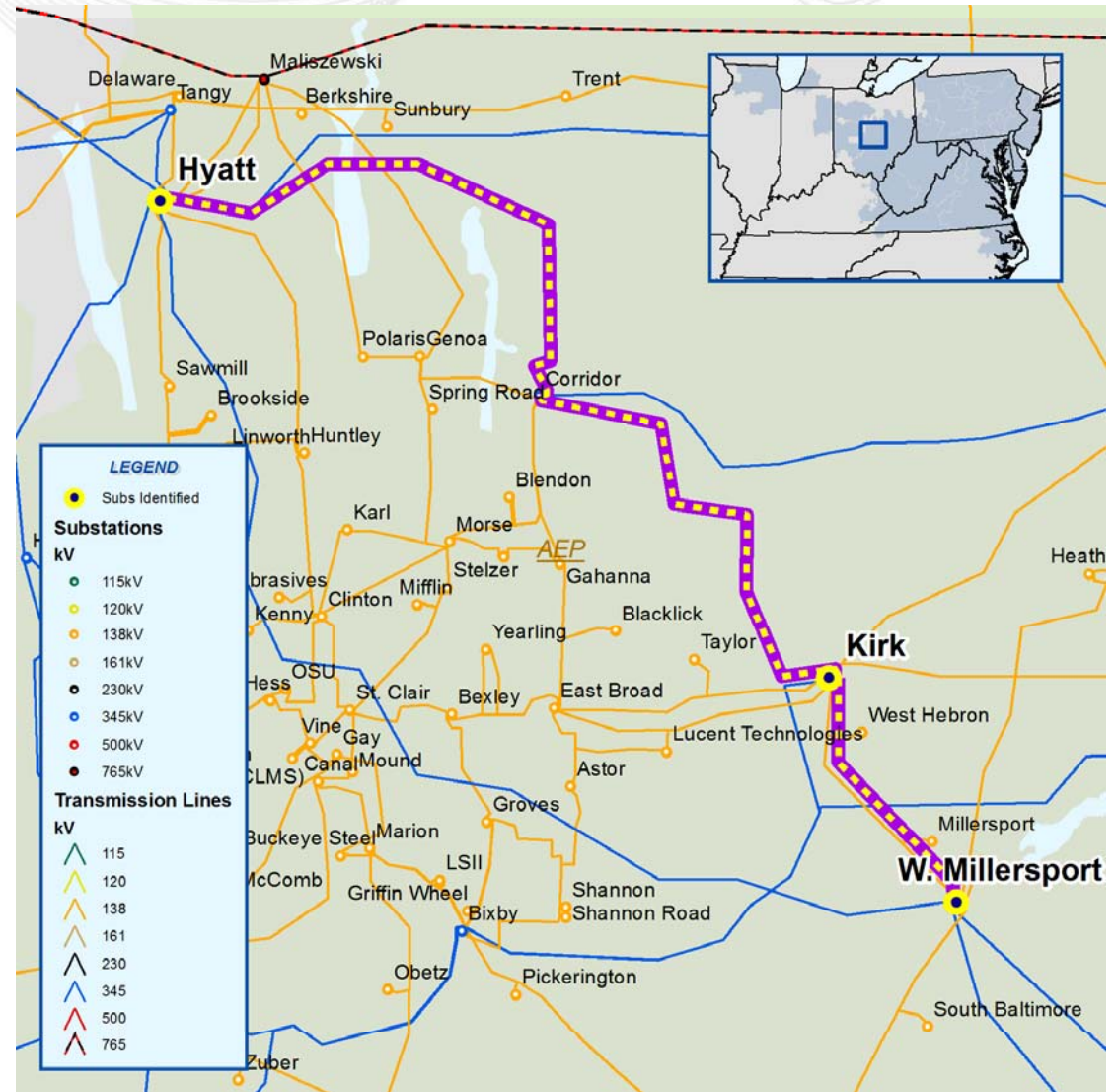
- Sunnyside - Torrey 138kV, Wagenhals - Northeast Canton 138kV, Torrey-Negley 138kV, and the Canton Central 345/138kV transformer are overloaded for N-1 and N-1-1 outage conditions
- Proposed Solution:
 - Establish new South Canton - West Canton 138kV line (replacing Torrey - West Canton) and Wagenhals - Wayview 138kV
 - Loop the existing South Canton - Wayview 138kV circuit in-and-out of West Canton
 - Install a 345/138kV 450 MVA transformer at Canton Central
 - Rebuild/reconductor the Sunnyside - Torrey 138kV line
- Estimated Project Cost: \$28M
- Required IS Date: 6/1/2014



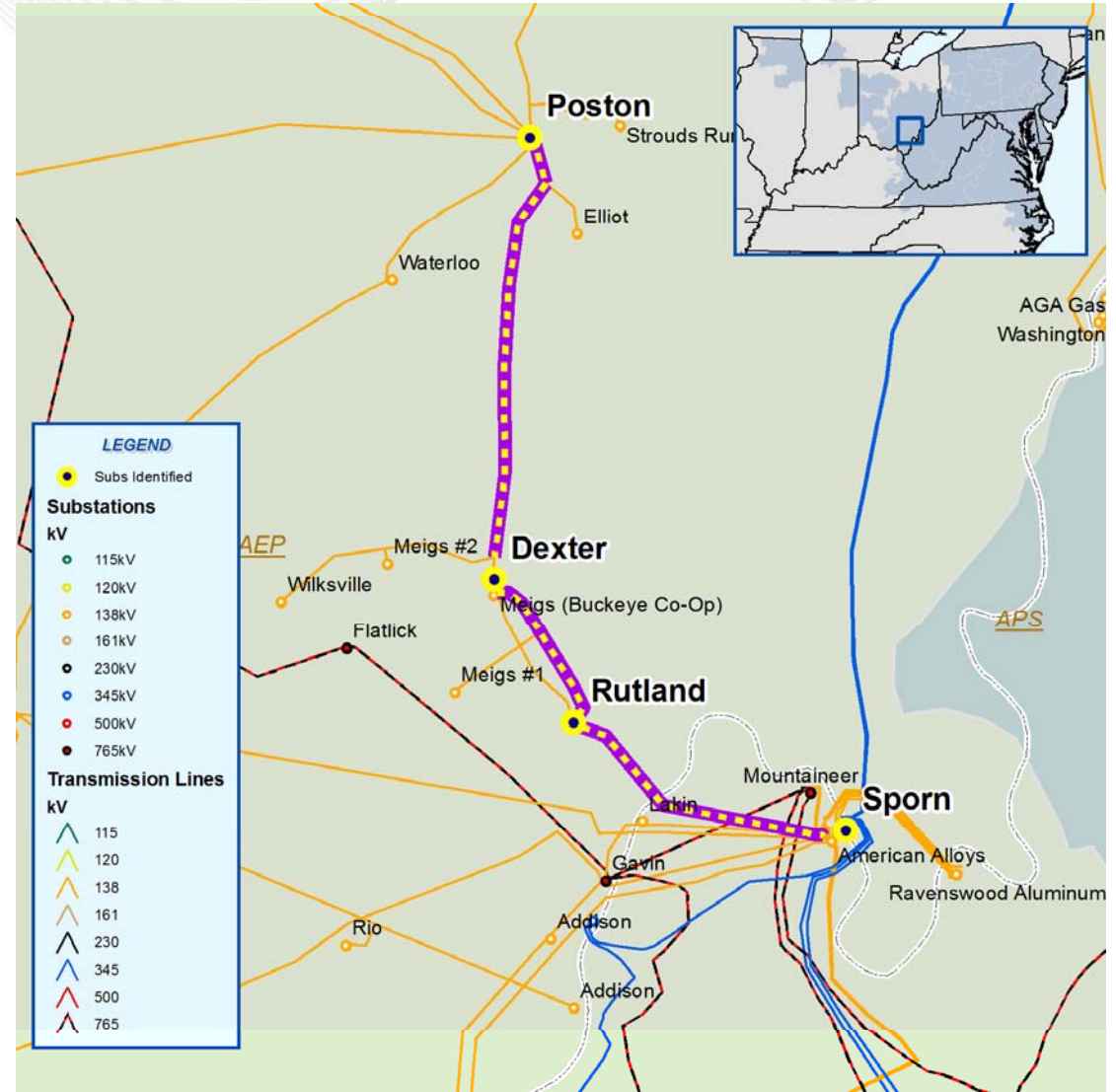
- N-1-1 thermal overloads of County Road 4 – Twin Branch 138kV, Sections of County Road 4 – East Elkhart 138kV, and Concord – Jackson Road 138kV for the loss of the East Elkhart 345/138kV transformer and Cook – East Elkhart 138kV
- Proposed Solution: String the vacant circuit of the East Elkhart – Twin Branch 138kV line and establish a new 138/69-34.5kV Station to interconnect the existing 34.5kV network.
- Estimated Project Cost: \$9.5M
- Required IS Date: 6/1/2014



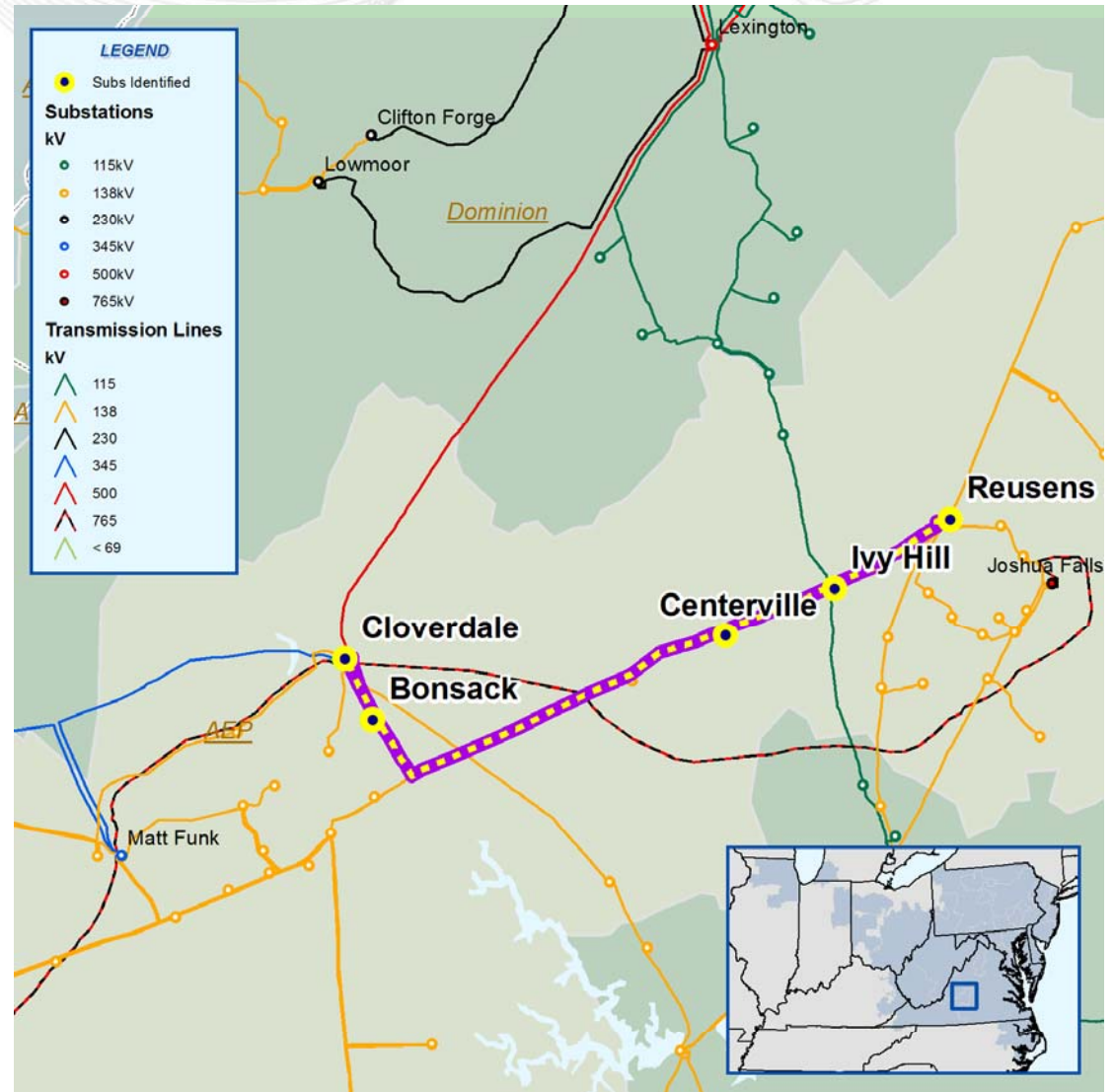
- N-1-1 thermal overloads of West Lancaster – South Baltimore 138kV for the loss of Kimbry - Poston 138kV + Crooks – South Lancaster 138kV
- Proposed Solution:
 - Establish a third 345kV breaker string in the West Millersport Station
 - Construct a new West Millersport – Gahanna 138kV circuit (fourth 138kV outlet)
 - Miscellaneous improvements to upgrade other limiting elements and improve the performance of the 138kV transmission system
- Estimated Project Cost: \$28M
- Required IS Date: 6/1/2014



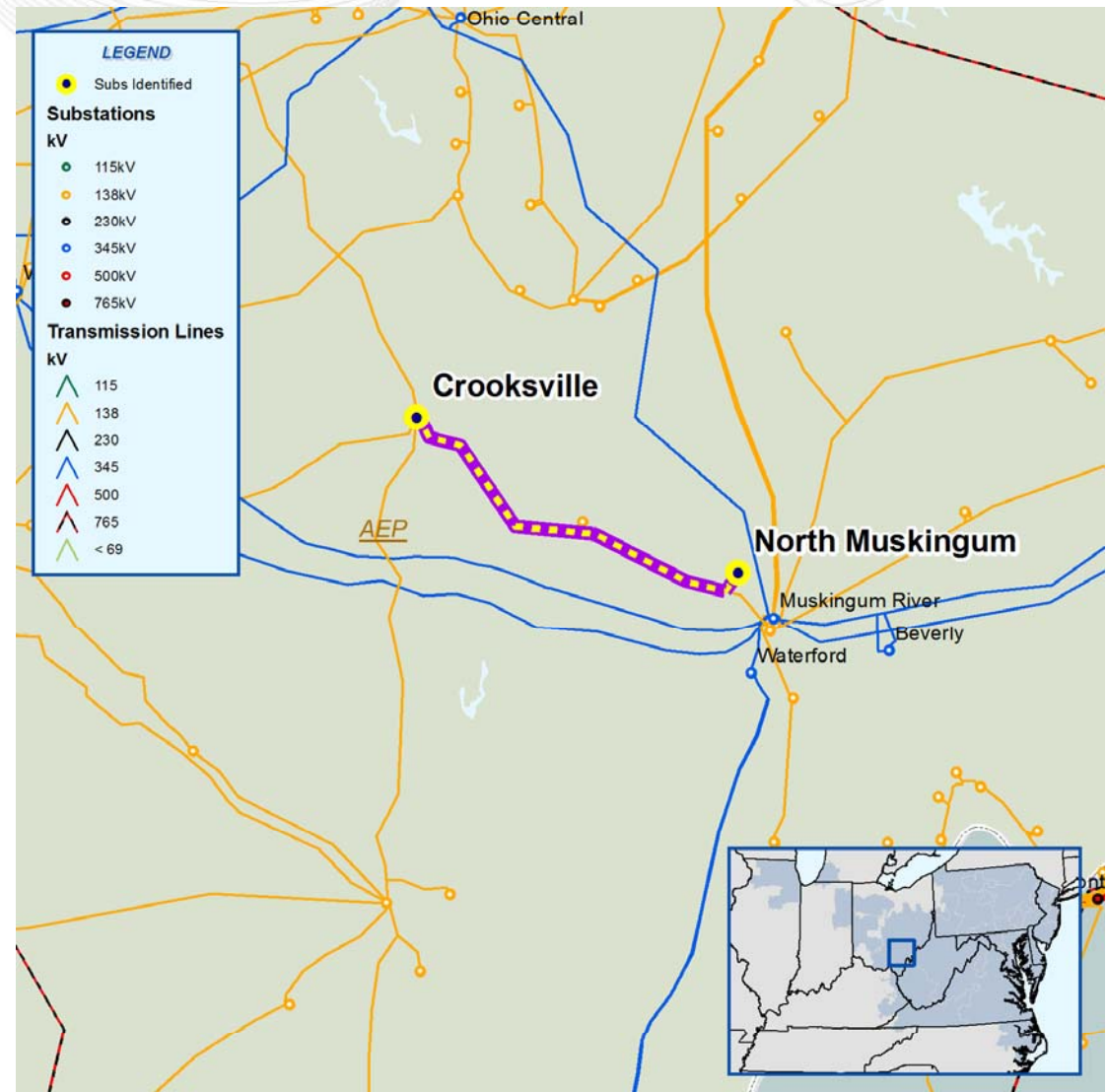
- Generator deliverability overload of Elliot – Poston 138kV for both normal system and various contingency conditions
- Proposed Solution:
 - Upgrade the terminal equipment at Poston Station
 - Update remote end relays
- Estimated Project Cost: \$1.4M
- Required IS Date: 6/1/2014



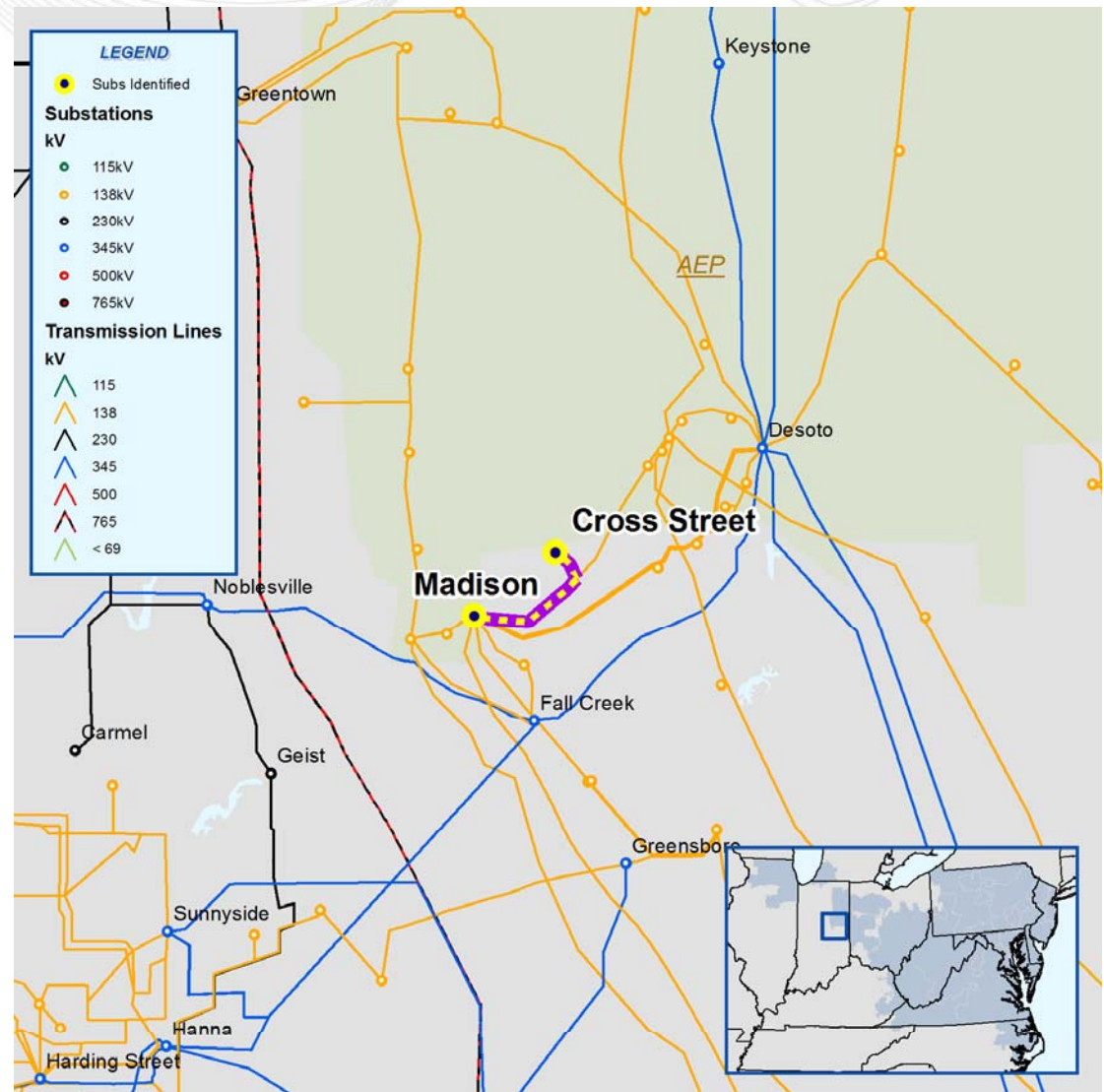
- N-1-1 thermal overload of Bonsack – Cloverdale 138kV
 - Loss of Joshua Falls – Cloverdale 765kV line, Joshua Falls 765/138kV transformer + Cloverdale – Huntington CT 138kV line
- N-1-1 thermal overload of Cloverdale – Centerville 138kV
 - Loss of Joshua Falls – Cloverdale 765kV line, Joshua Falls 765/138kV transformer + Moseley 1 – Roanoke 2 138kV line
- N-1-1 thermal overload of Centerville – Ivy Hill 138kV
 - Loss of Joshua Falls – Cloverdale 765kV line, Joshua Falls 765/138kV transformer + Moseley 1 – Roanoke 2 138kV line
- N-1-1 thermal overload of Ivy Hill – Reusens 138kV
 - Loss of Joshua Falls – Cloverdale 765kV line, Joshua Falls 765/138kV transformer + Moseley 1 – Roanoke 2 138kV line
- Proposed Solution: Sag check all of the above facilities as well as Bonsack 138kV – Reusens 138kV and the 138kV sections from Reusens – Monel – Gomingo – Joshua Falls. The cost includes funds to implement minor fixes to alleviate minor sag issues
- Estimated Project Cost: \$3M
- Required IS Date: 6/1/2014



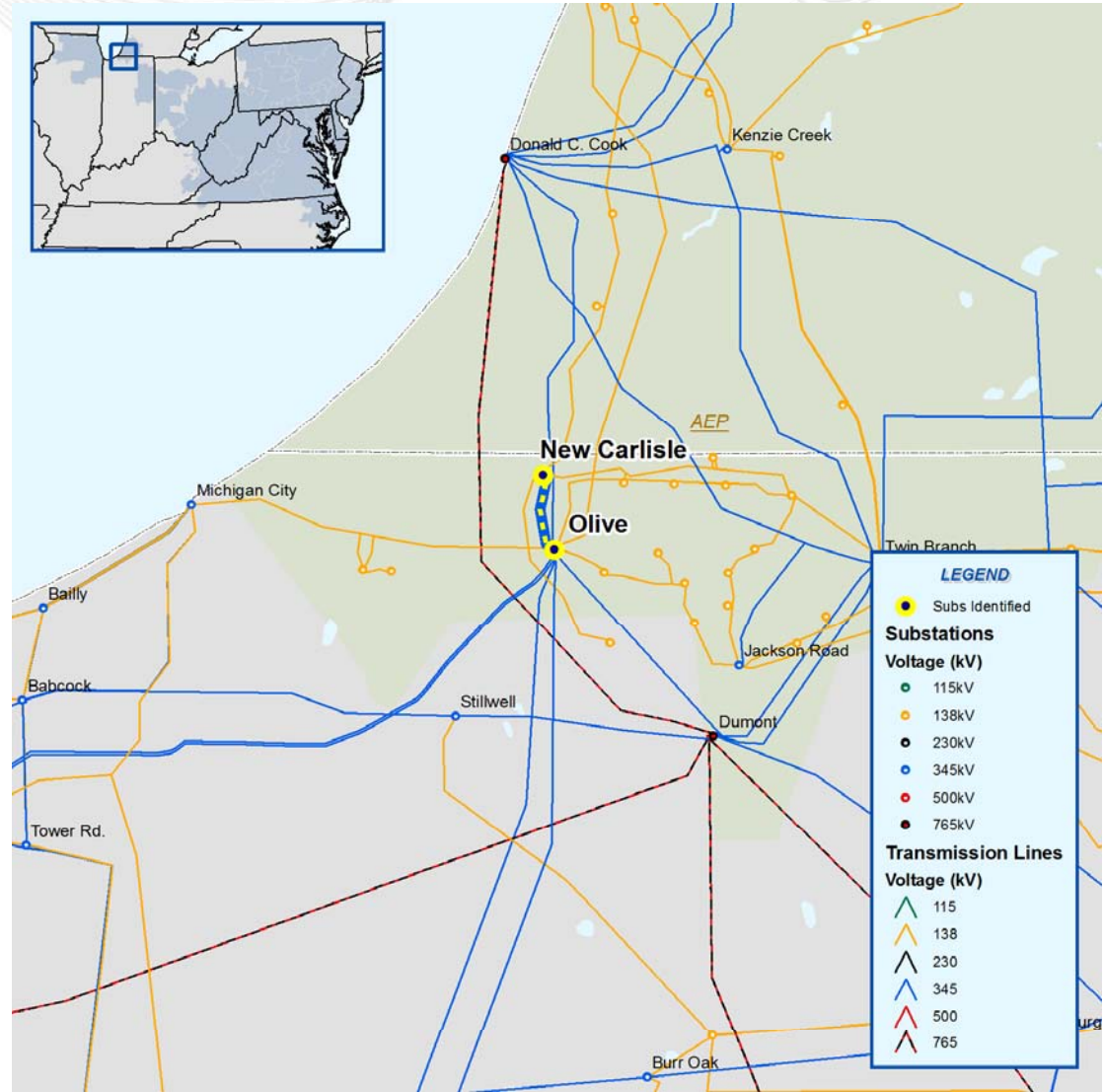
- Generator deliverability violation of Muskingum - North Muskingum - Crooksville 138kV for the loss of the Muskingum - West Millersport 345kV tower
- Proposed Solution: Check the Crooksville - Muskingum 138kV sag and perform the required work to improve the emergency rating
- Estimated Project Cost: \$1M
- Required IS Date: 6/1/2014



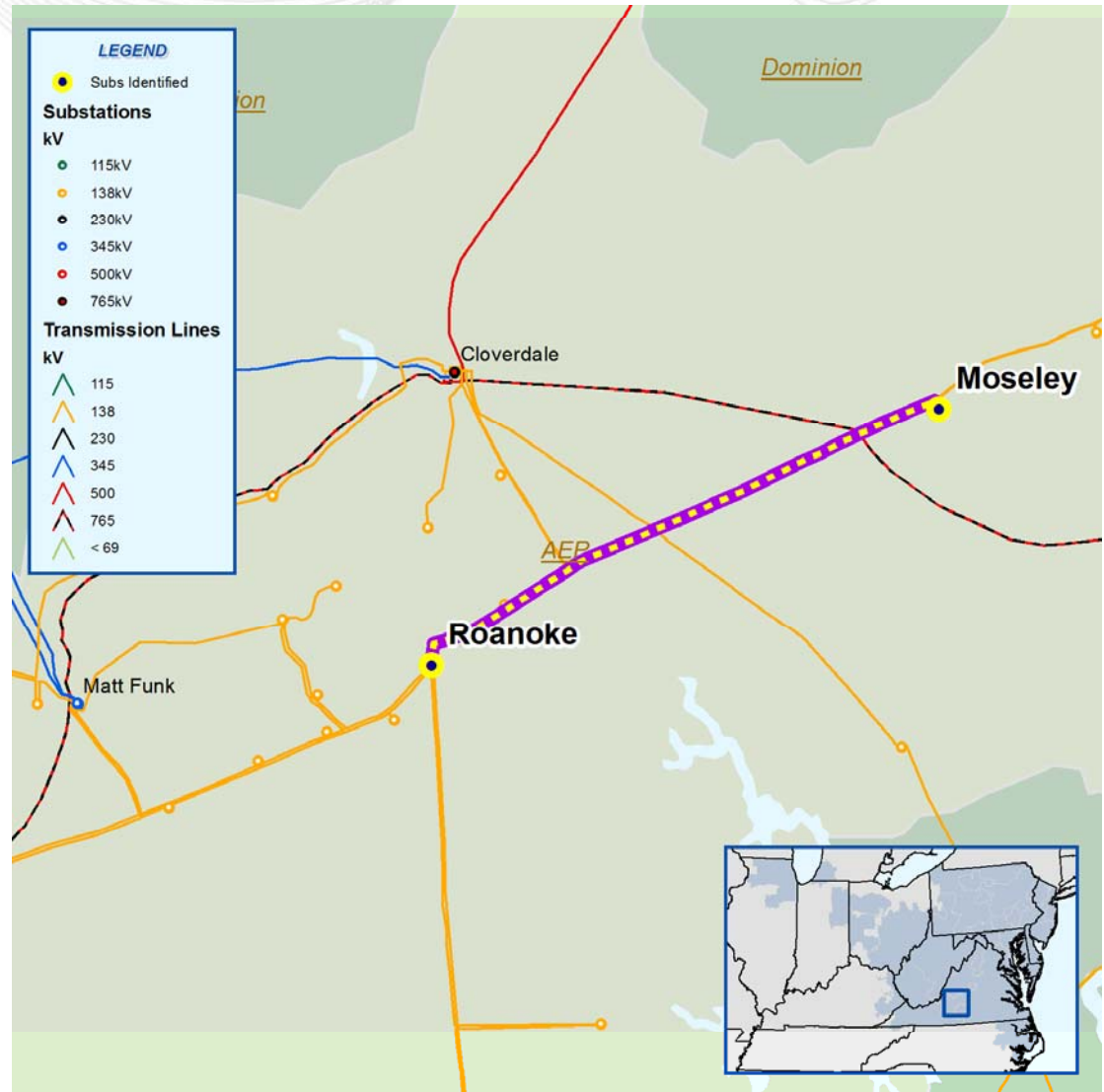
- N-1-1 thermal violation of Cross Street - Madison 138kV line for the loss of Desoto - Royert 138kV + Royert - Wesdel 138kV line + Desoto - Mayfie 138kV line
- Proposed Solution: Perform a sag study for the Madison – Cross Street 138kV line and perform the required work to improve the emergency rating
- Estimated Project Cost: \$0.150M
- Required IS Date: 6/1/2014



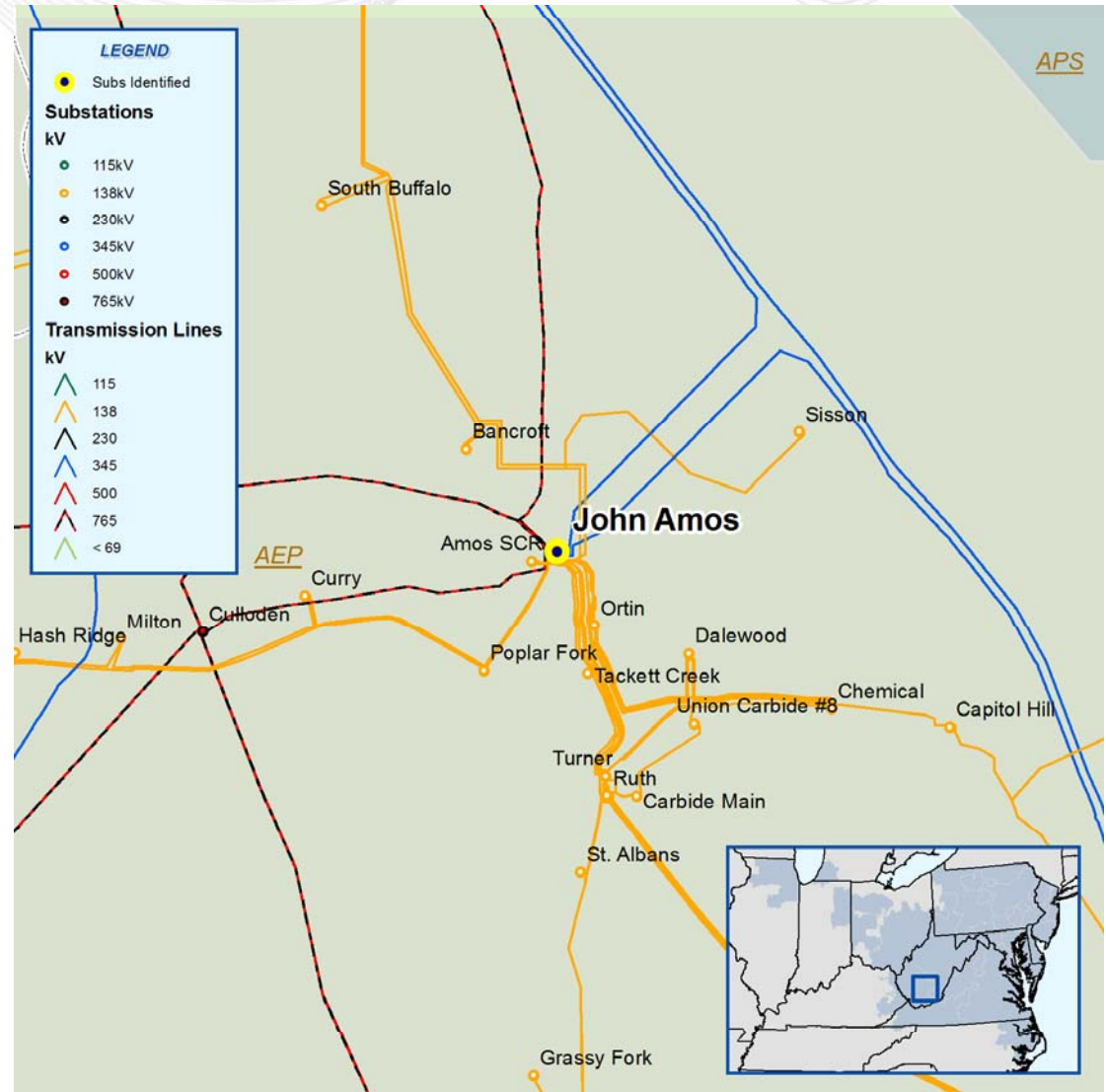
- N-1-1 thermal overload of New Carlisle – Olive 138kV for the loss of Dumont – Stillwell 345kV and the Stillwell 345/138kV transformer
- Proposed Solution: Rebuild an 0.065 mile section of the New Carlisle – Olive 138kV line and change the 138kV line switches at New Carlisle
- Estimated Project Cost: \$1M
- Required IS Date: 6/1/2014



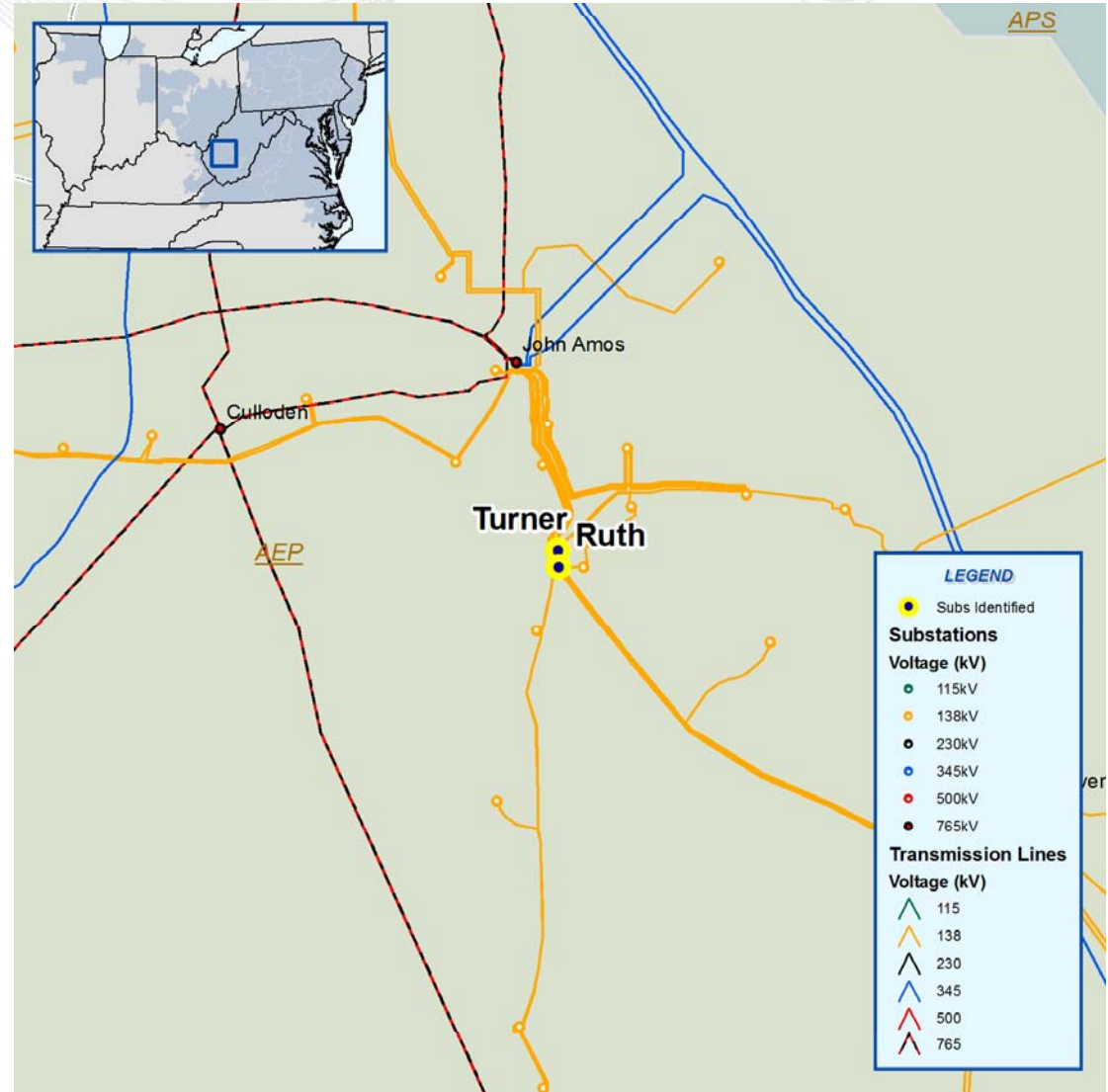
- N-1-1 thermal overload of Moseley – Roanoke 138kV for the loss of Candler Mountain – Smith Mountain 138kV + Joshua Falls – Cloverdale 765kV line + Joshua Falls 765/138kV transformer
- Proposed Solution: Perform a sag study to increase the emergency rating
- Estimated Project Cost: \$1.05M
- Required IS Date: 6/1/2014



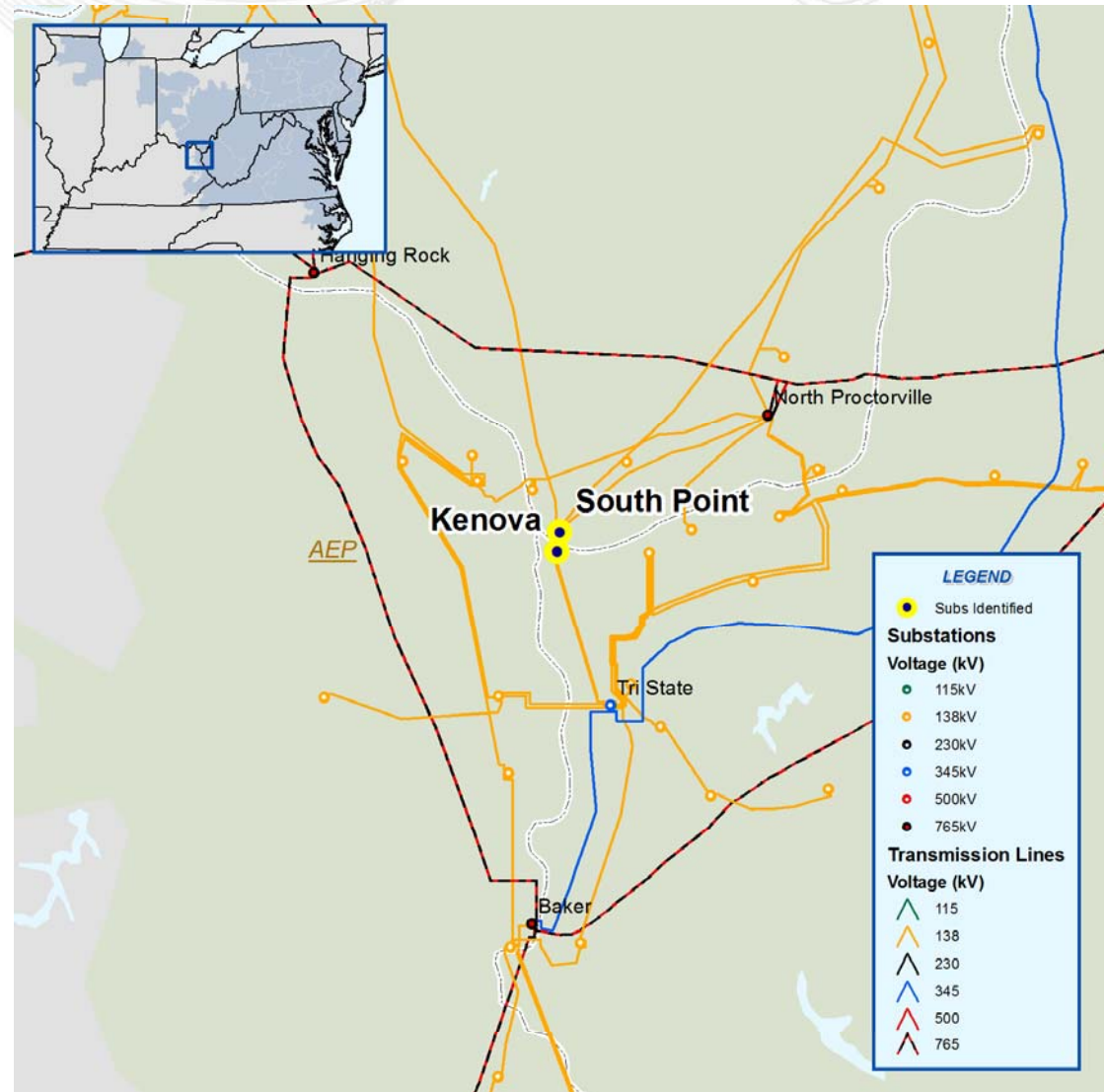
- N-1-1 thermal overload of Amos – Poca 138kV for the loss of Union Carbide Tap – Union Carbide No. 8 138kV, Union Carbide Tap Chemical #1 138kV and Amos - Dalewood – Chemical #2 138kV
- Generator deliverability violation of Amos – Poca 138kV for the loss of both Amos – Turner 138kV circuits
- Proposed Solution: Perform sag studies to raise the emergency rating of Amos – Poca 138kV
- Estimated Project Cost: \$0.055M
- Required IS Date: 6/1/2014



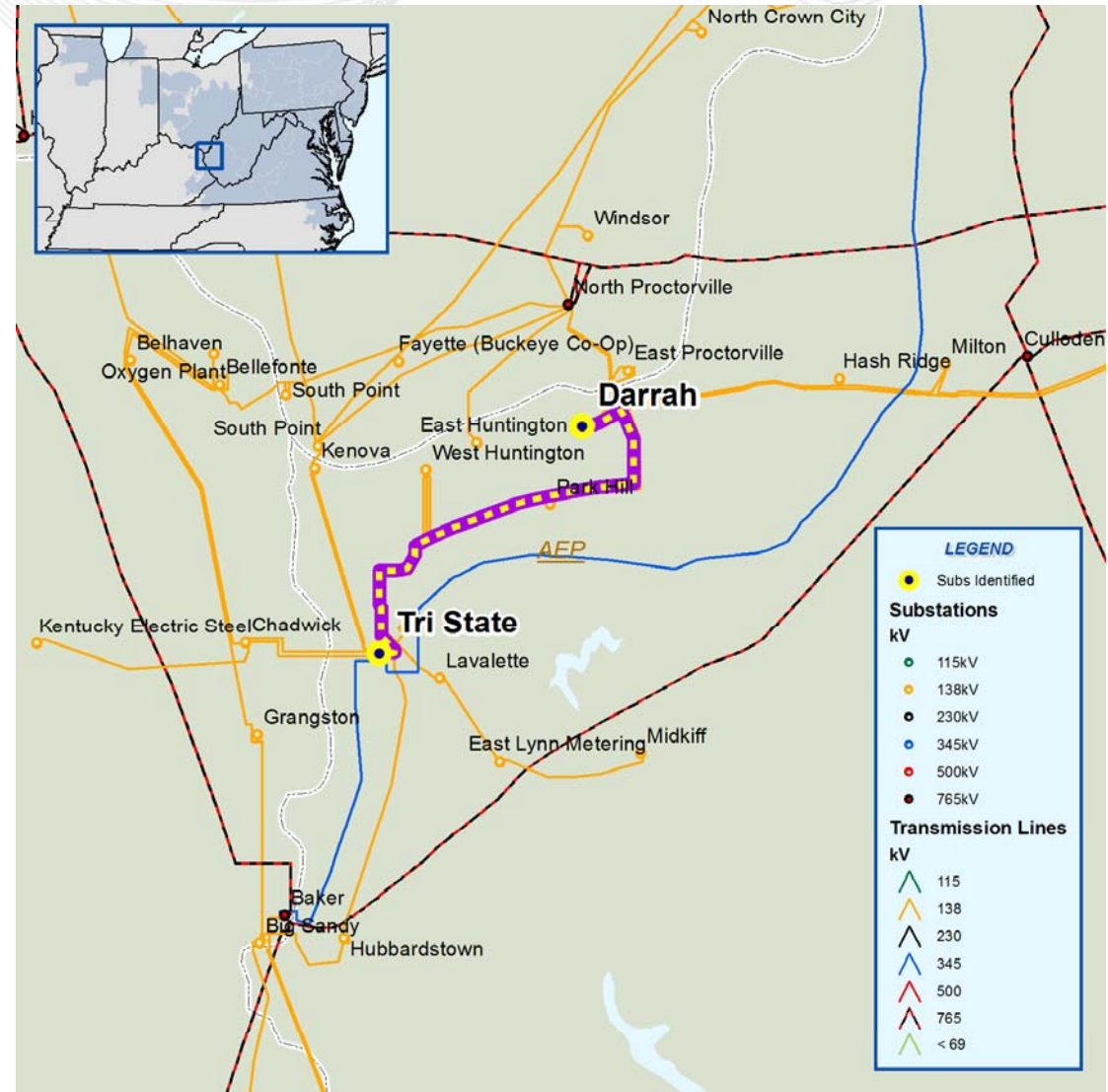
- Generator deliverability violation of Turner – Ruth 138kV for the tower outage of Amos – Kanawha 345kV and Kanawha – Sporn 345kV
- Proposed Solution: Perform sag studies to raise the emergency rating of Turner - Ruth 138kV
- Estimated Project Cost: \$0.02M
- Required IS Date: 6/1/2014



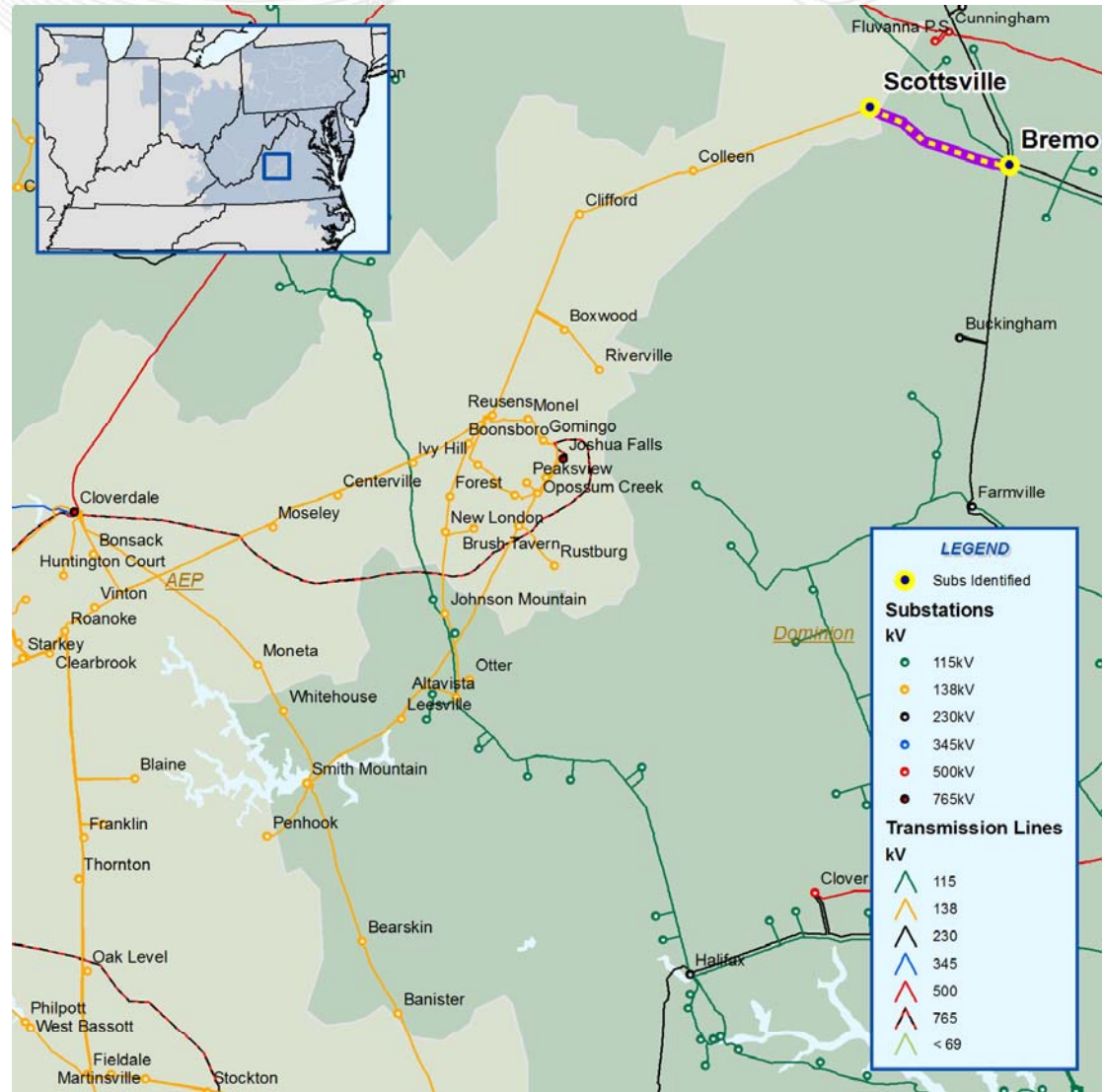
- Generator deliverability overload of Kenova – South Point 138kV for the loss of the Baker 765/345kV transformer
- Proposed Solution: Perform sag studies to raise the emergency rating of Kenova – South Point 138kV
- Estimated Project Cost: \$0.067M
- Required IS Date: 6/1/2014



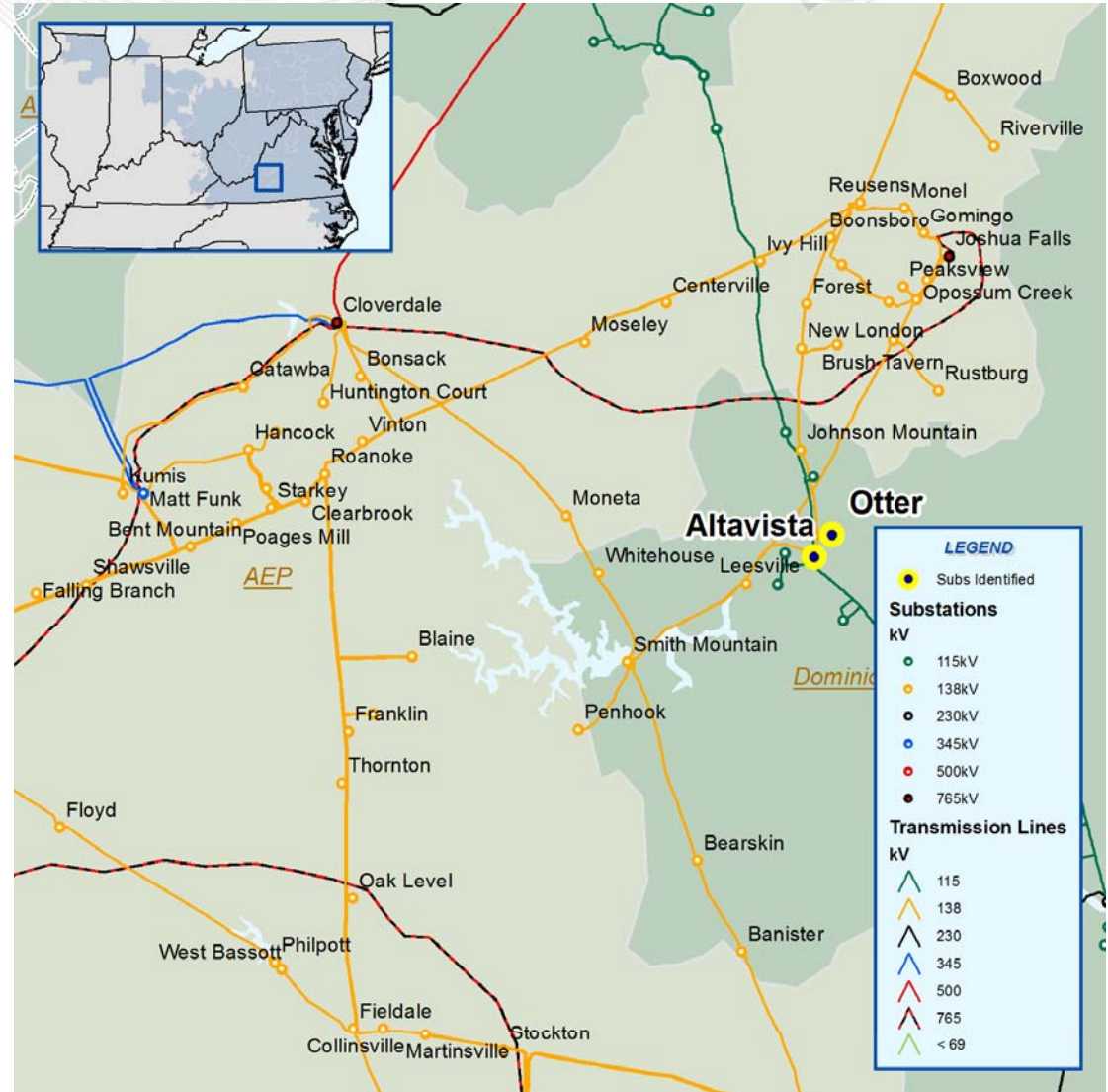
- N-1-1 thermal overload of Tri State - Darrah 138kV for the loss of East Proctorville - Darrah 138kV, East Proctorville - North Proctorville 138kV, and the Amos - Curry - Milton 138kV line
- Proposed Solution: Perform sag studies of the overloaded facilities to raise the emergency ratings
- Estimated Project Cost: \$0.662M
- Required IS Date: 6/1/2014



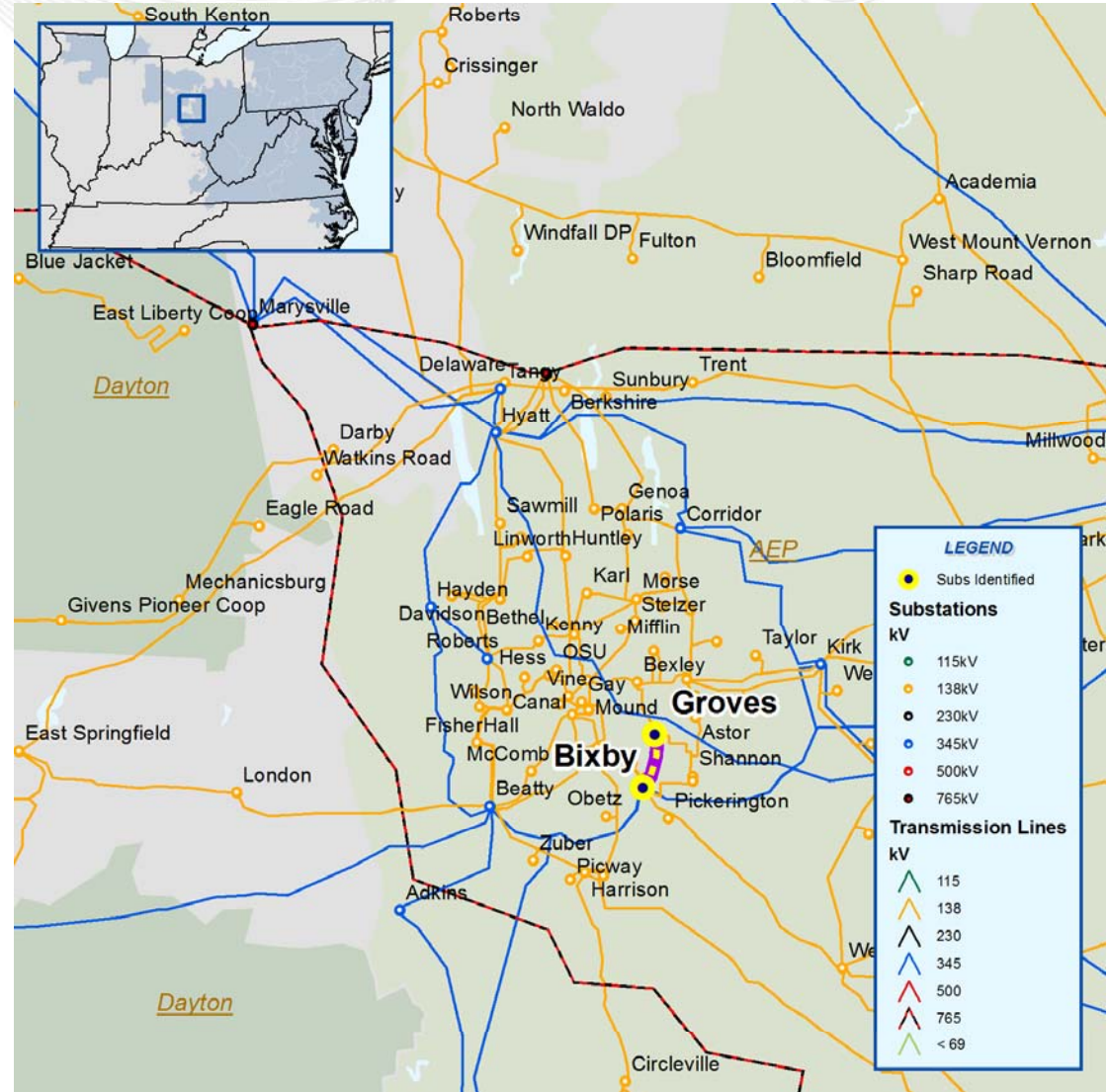
- N-1-1 thermal overload of Scottsville - Bremo 138kV (7.1 miles AEP ownership) for the loss of the following equipment:
 - Cloverdale - Jacksons Ferry 765kV line, Cloverdale - Joshua Falls 765kV line, Cloverdale 765/345kV transformer, Joshua Falls 765/138kV transformer and associated equipment
- Proposed Solution: Perform sag study of Scottsville – Bremo 138kV to raise the emergency rating
- Estimated Project Cost: \$0.350M
- Required IS Date: 6/1/2014



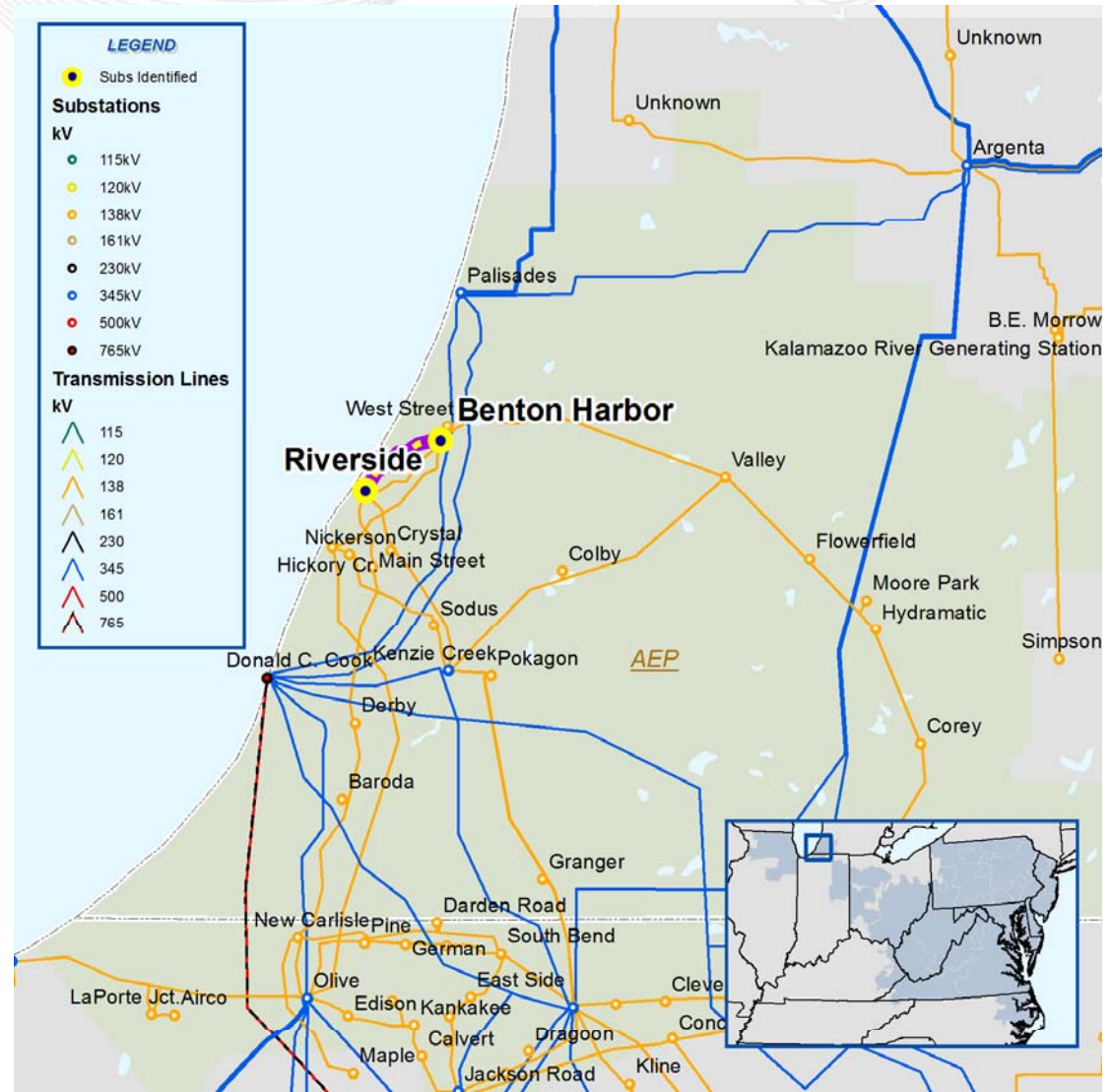
- N-1-1 thermal overload of Otter Switch - Altavista 138kV for the loss of the following equipment:
 - Cloverdale - Jacksons Ferry 765kV line, Cloverdale - Joshua Falls 765kV line, Cloverdale 765/345kV transformer, Joshua Falls 765/138kV transformer and associated equipment
- Proposed Solution: Perform sag study of Otter Switch - Altavista 138kV to raise the emergency rating
- Estimated Project Cost: \$0.050M
- Required IS Date: 6/1/2014



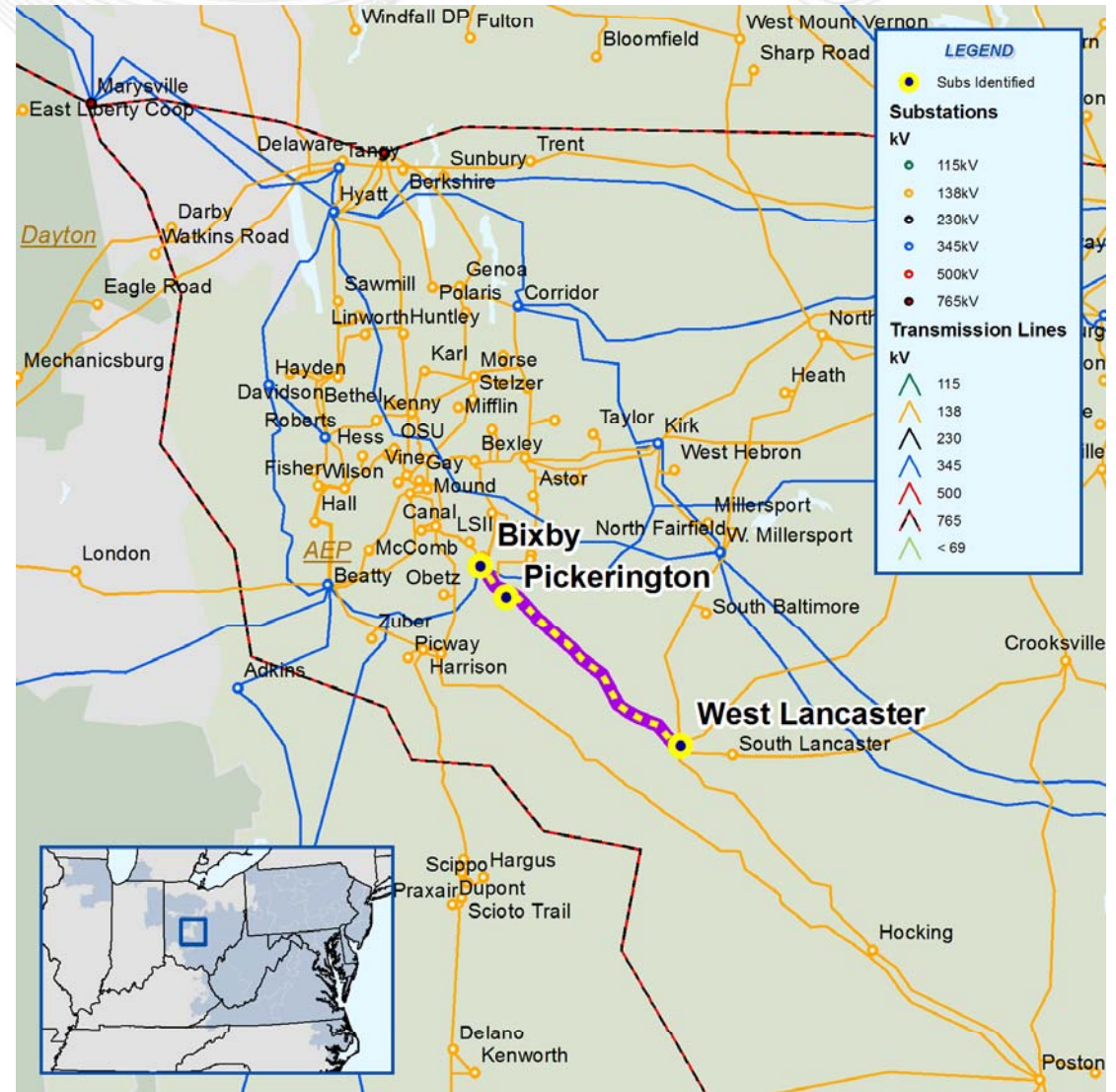
- N-1 thermal overload of Bixby – Three C – Groves 138kV for the loss of the parallel Bixby – Groves 138kV
- Proposed Solution: Reconductor the Bixby – Three C – Groves and Bixby – Groves 138kV tower line
- Estimated Project Cost: \$5.9M
- Required IS Date: 6/1/2014



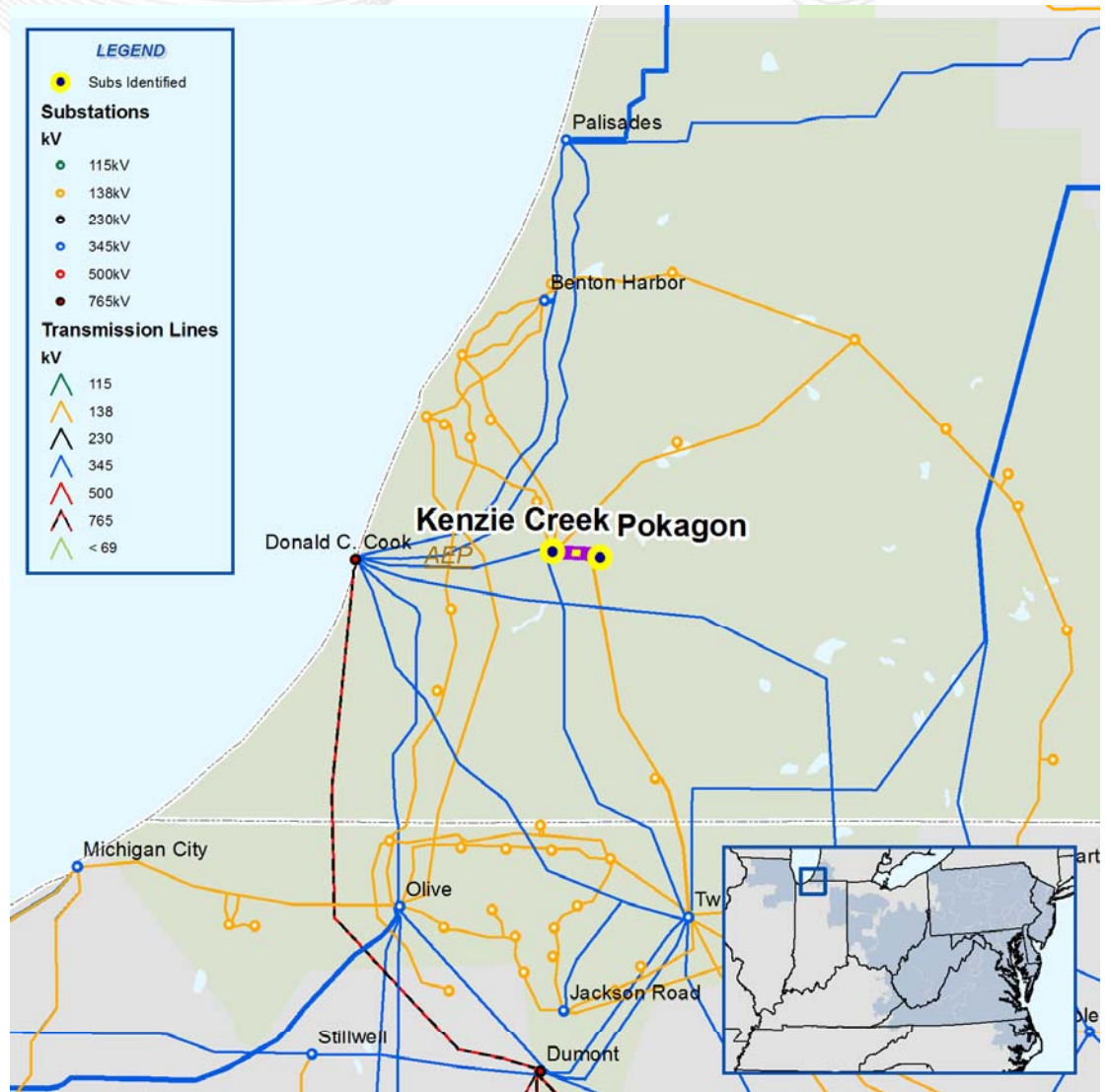
- N-1 thermal overload of Benton Harbor - Riverside 138kV for the loss of the parallel Benton Harbor - Riverside 138kV or the Benton Harbor – West Street 138kV circuit
- Proposed Solution: Upgrade the risers at the Riverside station to increase the rating of Benton Harbor – Riverside 138kV
- Estimated Project Cost: \$0.1M
- Required IS Date: 6/1/2014



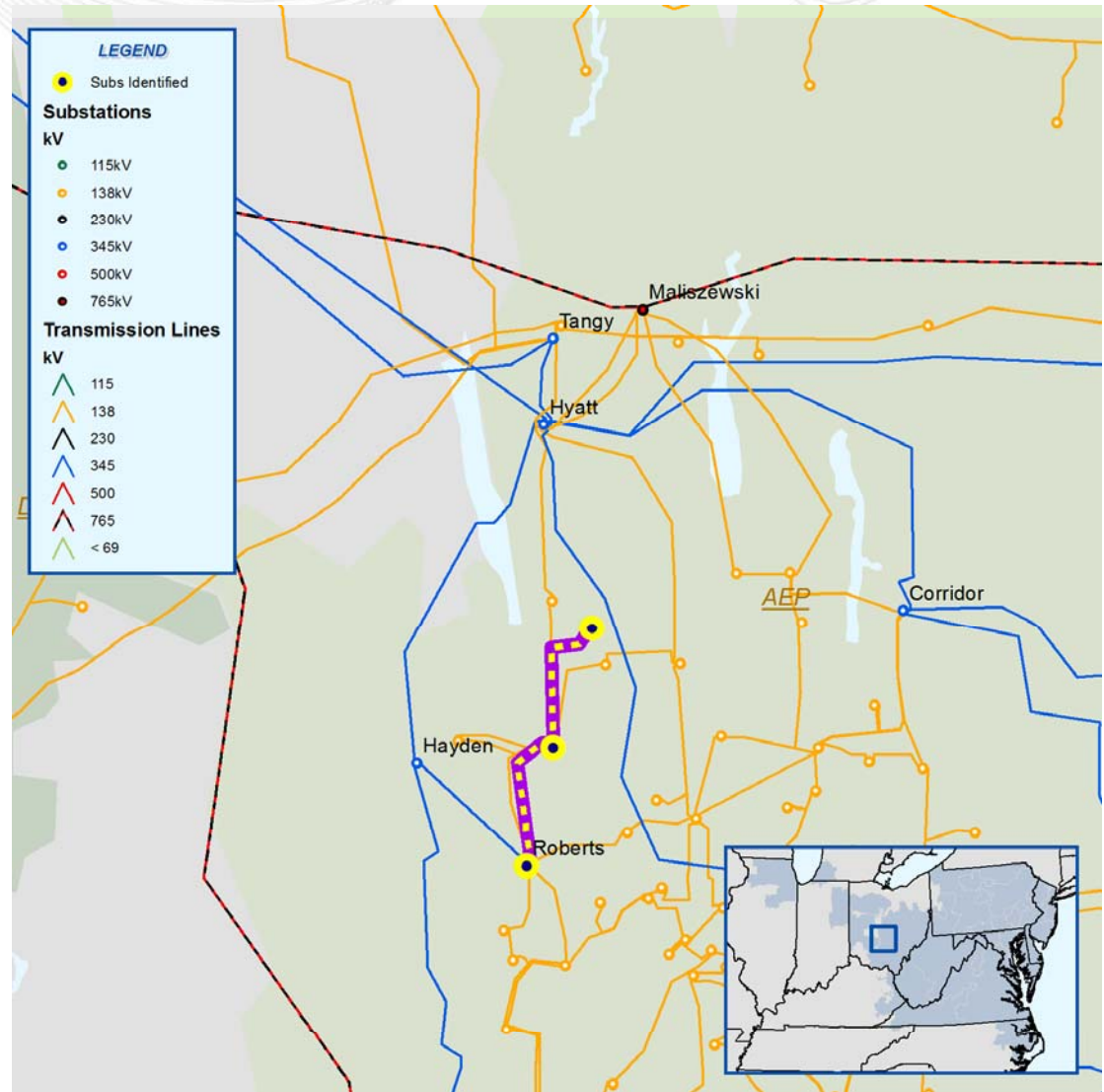
- N-1-1 thermal overload of Bixby – Pickerington Road - West Lancaster 138kV for the loss of Baltimore – West Millersport 138kV + Kimbry - Poston 138kV line
- Proposed Solution: Rebuilding and reconductor the Bixby – Pickerington Road - West Lancaster 138kV line
- Estimated Project Cost: \$12.5M
- Required IS Date: 6/1/2014



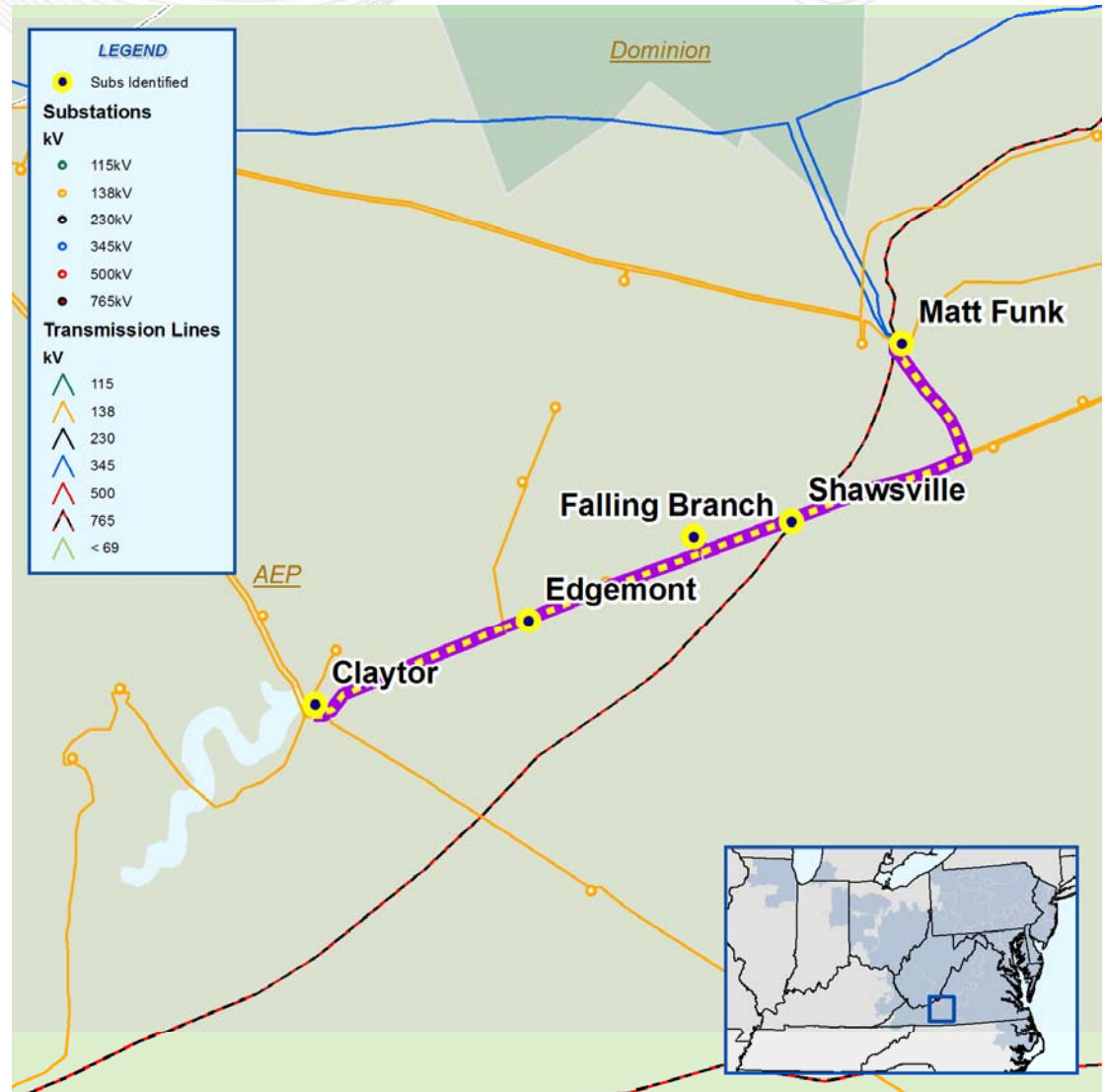
- N-1-1 thermal overload of Kenzie Creek - Pokagon 138kV for the loss of the Twin Branch 345/138kV transformer 7 and the Jackson Road 345/138kV transformer
- Proposed Solution: Perform a sag study for the Kenzie Creek – Pokagon 138kV line and perform the required work to improve the emergency rating
- Estimated Project Cost: \$0.150M
- Required IS Date: 6/1/2014



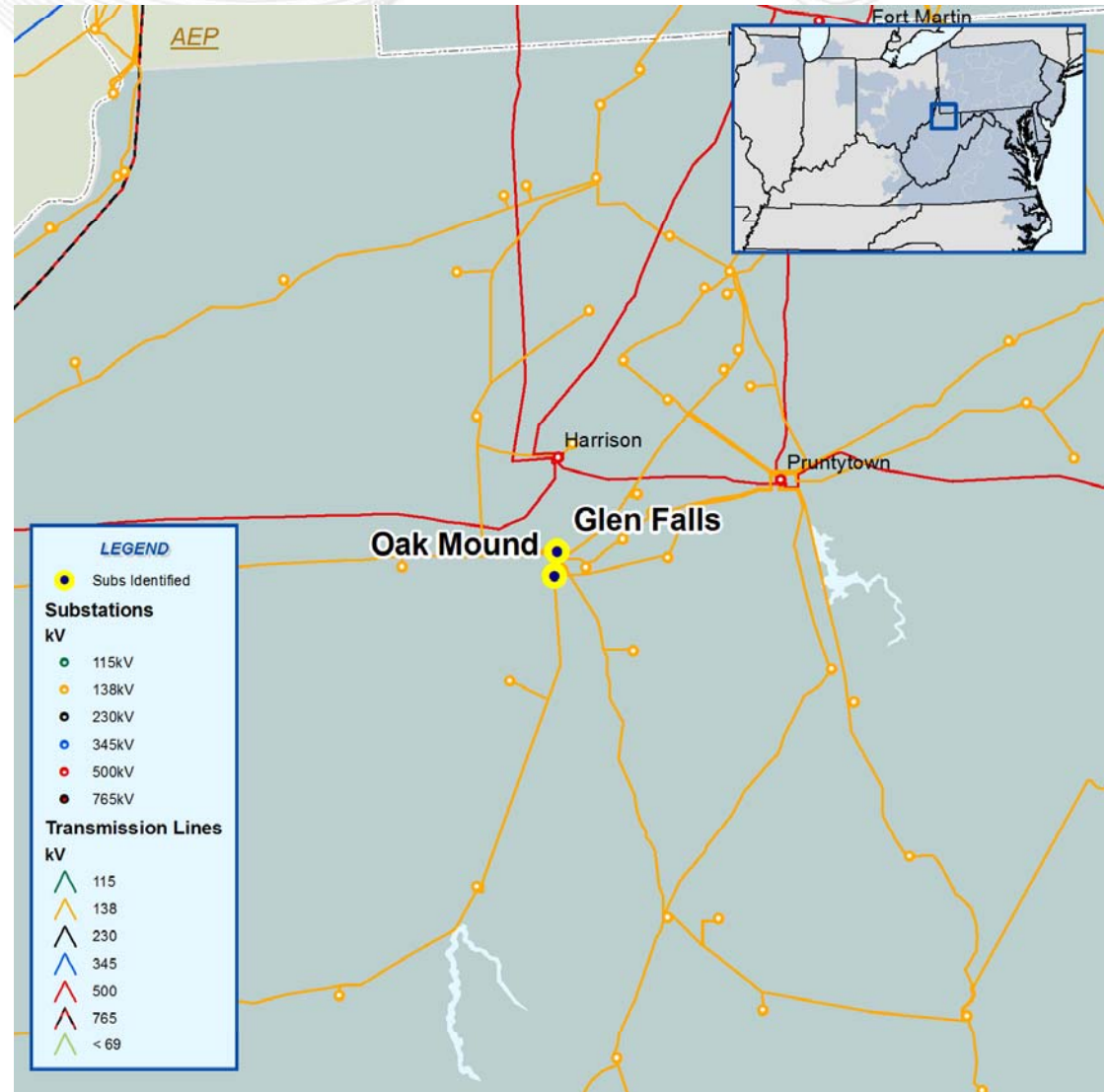
- N-1-1 thermal overload of Bethel - Robert 138kV for the loss of Davidson - Roberts 138kV and Hyatt - Sawmill 138kV
- N-1-1 thermal overload of Bethel - Brooks 138kV for the loss of Davidson - Dublin 138kV and Hyatt - Sawmill 138kV
- Proposed Solution: Un-six-wire the existing Hyatt - Sawmill 138kV line to form two Hyatt - Sawmill 138kV circuits
- Estimated Project Cost: \$3.1M
- Required IS Date: 6/1/2014



- N-1-1 thermal overloads of Claytor – Edgemont 138kV, Edgemont – Falling Branch 138kV, Falling Branch – Shawsville 138kV, and Matt Funk – Shawsville 138kV for multiple 138kV N-1-1 combinations in the area
- Proposed Solution: Perform a sag study and remediation of 32 miles between Claytor and Matt Funk.
- Estimated Project Cost: \$1.6M
- Required IS Date: 6/1/2014



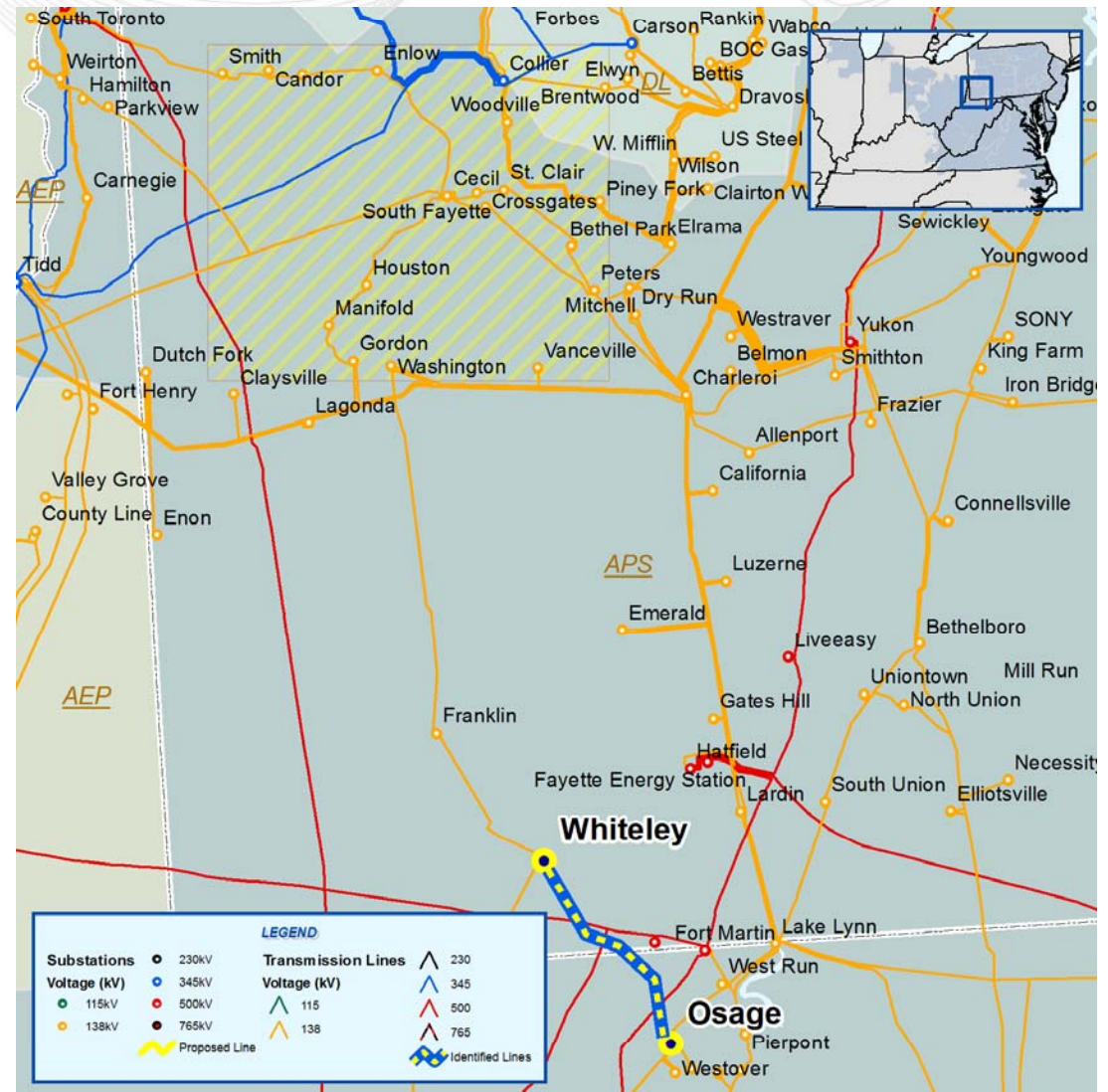
- N-1-1 thermal overload of Glen Falls – Oak Mound 138kV for the loss of Goff Run – Grantsville 138kV and Pruntytown – Maple Lake 138kV
- Proposed Solution: Reconductor Glen Falls - Oak Mound 138kV with 954 ACSR
- Estimated Project Cost: \$1.00M
- Required IS Date: 6/01/2013



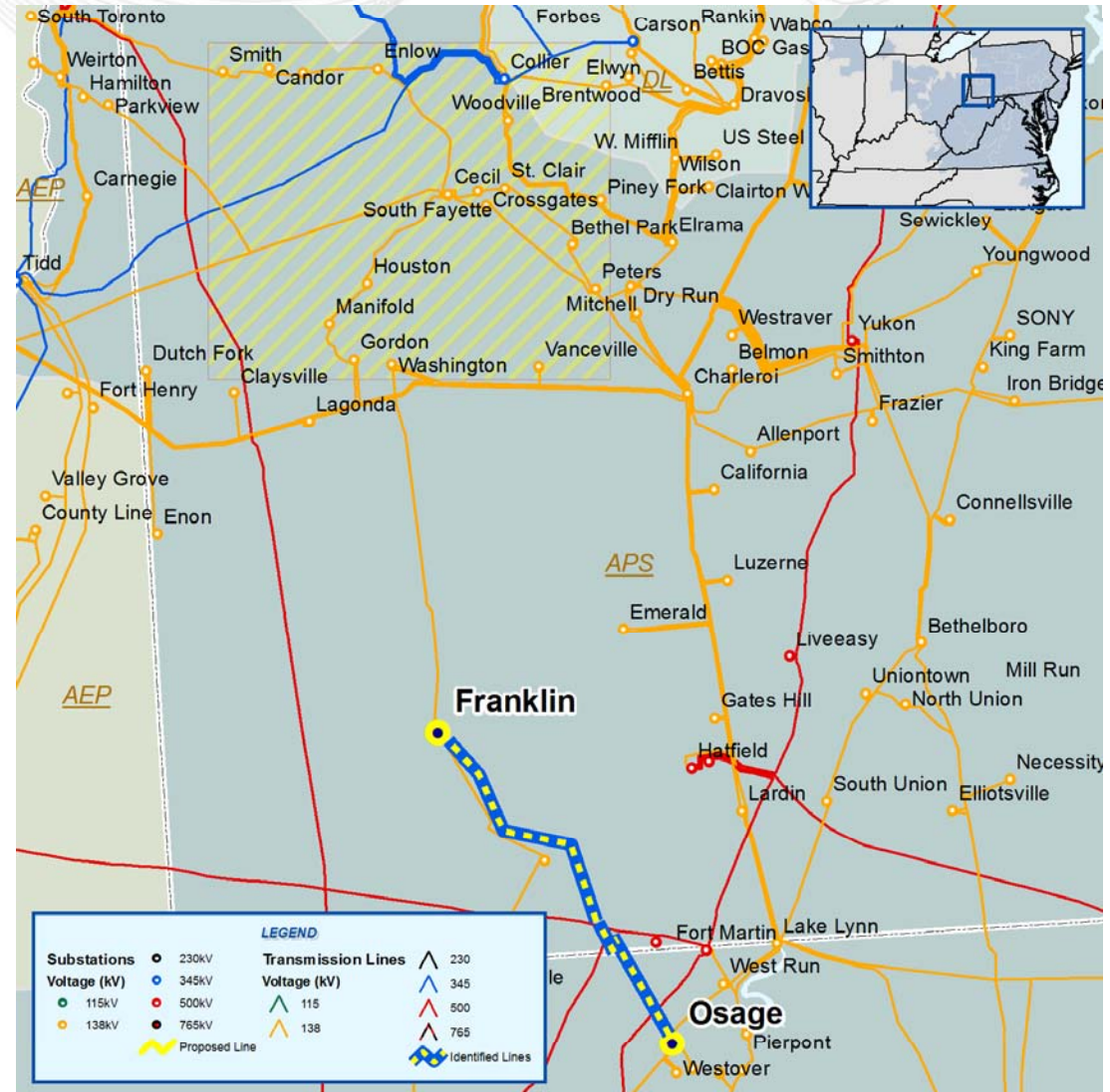
- Prexy Replacement Project
- Reconfigure the Peters to Bethel Park 138kV line and Elrama to Woodville 138kV line to create a 138kV path from Woodville to Peters and a 138kV path from Elrama to Bethel Park.
- Reconductor both Collier – Woodville 138kV lines
- Add static capacitors at five substations in the area
- Cost Estimate: \$11.6M



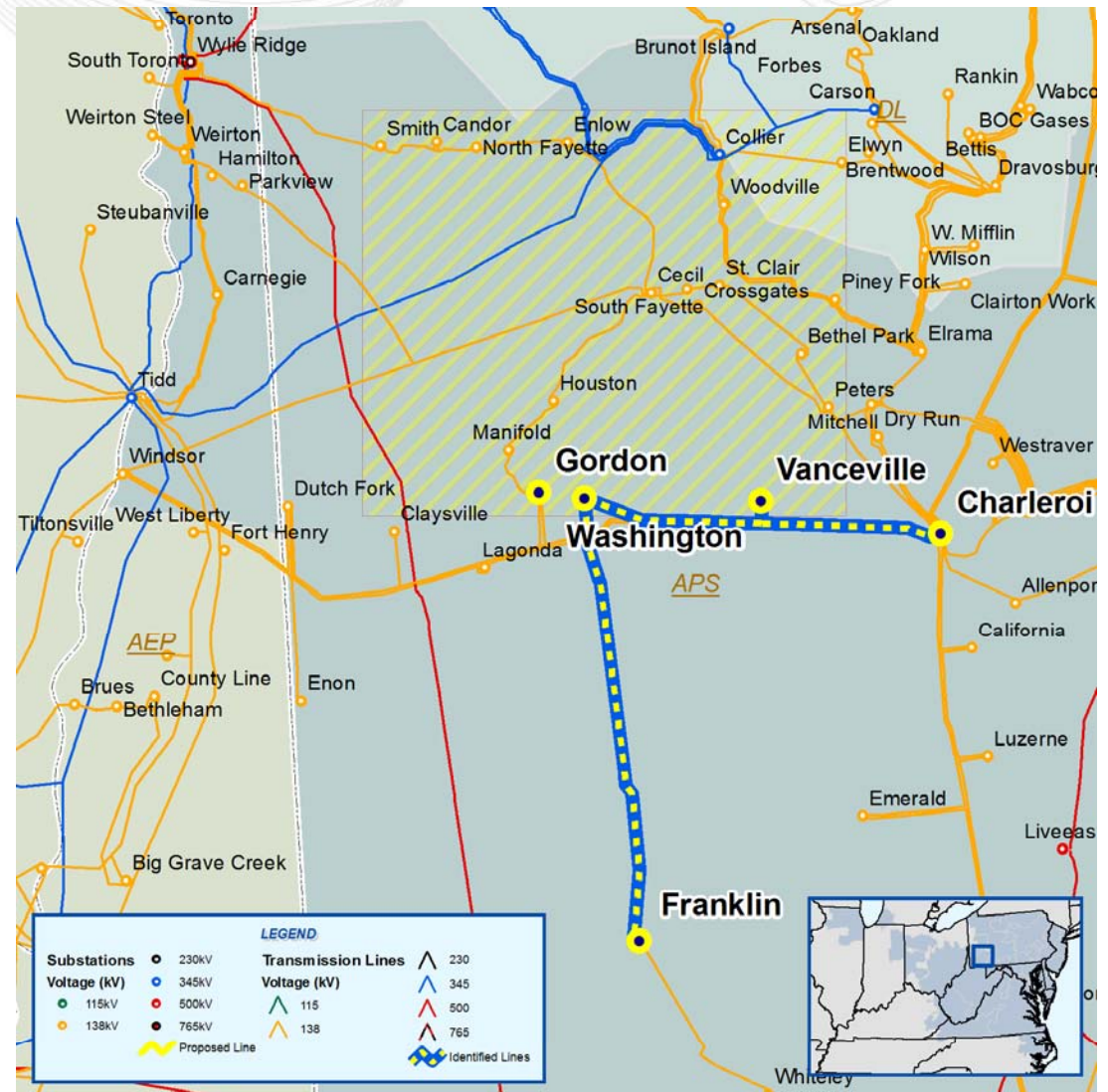
- Prexy Replacement Project
- Construct a new Osage – Whiteley 138kV line: (b0674)
- Cost: \$20.9M
- This project has already been approved as a baseline upgrade b0674



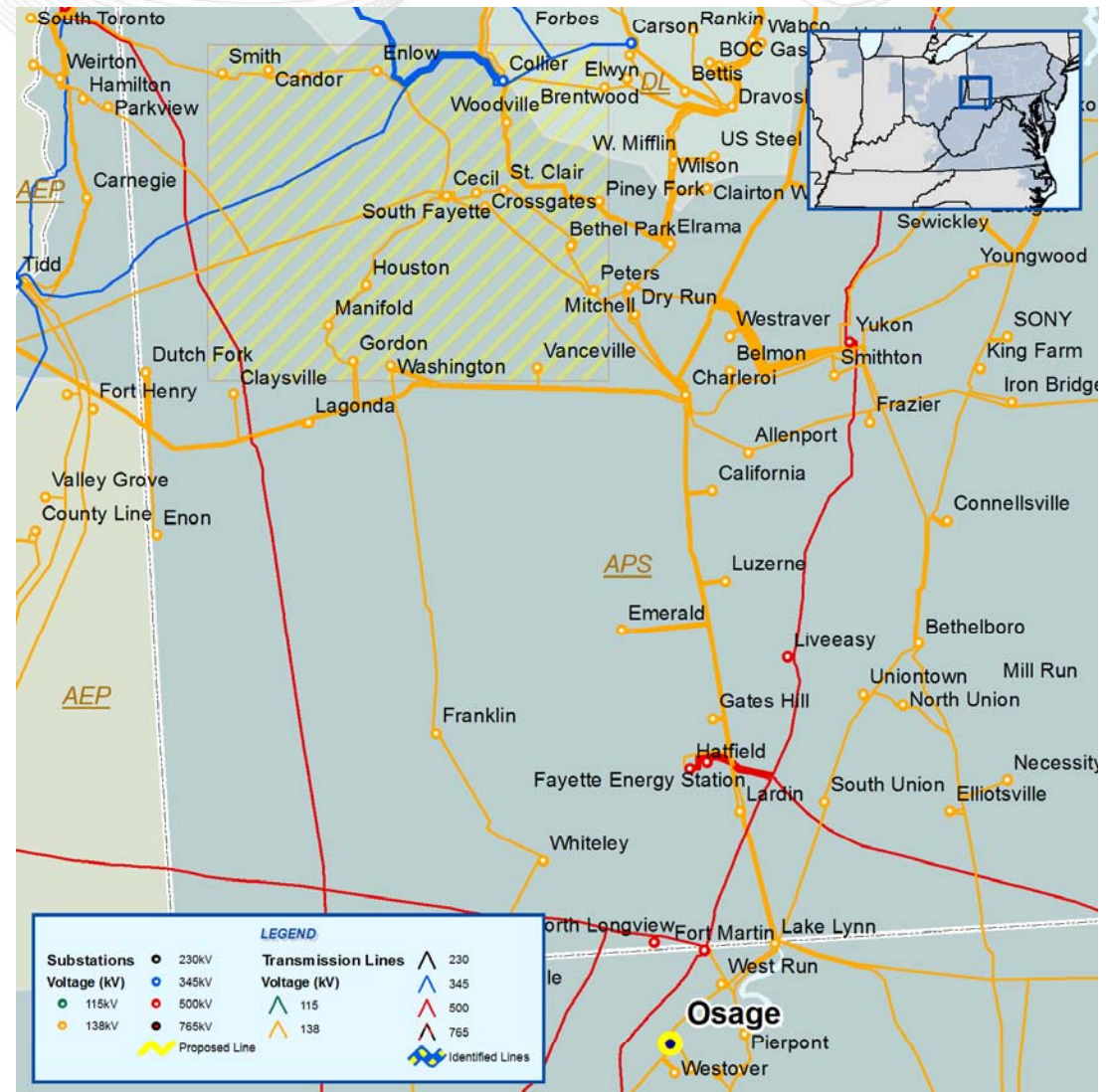
- Prexy Replacement Project
- At 502 Junction Substation, install a 500/138kV transformer
- Cost: \$27.2M
- Construct a new Franklin – 502 Junction 138kV line including a rebuild of the Whiteley – Franklin 138kV line to double circuit
- Cost: \$17.1M
- Construct a new 502 Junction – Osage 138kV line
- Cost: \$4.2M



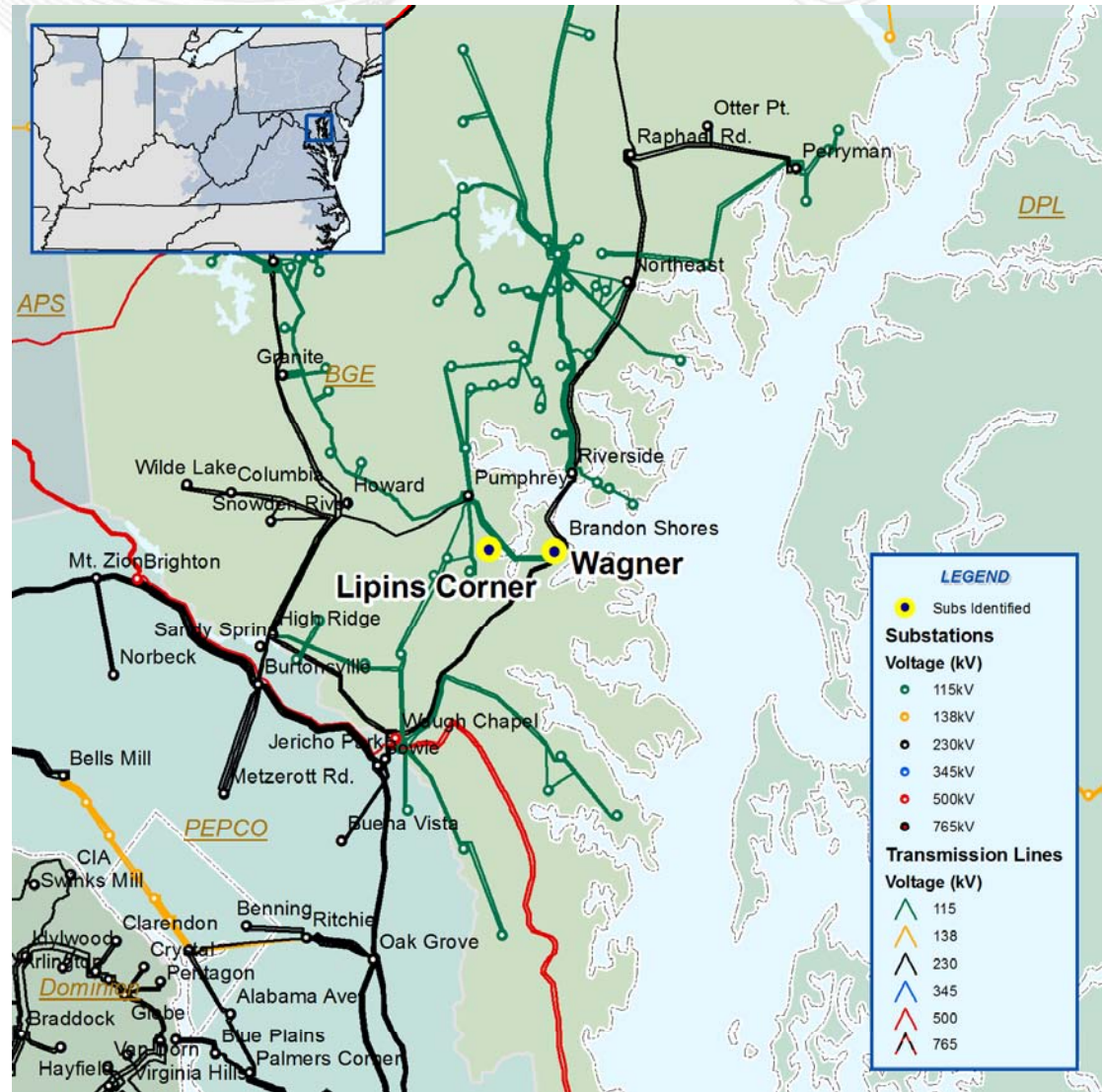
- Prexy Replacement Project
- Construct Braddock Station, a new 138kV breaker station that connects the Charleroi–Gordon 138kV line, Washington–Franklin 138kV line and the Washington–Vanceville 138kV line including a 66 MVar capacitor
- Cost: \$15.1M



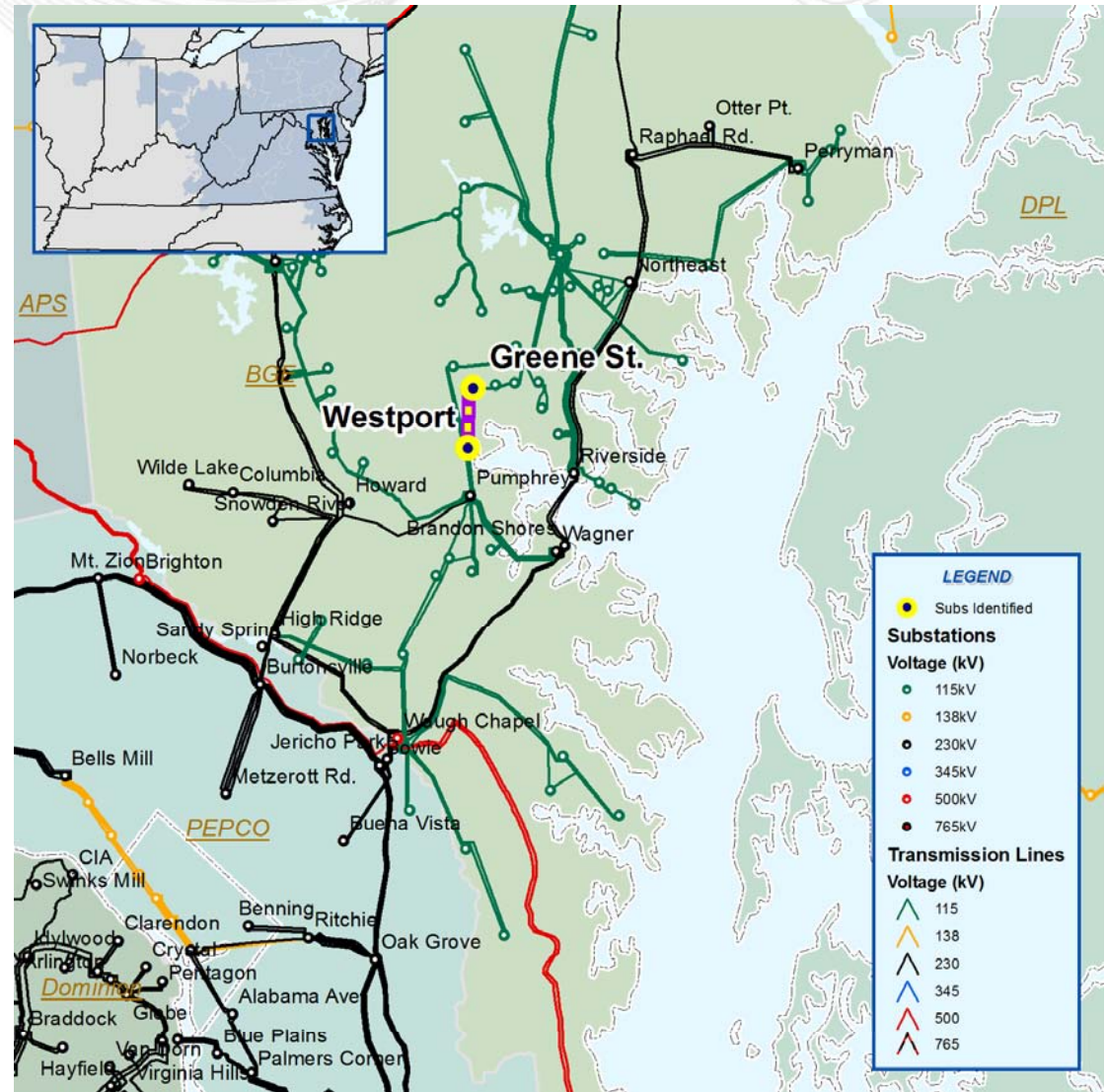
- Prexy Replacement Project
- Raise three structures on the Osage-Collins Ferry 138kV line to increase the line rating
- Cost: \$0.4M



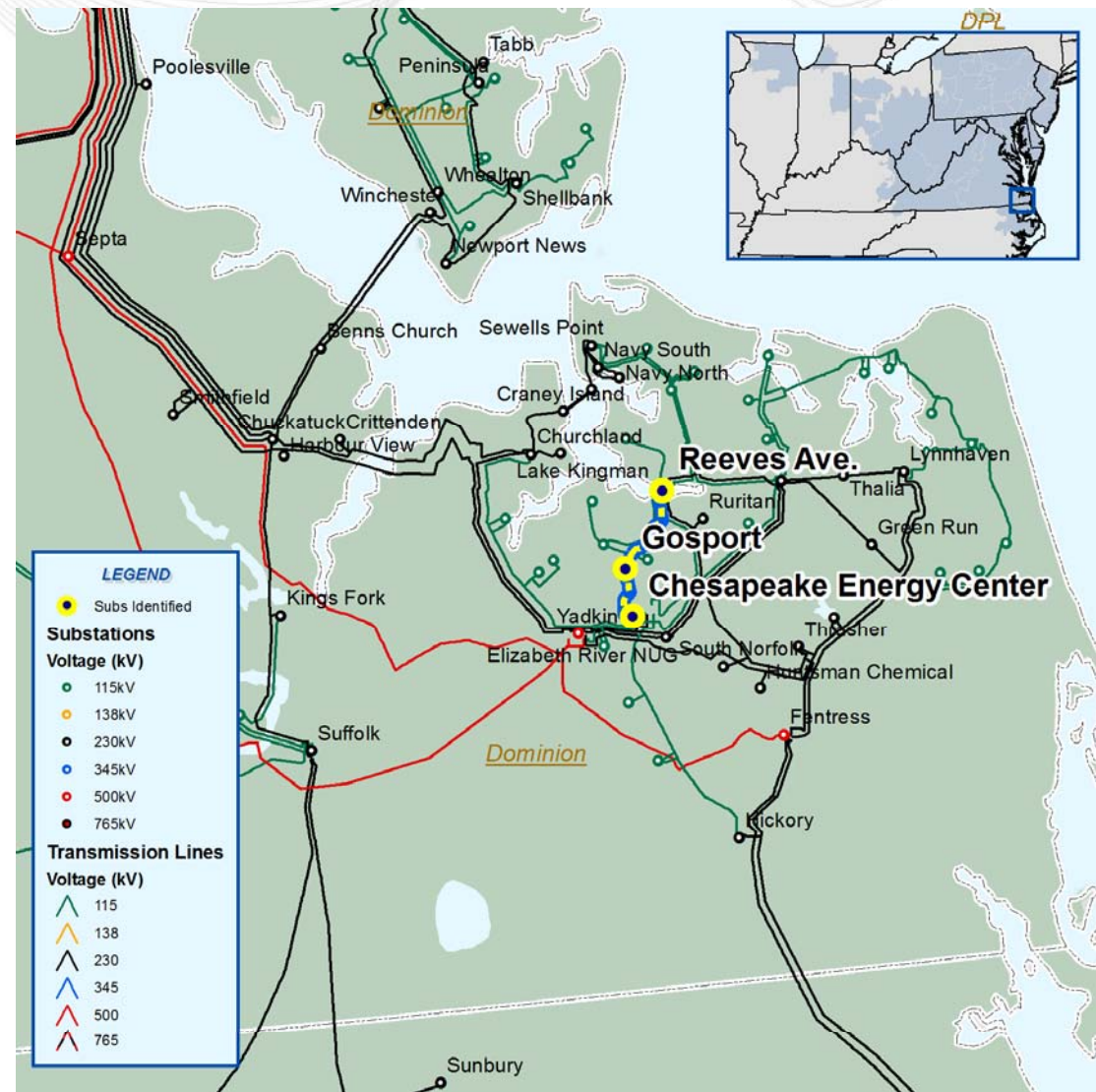
- Generation Deliverability Violation
- Wagner – Solley 115kV circuit 110534 is overloaded for tower contingency that removes the two Wagner to Pumphrey 115kV circuits.
- Proposed solution:
Upgrade wire sections at Wagner on both 110534 and 110535 115kV circuits.
Reconfigure Lipins Corner substation.
- Estimate Cost:
\$0.1M
- Expected IS Date:
06/01/2014



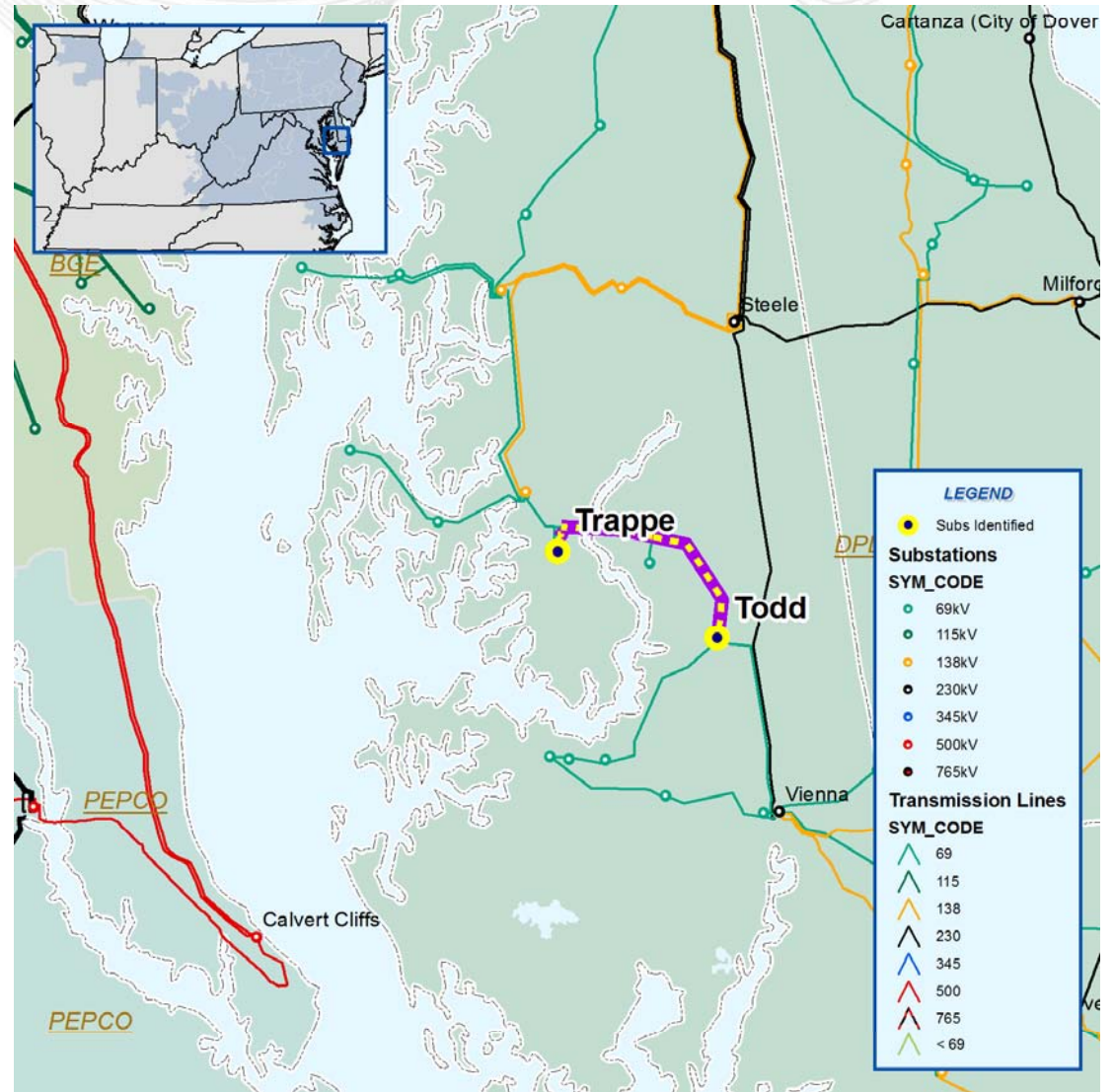
- Generation Deliverability Violation
- Westport – Greene St. 115kV circuits #110553 and #110554 are overloaded for line fault stuck breaker contingency.
- Proposed Solution: Move the Hillen Rd substation from circuits 110507/110508 to circuits 110505/110506.
- Estimated Project Cost: \$0.2 M
- Expected IS Date: 6/01/2011



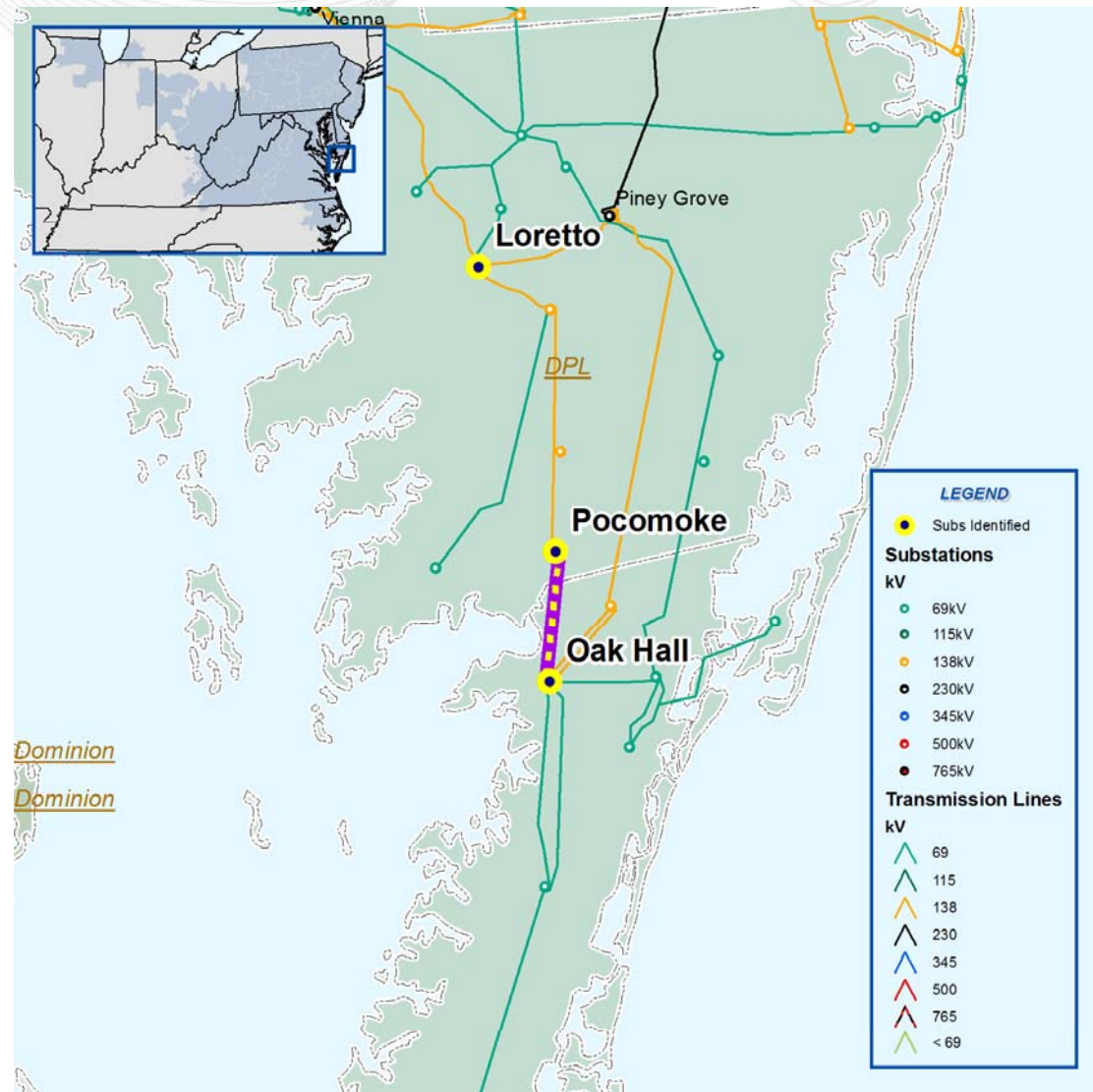
- Gosport generator instability and low voltages as a result of a double line to ground fault on the Gosport to Reeves Avenue 115kV or Gosport to Chesapeake 115kV circuits and primary relay failure
- Proposed Solution: Install dual primary protection schemes on Gosport line 62 and 51 at the remote terminals (b0583)
- Estimated Project Cost: \$0.46M
- Expected IS Date: 6/01/2010



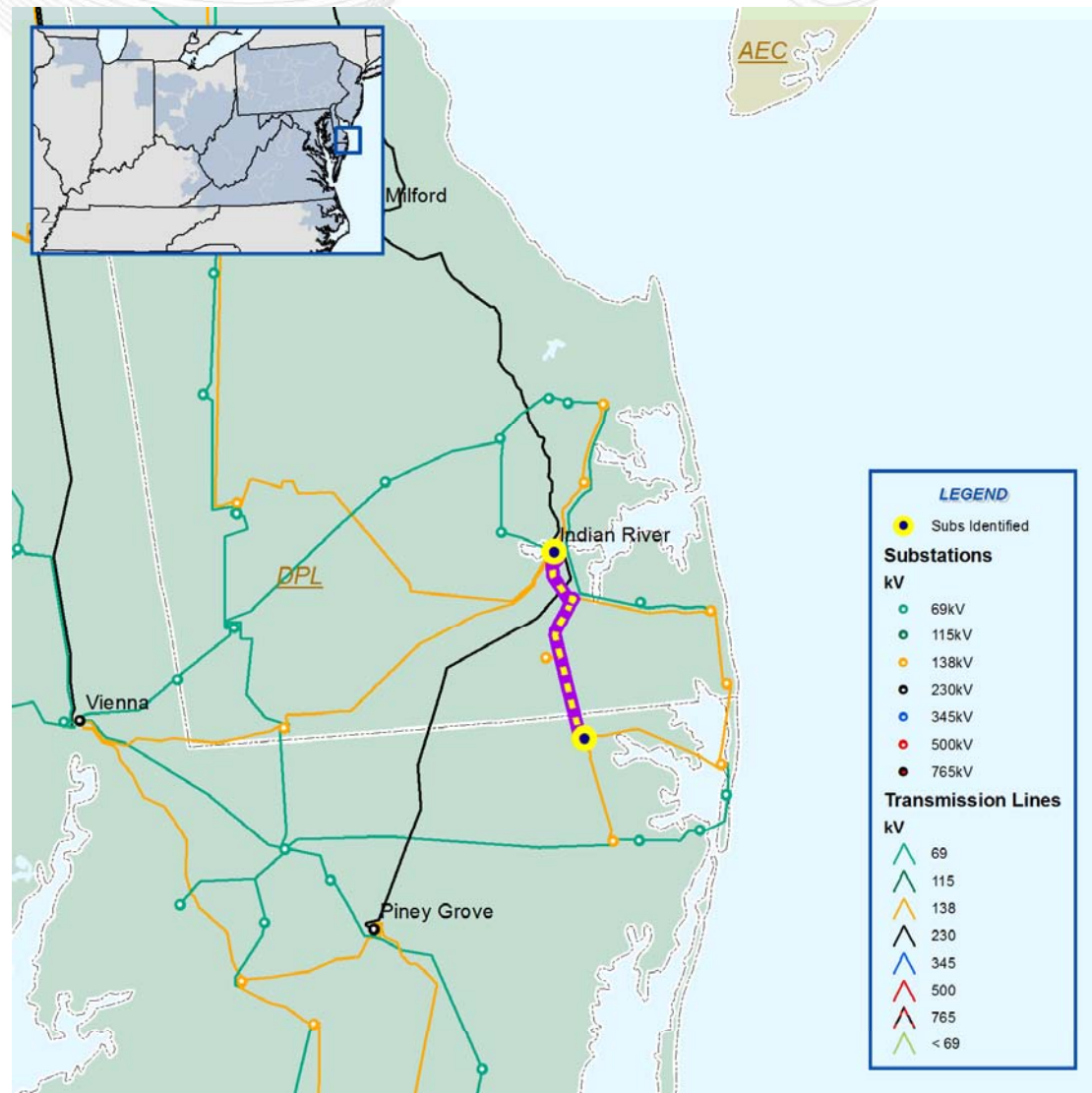
- The 2007 RTEP identified an overload on the Trappe Tap – Todd 69kV line for DPL South load deliverability in 2010
- Approved solution (b0566) is to rebuild the Trappe Tap – Todd 69kV line
- Updated analysis using this years RTEP assumptions indicates this upgrade can be deferred to 2012



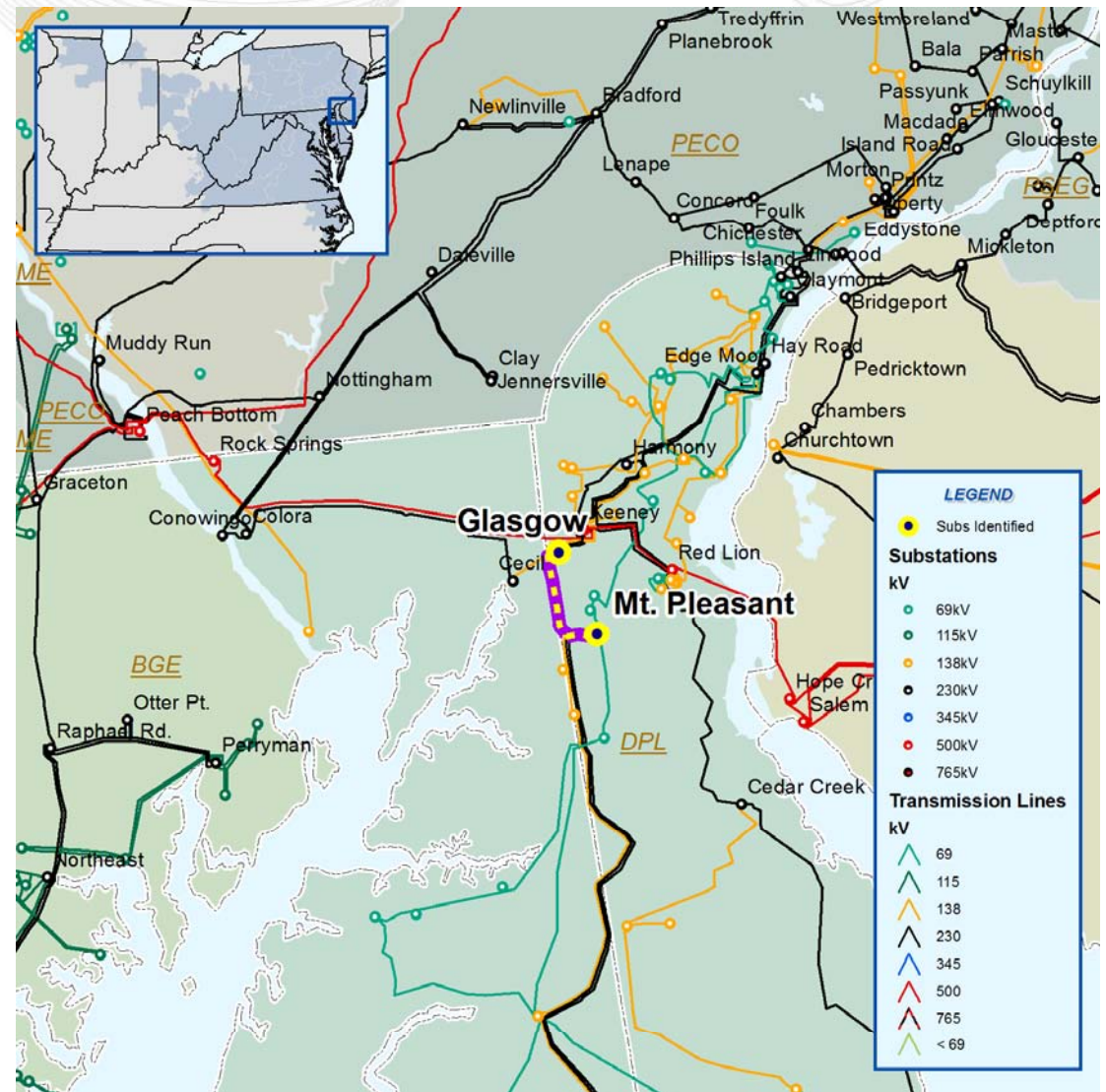
- The 2008 RTEP identified N-1-1 voltage violations, specifically, low voltage magnitude and voltage drop violations at several 138kV buses / loss of Loretto 230/138kV transformer + loss of Oak Hall – Pocomoke 138kV line in 2013
- Approved solution (b0753) is to add a 2nd Loretto 230/138kV transformer
- Updated analysis using this years RTEP assumptions indicates this upgrade can be deferred to 2014



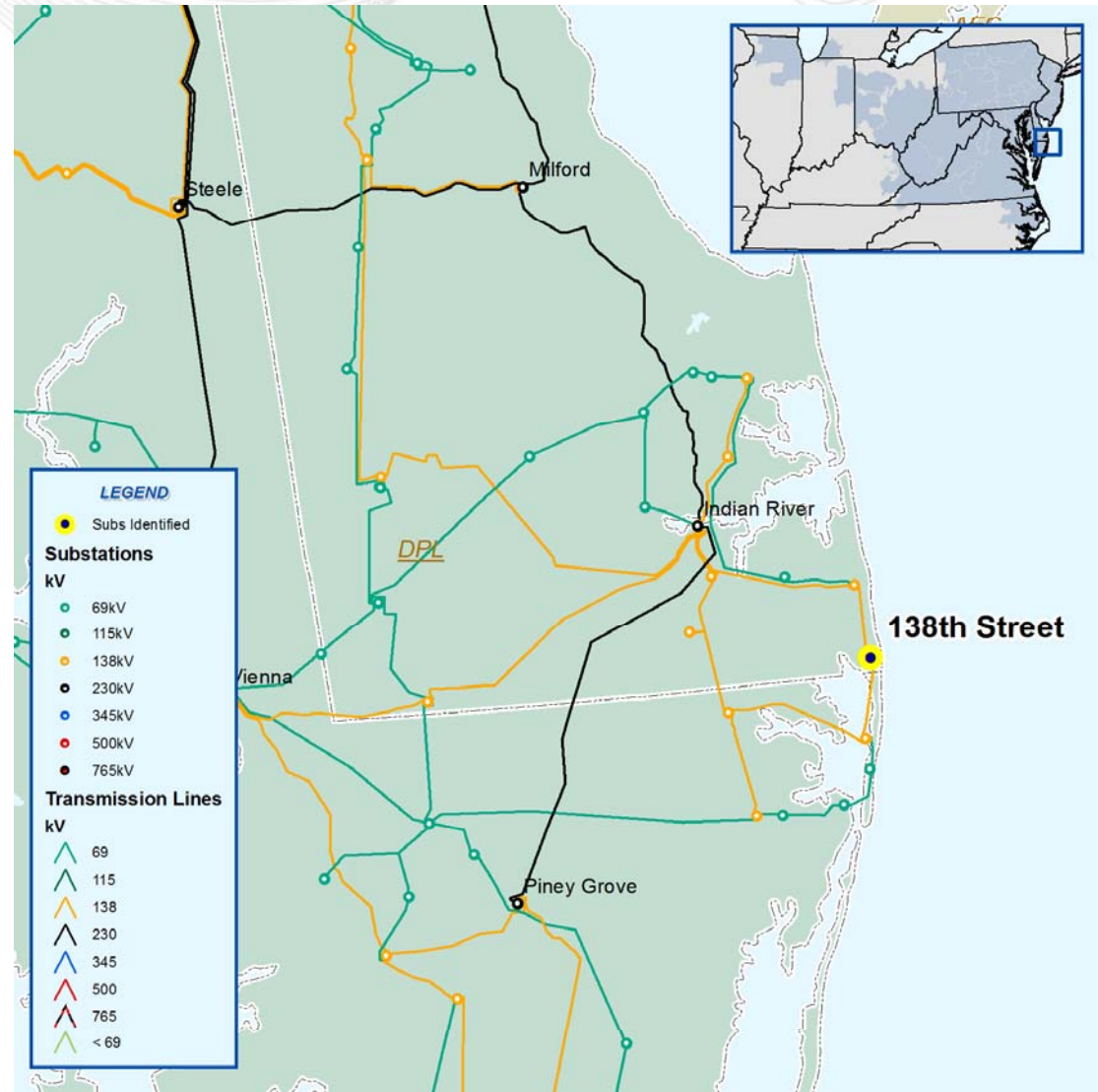
- Baseline upgrade (b0735) to rebuild Indian River-Bethany 138kV line now cancelled
- This upgrade addressed the N-1-1 thermal violations in the area, but does not address the N-1-1 reactive violations.
- The upgrade is no longer needed due to the baseline upgrade (b0737) to build a new Indian River-Bishop 138kV line
- Both upgrades were presented at the September 2008 TEAC



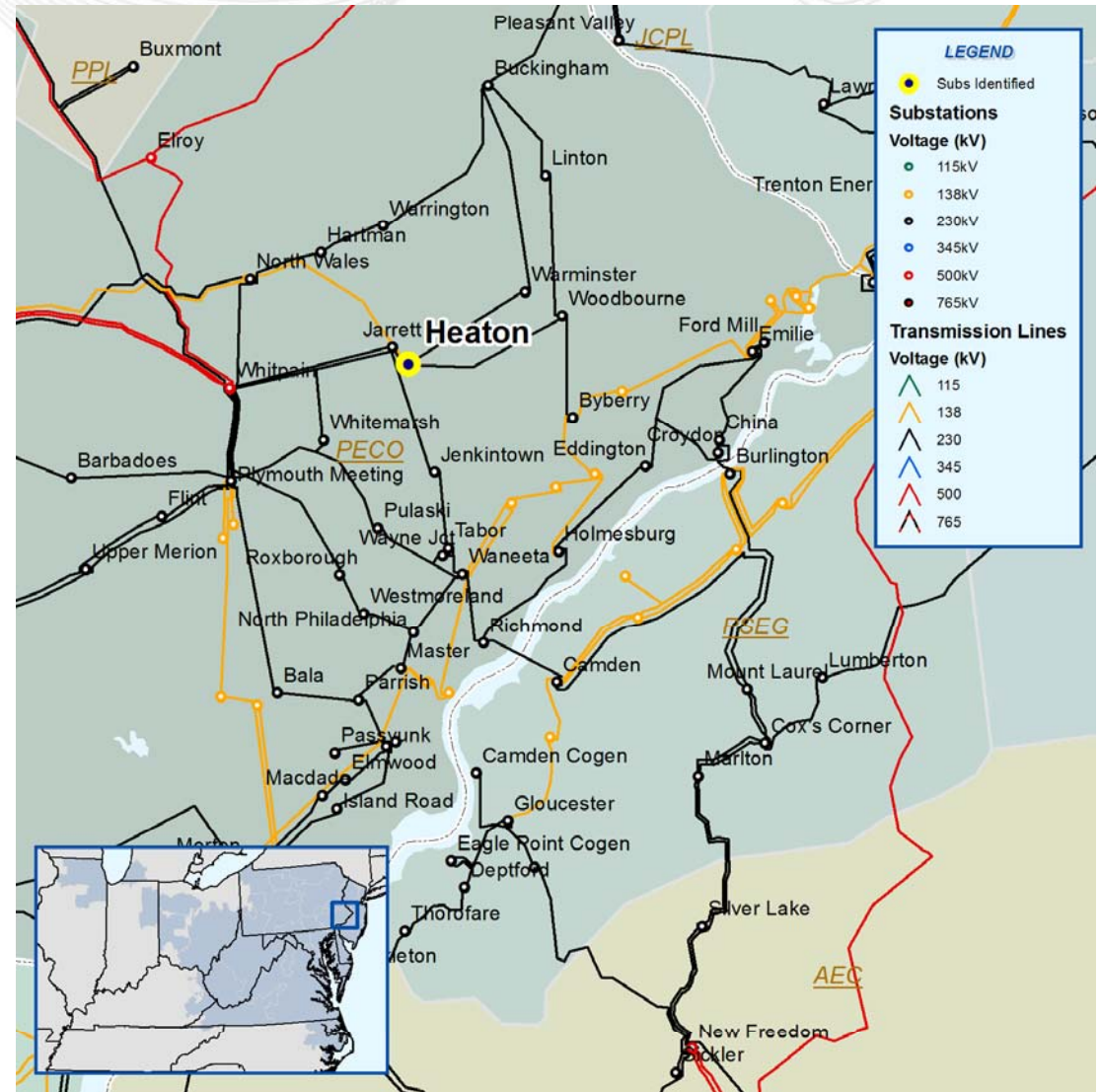
- Baseline upgrade (b0734) to rebuild Steele-Church 138kV line now cancelled
- This upgrade was presented at the September 2008 TEAC
- This upgrade addressed the N-1-1 thermal violations in the area, but does not address the N-1-1 reactive violations.
- The new proposed upgrade is to build a 2nd Glasgow-Mt Pleasant 138kV line which resolves both the thermal and reactive violations.
- Estimated Project Cost: \$16.3 M
- Required IS Date: 6/1/2013



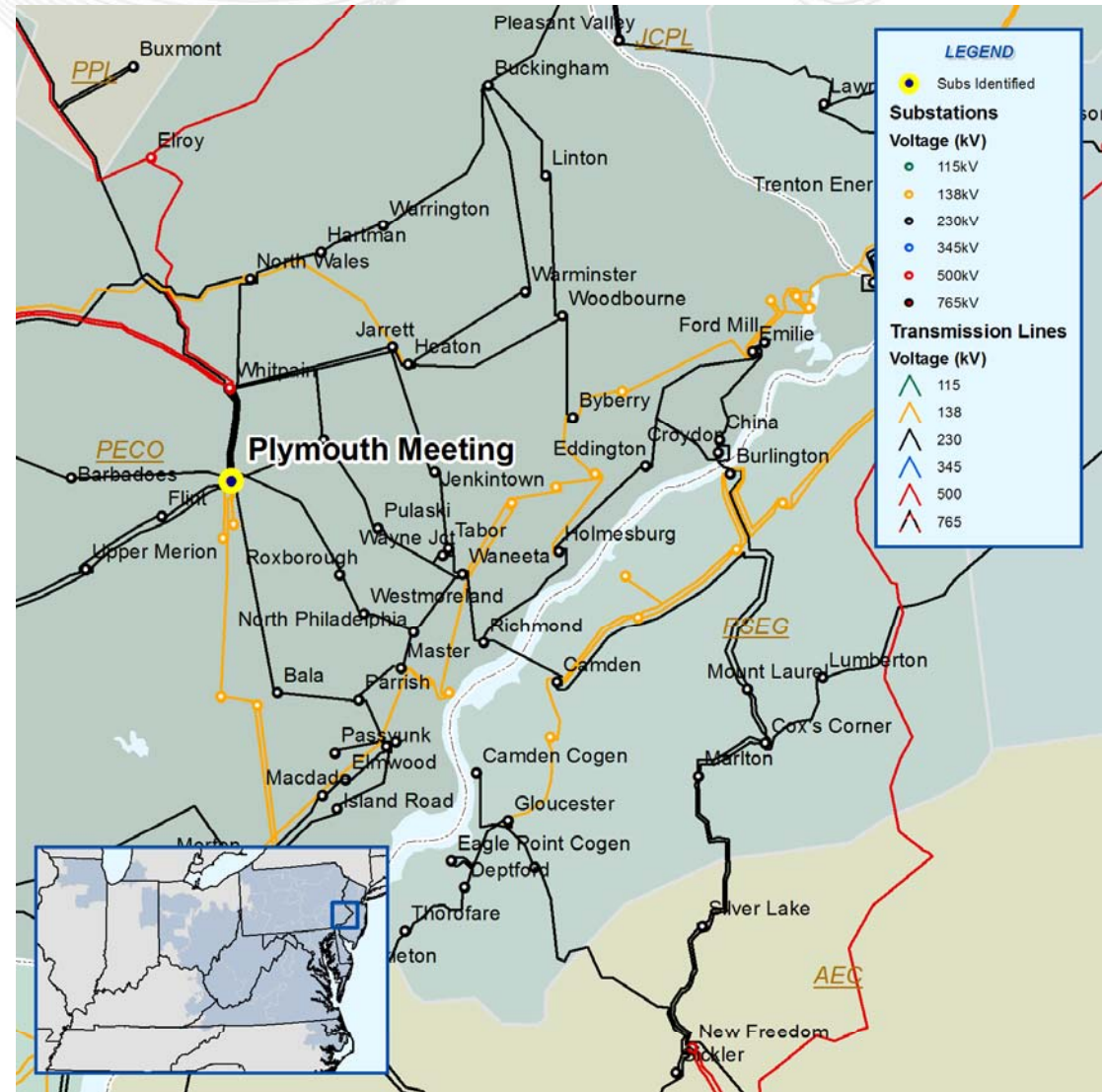
- Low voltage magnitude and voltage drop violations in the 138th Street area for several N-1-1 contingency combinations.
- Proposed Solution: Install a 50 MVAR SVC at the 138th Street 138kV bus
- Estimated Project Cost: \$8.65 M
- Required IS Date: 6/01/2013



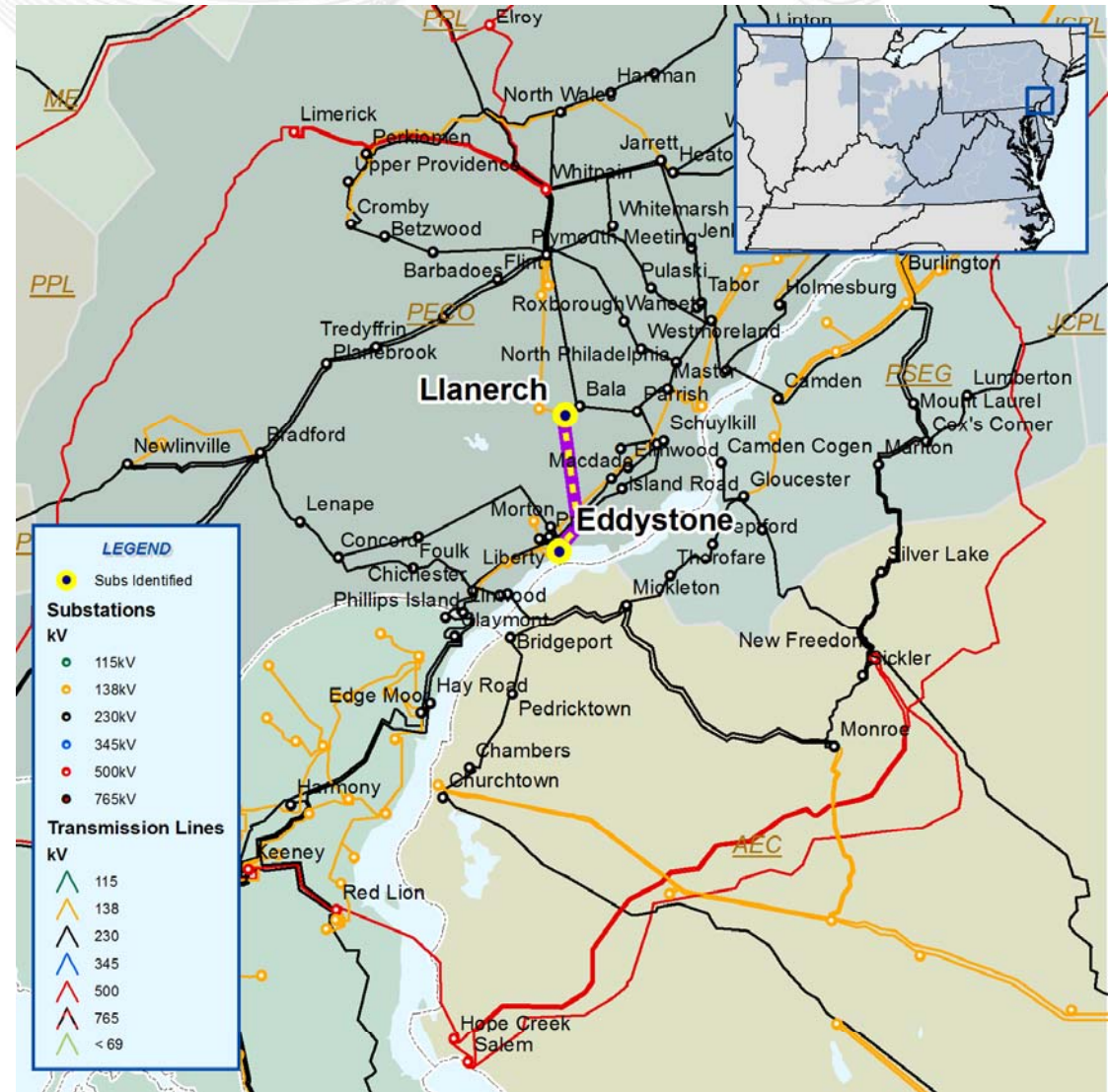
- Voltage magnitude and voltage drop violations at Heaton, North Wales, and Perkiomen 138kV buses / loss of various N-1-1 contingency combinations
- Proposed Solution: Install a 2nd 230/138kV transformer and 35 MVAR capacitor at the Heaton 138kV bus (b0842)
- Estimated Project Cost: \$6.4 M
- Expected IS Date: 6/01/2013



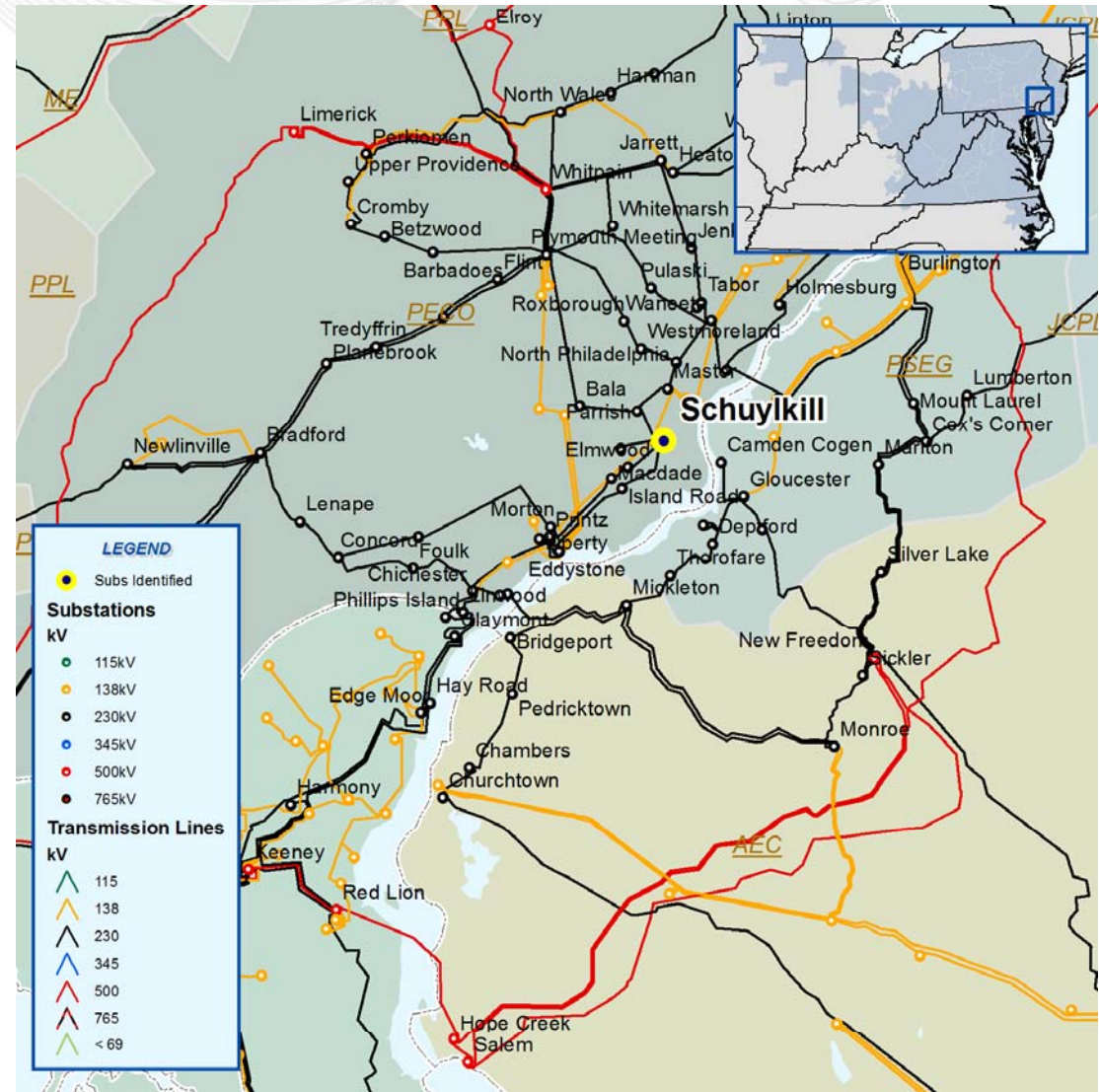
- Voltage magnitude and voltage drop violations at the Plymouth Meeting 138kV bus / loss of various N-1-1 contingency combinations
- Proposed Solution: Move the connection points for the 2nd Plymouth Meeting 230/138kV transformer (b0841)
- Estimated Project Cost: \$3.0 M
- Expected IS Date: 6/01/2013



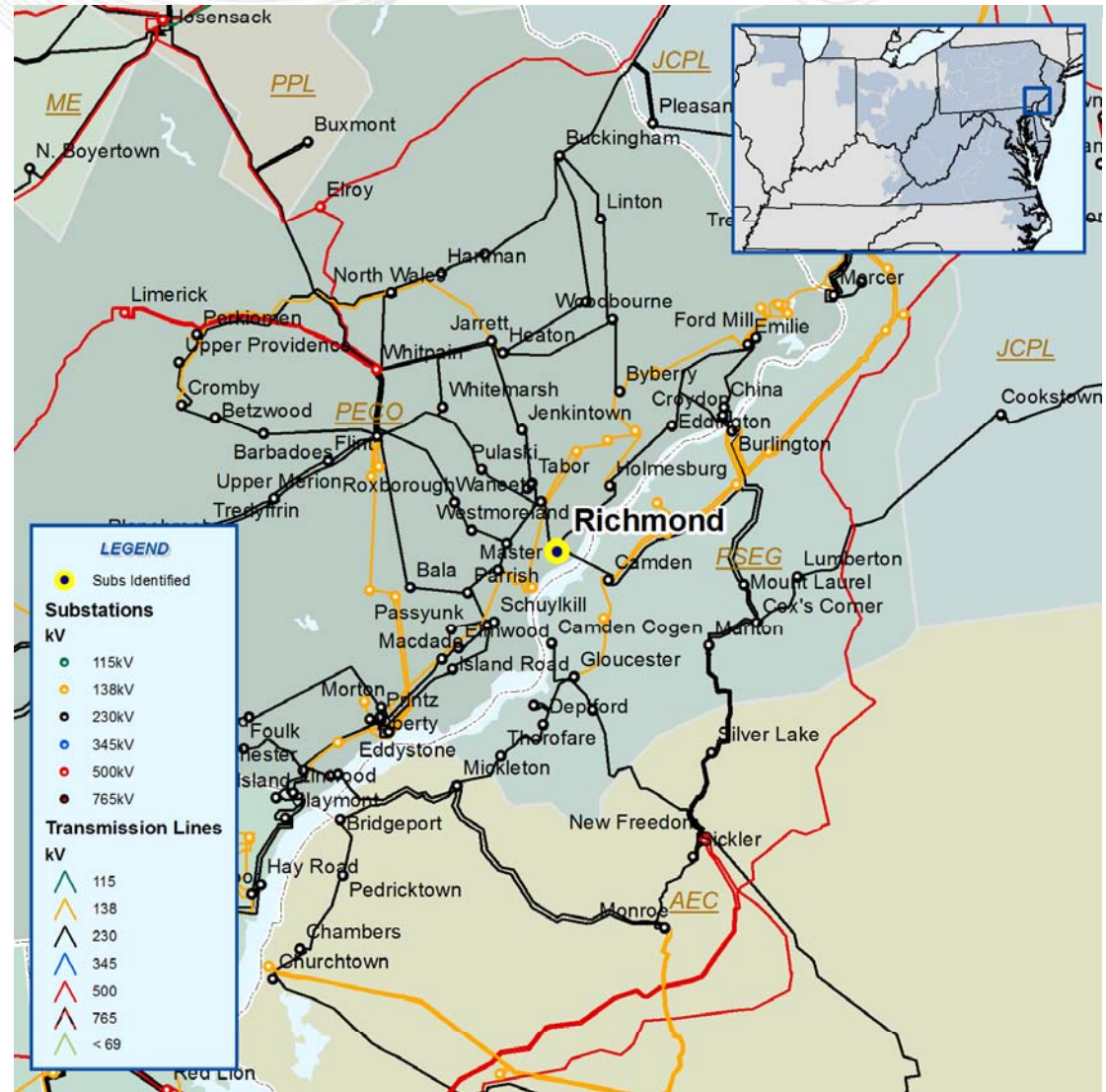
- Low voltage at Llanerch and Bryn Mawr stations / N-1-1 loss of Llanerch 138kV bus #5 + loss of Llanerch – Eddystone 138kV line 130-45
- Install a 75 MVAR capacitor at the Llanerch 138kV bus
- Estimated Project Cost: \$2.6 M
- Required IS Date: 6/1/2013



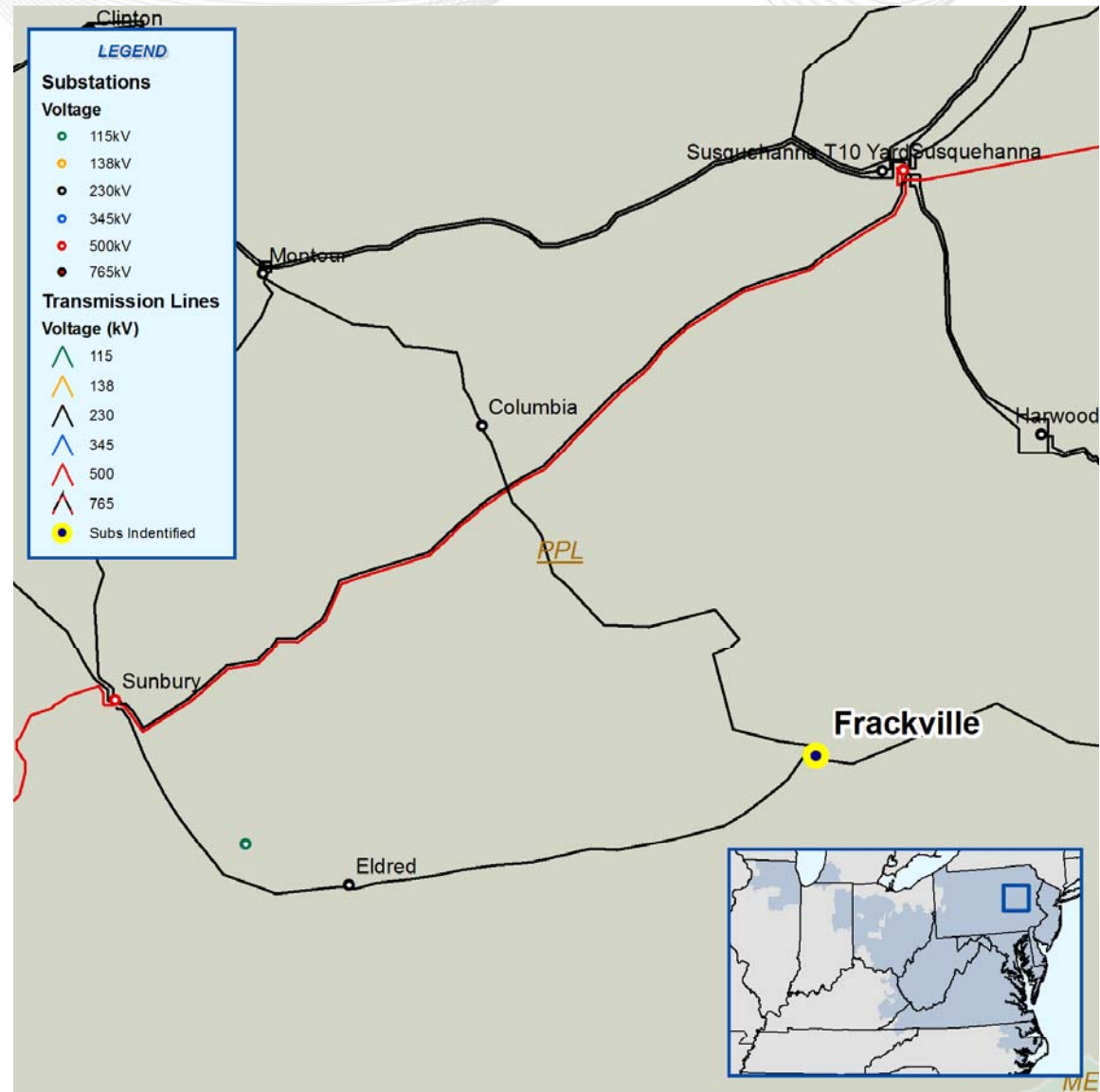
- Angora – Schuylkill
69kV line / N-1-1
loss of Llanerch
138kV bus #5 +
Basecase
- Move the connection
point for the
Llanerch 138/69kV
transformer
- Estimated Project
Cost: \$0.5 M
- Required IS Date:
6/1/2013



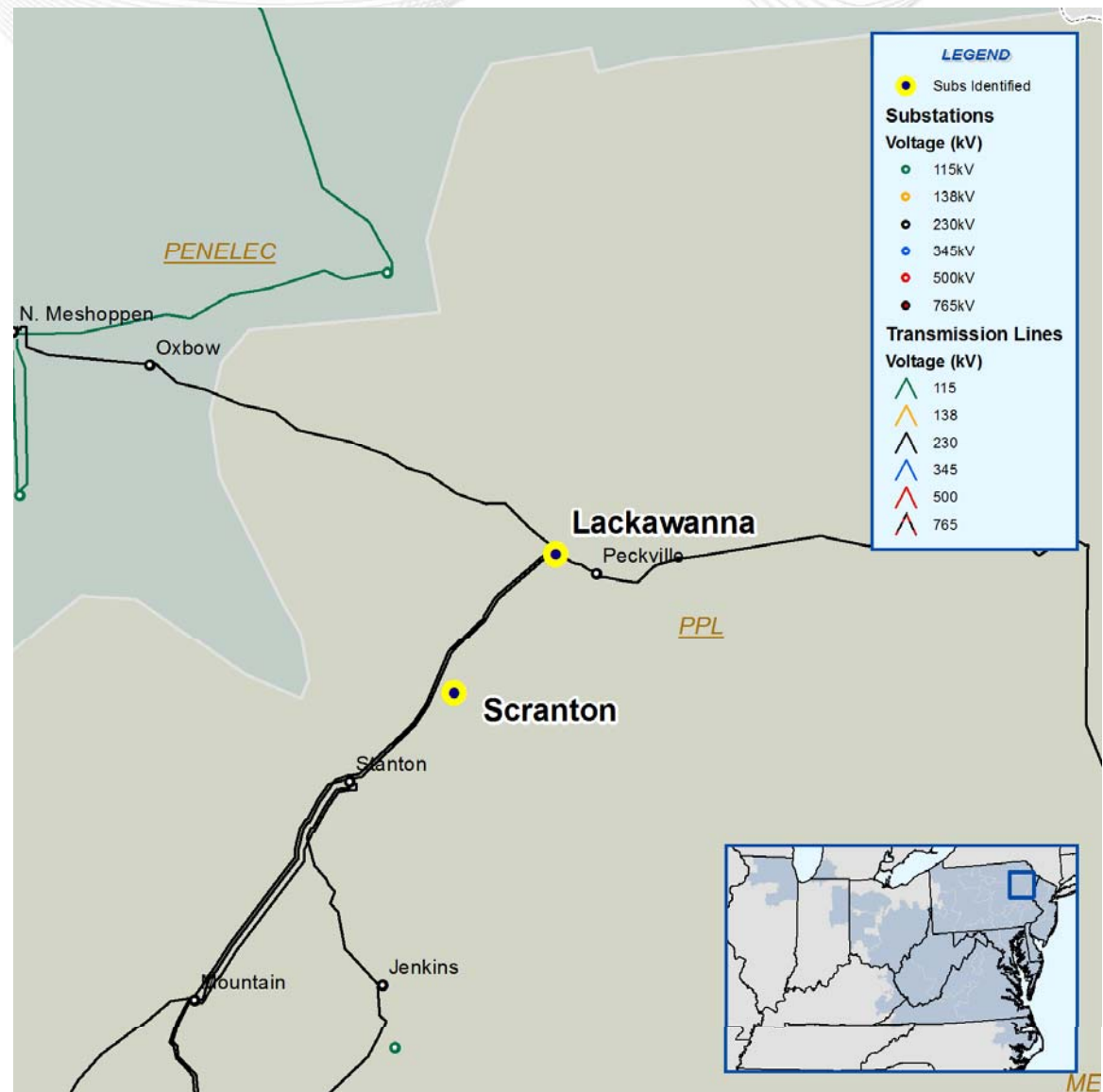
- Richmond – Tacony 69kV line / loss of Bluegrass-Holmesburg 138kV line + loss of Holmesburg 230/138kV transformer
- Replace Richmond – Tacony 69kV line
- Estimated Project Cost: \$5.2 M
- Required IS Date: 6/1/2012



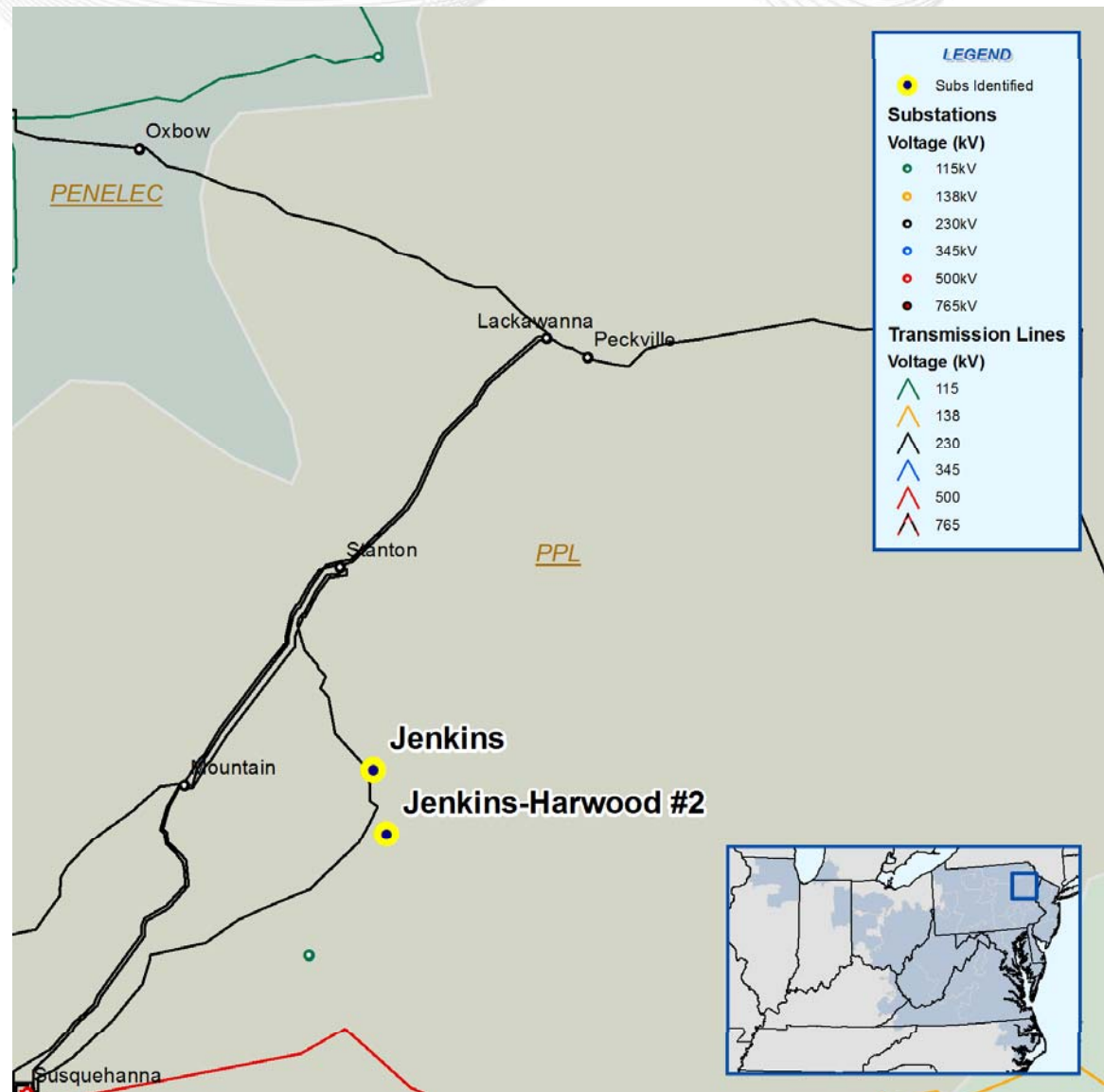
- Frackville 230/69kV transformer #2 / loss of Frackville-Eldred 230kV line with a stuck breaker at Frackville
- Frackville 230/69kV transformer #3 / loss of Frackville-Columbia 230kV line with a stuck breaker at Frackville
- Frackville 69kV voltage violation / loss of Frackville-Eldred 230kV line with a stuck breaker at Frackville
- Recommended Solutions: Install motor operators on disconnects at Frackville
- Estimated Project Cost: \$0.444 M
- Expected IS Date: 6/01/2011



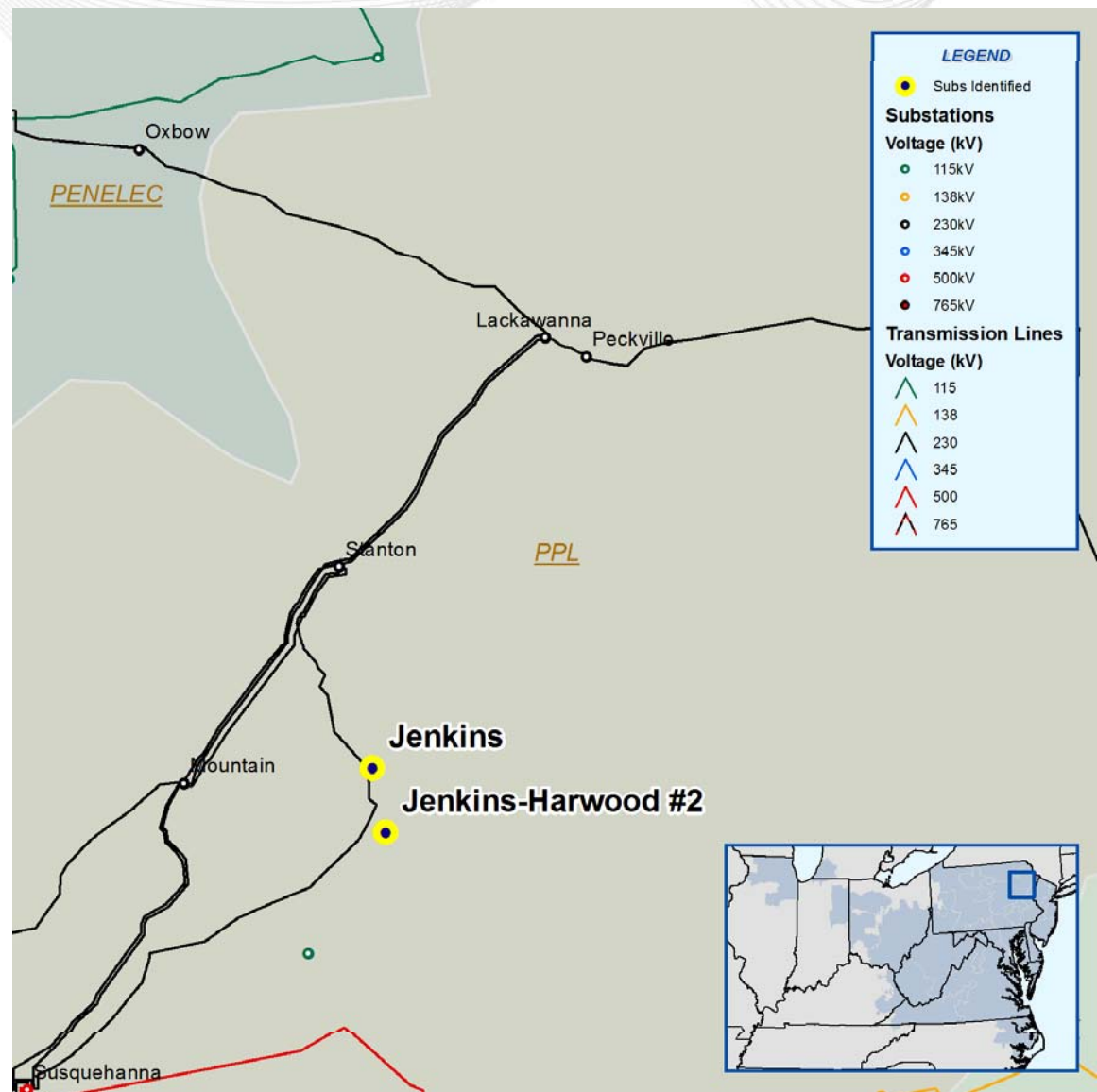
- Low voltage along the Lackawanna-Scranton #1 and #2 69kV lines / various maintenance conditions
- Proposed Solution: Install 2, 10.8 MVAR capacitor banks at Scranton 69kV
- Estimated Project Cost: \$1.74 M
- Expected IS Date: 11/01/2011



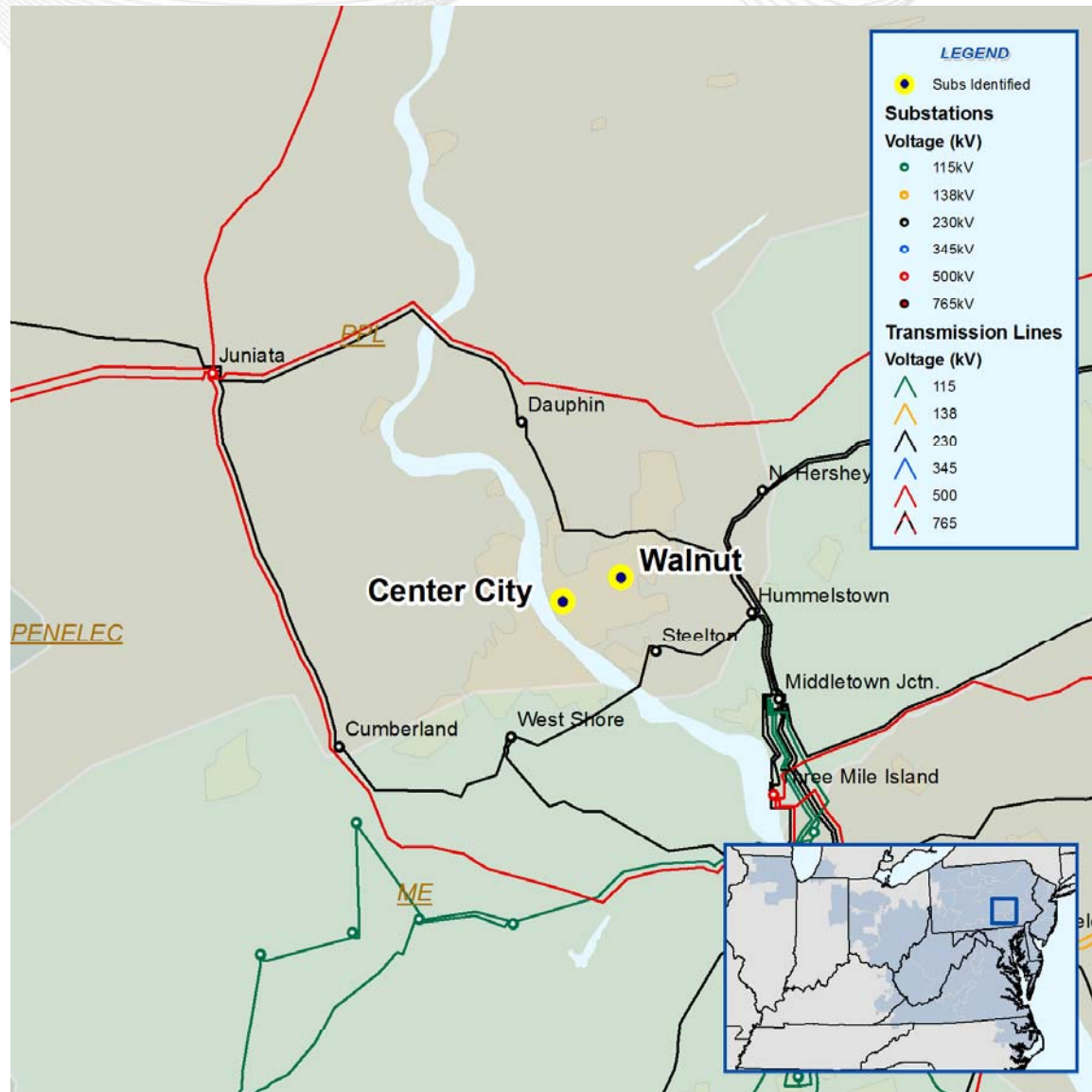
- Exceeds PPL guidelines for maximum allowable load loss / loss of Harwood-Jenkins #1 69kV line
- Proposed Solution: Extend Cando Tap to the Harwood-Jenkins #2 69kV line
- Estimated Project Cost: \$0.799 M
- Expected IS Date: 11/01/2011



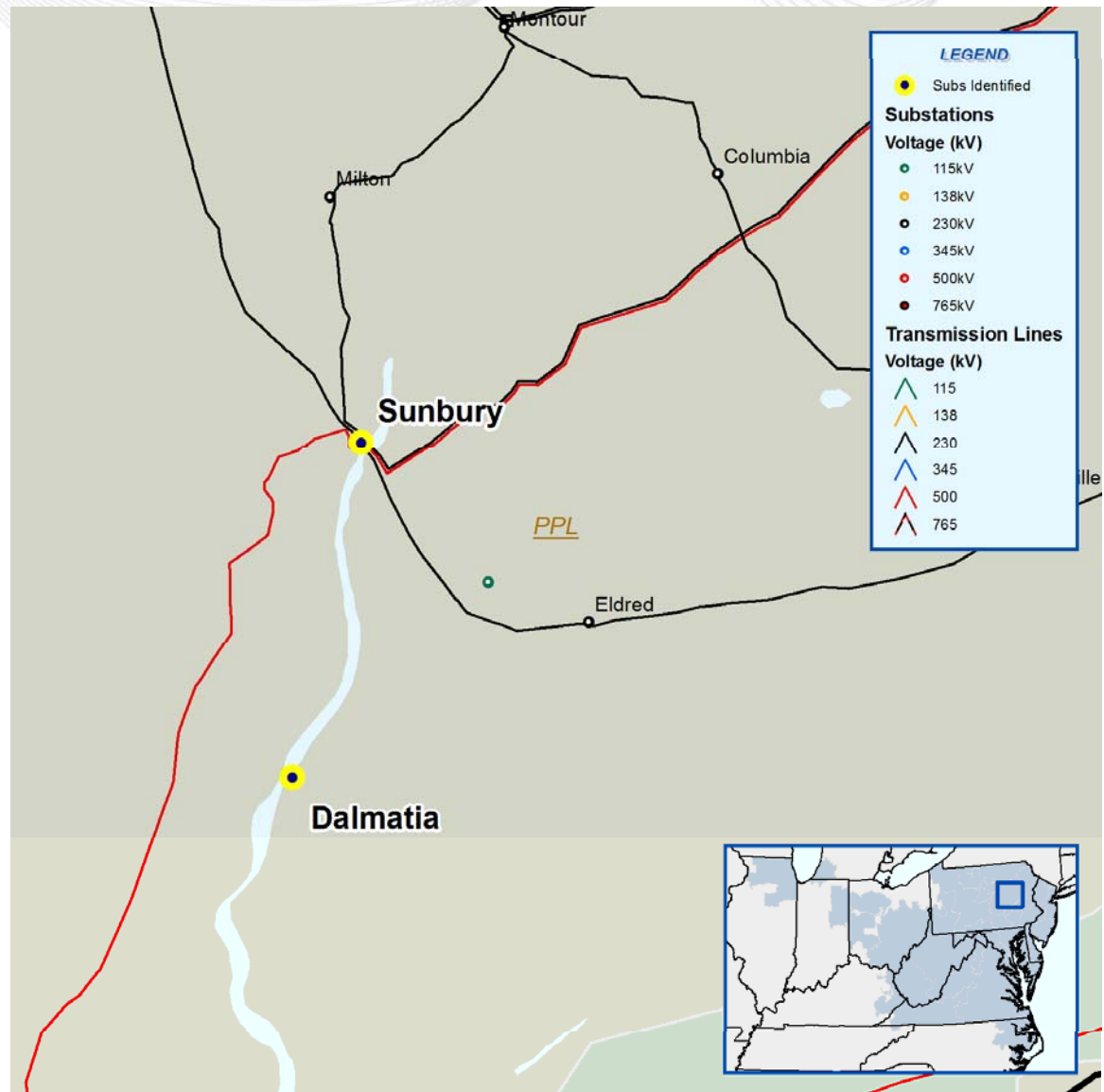
- Harwood-Jenkins #1 and #2 69kV lines / loss of the other line
- Proposed Solution: Build a 3rd 69kV line from Harwood to Valmont Taps
- Estimated Project Cost: \$2.442 M
- Expected IS Date: 11/01/2012



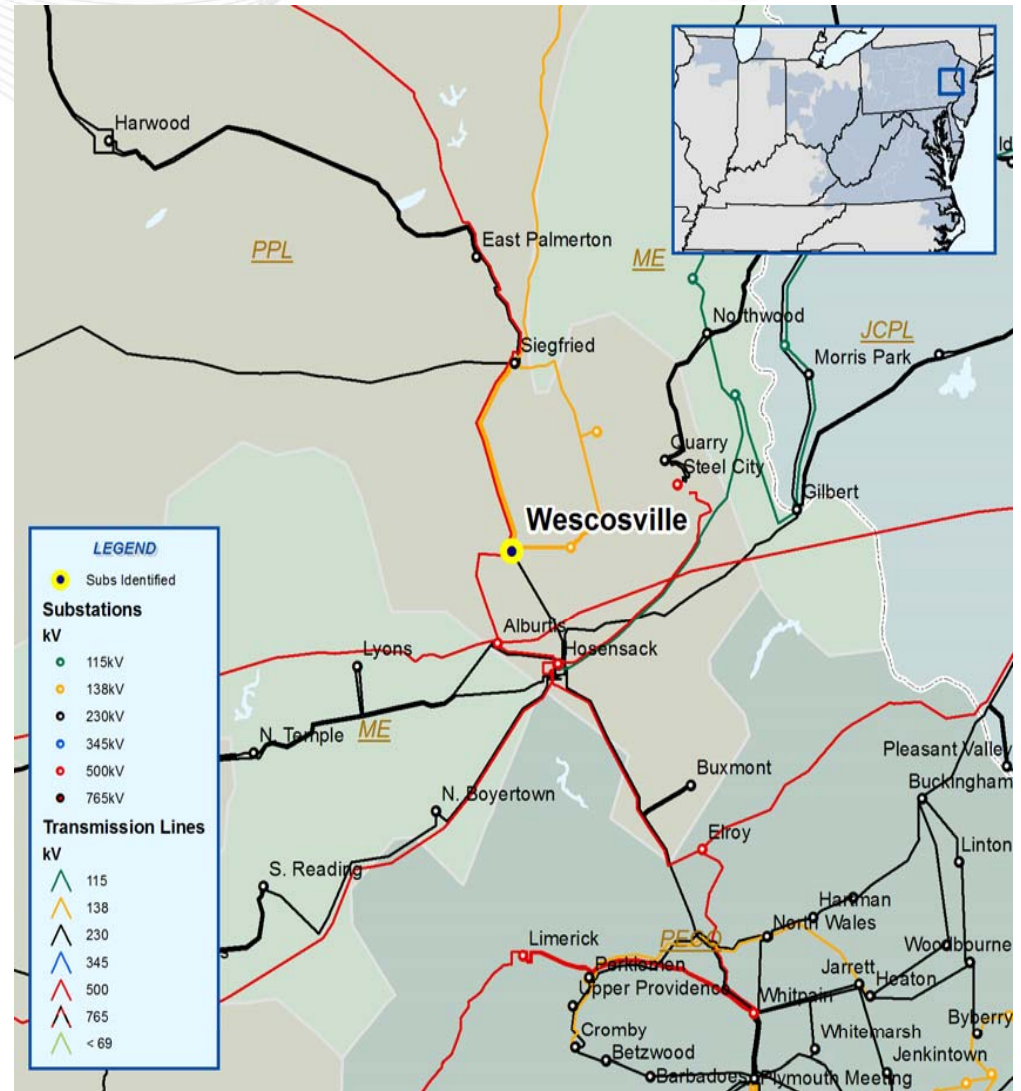
- Walnut-Center City 69kV overload / loss of Dauphin-Capital Park #1 and #2 69kV double circuit lines
- Proposed Solution: Replace Walnut-Center City 69kV cable
- Estimated Project Cost: \$1.73 M
- Expected IS Date: 5/01/2013

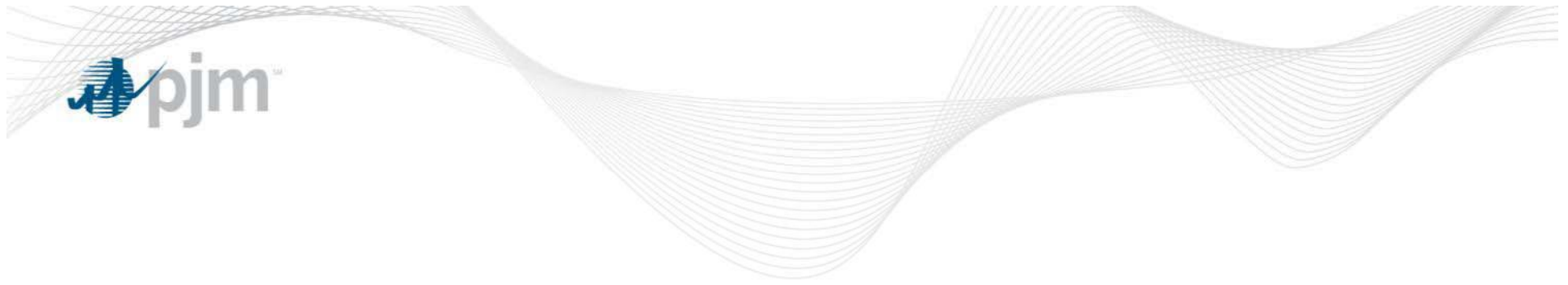


- Sunbury-Dalmatia 69kV overload / Basecase
- Proposed Solution: Reconductor Sunbury-Dalmatia 69kV line
- Estimated Project Cost: \$9.1 M
- Expected IS Date: 5/01/2012



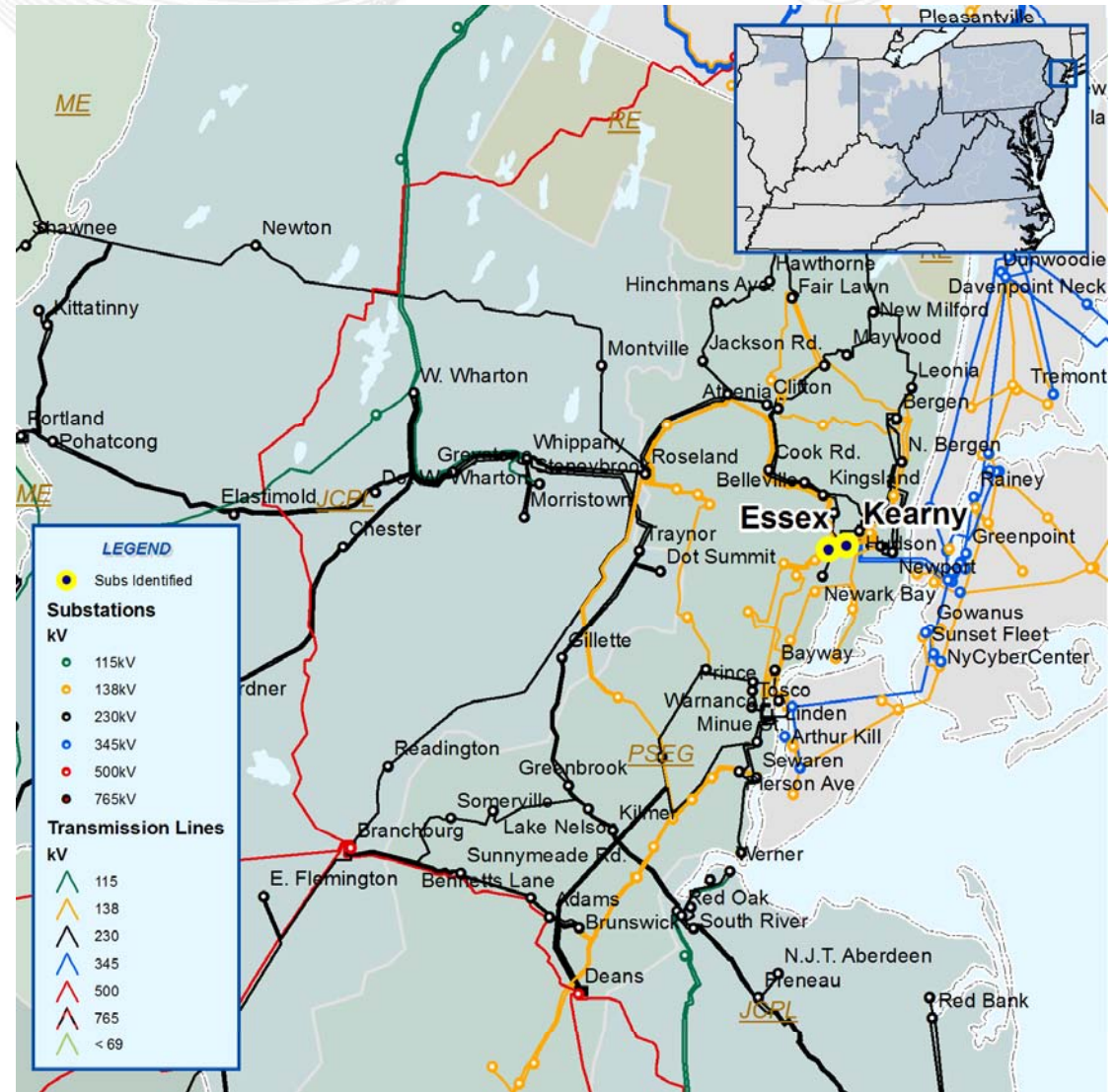
- Wescosville 138/69kV transformer #1 is loaded over the normal rating. Additionally, both Wescosville 138/69kV transformers are contingency overloaded for the loss of the other.
- Proposed Solution: Install a new #4 138/69kV transformer at Wescosville
- Estimated project cost: \$4.179 M
- Expected IS Date 5/1/2009



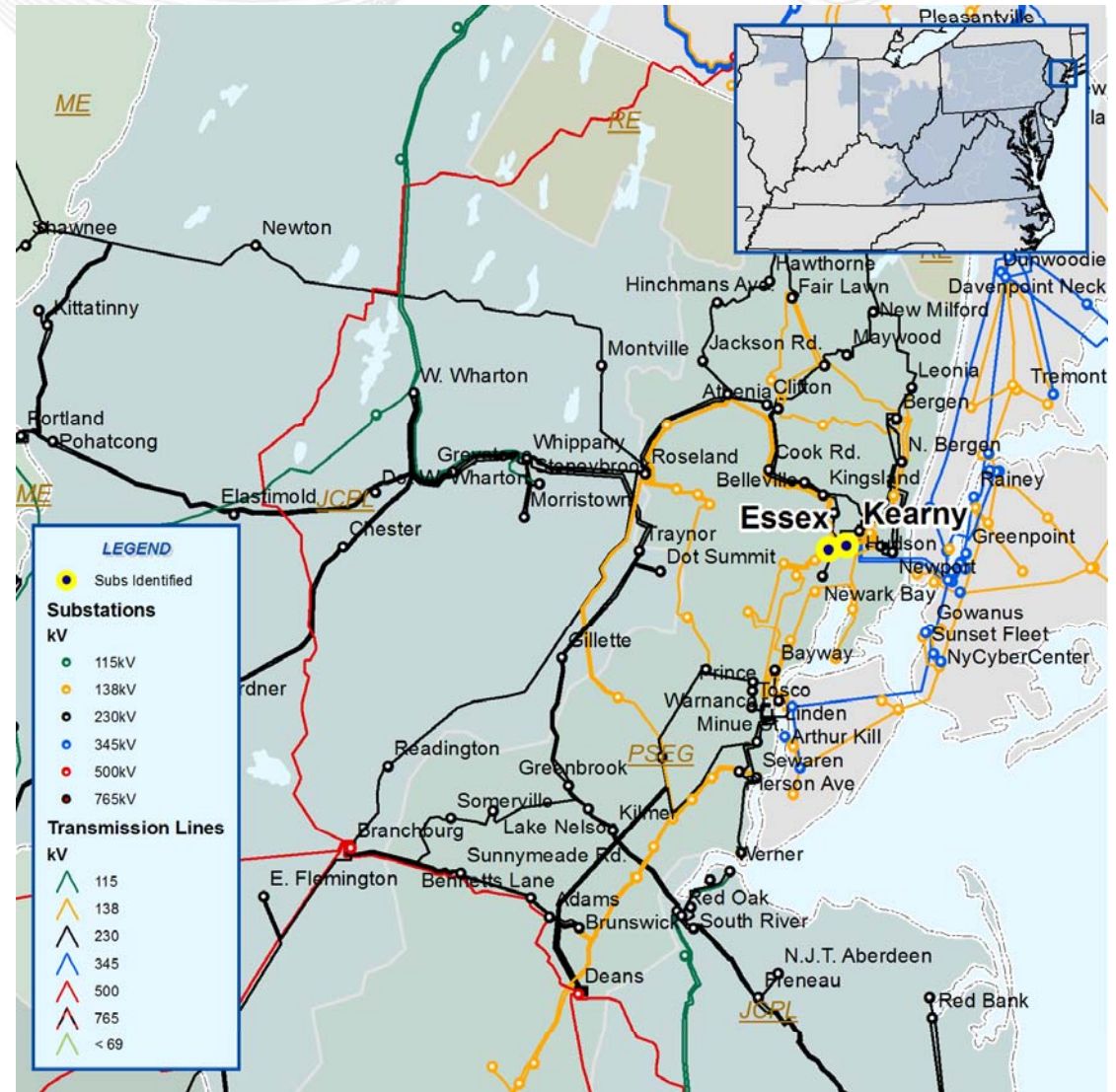


Short Circuit Upgrades

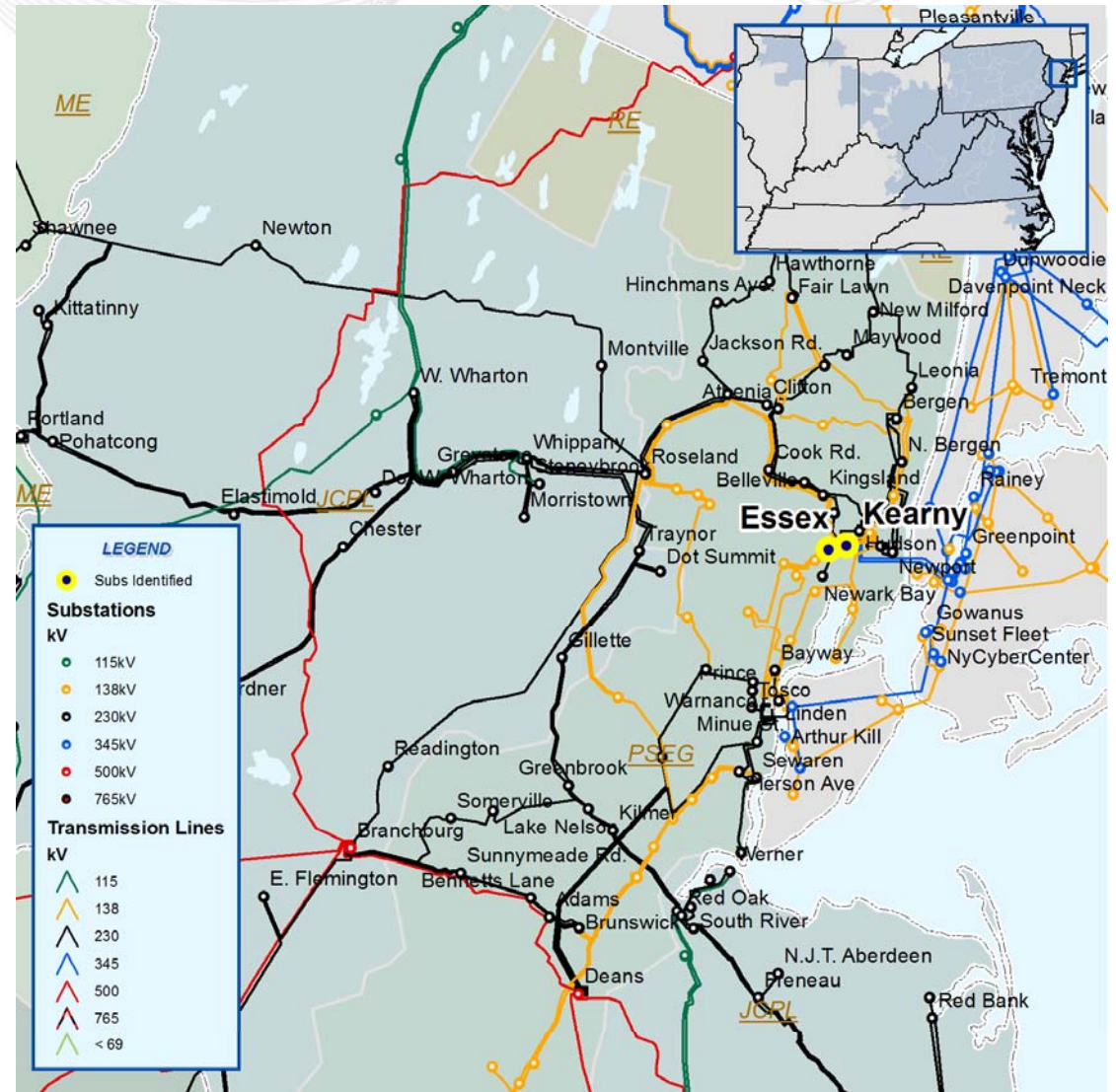
- The following breaker upgrades are driven by the new Essex-Kearny 138kV line and closing the Kearny 138kV bus tie
- Replace the following Kearny 138kV breakers with 80 kA breakers:
 - ‘1-SHT’
 - ‘15HF’
 - ‘14HF’
 - ‘10HF’
 - ‘2HT’
 - ‘22HF’
 - ‘4HT’
 - ‘25HF’
- Estimated Project Cost: \$1.0 M per breaker
- Required IS Date: 06/01/2013



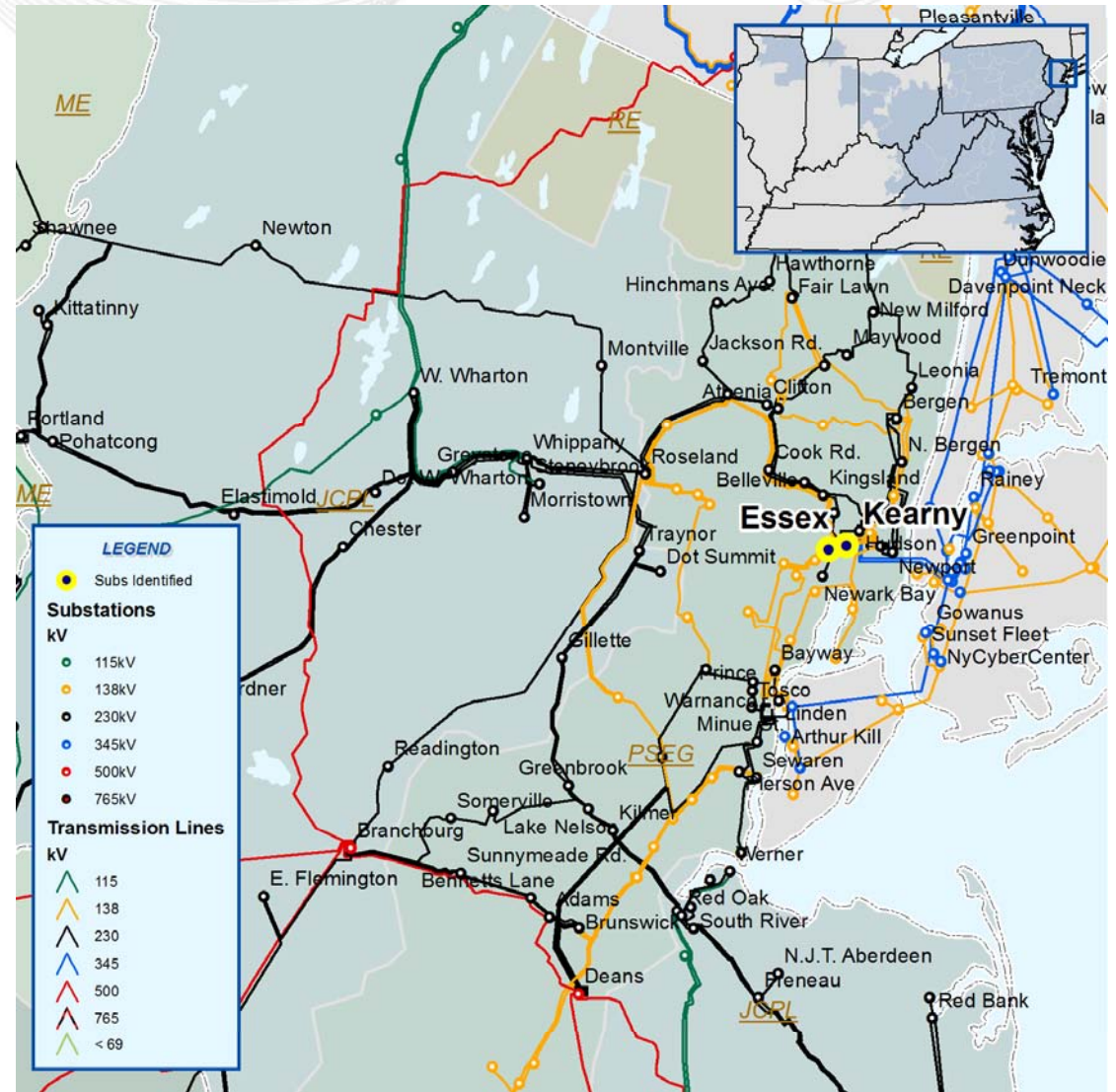
- The following breaker upgrades are driven by the new Essex-Kearny 138kV line and closing the Kearny 138kV bus tie
- Replace the following Marion 138kV breakers with 63 kA breakers:
 - ‘2HM’
 - ‘2LM’
 - ‘1LM’
 - ‘6PM’
 - ‘3PM’
 - ‘4LM’
 - ‘3LM’
 - ‘1HM’
 - ‘2PM3’
 - 2PM1’
- Estimated Project Cost: \$0.5 M per breaker
- Required IS Date: 06/01/2013



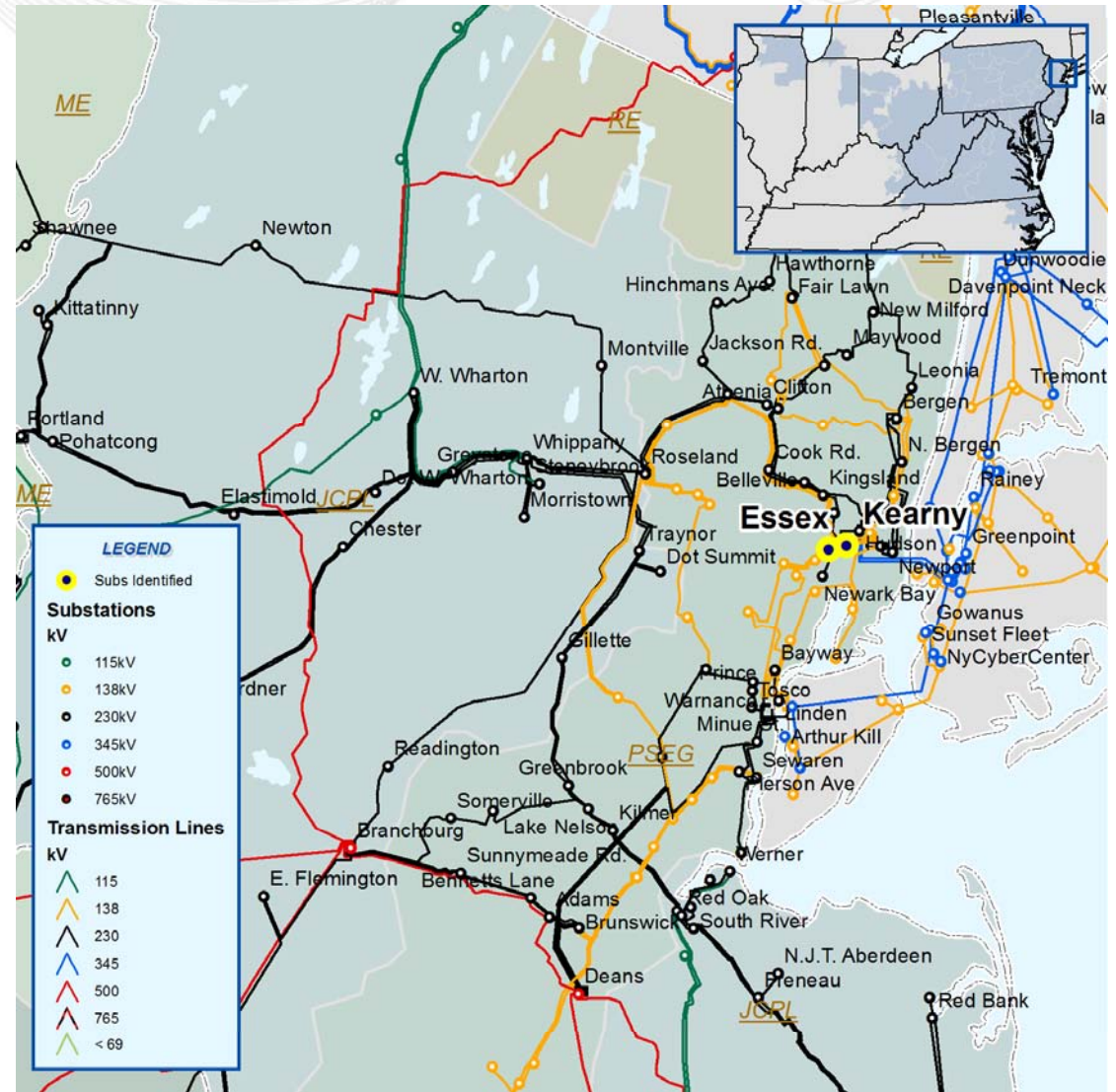
- The following breaker upgrades are driven by the new Essex-Kearny 138kV line and closing the Kearny 138kV bus tie
- Replace the following Essex 138kV breakers with 63 kA breakers with at least a 2.5 cycle contact parting time:
 - ‘1BT’
 - ‘2PM’
 - ‘2LM’
- Estimated Project Cost: \$0.5 M per breaker
- Required IS Date: 06/01/2013

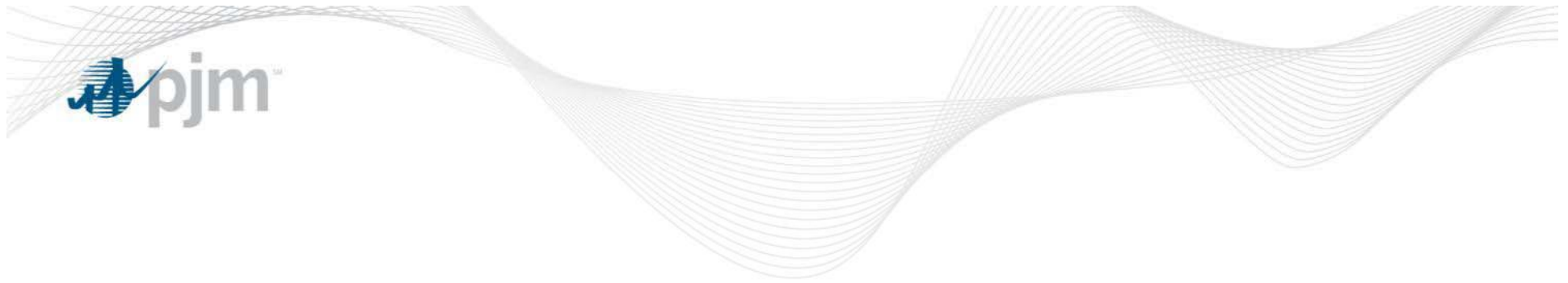


- The following breaker upgrades are driven by the new Essex-Kearny 138kV line and closing the Kearny 138kV bus tie
- Change the contact parting time on the following Essex 138kV breakers to least 2.5 cycles:
 - ‘3LM’
 - ‘2BM’
 - ‘1BM’
 - ‘3PM’
 - ‘4LM’
 - ‘1PM’
 - ‘1LM’
- Estimated Project Cost: \$0.0 M per breaker
- Required IS Date: 06/01/2013



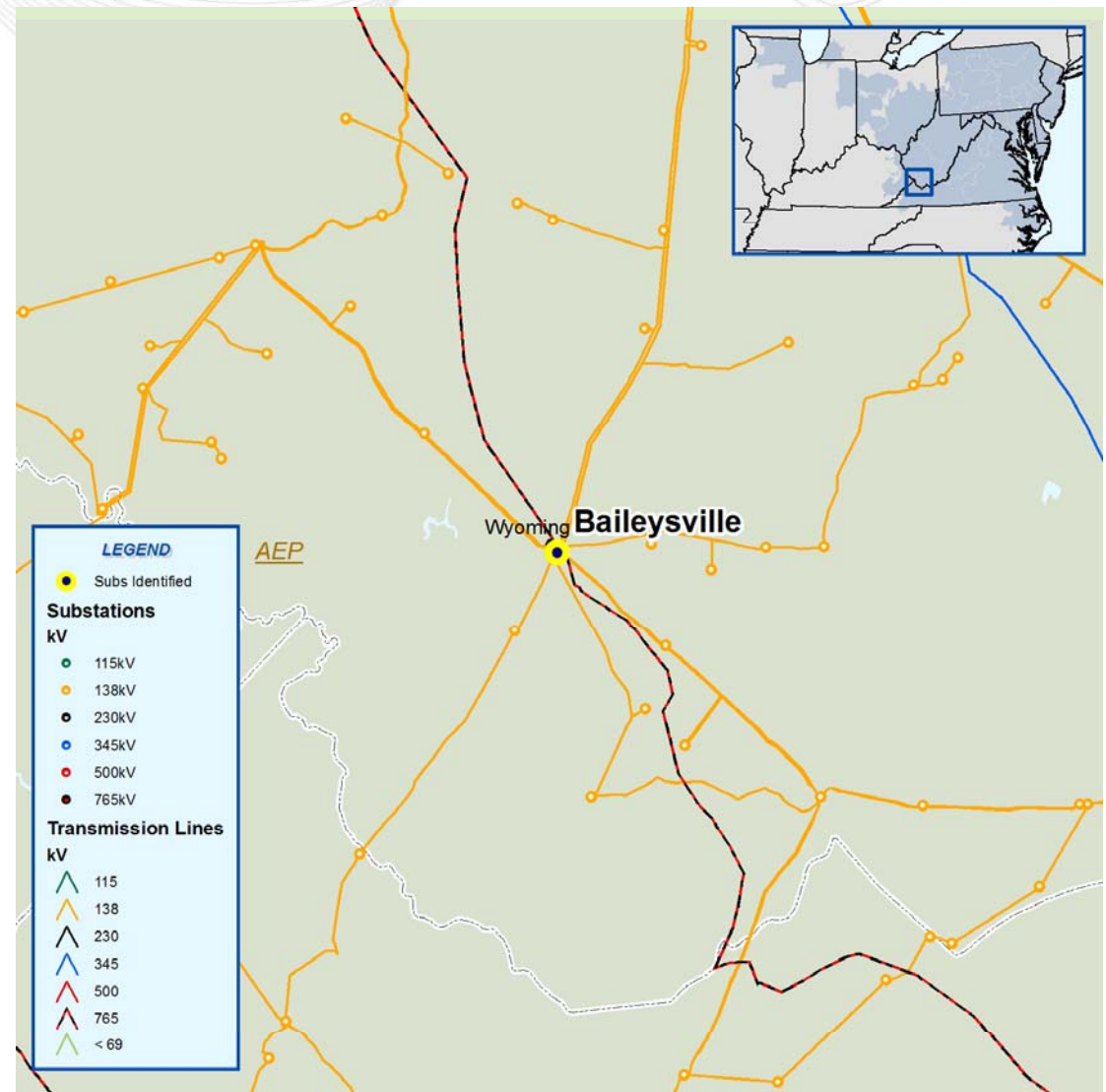
- The following breaker upgrades are driven by the new Essex-Kearny 138kV line and closing the Kearny 138kV bus tie
- Replace Foundry 138kV breaker '21P'
- Replace ECRR 138kV breaker '903'
- Estimated Project Cost: \$0.5 M per breaker
- Required IS Date: 06/01/2013



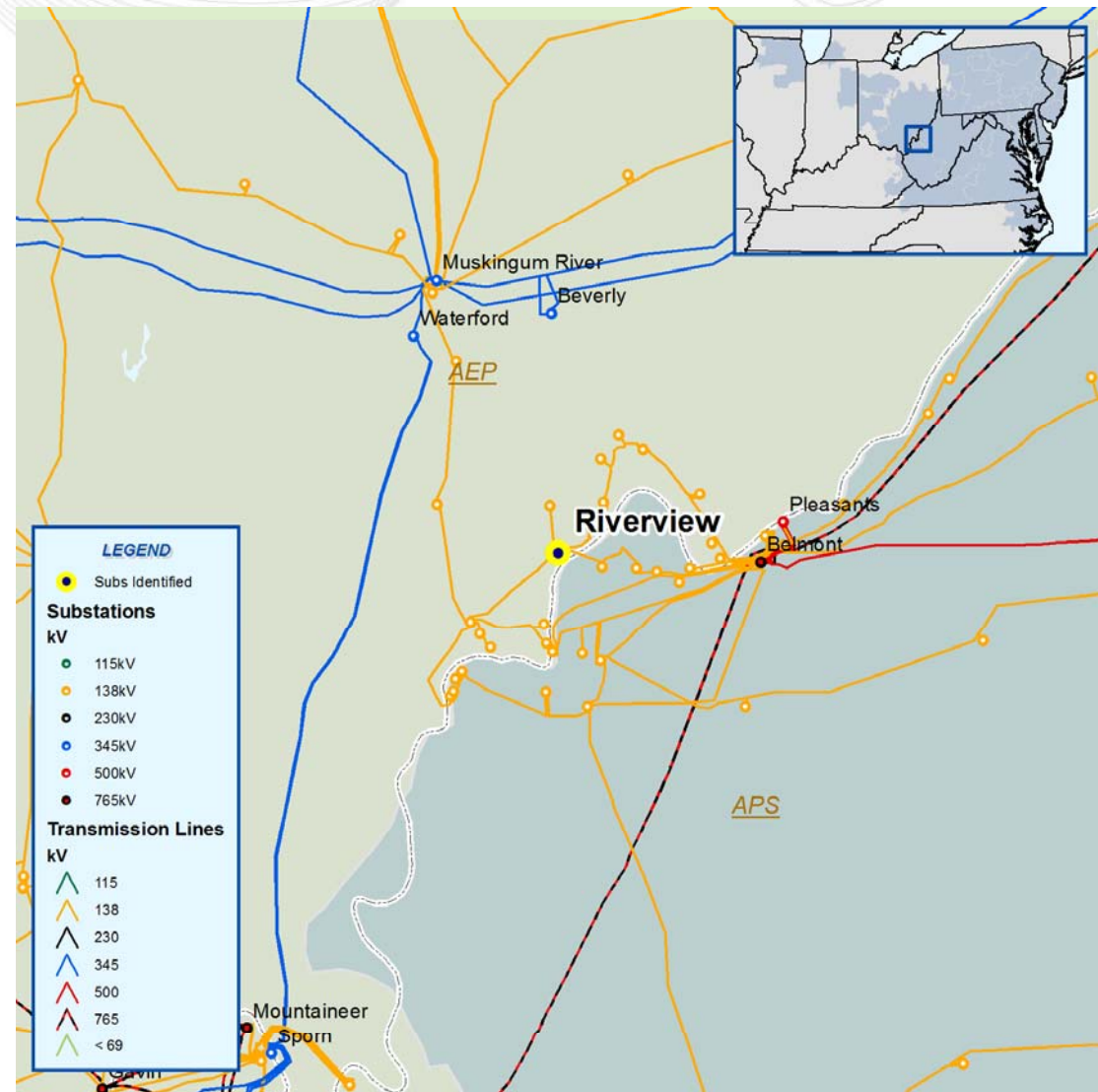


2009 Short Circuit Baseline Analysis for 115kV and 138kV Circuit Breakers

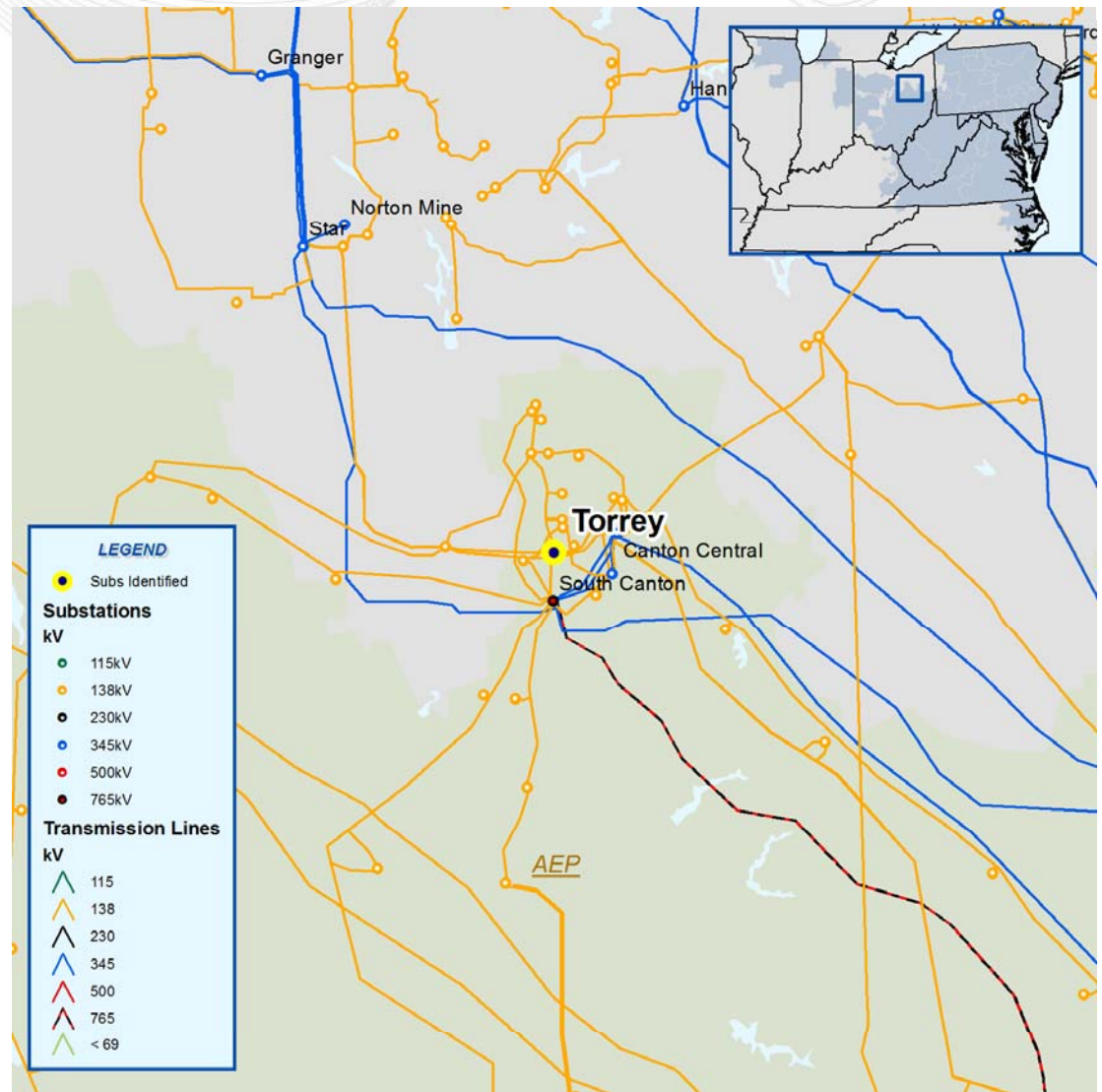
- Replace Baileysville 138kV breaker 'P'
- Estimated Project Cost: \$0.4 M
- Required IS Date: 06/01/2009



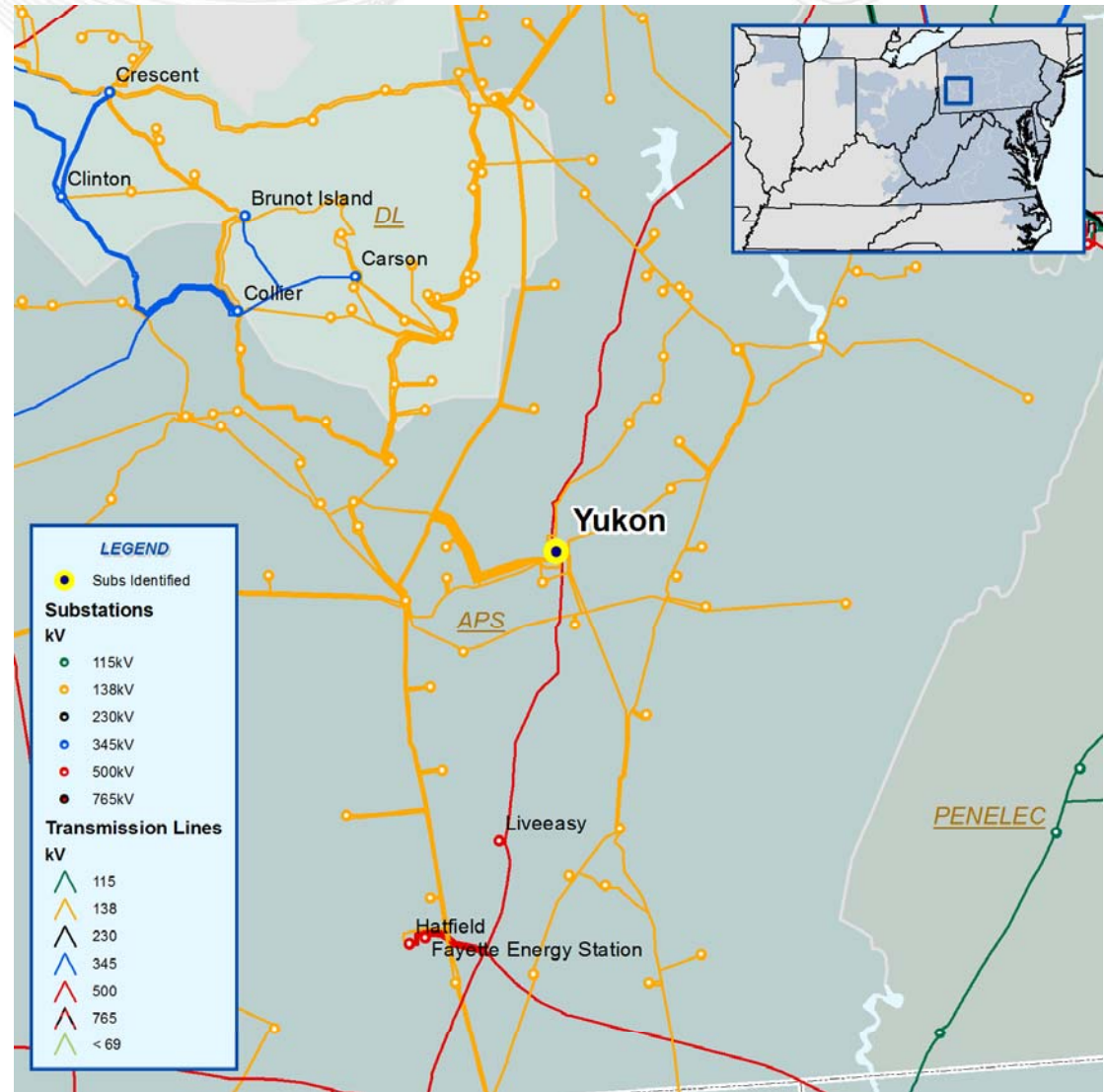
- Replace Riverview 138kV breaker '634'
- Estimated Project Cost: \$0.4 M
- Required IS Date: 06/01/2009



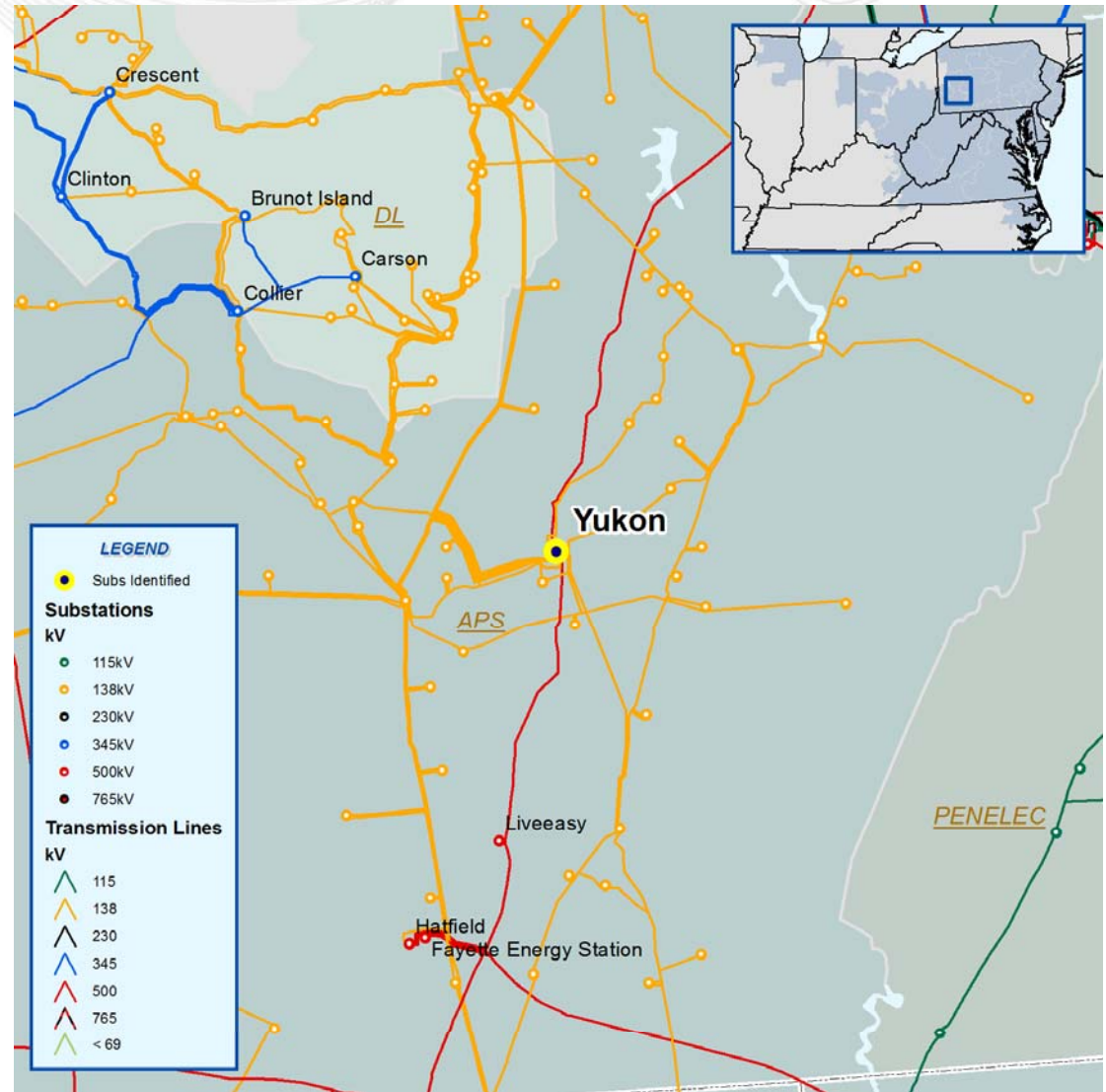
- Replace Torrey 138kV breaker 'W'
- Estimated Project Cost: \$0.4 M
- Required IS Date: 06/01/2009



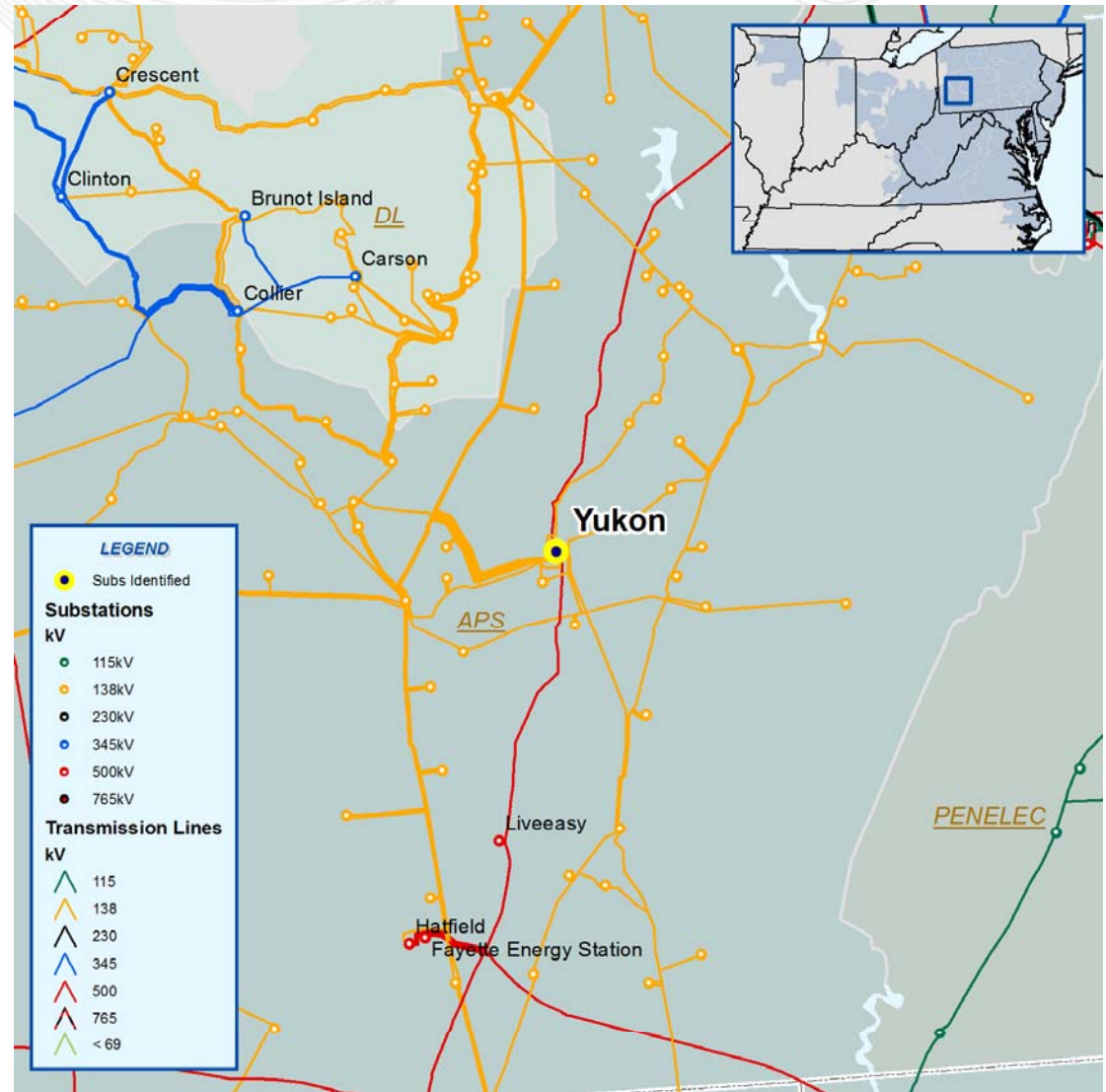
- Replace Yukon 138kV breaker 'Y-1'
- Replace Yukon 138kV breaker 'Y-2'
- Replace Yukon 138kV breaker 'Y-3'
- Replace Yukon 138kV breaker 'Y-4'
- Replace Yukon 138kV breaker 'Y-5'
- Estimated Project Cost: \$0.203 M per breaker
- Required IS Date: 06/01/2009



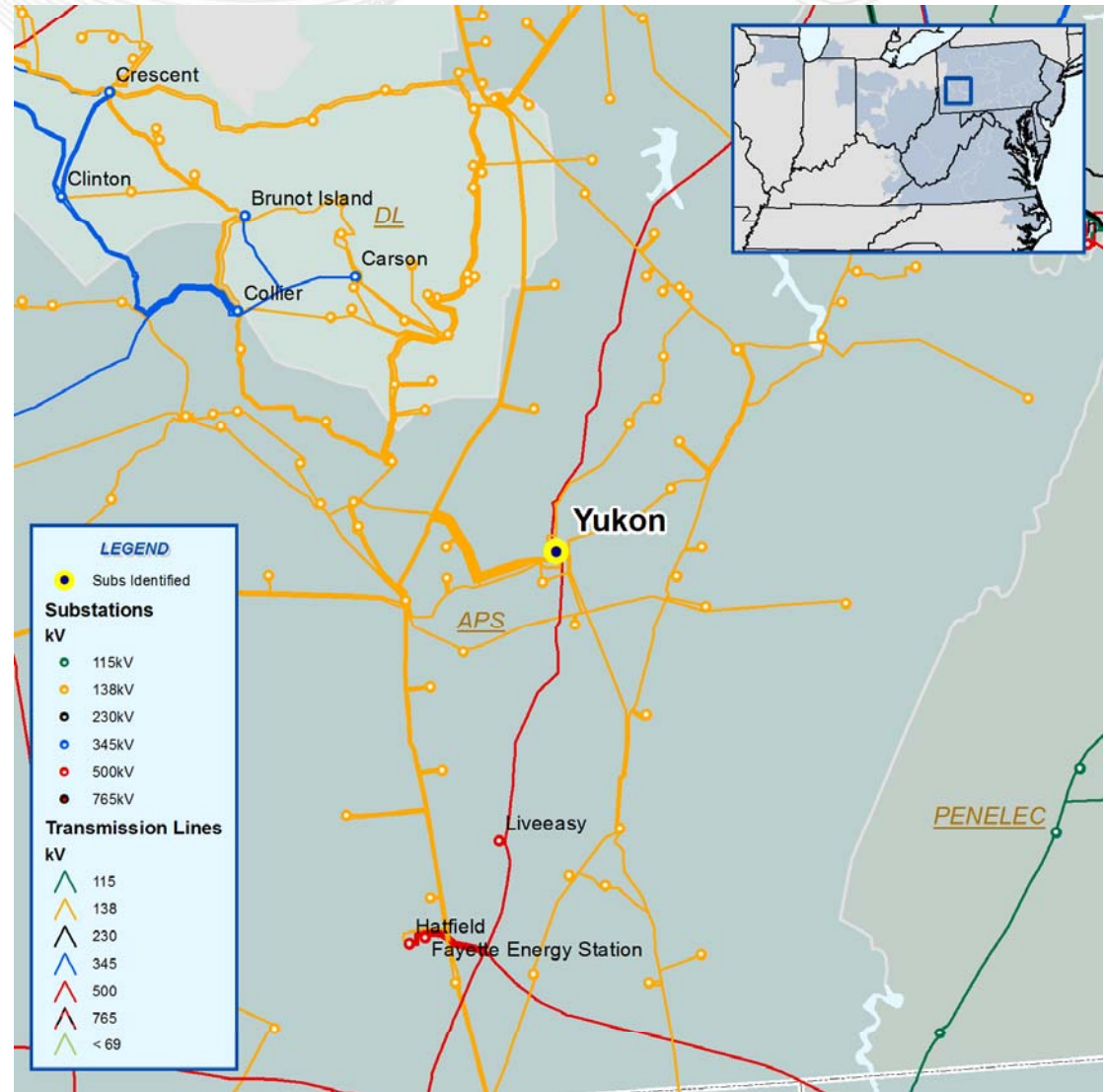
- Replace Yukon 138kV breaker 'Y-7'
- Replace Yukon 138kV breaker 'Y-8'
- Replace Yukon 138kV breaker 'Y-9'
- Replace Yukon 138kV breaker 'Y-10'
- Estimated Project Cost: \$0.203 M per breaker
- Required IS Date: 06/01/2009



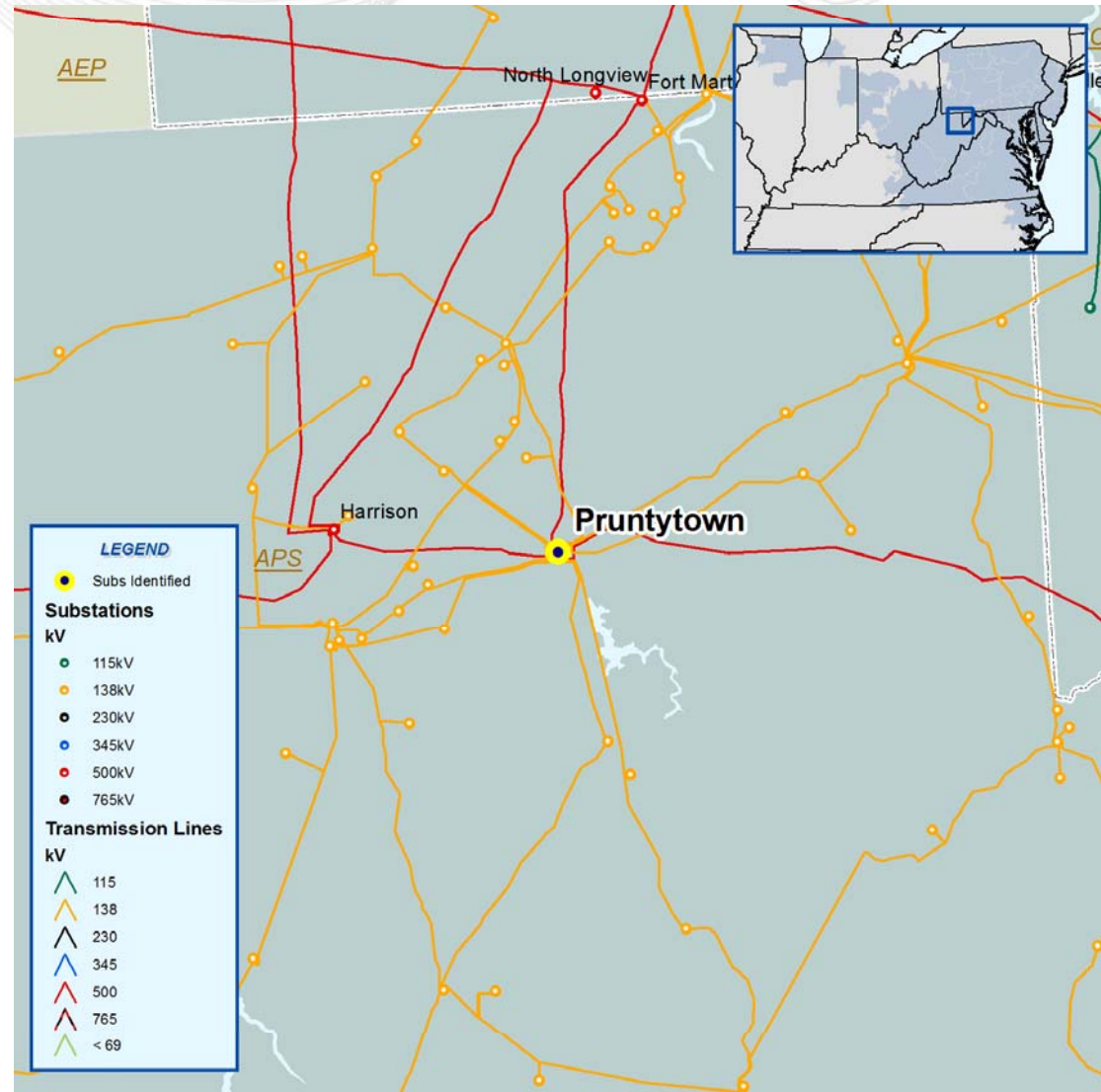
- Replace Yukon 138kV breaker 'Y-11'
- Replace Yukon 138kV breaker 'Y-12'
- Replace Yukon 138kV breaker 'Y-13'
- Replace Yukon 138kV breaker 'Y-14'
- Estimated Project Cost: \$0.203 M per breaker
- Required IS Date: 06/01/2009



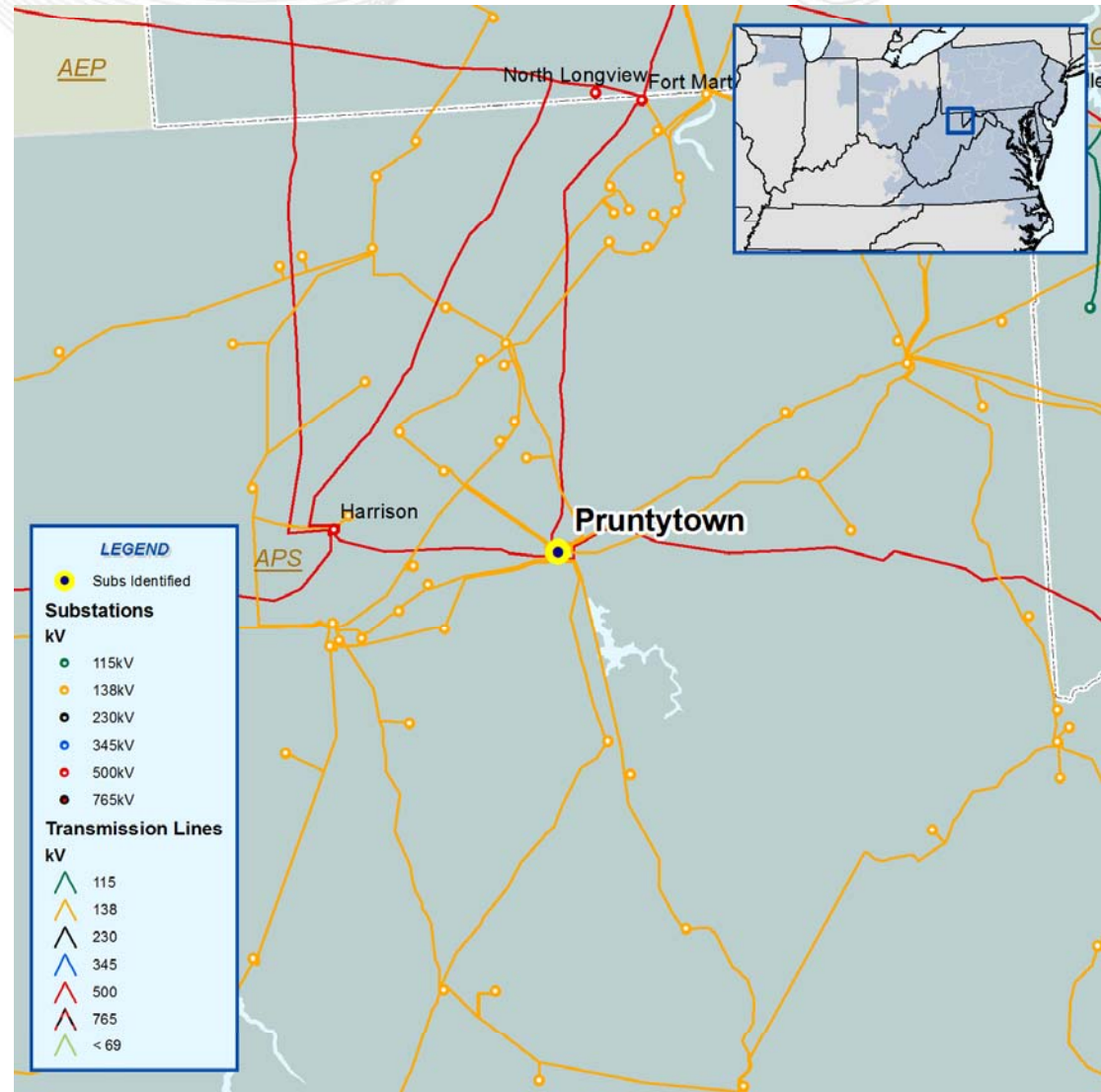
- Replace Yukon 138kV breaker 'Y-16'
- Replace Yukon 138kV breaker 'Y-17'
- Replace Yukon 138kV breaker 'Y-18'
- Replace Yukon 138kV breaker 'Y-19'
- Estimated Project Cost: \$0.203 M per breaker
- Required IS Date: 06/01/2009



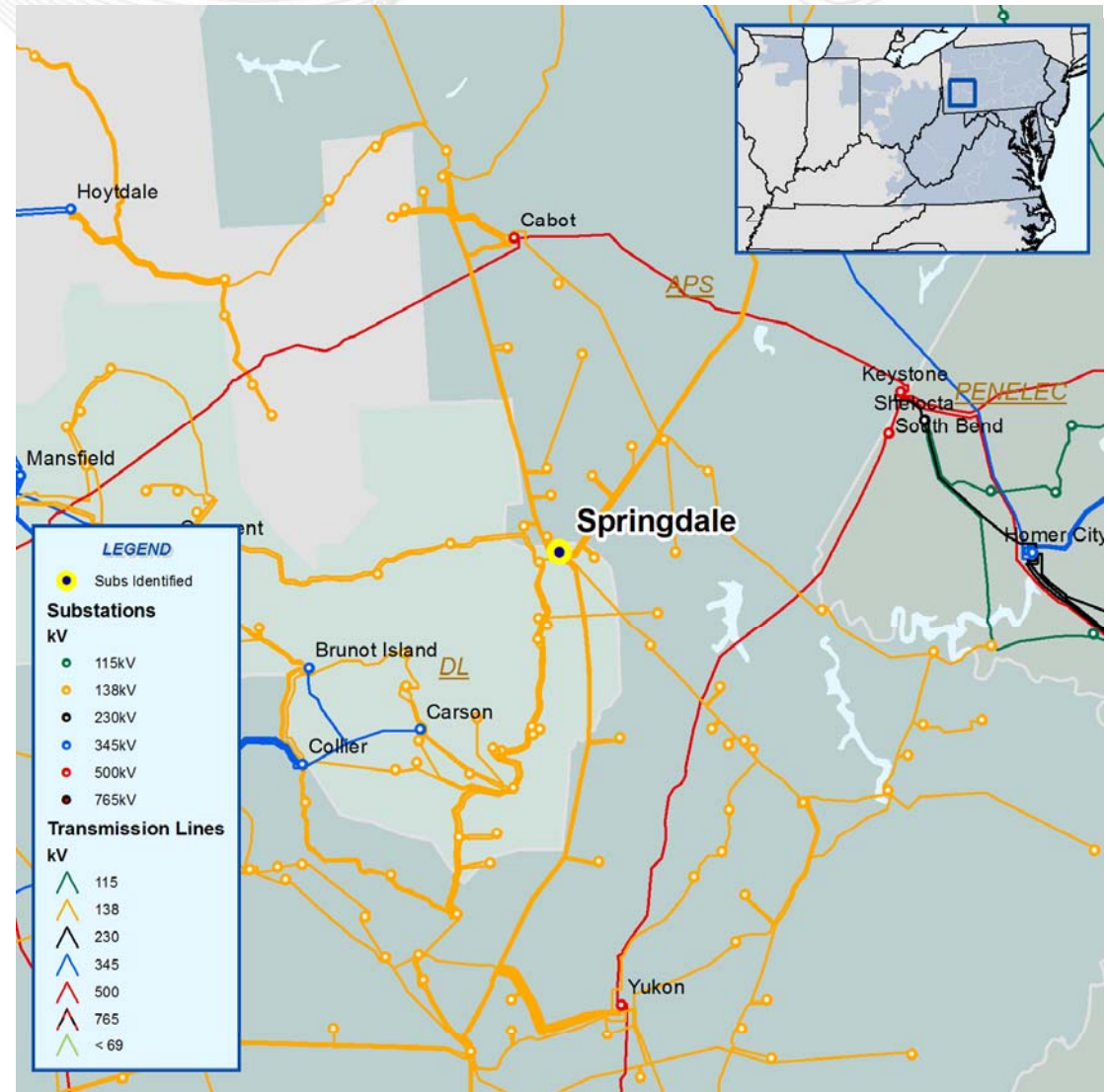
- Replace Pruntytown 138kV breaker 'P-2'
- Replace Pruntytown 138kV breaker 'P-5'
- Replace Pruntytown 138kV breaker 'P-8'
- Replace Pruntytown 138kV breaker 'P-9'
- Estimated Project Cost: \$0.203 M per breaker
- Required IS Date: 06/01/2009



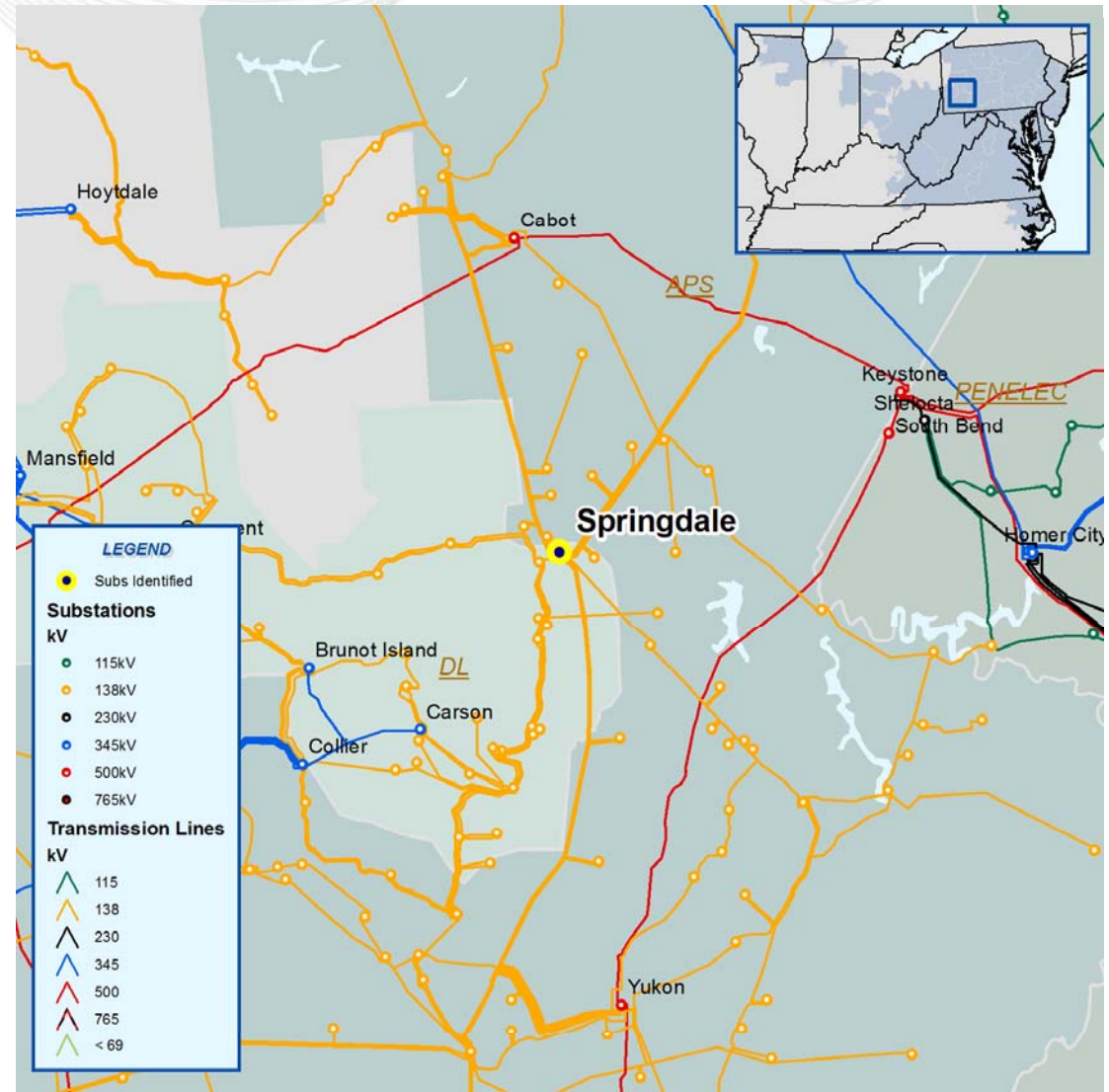
- Replace Pruntytown 138kV breaker 'P-11'
- Replace Pruntytown 138kV breaker 'P-12'
- Replace Pruntytown 138kV breaker 'P-14'
- Replace Pruntytown 138kV breaker 'P-15'
- Estimated Project Cost: \$0.203 M per breaker
- Required IS Date: 06/01/2009



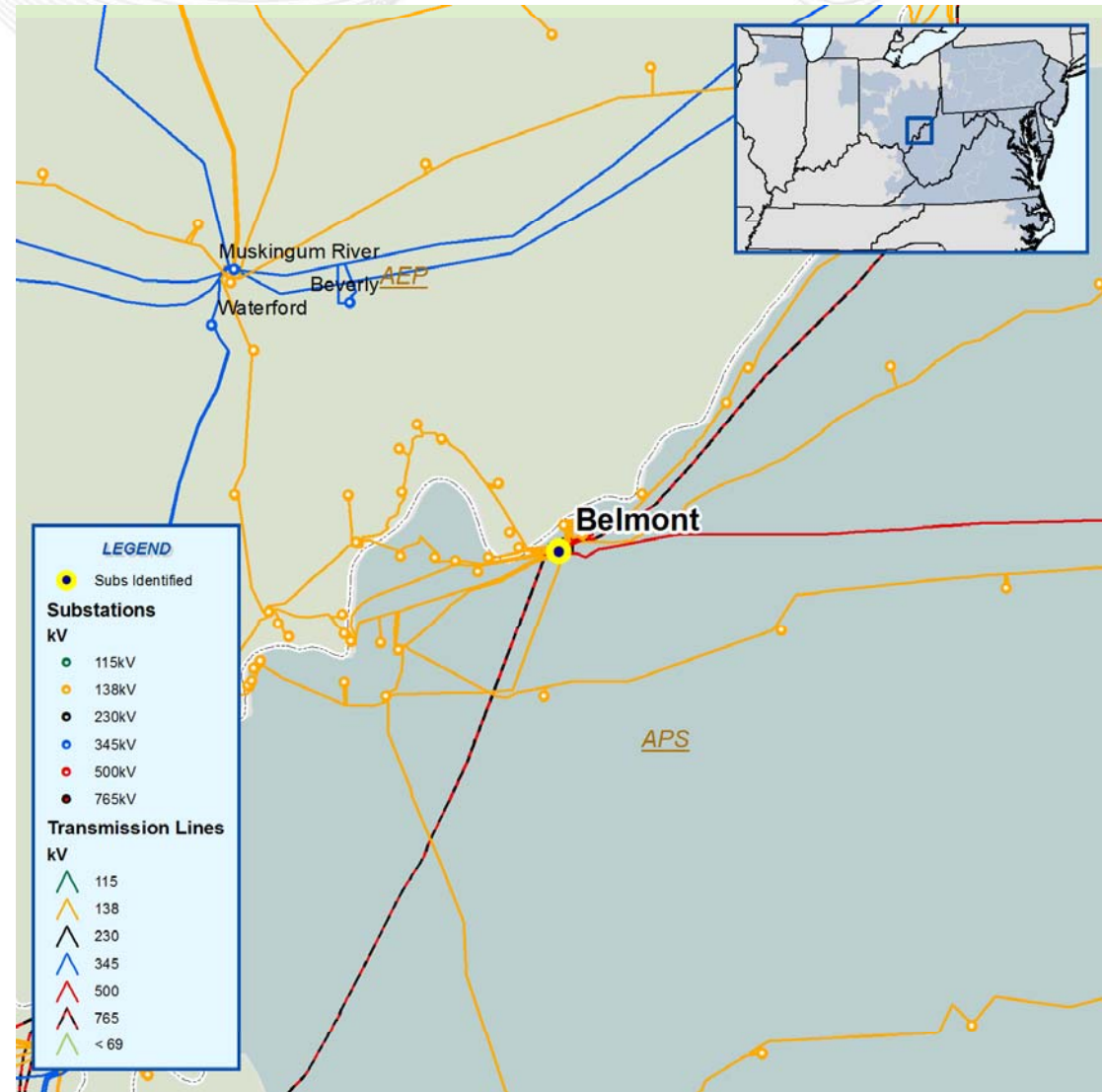
- Replace Springdale 138kV breaker '138C'
- Replace Springdale 138kV breaker '138D'
- Replace Springdale 138kV breaker '138E'
- Replace Springdale 138kV breaker '138F'
- Replace Springdale 138kV breaker '138G'
- Estimated Project Cost: \$0.203 M per breaker
- Required IS Date: 06/01/2009



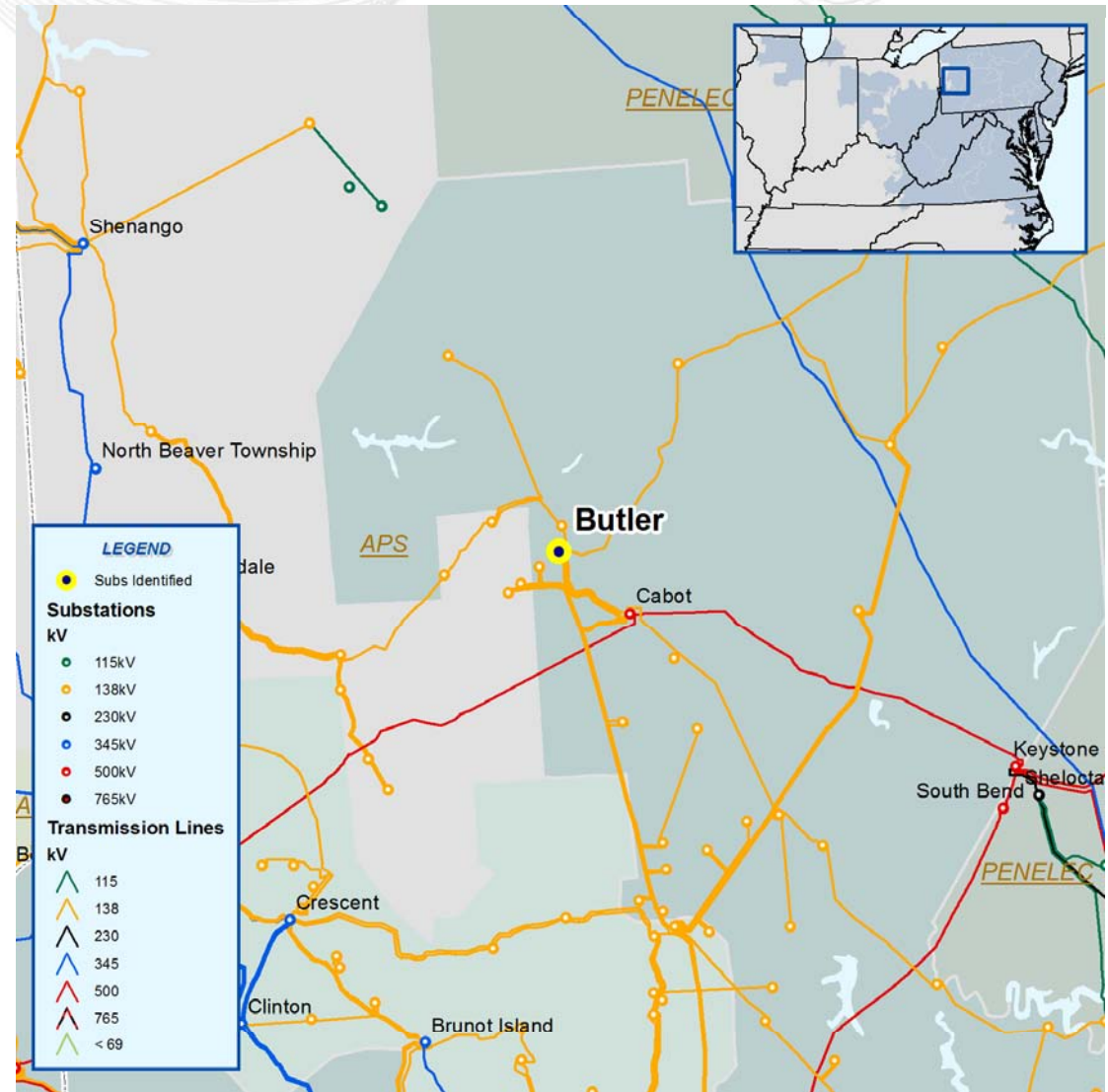
- Replace Springdale 138kV breaker '138P'
- Replace Springdale 138kV breaker '138R'
- Replace Springdale 138kV breaker '138T'
- Replace Springdale 138kV breaker '138U'
- Replace Springdale 138kV breaker '138V'
- Estimated Project Cost: \$0.203 M per breaker
- Required IS Date: 06/01/2009



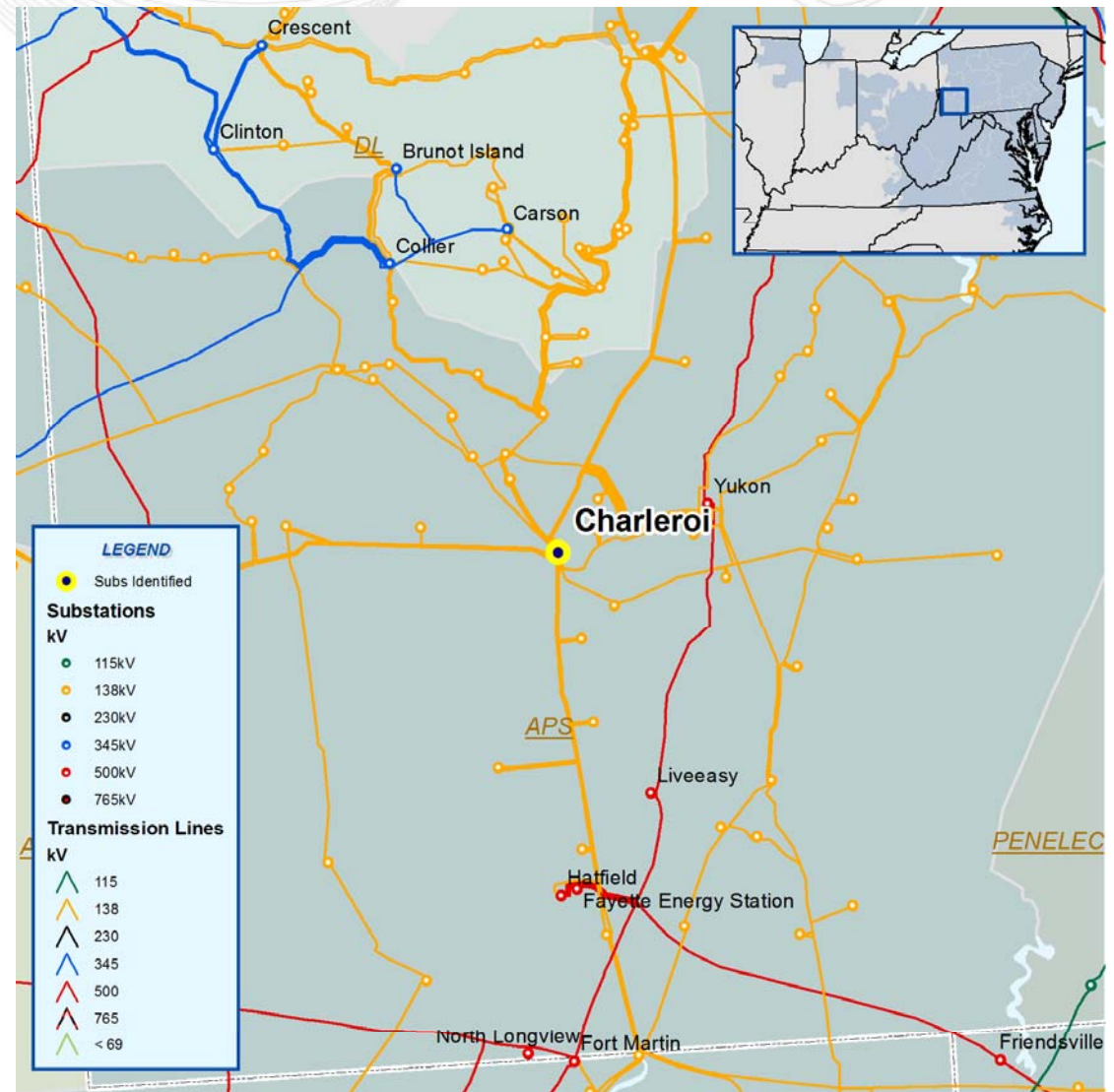
- Replace Belmont 138kV breaker 'B-14'
- Replace Belmont 138kV breaker 'B-16'
- Replace Belmont 138kV breaker 'B-17'
- Estimated Project Cost: \$0.203 M per breaker
- Required IS Date: 06/01/2009



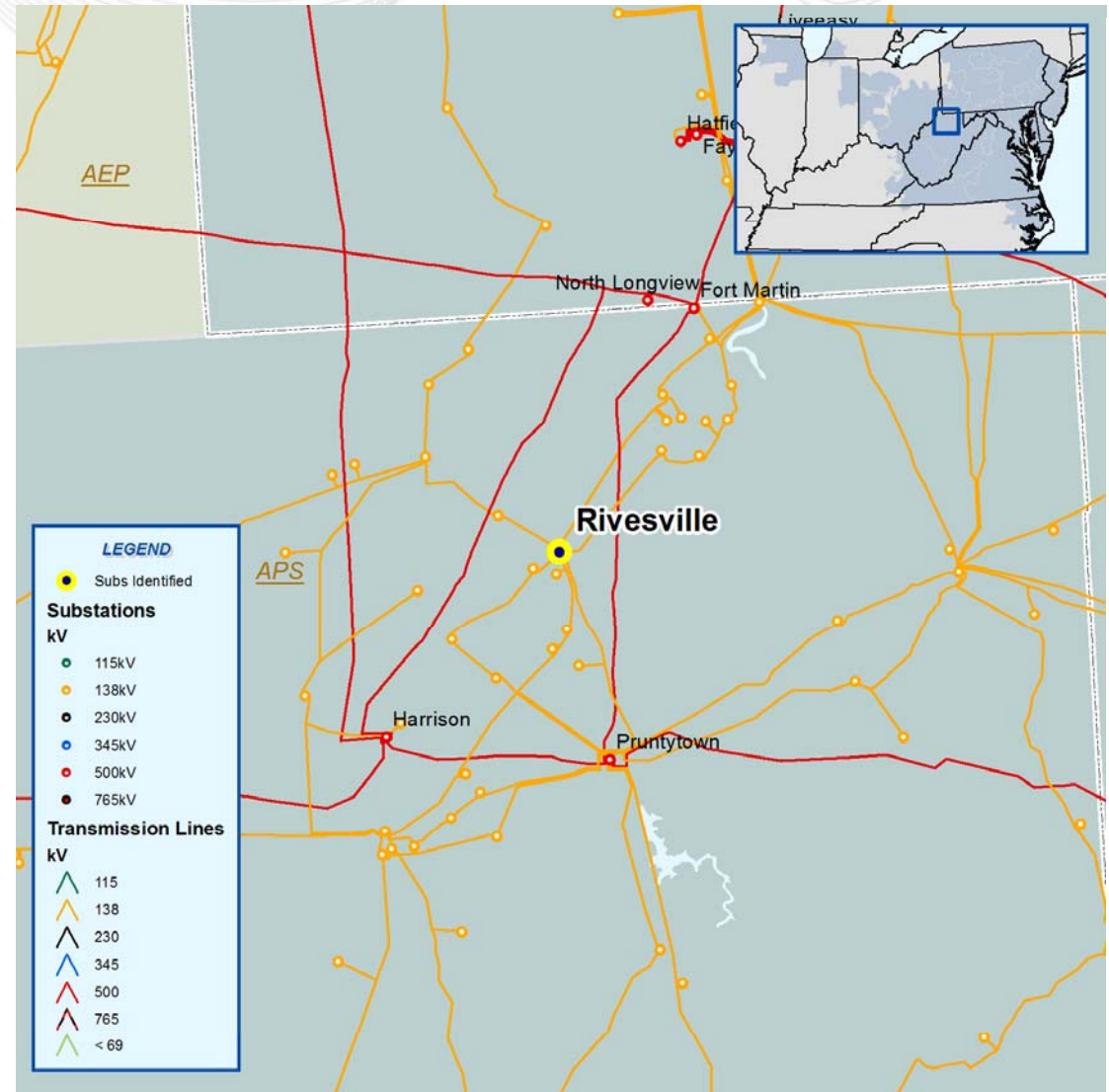
- Replace Butler 138kV breaker Bank' #1
- Replace Butler 138kV breaker Bank' #2
- Estimated Project Cost: \$0.142 M per breaker
- Required IS Date: 06/01/2009



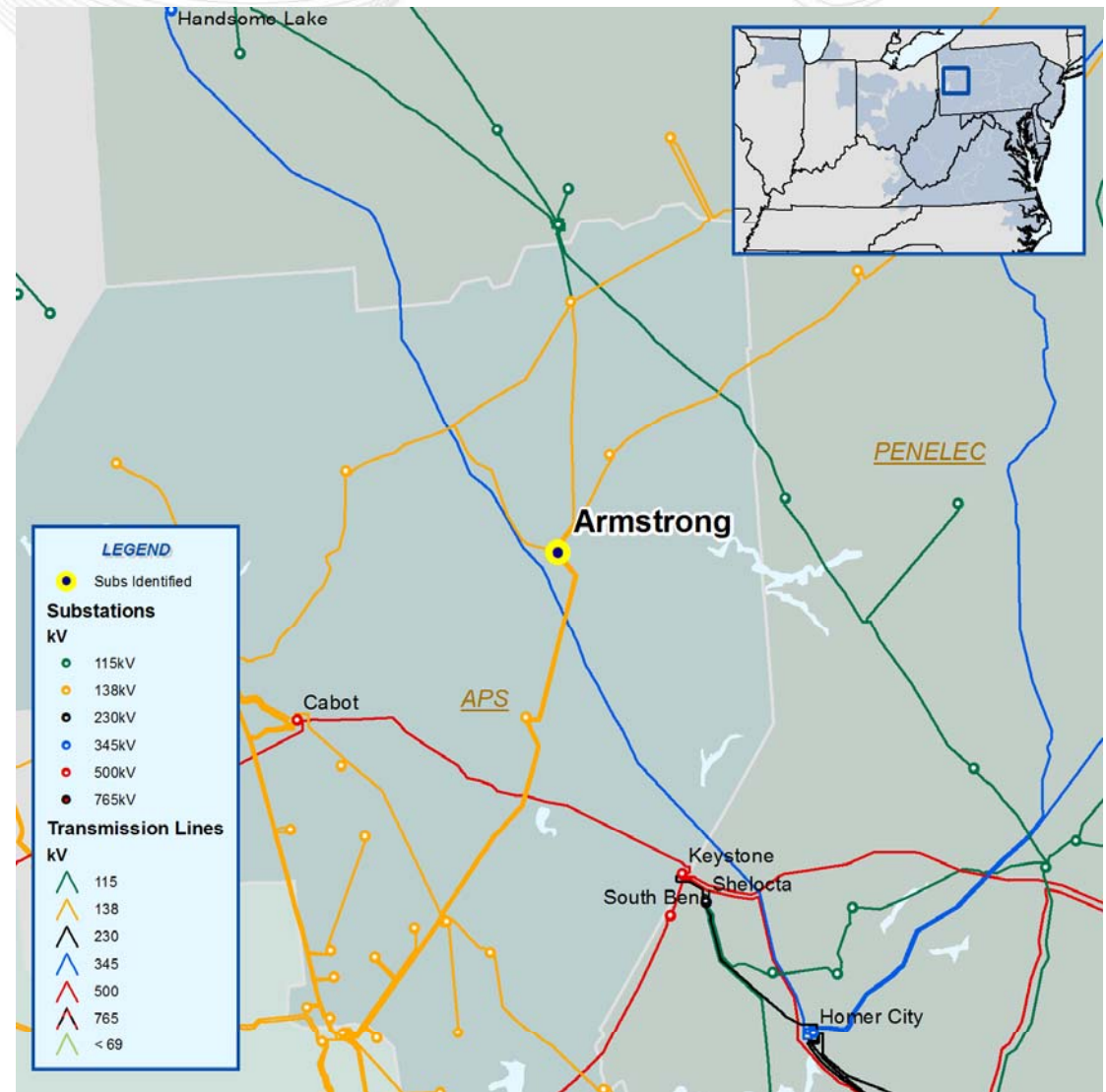
- Replace Charleroi 138kV breaker XFMR BANK' #1
- Replace Charleroi 138kV breaker XFMR BANK' #2
- Estimated Project Cost: \$0.168 M per breaker
- Required IS Date: 06/01/2009



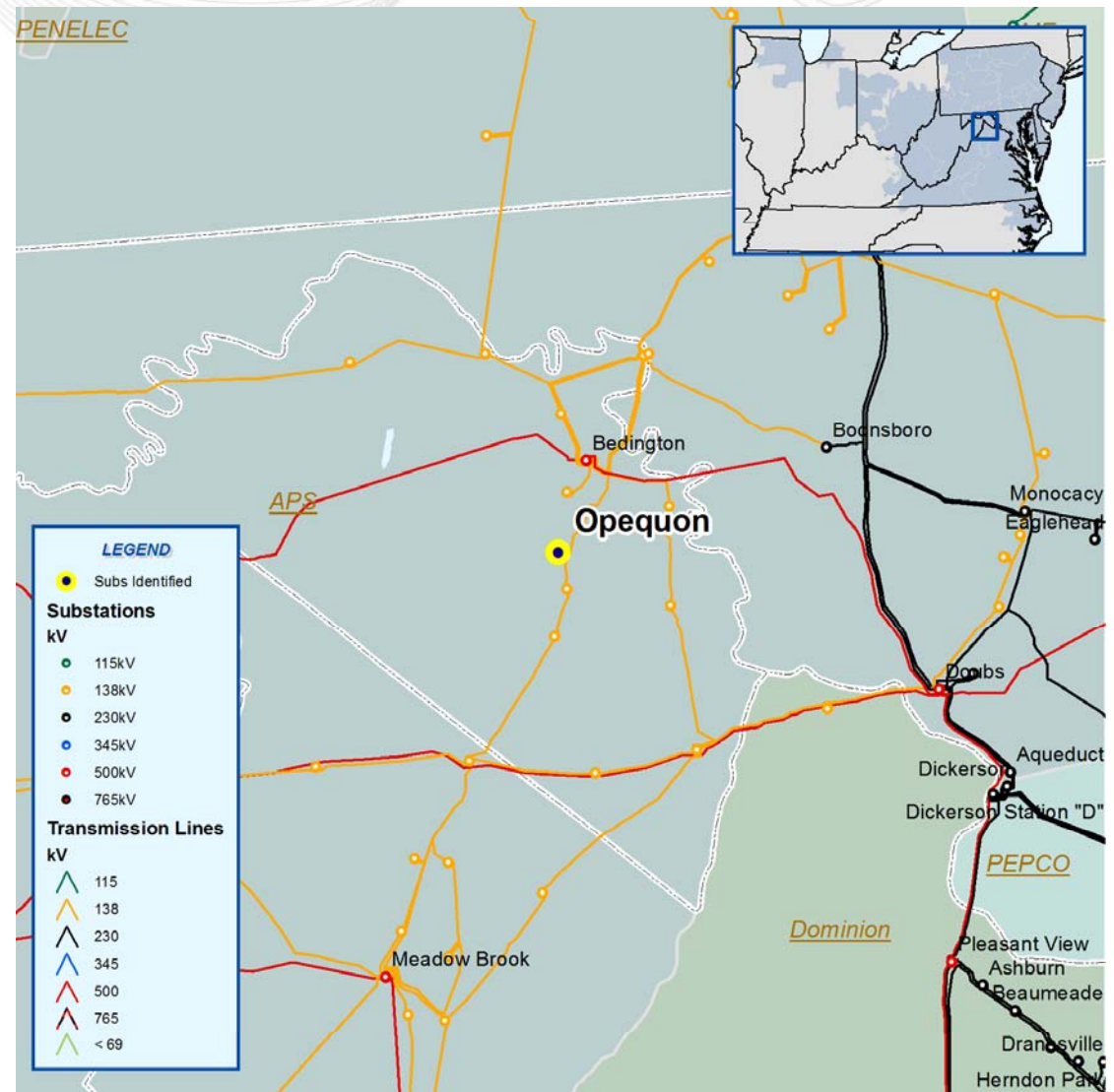
- Replace Rivesville 138kV breaker 'XFRM BANK' #8
- Replace Rivesville 138kV breaker '#10 XFRM BANK'
- Estimated Project Cost: \$0.142 M per breaker
- Required IS Date: 06/01/2009



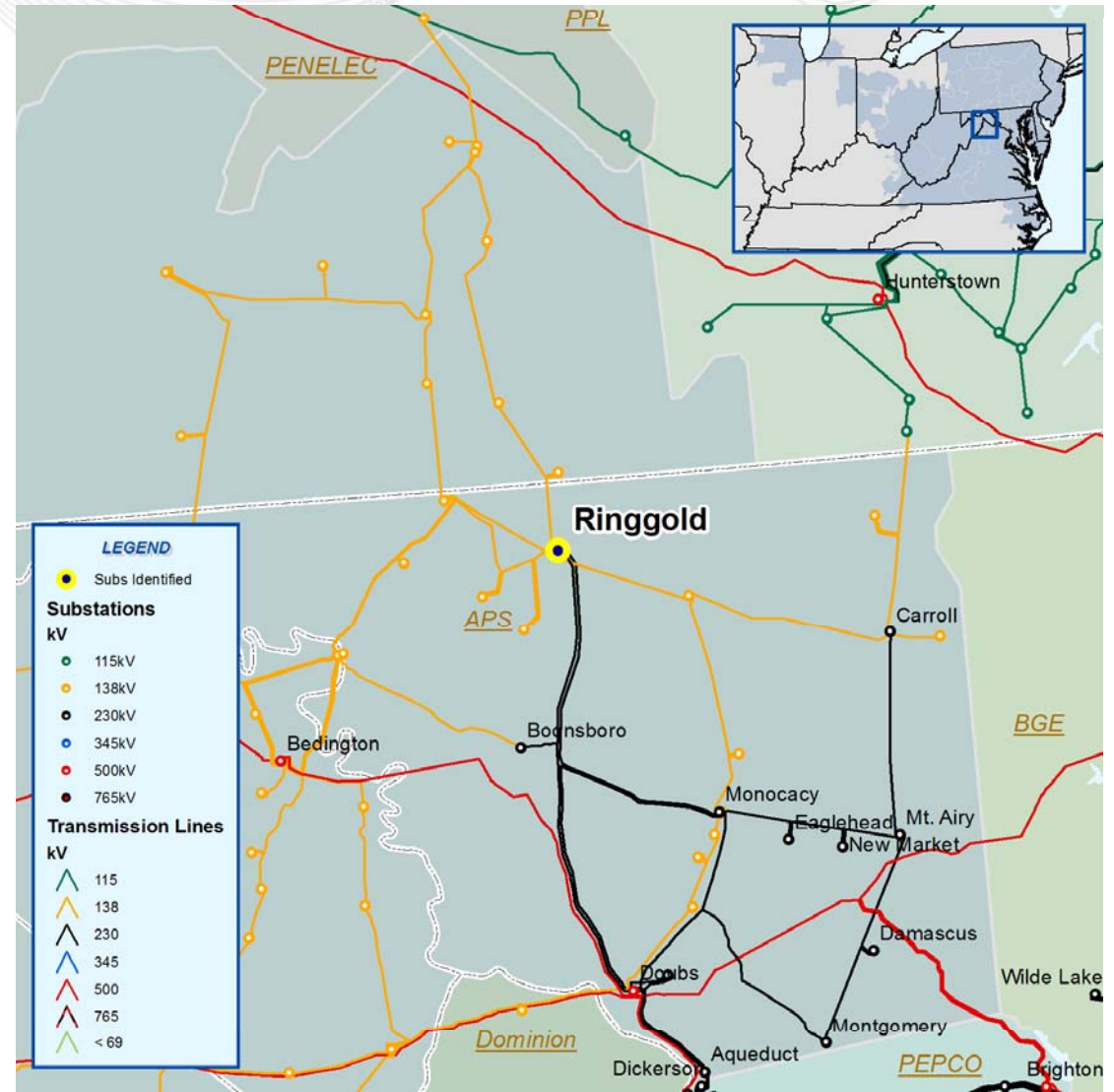
- Replace Armstrong 138kV breaker 'Brookville'
- Replace Armstrong 138kV breaker 'Reserve Bus'
- Estimated Project Cost: \$0.142 M per breaker
- Required IS Date: 06/01/2009



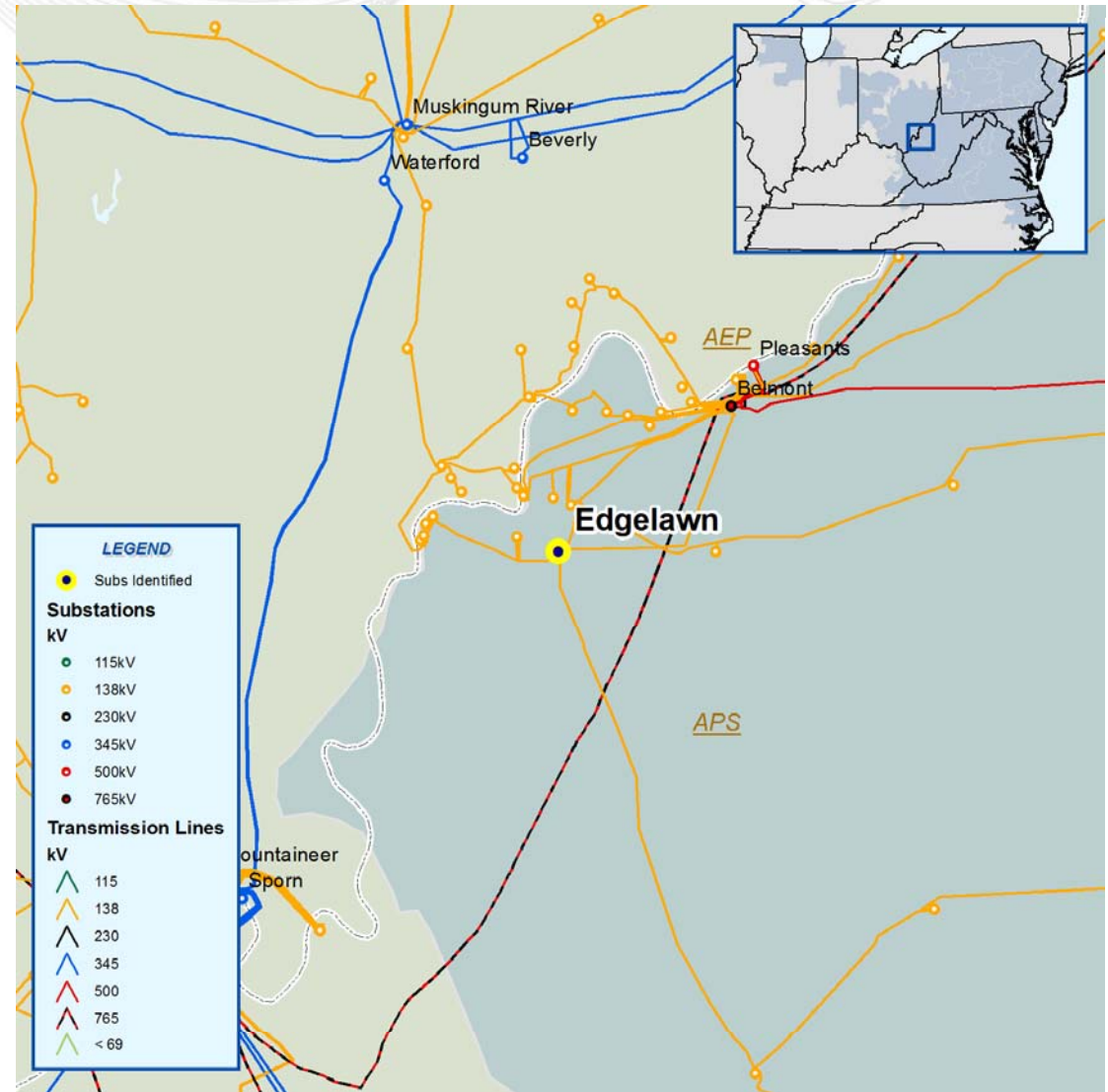
- Replace Opequon 138kV breaker 'Bus Tie'
- Estimated Project Cost: \$0.142 M
- Required IS Date: 06/01/2009



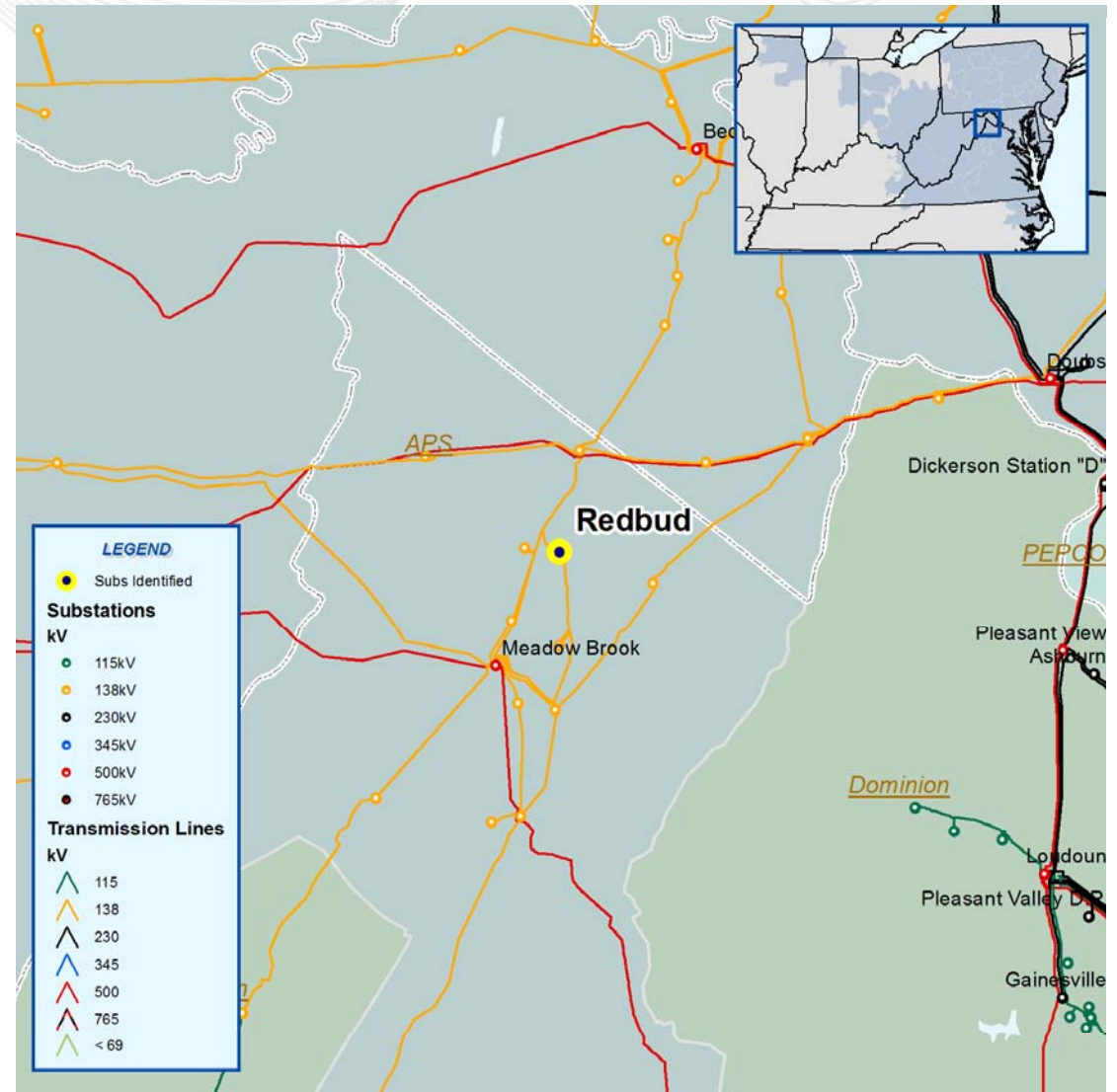
- Replace Ringgold 138kV breaker 'XFRM BANK' #3
- Estimated Project Cost: \$0.142 M
- Required IS Date: 06/01/2009



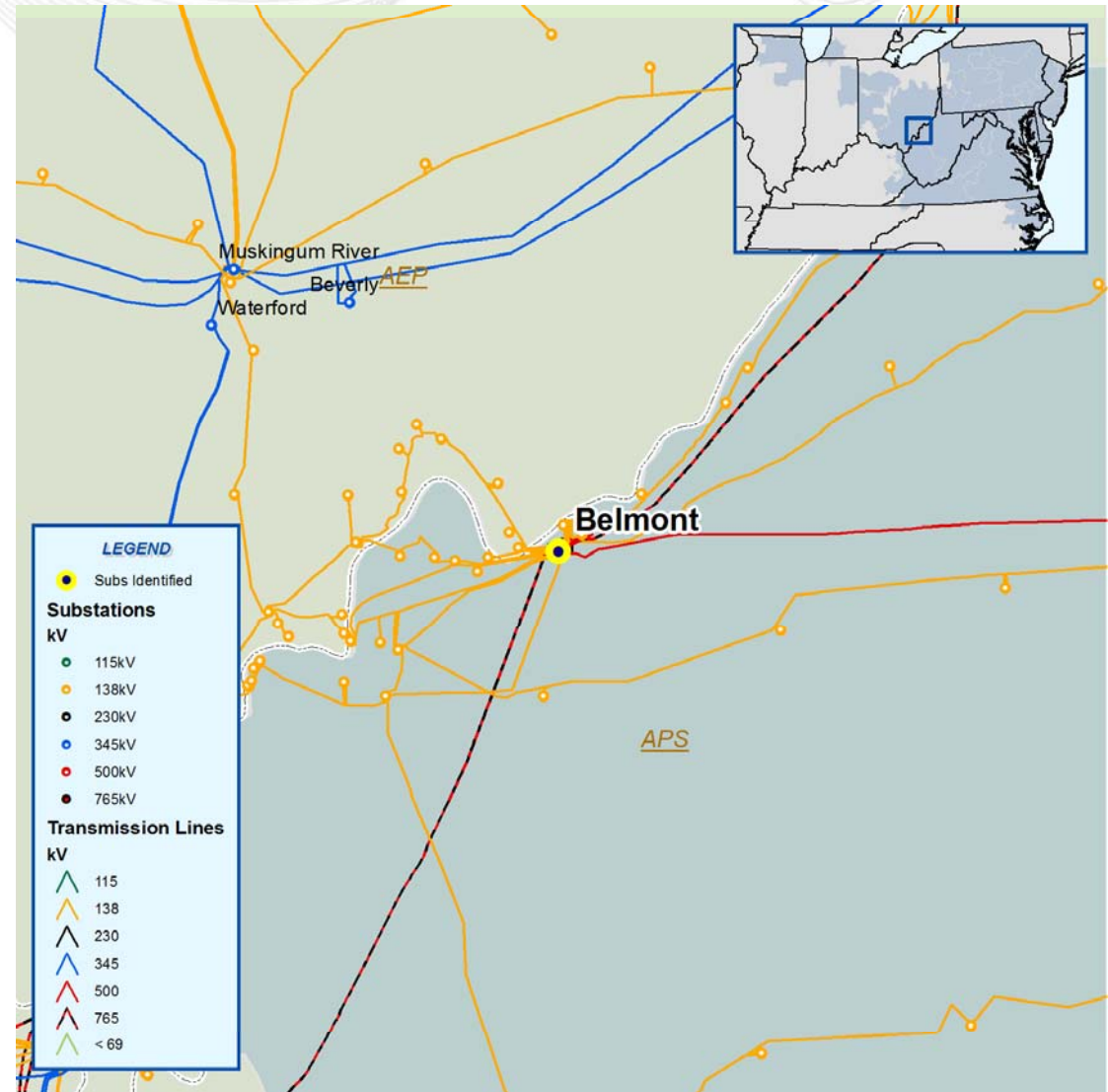
- Replace Edgelawn 138kV breaker 'GOFF RUN #632'
- Estimated Project Cost: \$0.142 M
- Required IS Date: 06/01/2009



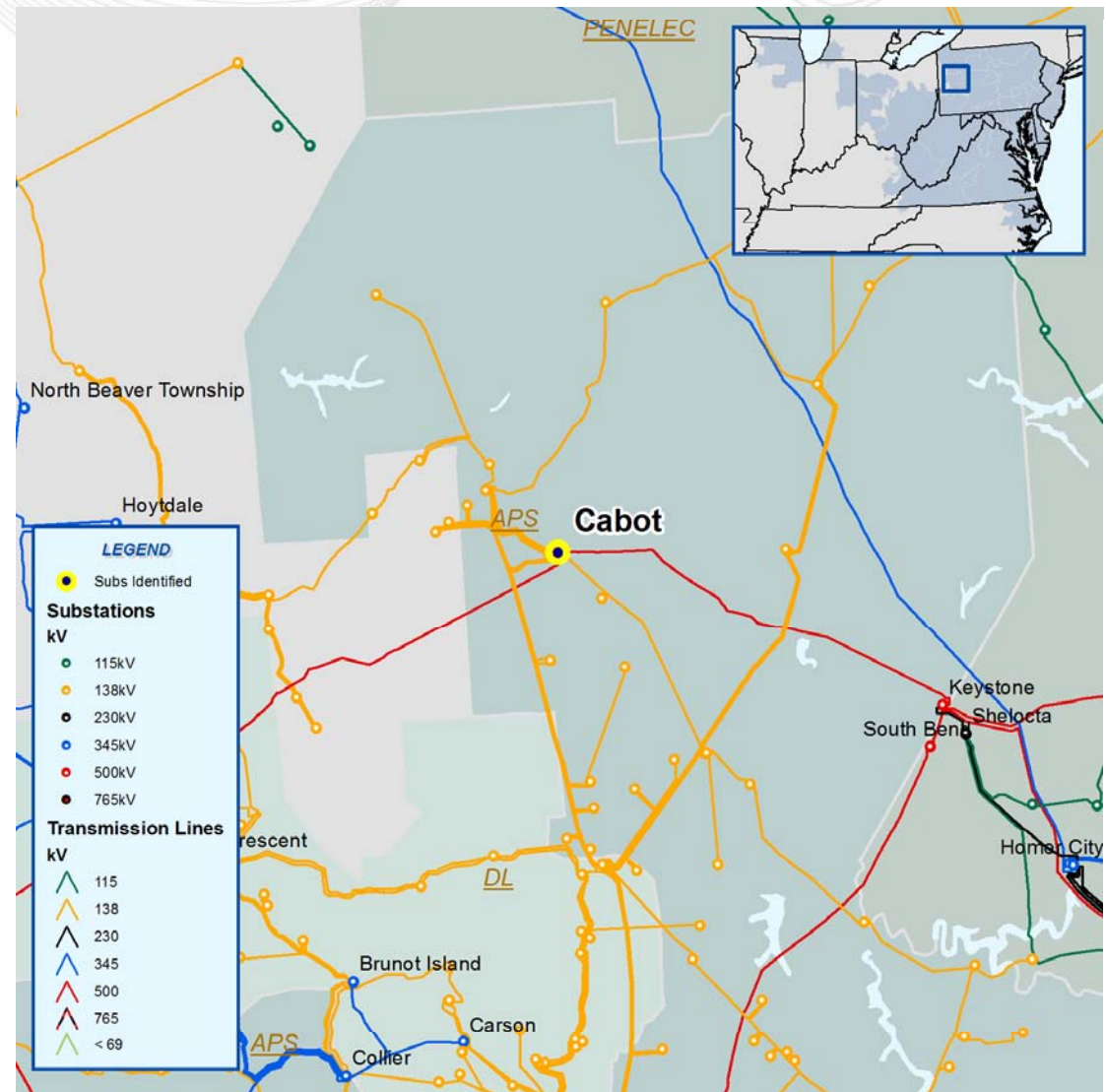
- Replace Redbud 138kV breaker 'Bus Tie'
- Estimated Project Cost: \$0.142 M
- Required IS Date: 06/01/2009



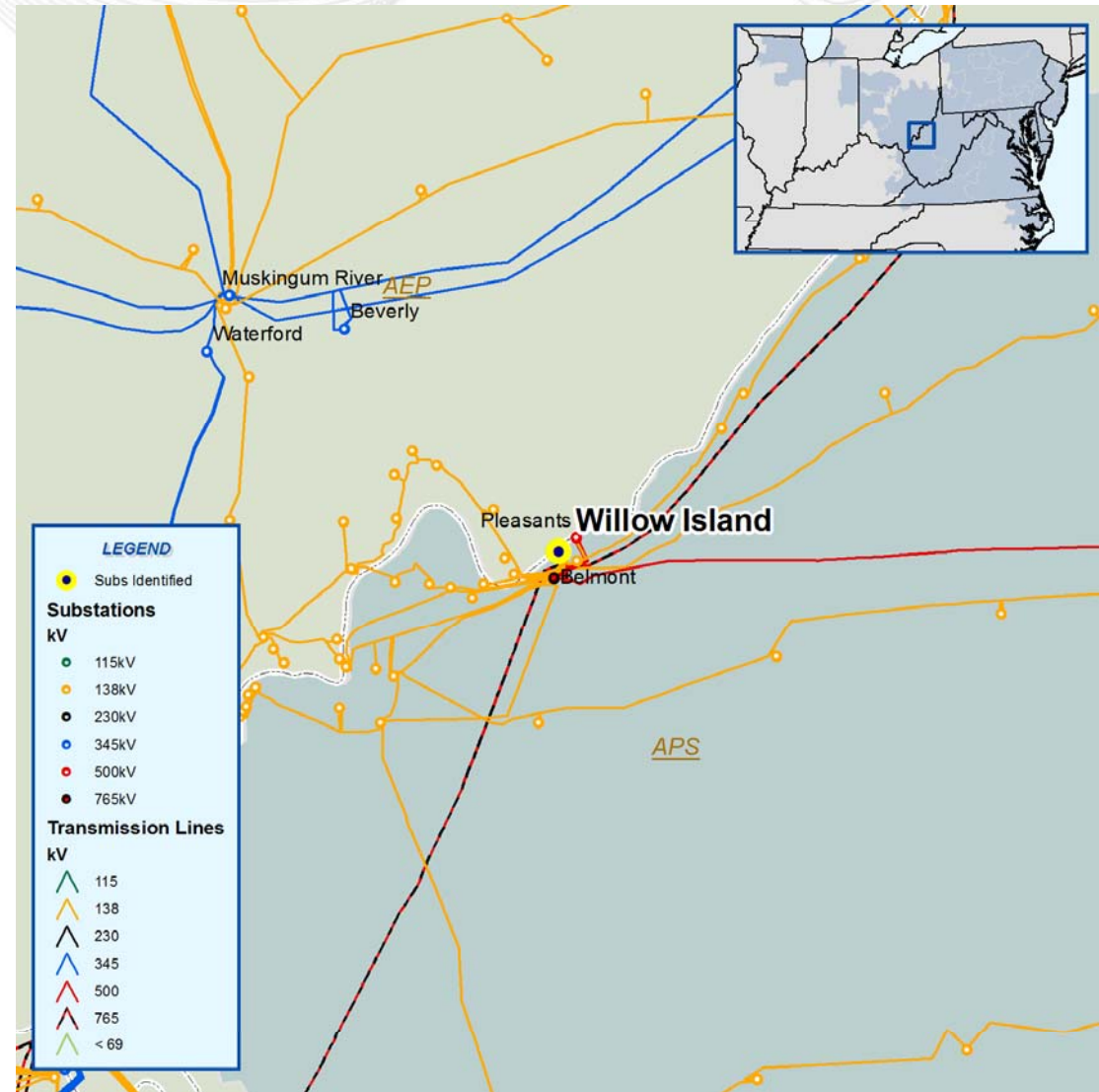
- Change reclosing on Belmont 138kV breaker 'B-7'
- Change reclosing on Belmont 138kV breaker 'B-9'
- Change reclosing on Belmont 138kV breaker 'B-12'
- Change reclosing on Belmont 138kV breaker 'B-19'
- Change reclosing on Belmont 138kV breaker 'B-21'
- Estimated Project Cost: \$1.0 K
- Required IS Date: 06/01/2009



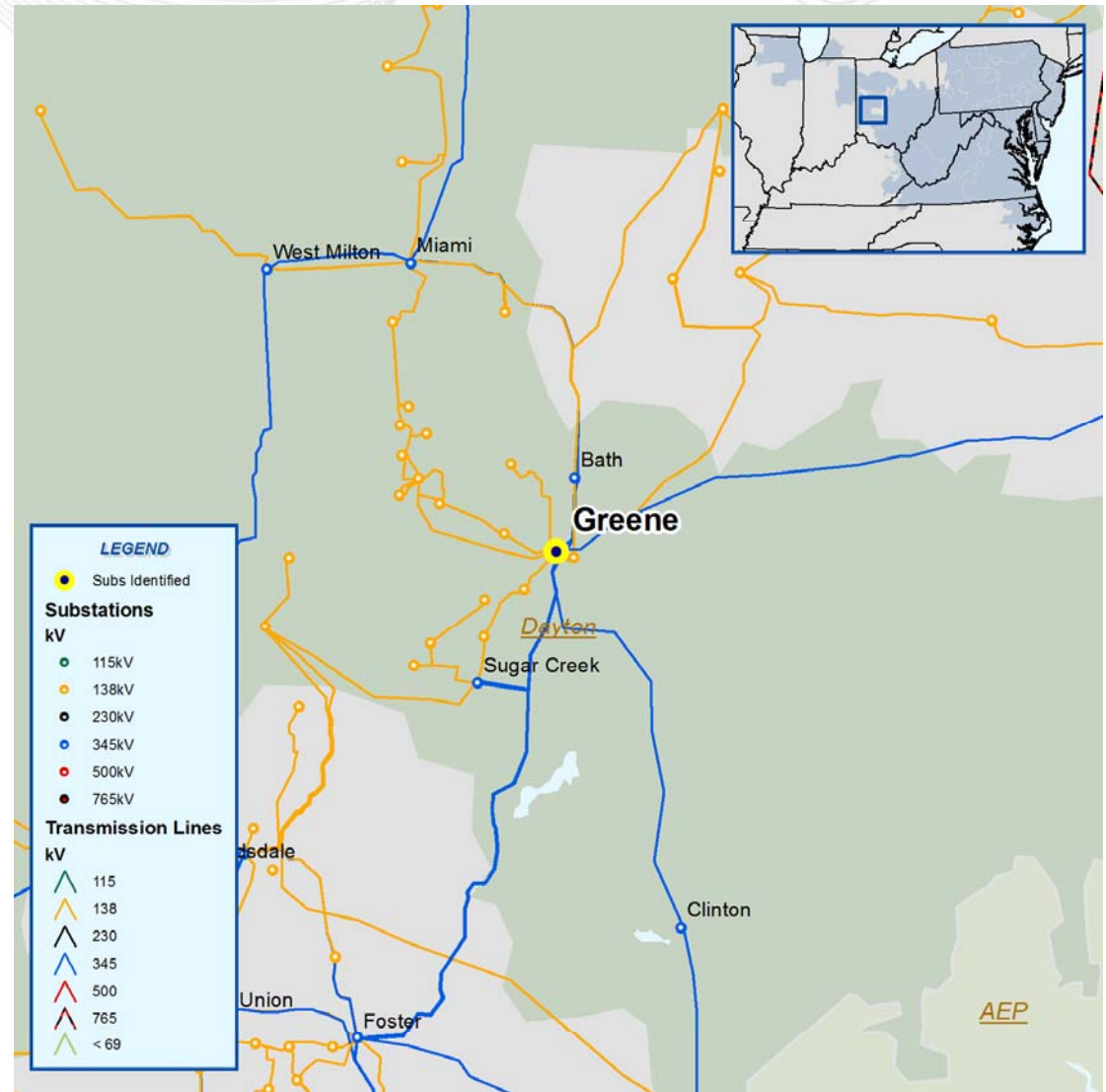
- Change reclosing on Cabot 138kV breaker 'C-1'
- Change reclosing on Cabot 138kV breaker 'C-4'
- Change reclosing on Cabot 138kV breaker 'C-9'
- Estimated Project Cost: \$1.0 K
- Required IS Date: 06/01/2009



- Change reclosing on Willow Island 138kV breaker 'Fairview #84'
- Estimated Project Cost: \$1.0 K
- Required IS Date: 06/01/2009



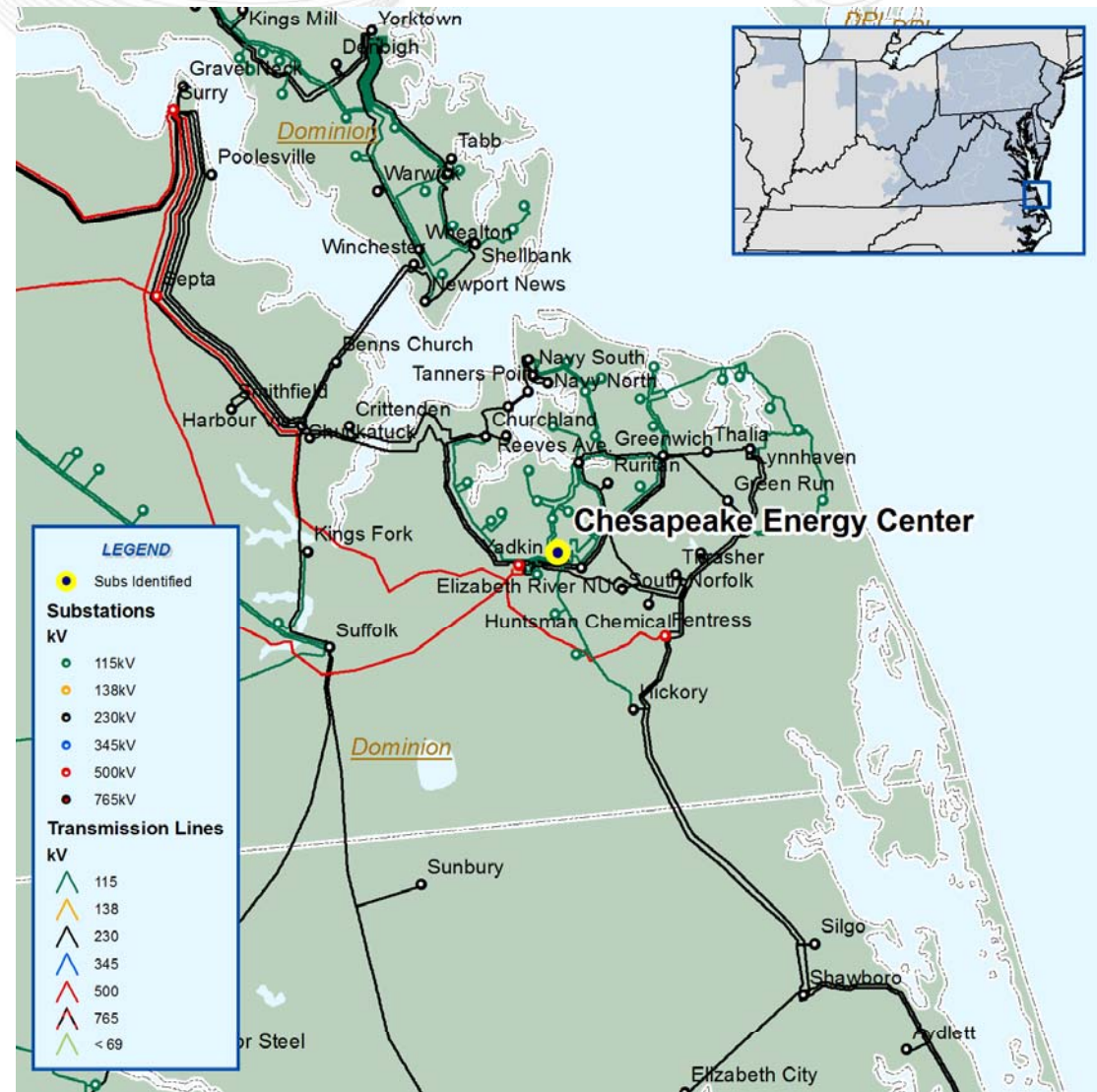
- Replace Greene 138kV breaker 'GJ-D'
- Replace Greene 138kV breaker 'GJ-E'
- Replace Greene 138kV breaker 'GJ-F'
- Replace Greene 138kV breaker 'GJ-H'
- Replace Greene 138kV breaker 'GJ-I'
- Estimated Project Cost: \$0.185 M per breaker
- Required IS Date: 06/01/2009



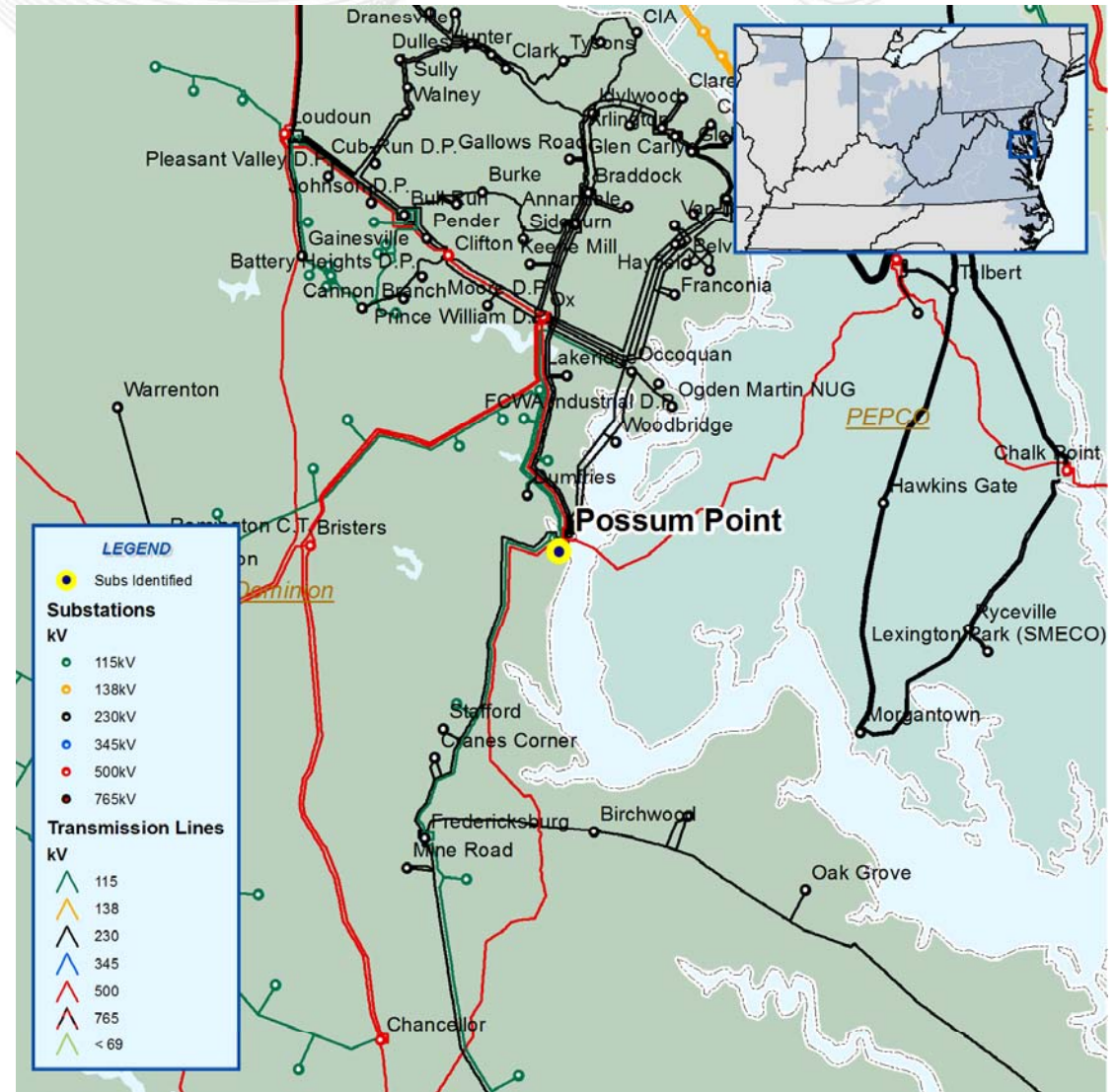


Dominion Transmission Zone

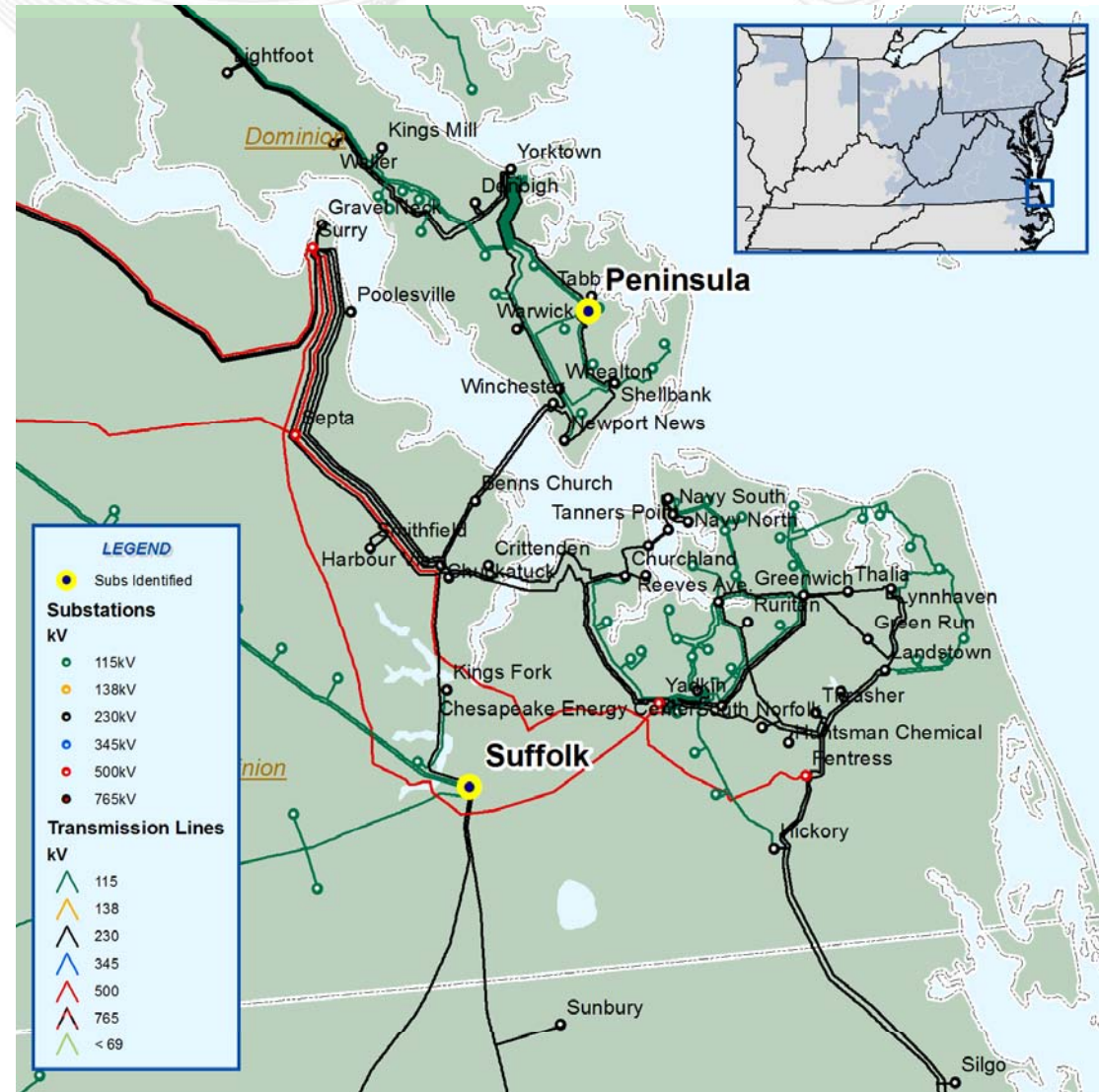
- Replace Chesapeake 115kV breaker 'SX522'
- Replace Chesapeake 115kV breaker 'T202'
- Estimated Project Cost: \$0.2 M per breaker
- Required IS Date: 06/01/2009



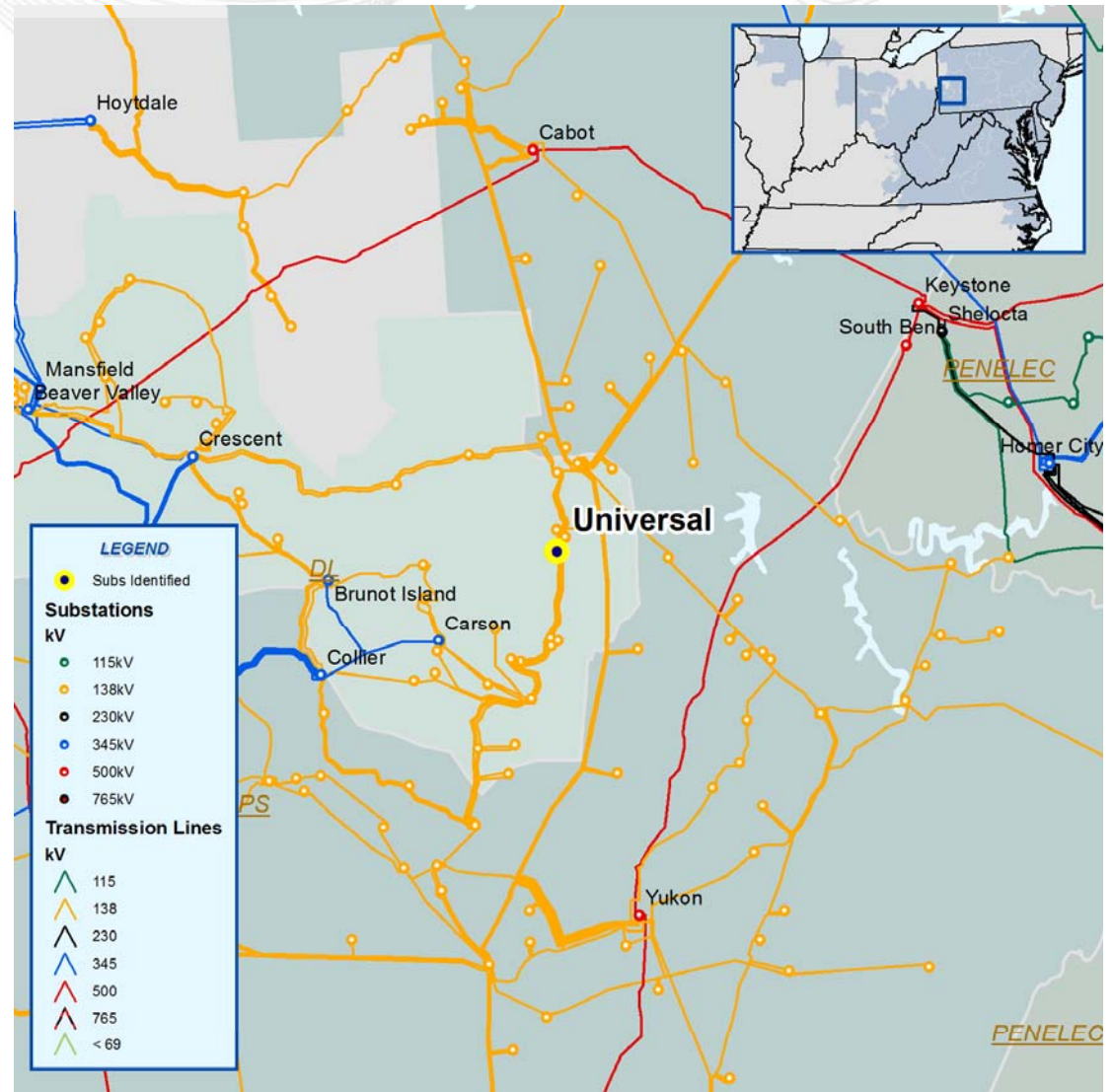
- Replace Possum Point 115kV breaker 'SX-32'
- Replace Possum Point 115kV breaker 'L92-1'
- Replace Possum Point 115kV breaker 'L92-2'
- Estimated Project Cost: \$0.2 M per breaker
- Required IS Date: 06/01/2009



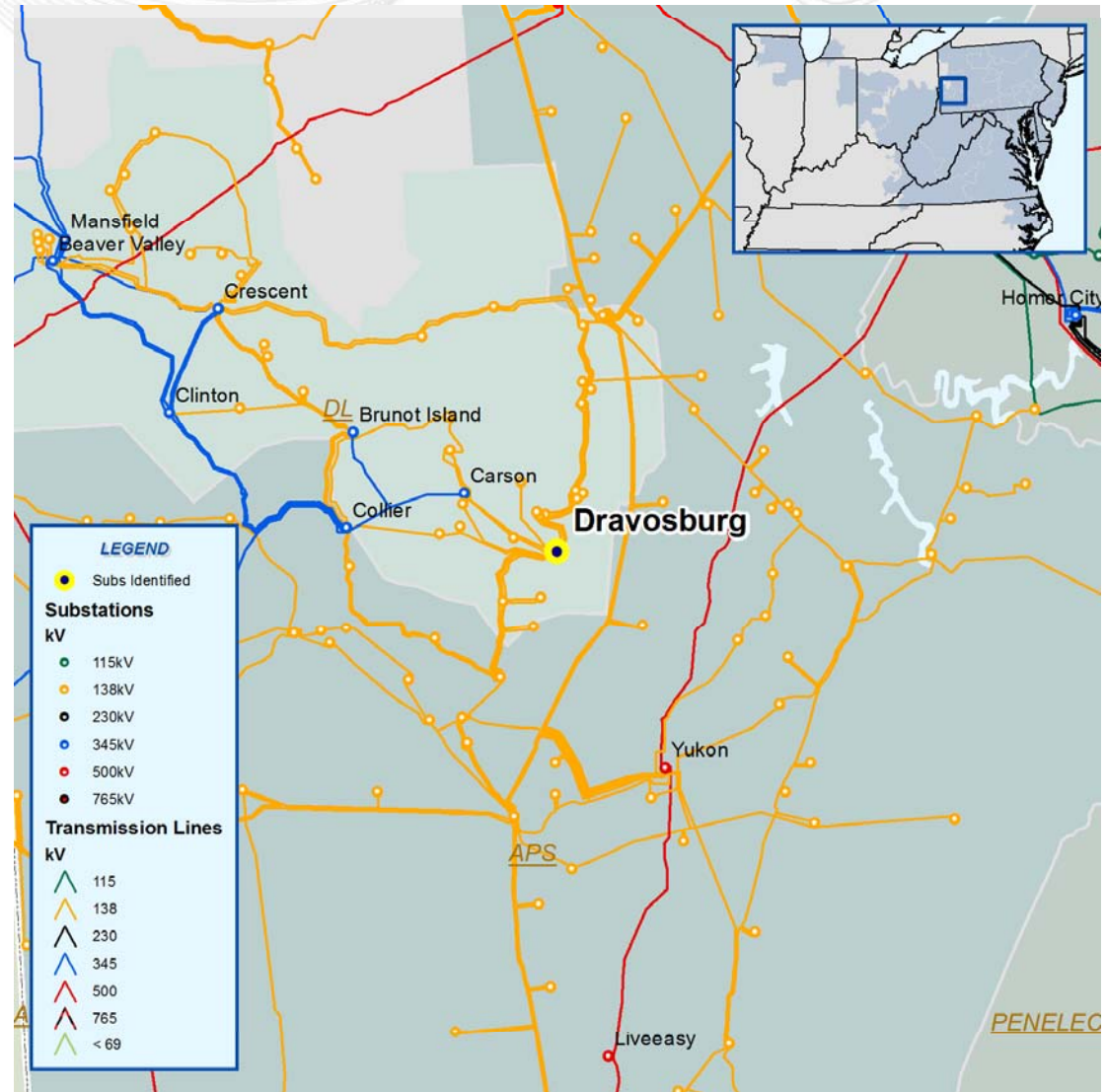
- Replace Suffolk 115kV breaker 'T202'
- Replace Peninsula 115kV breaker 'SC202'
- Estimated Project Cost: \$0.2 M per breaker
- Required IS Date: 06/01/2009



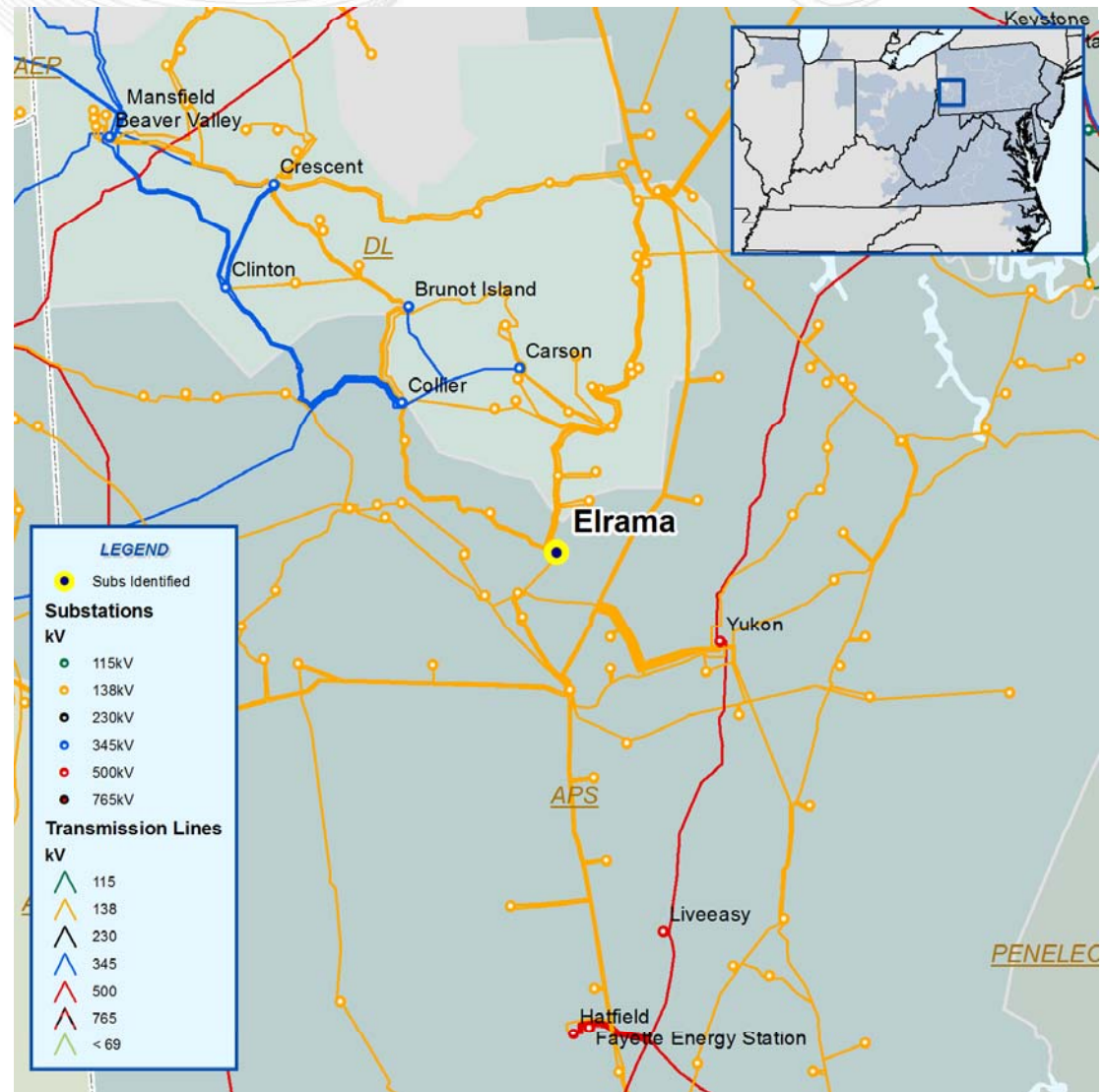
- Replace Universal 138kV breaker 'Z-152'
- Replace Universal 138kV breaker 'Z-78'
- Replace Universal 138kV breaker 'NO 1-3'
- Estimated Project Cost: \$0.3 M per breaker
- Required IS Date: 06/01/2009



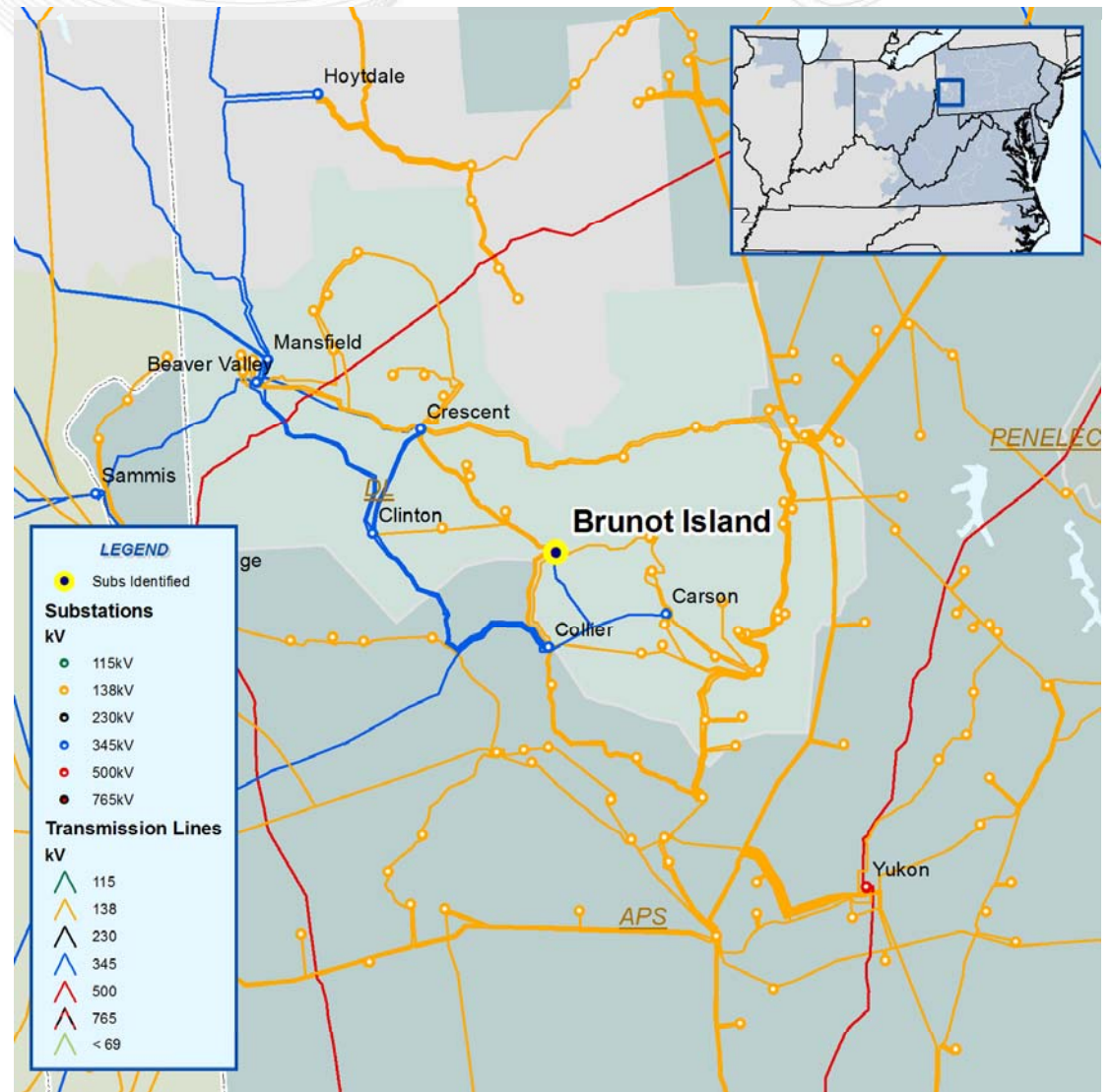
- Replace Dravosburg 138kV breaker 'Z-91'
- Replace Dravosburg 138kV breaker 'Z-87'
- Replace Dravosburg 138kV breaker 'Z-76'
- Replace Dravosburg 138kV breaker 'Z-77'
- Replace Dravosburg 138kV breaker 'Z-74'
- Estimated Project Cost: \$0.309 M per breaker
- Required IS Date: 06/01/2009



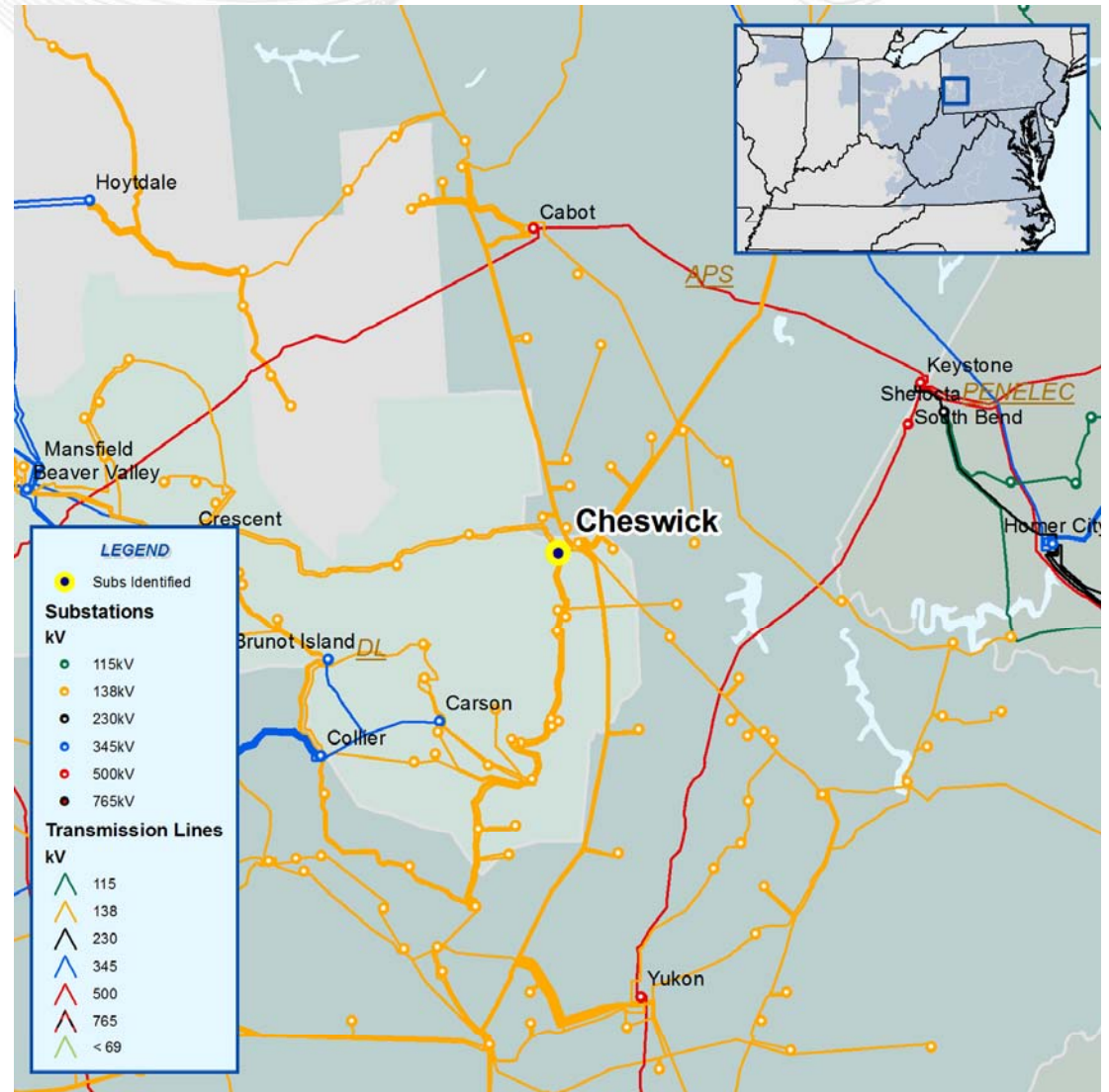
- Replace Elrama 138kV breaker '#3 SYN B'
- Replace Elrama 138kV breaker '#4 SYN REA'
- Estimated Project Cost: \$0.318 M per breaker
- Required IS Date: 06/01/2009



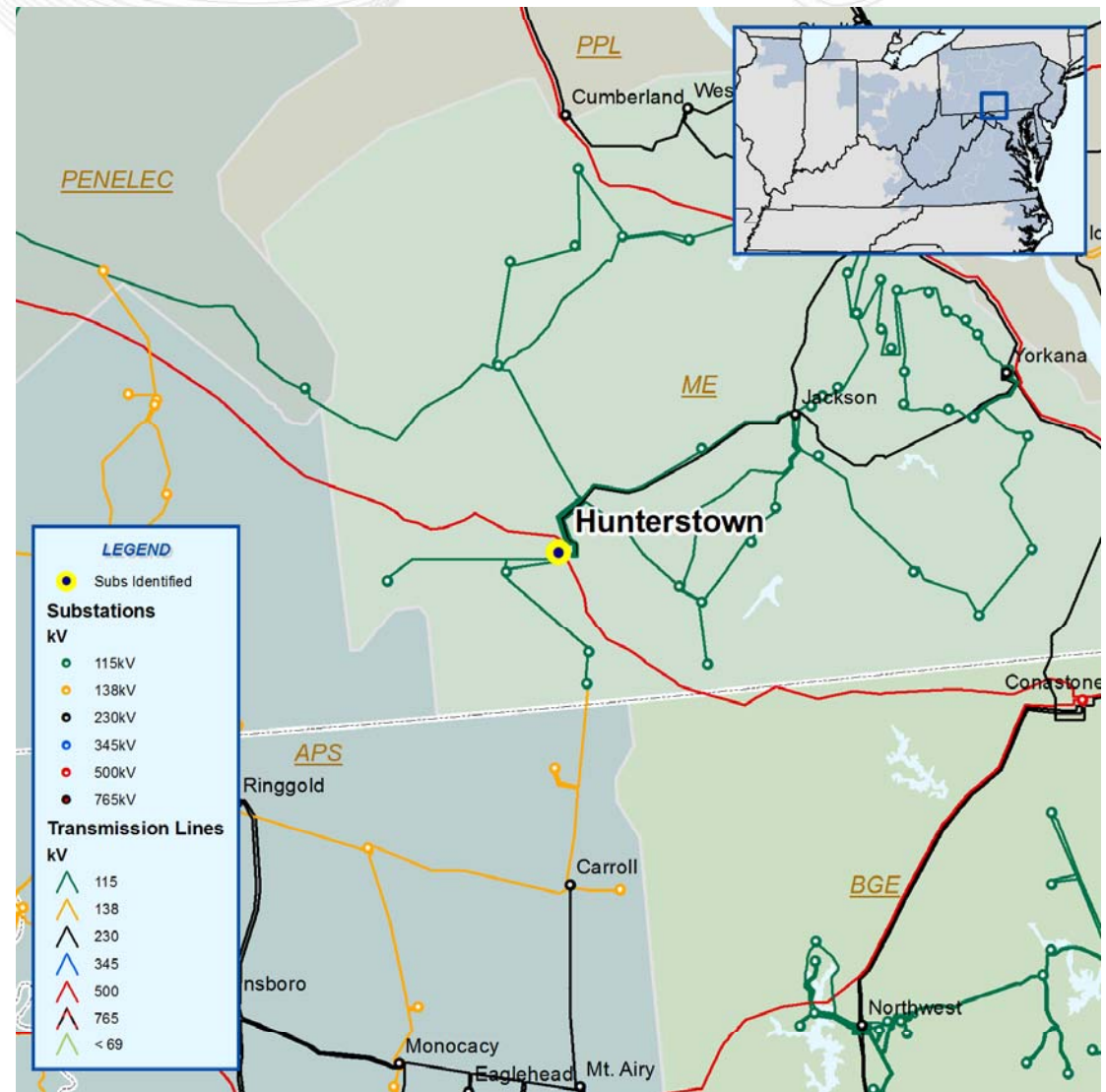
- Replace Brunot Island 138kV breaker 'GEN2 69 XFMR'
- Estimated Project Cost: \$0.3 M
- Required IS Date: 06/01/2009



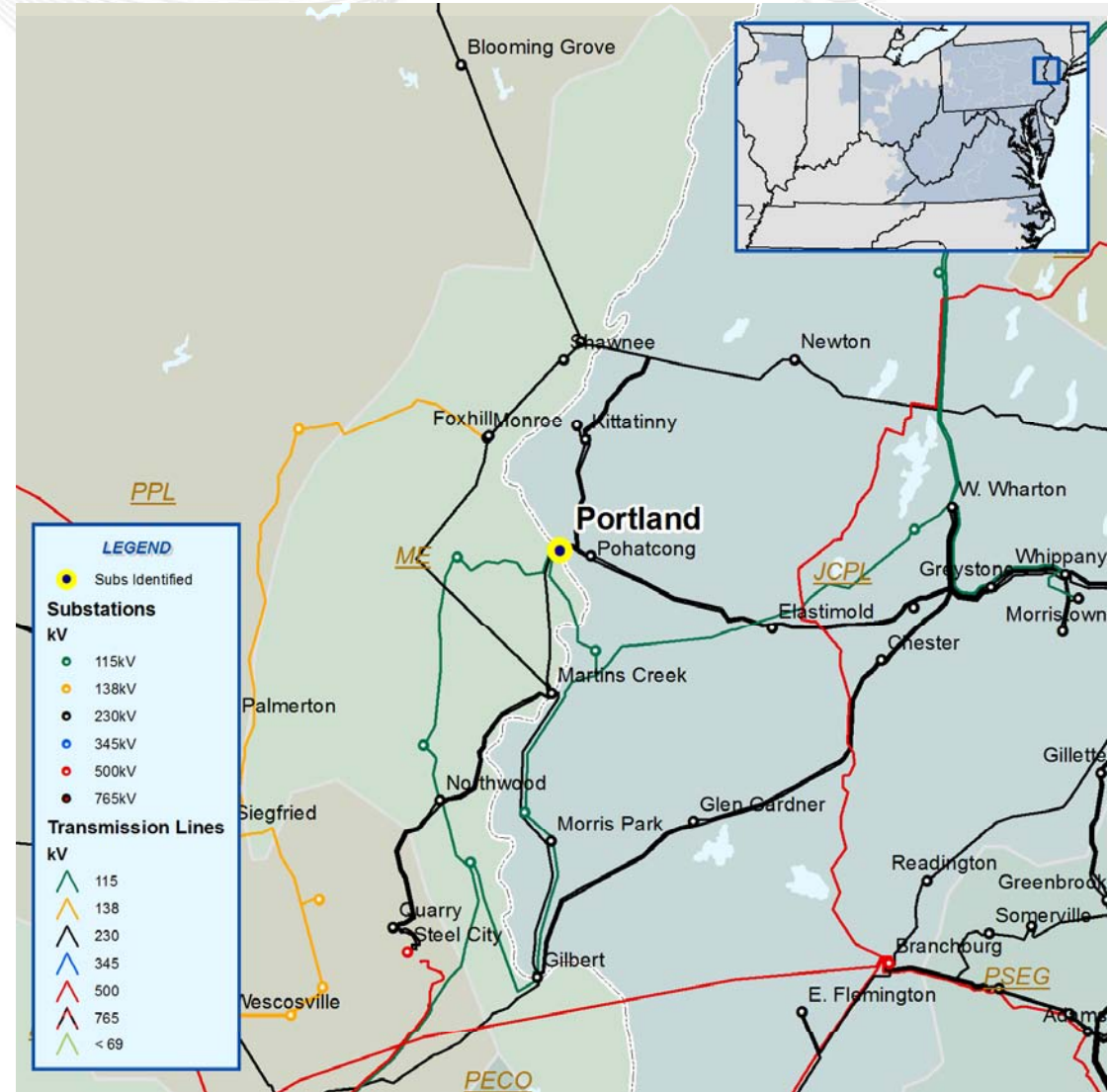
- Replace Cheswick 138kV breaker '2A/2B CAP'
- Estimated Project Cost: \$0.318 M
- Required IS Date: 06/01/2009



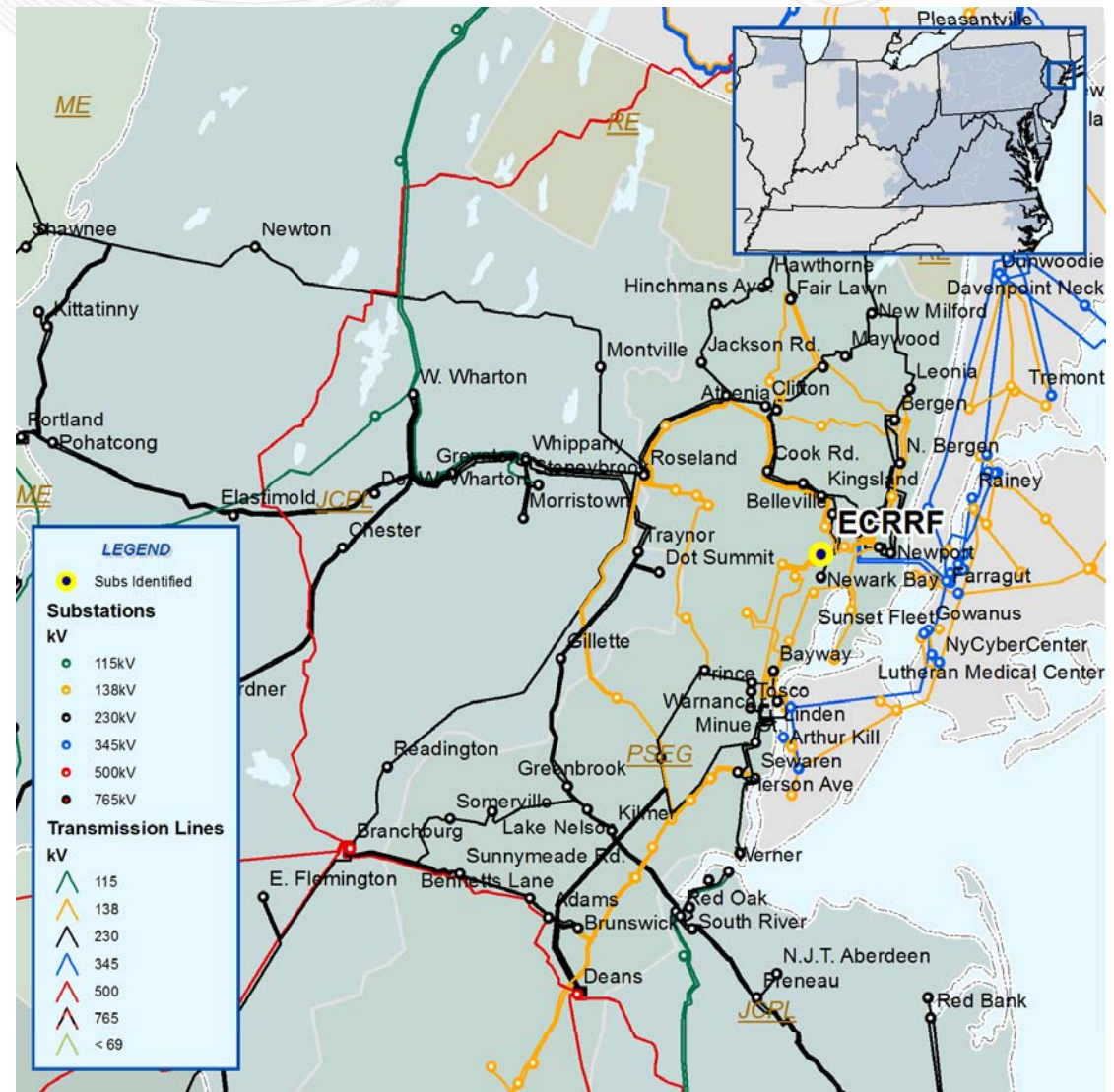
- Replace Hunterstown 115kV breaker '96392'
- Replace Hunterstown 115kV breaker '96292'
- Replace Hunterstown 115kV breaker '99192'
- Estimated Project Cost: \$0.225 M per breaker
- Required IS Date: 06/01/2009



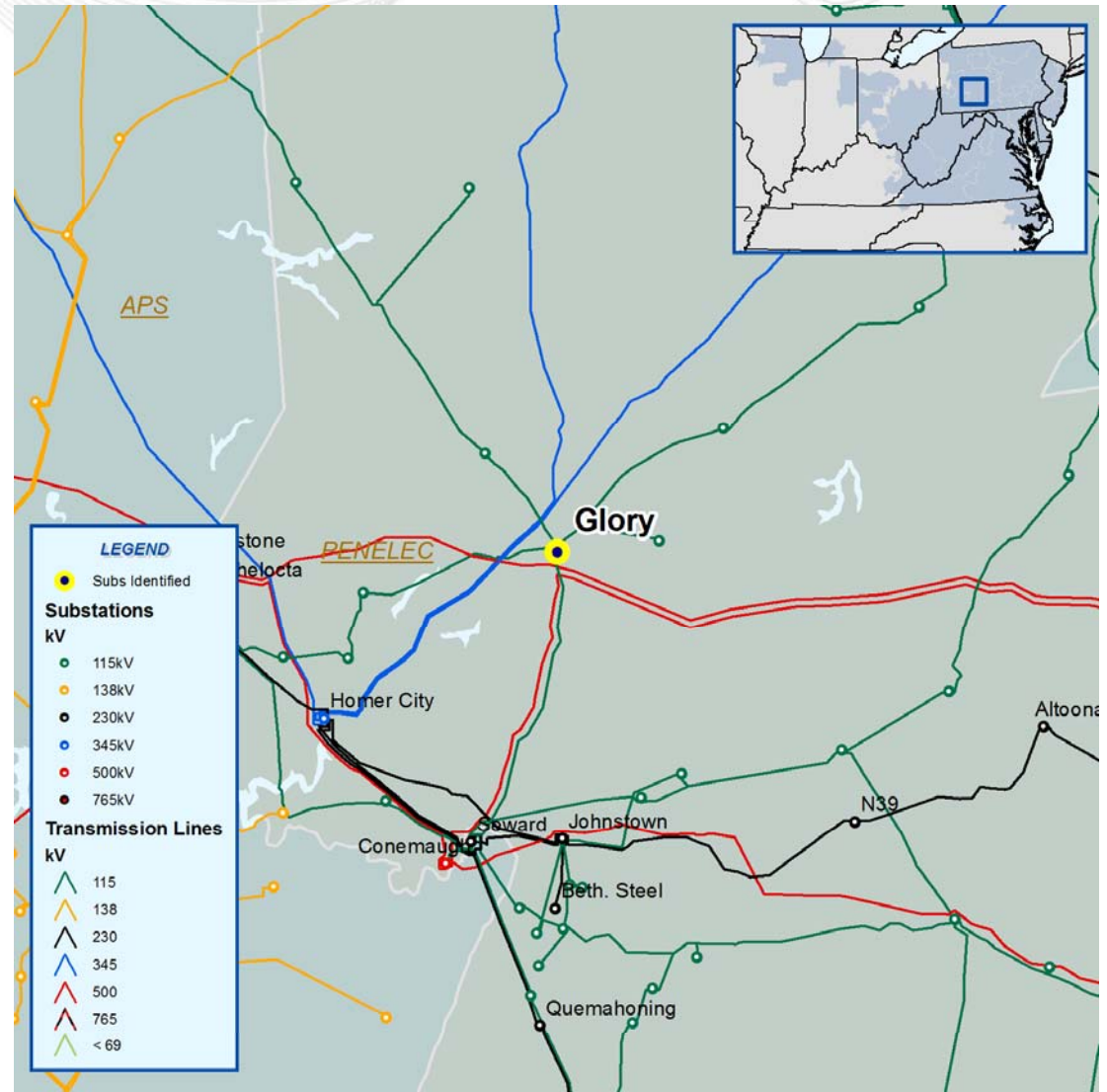
- Replace Portland 115kV breaker '95312'
- Replace Portland 115kV breaker '92712'
- Estimated Project Cost: \$0.225 M per breaker
- Required IS Date: 06/01/2009



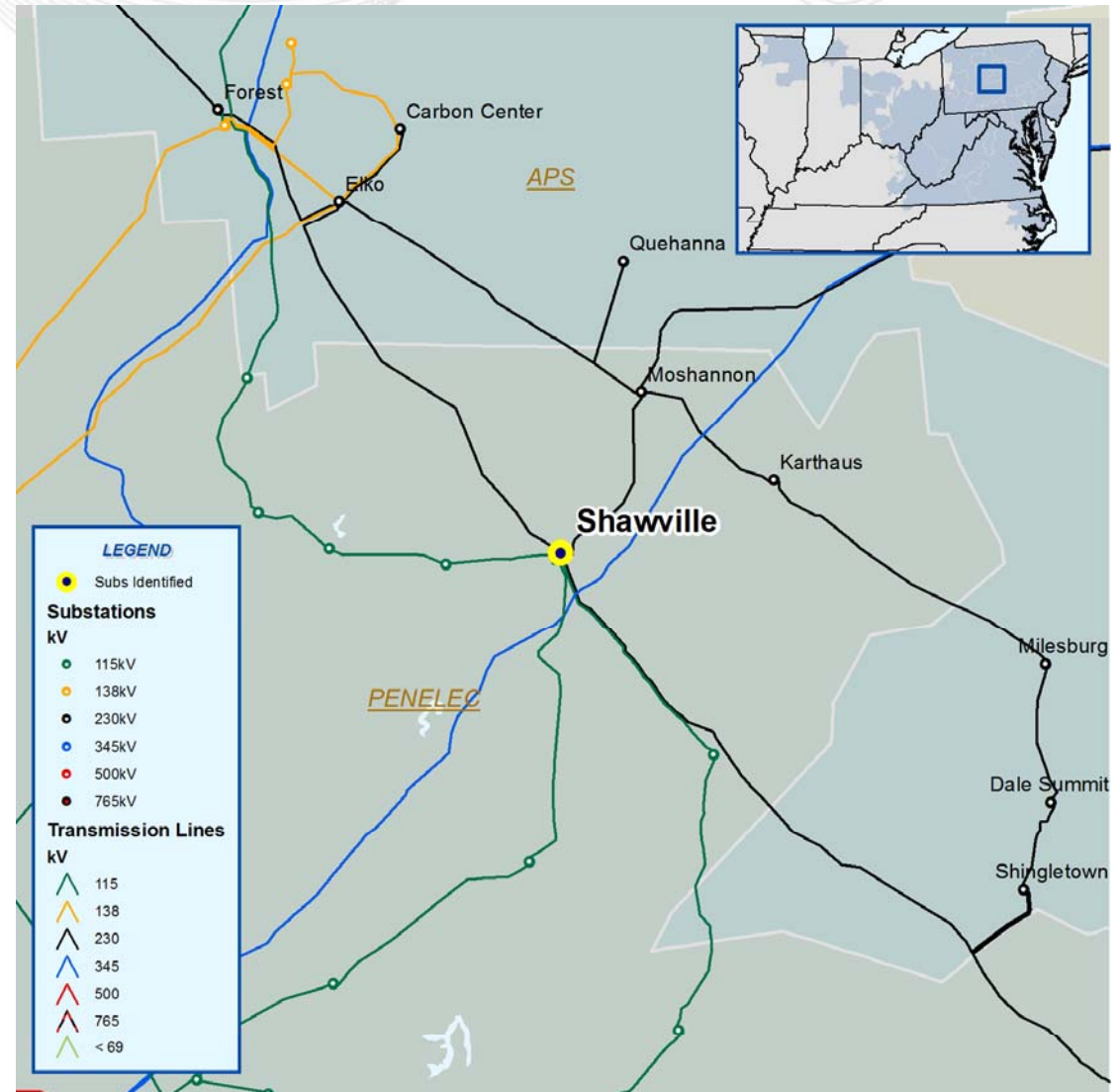
- Replace ECRR 138kV breaker '901'
- Replace ECRR 138kV breaker '902':
- Estimated Project Cost: \$0.5 M per breaker
- Required IS Date: 06/01/2009



- Replace Glory 115kV breaker 'NO.7 XFMR'
- Estimated Project Cost: \$0.225 M
- Required IS Date: 06/01/2009



- Replace Shawville 115kV breaker 'NO. 1B TX'
- Replace Shawville 115kV breaker 'NO. 2B TX'
- Replace Shawville 115kV breaker 'NO. 14 XFMR'
- Replace Shawville 115kV breaker 'NO. 15 XFMR'
- Estimated Project Cost: \$0.225 M per breaker
- Required IS Date: 06/01/2009



- Replace Shawville 115kV breaker 'Philipsburg'
- Replace Shawville 115kV breaker 'Garman'
- Replace Shawville 115kV breaker 'Dubois'
- Estimated Project Cost: \$0.225 M per breaker
- Required IS Date: 06/01/2009

