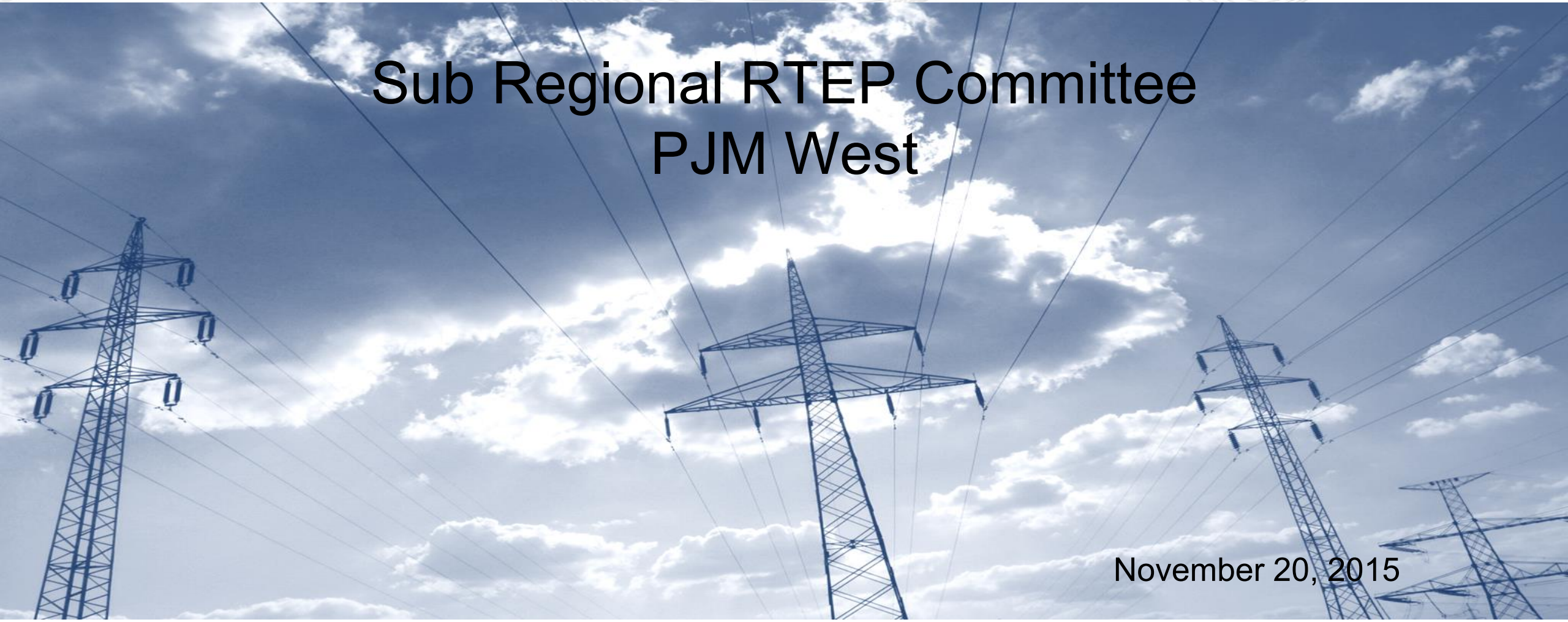


Sub Regional RTEP Committee
PJM West

November 20, 2015

Reliability Updates

APS Transmission Area

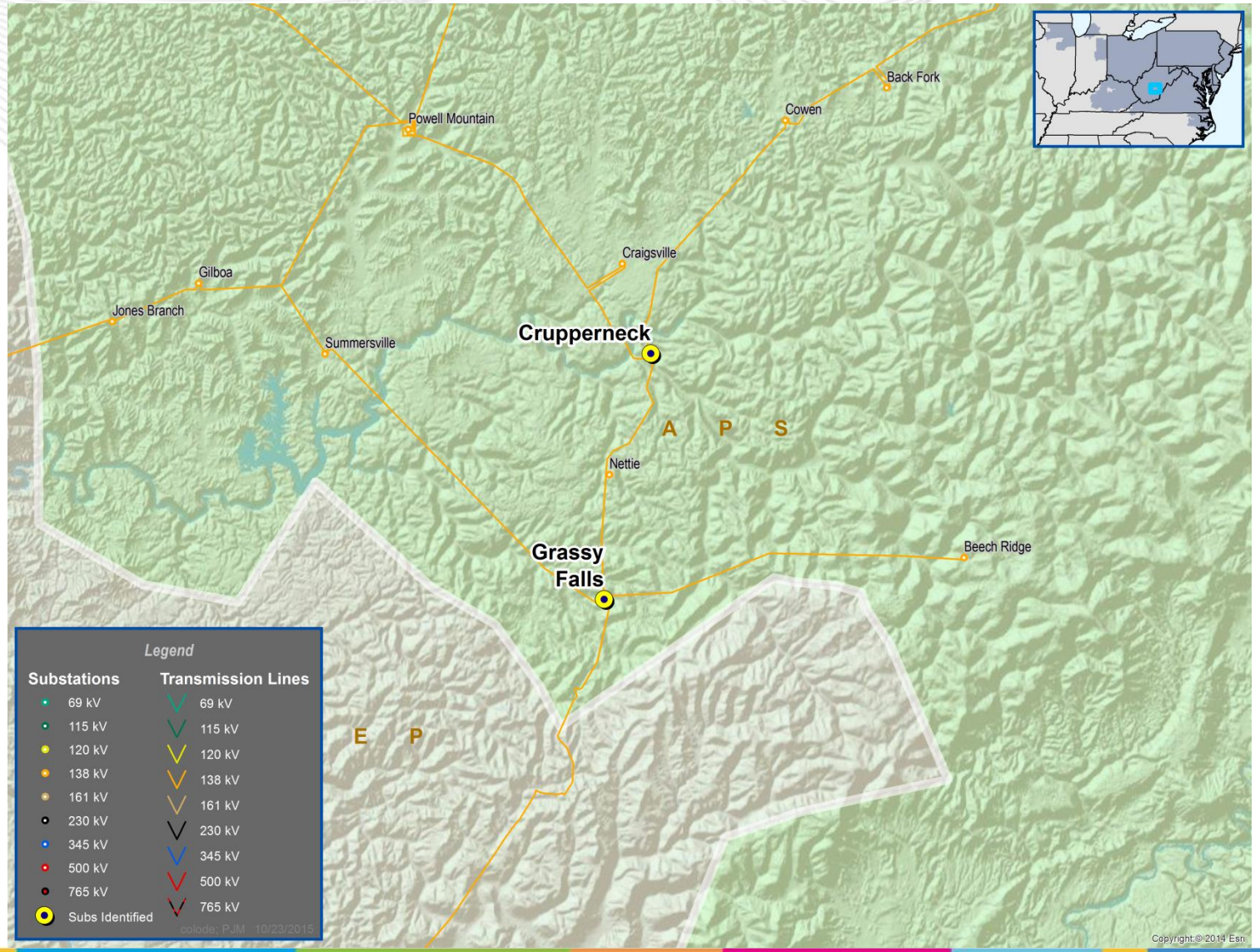
- **Project Scope Change: B2168**

- Old Scope: For Grassy Falls 138kV Capacitor bank adjust turn-on voltage to 1.0pu with a high limit of 1.04pu, For Crupperneck and Powell Mountain 138kV Capacitor Banks adjust turn-on voltage to 1.01pu with a high limit.

- As the engineering progressed on the project, it was determined the capacitor at Crupperneck was unable to accept the proposed settings since the physical high voltage limitation of the 138 kV capacitor was 1.02 per unit (141 kV).

- New Scope: Adjust Grassy Falls 138kV Capacitor bank high voltage limit from 1.04pu to 1.0pu; Replace the 138 kV capacitor at Crupperneck and adjust Crupperneck and Powell Mountain 138kV Capacitor Banks high voltage limit to 1.01pu

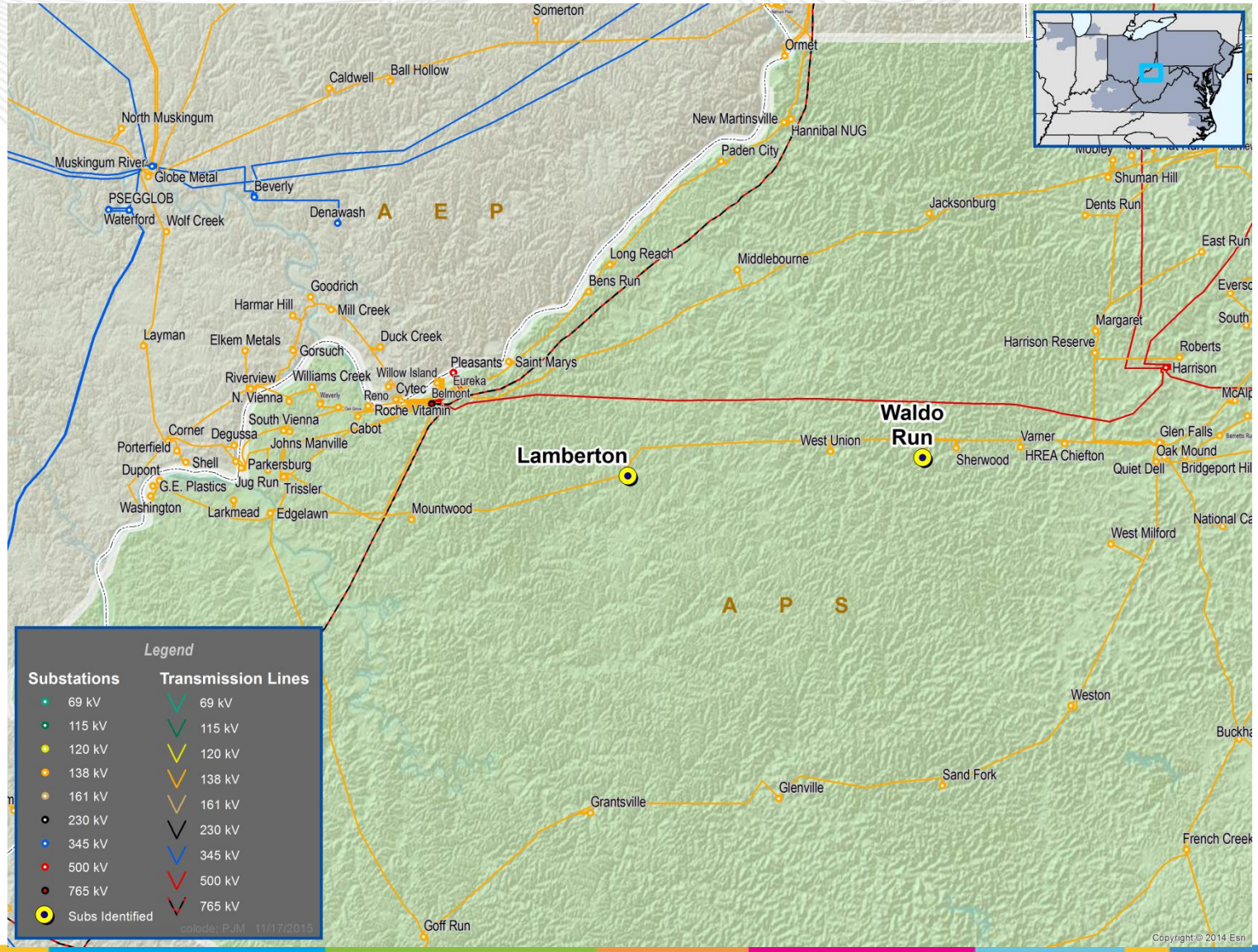
- Old Estimated Project Cost: $0M
- New Estimated Project Cost: $0.3M
- Required IS Date: 6/1/2016



Supplemental Projects

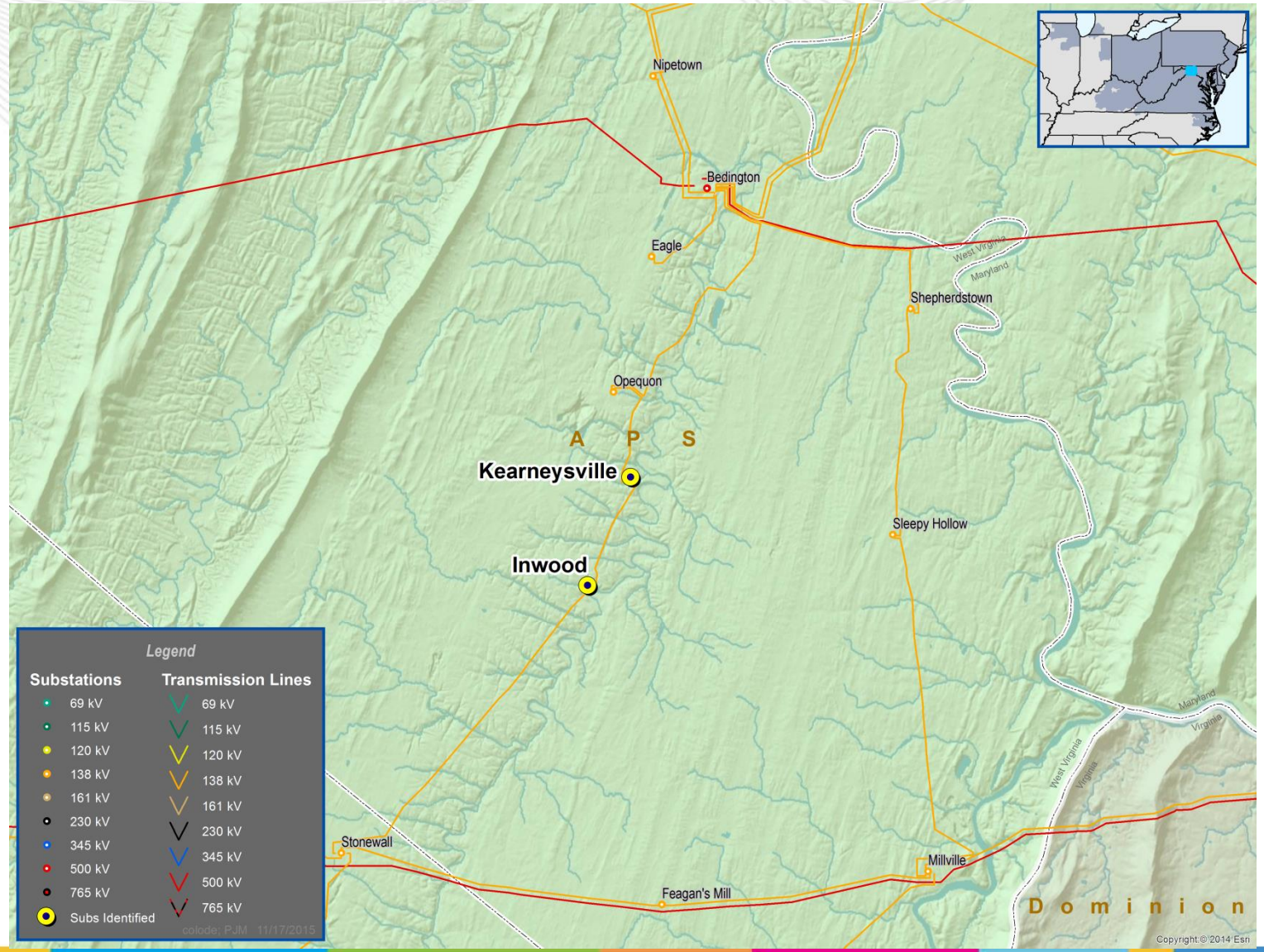
APS Transmission Area

- **Supplemental Project**
- Construct a new 138-34.5 kV substation (Hugle Run Substation) on the Lamberton-Waldo Run 138 kV line (S1038)
- New Customer
- Estimated Project Cost: $7.6M
- Expected IS Date: 6/1/2016



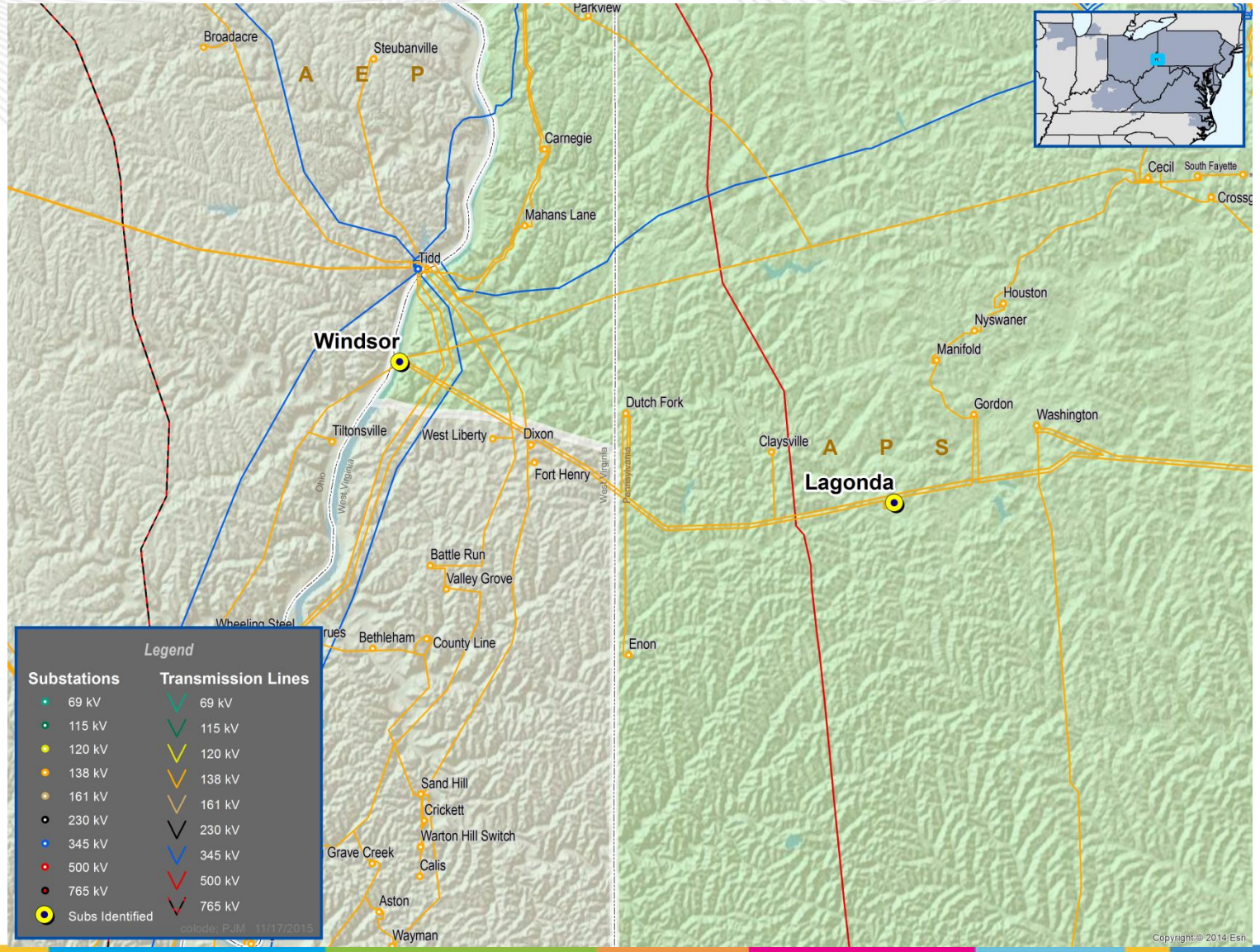
APS Transmission Area

- **Supplemental Project**
- Construct a new 138-34.5 kV substation (Vanville Substation) on the Innwood-Kearneysville 138 kV line (S1039)
- New Customer
- Estimated Project Cost: $9.1M
- Expected IS Date: 4/1/2017



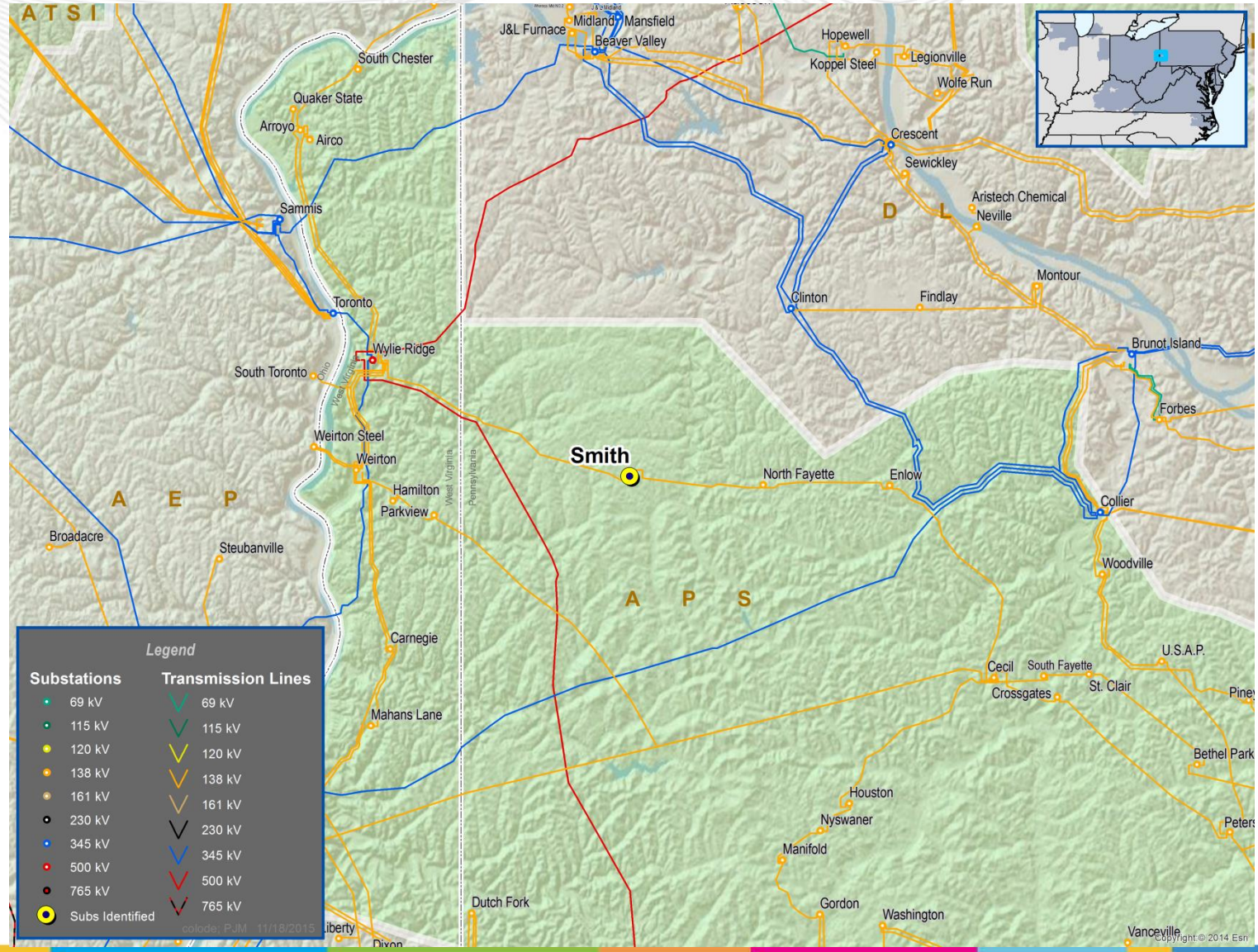
APS Transmission Area

- **Supplemental Project**
- Tap Windsor-Lagonda 138 kV line and provide 138 kV service to new customer. (S1040)
- New Customer
- Estimated Project Cost: $1.5M
- Expected IS Date: 6/1/2016



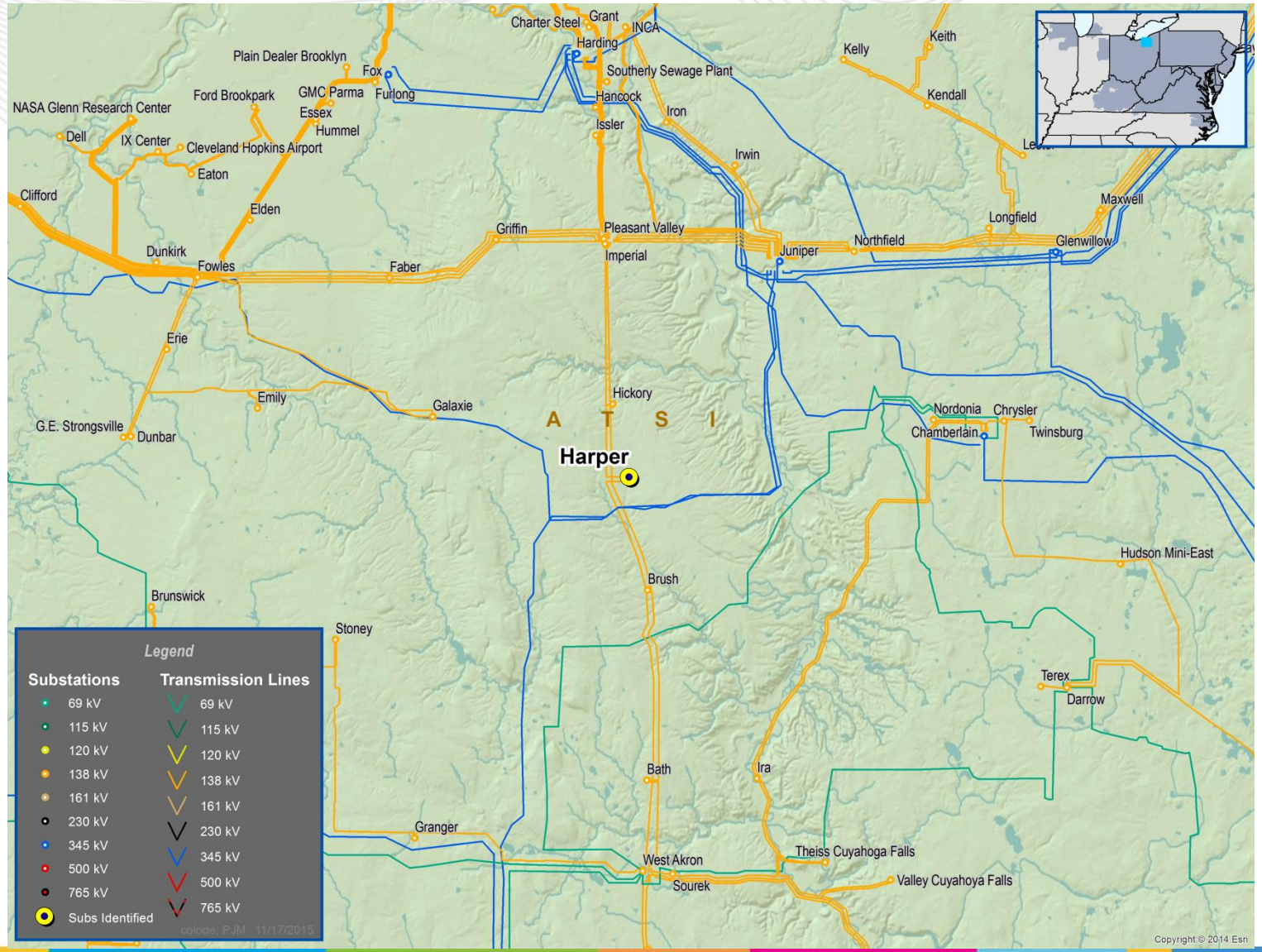
APS Transmission Area

- **Supplemental Project**
- Install 138 kV breaker at Joffre substation and construct approximately 1.3 miles of radial 138 kV line from Joffre substation to new customer facility. (S1041)
- New Customer
- Estimated Project Cost: $3.5M
- Expected IS Date: 12/1/2016



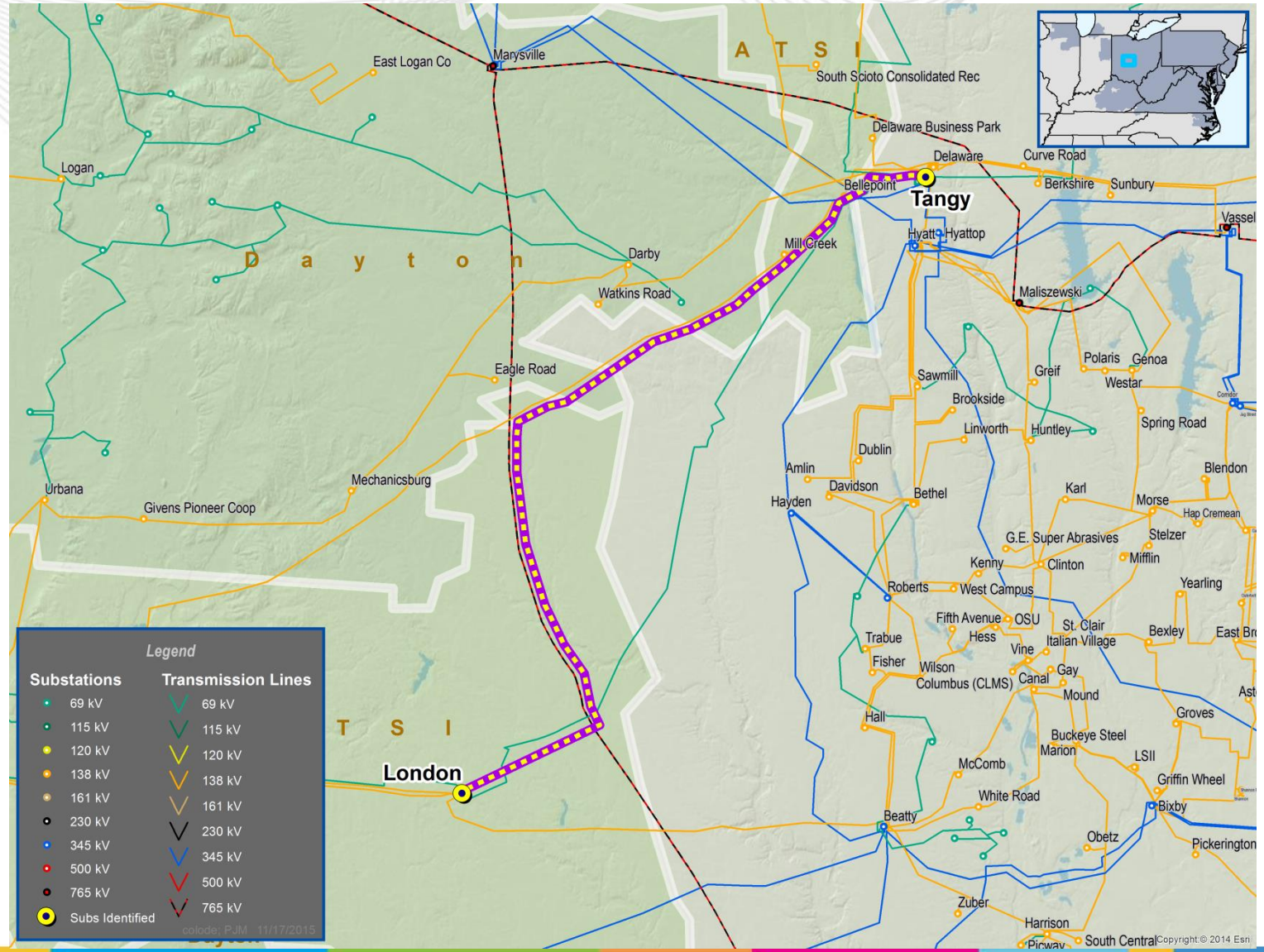
ATSI Transmission Area

- **Supplemental Project**
- Connect a new 138-13.2 kV substation (Harper) on the Pleasant Valley-Harper Q21 138 kV line at existing Harper substation. (S1042)
- New Customer
- Estimated Project Cost: $1.1M
- Expected IS Date: 6/1/2017



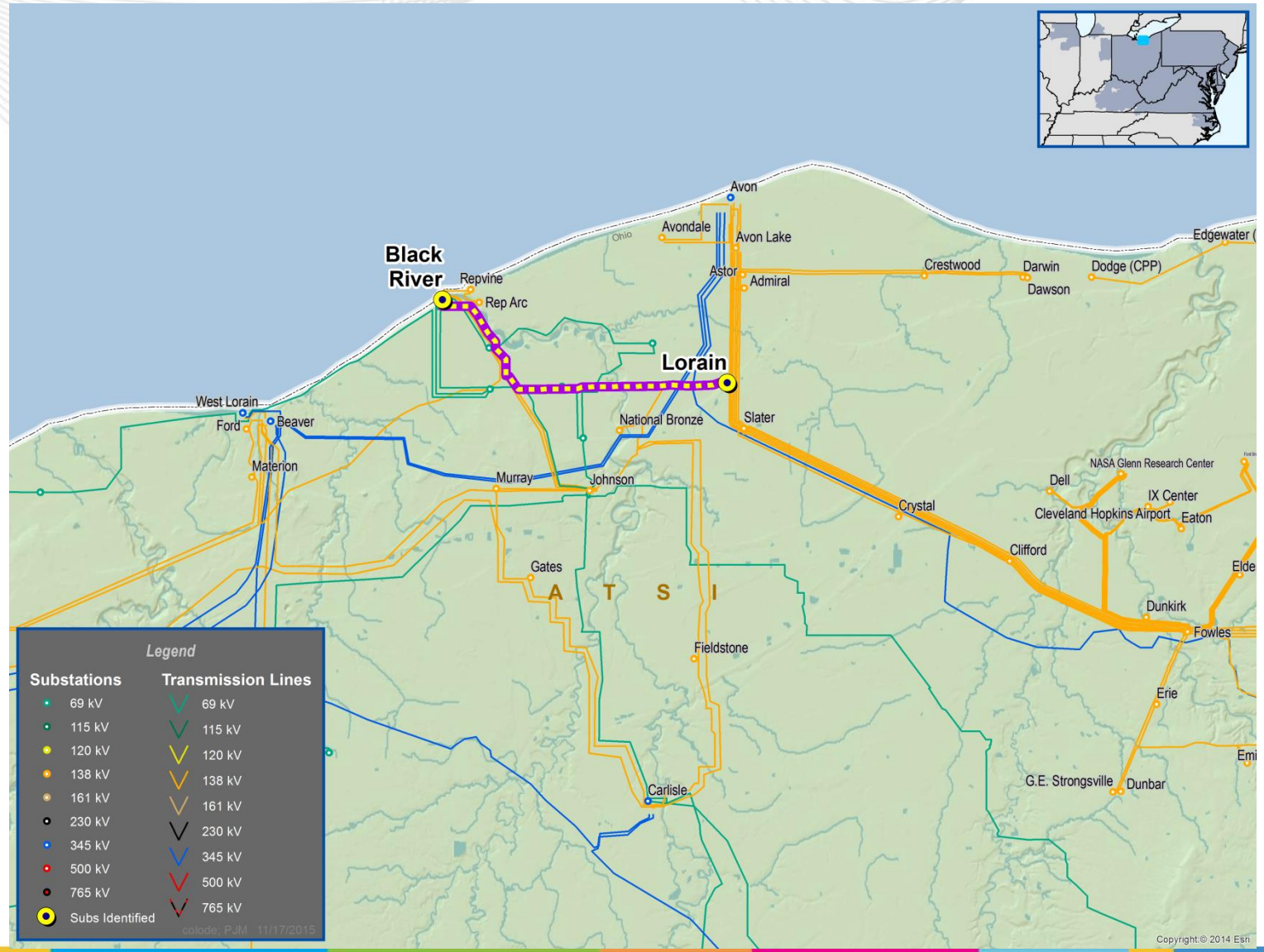
ATSI Transmission Area

- **Supplemental Project**
- Connect a new 138-12.47 kV substation (National Substation) on the London-Tangy 138 kV line. (S1043)
- New Customer
- Estimated Project Cost: $0.5M
- Expected IS Date: 6/2/2017



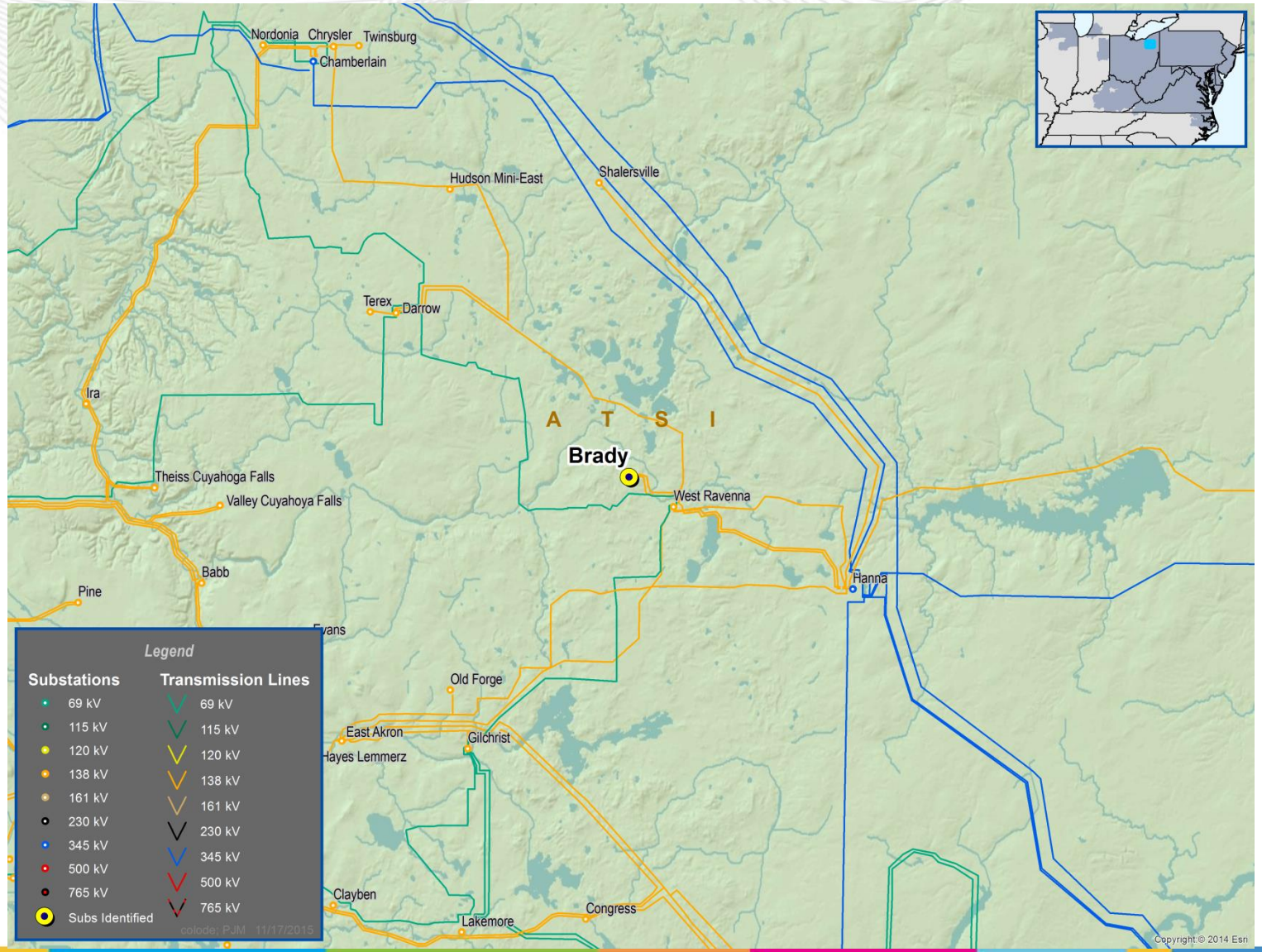
ATSI Transmission Area

- **Supplemental Project**
- Construct a 0.7 mile 795 ACSS loop from the existing Black River-Lorain 138 kV Line to new customer facility. (S1044)
- New Customer
- Estimated Project Cost: $1.0M
- Expected IS Date: 10/1/2016



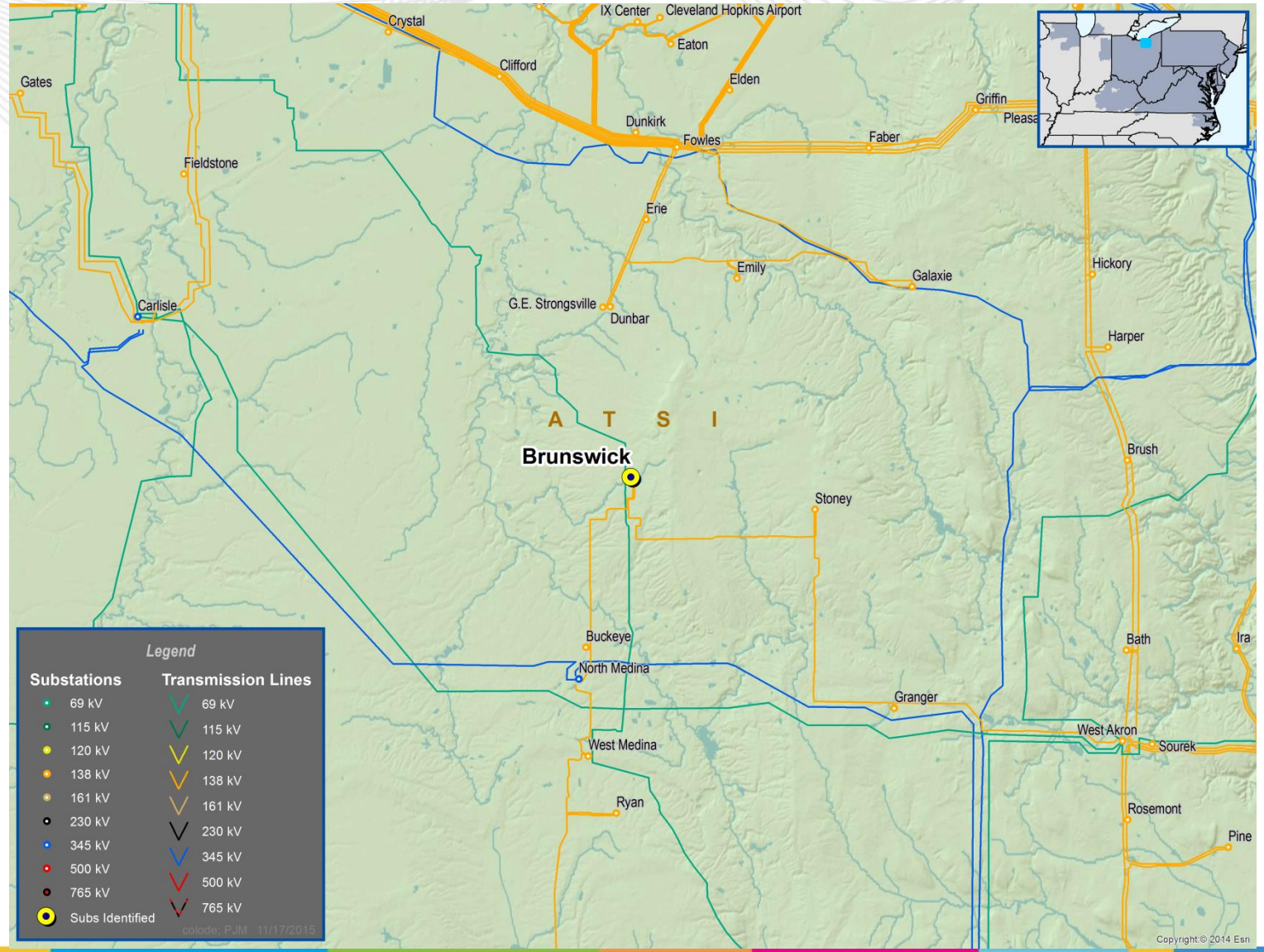
ATSI Transmission Area

- **Supplemental Project**
- Brady 138kV SS - Build 3 Circuit Breaker Ring Bus. (S1045)
- Reliability Enhancement - System Performance
- Estimated Project Cost: $3.2M
- Expected IS Date: 12/31/2016



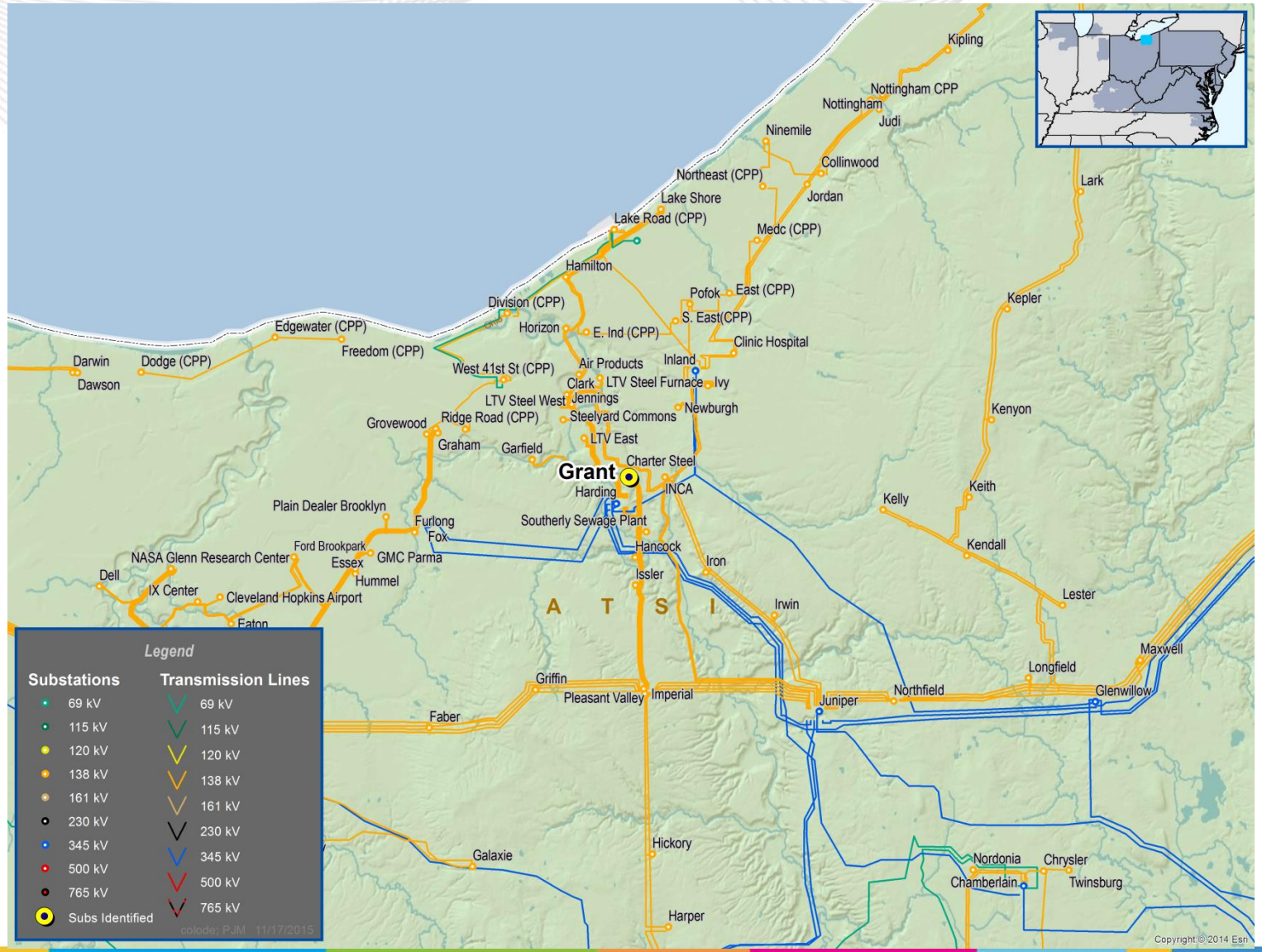
ATSI Transmission Area

- **Supplemental Project**
- Brunswick 138kV SS - Build 4 Circuit Breaker Ring Bus. (S1046)
- Reliability Enhancement - System Performance
- Estimated Project Cost: $3.3M
- Expected IS Date: 12/31/2016



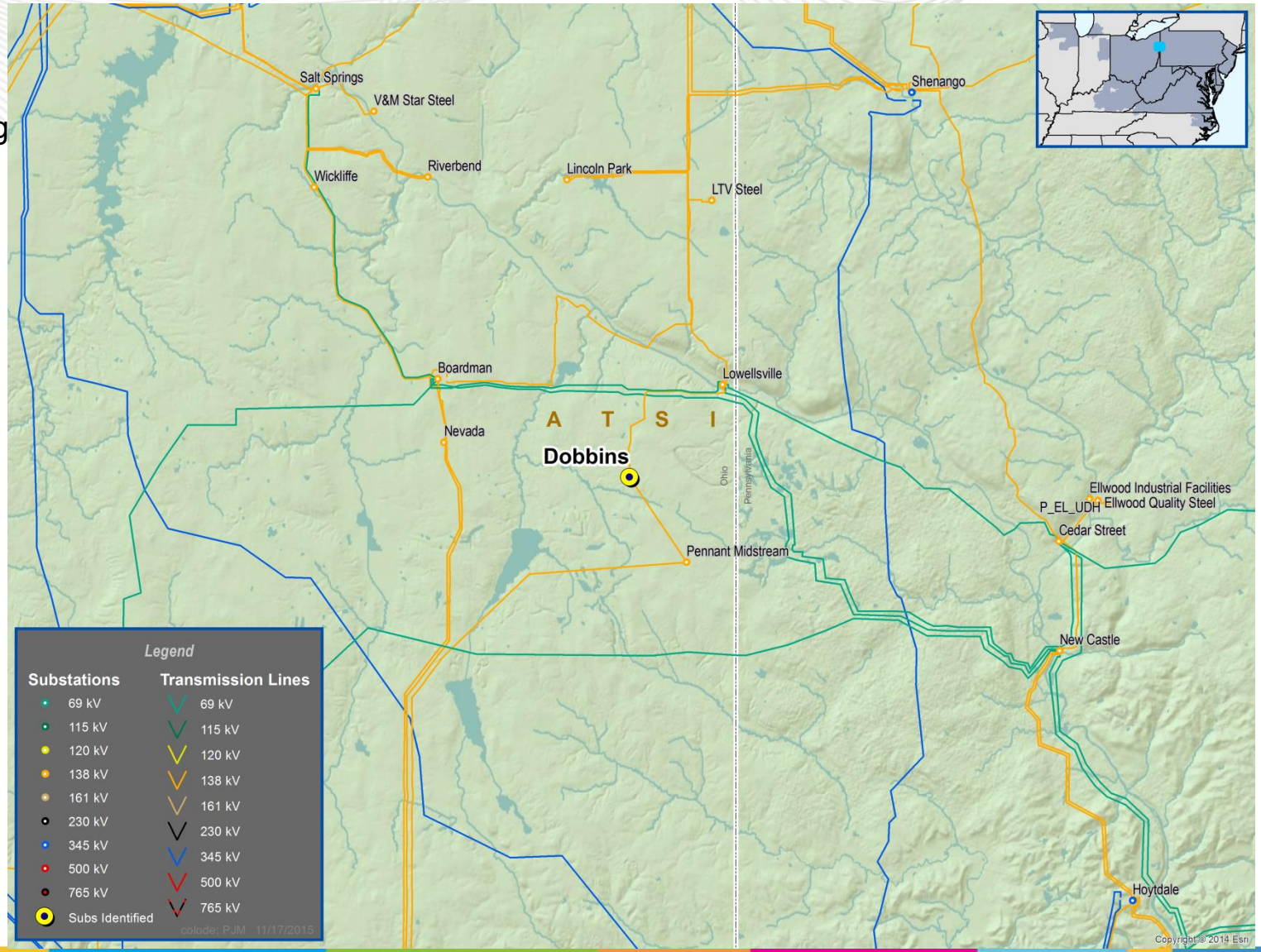
ATSI Transmission Area

- **Supplemental Project**
- Grant St - Hillcrest 69KV: Network 69kV Lines (1.6 miles of 477 ACSR). (S1047)
- Reliability Enhancement - System Performance
- Estimated Project Cost: $5.7M
- Expected IS Date: 12/31/2016



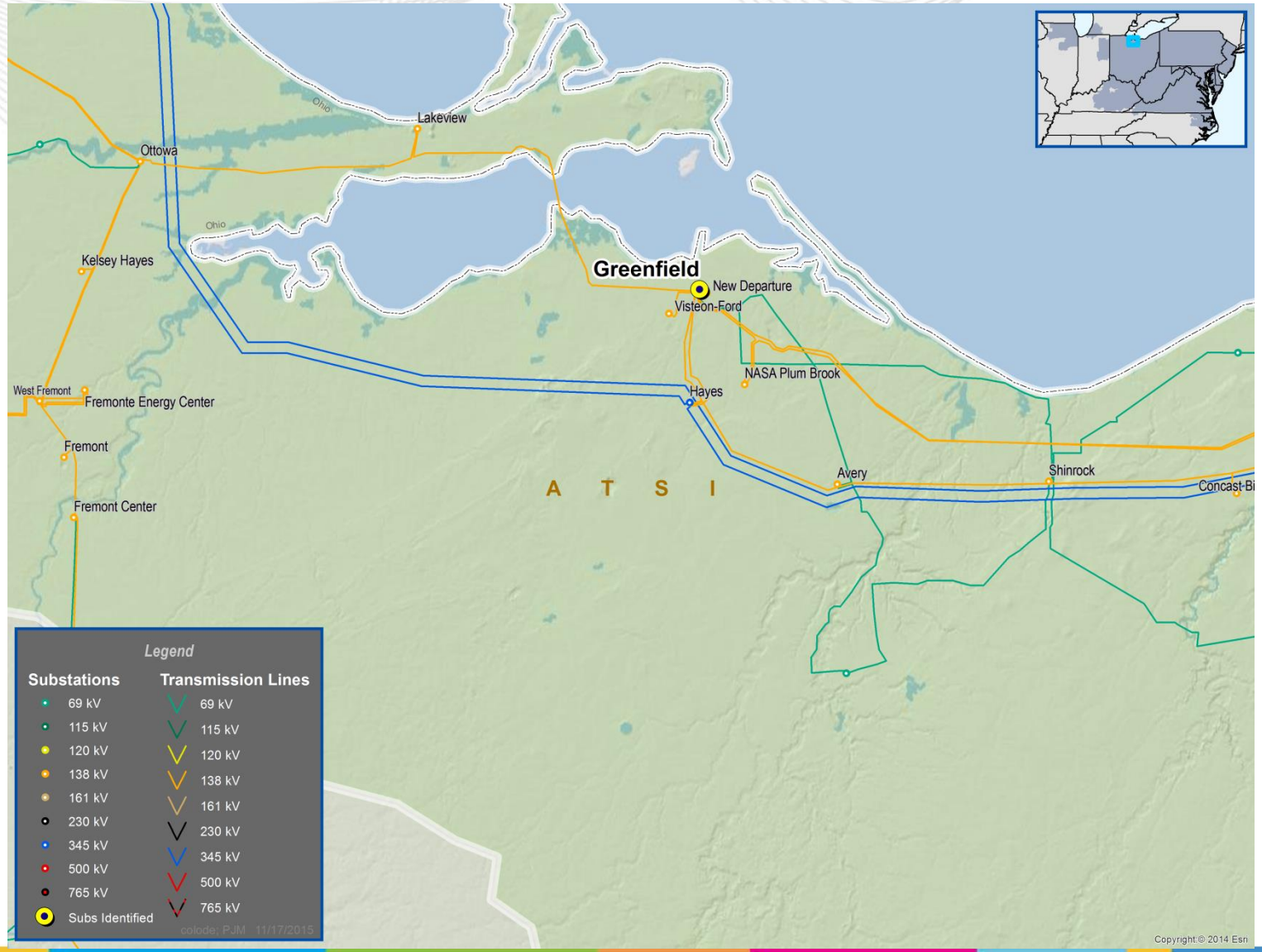
ATSI Transmission Area

- **Supplemental Project**
- Dobbins 138kV SS - Build 4 Circuit Breaker Ring Bus (S1048)
- Reliability Enhancement - System Performance
- Estimated Project Cost: $4.7M
- Expected IS Date: 12/31/2016



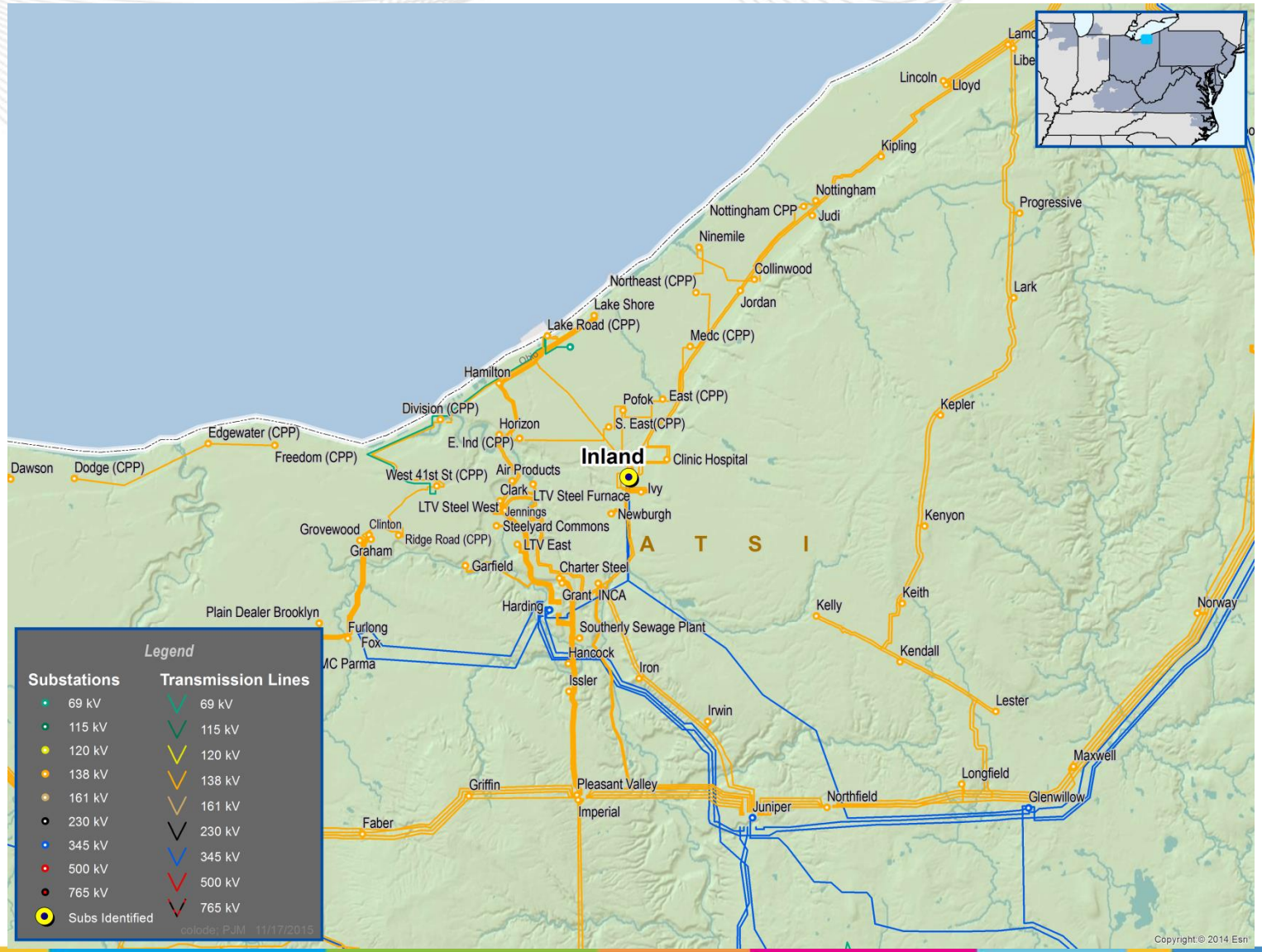
ATSI Transmission Area

- **Supplemental Project**
- Greenfield SS - Retire Transformer #4 and Install 138 & 69kV Bus Section Circuit Breakers(S1049)
- Reliability Enhancement - System Performance
- Estimated Project Cost: $2.4M
- Expected IS Date: 12/31/2016



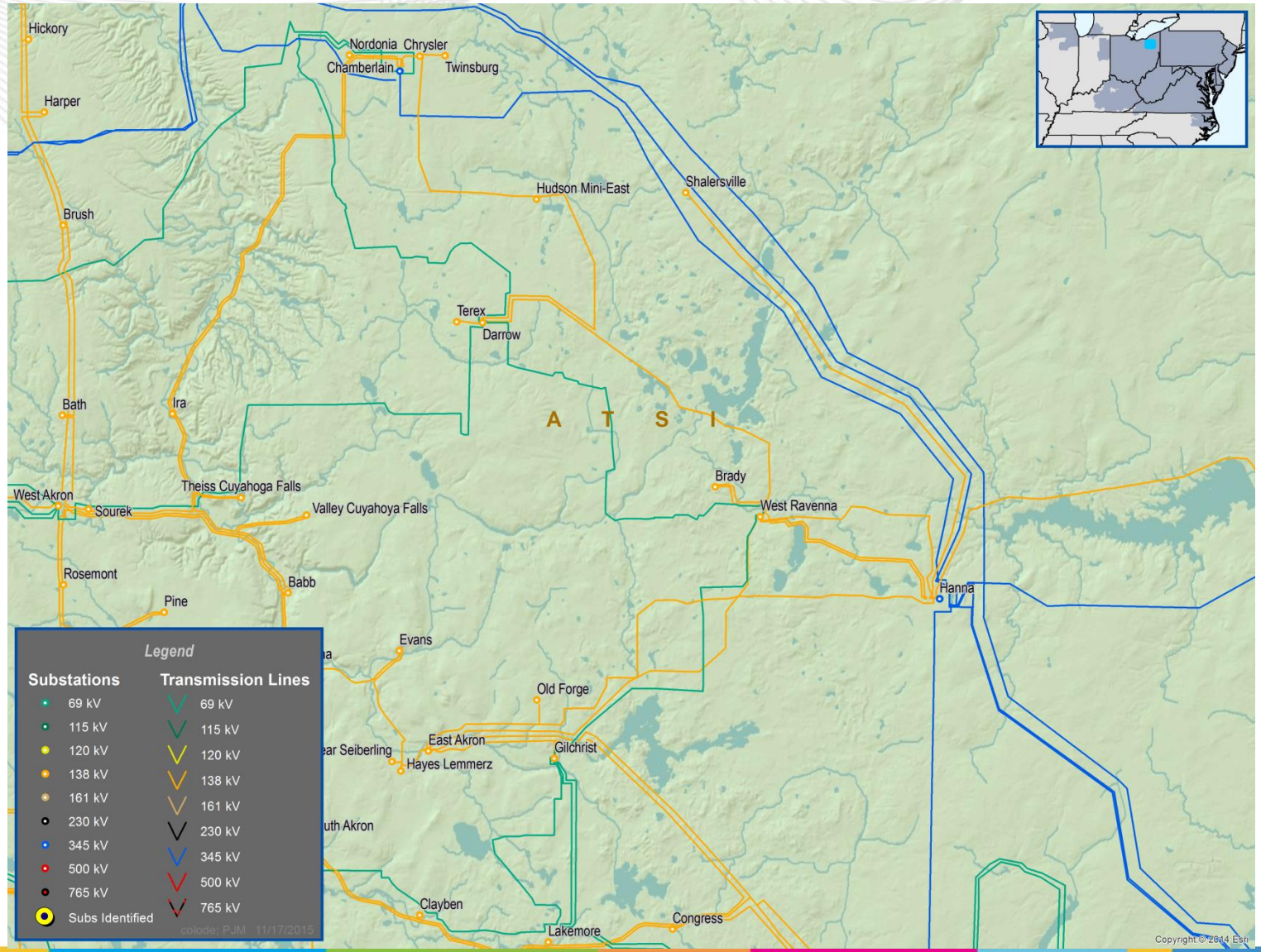
ATSI Transmission Area

- **Supplemental Project**
- Inland - Replace 345kV GIS, XFMR #4, 138kV B-12 and relays (S1050)
- Reliability Enhancement - System Performance
- Estimated Project Cost: $15.9M
- Expected IS Date: 12/31/2016



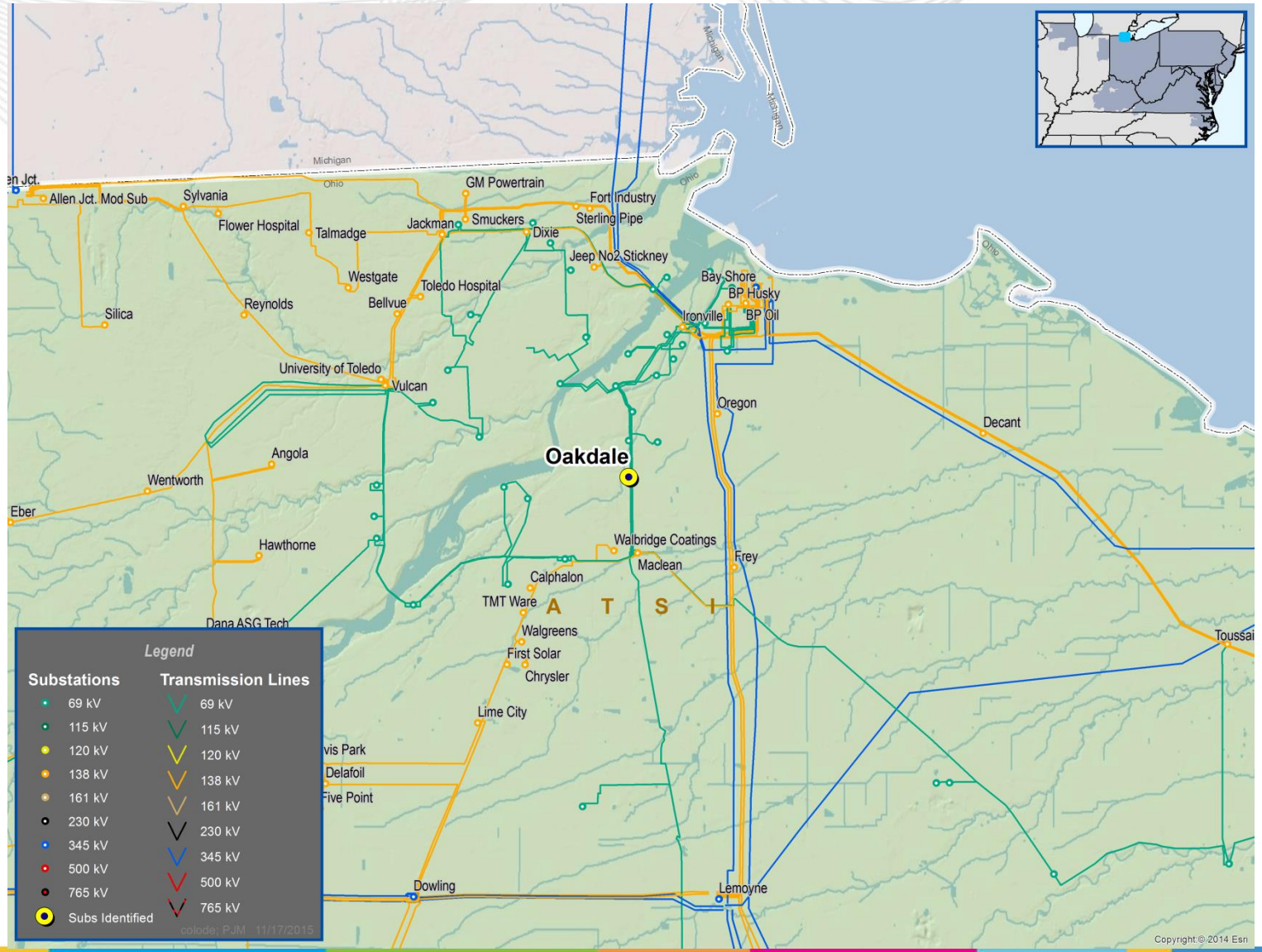
ATSI Transmission Area

- **Supplemental Project**
- Kent 69kV SS - Build 4 Circuit Breaker Ring (S1051)
- Reliability Enhancement - System Performance
- Estimated Project Cost: $3.8M
- Expected IS Date: 12/31/2016



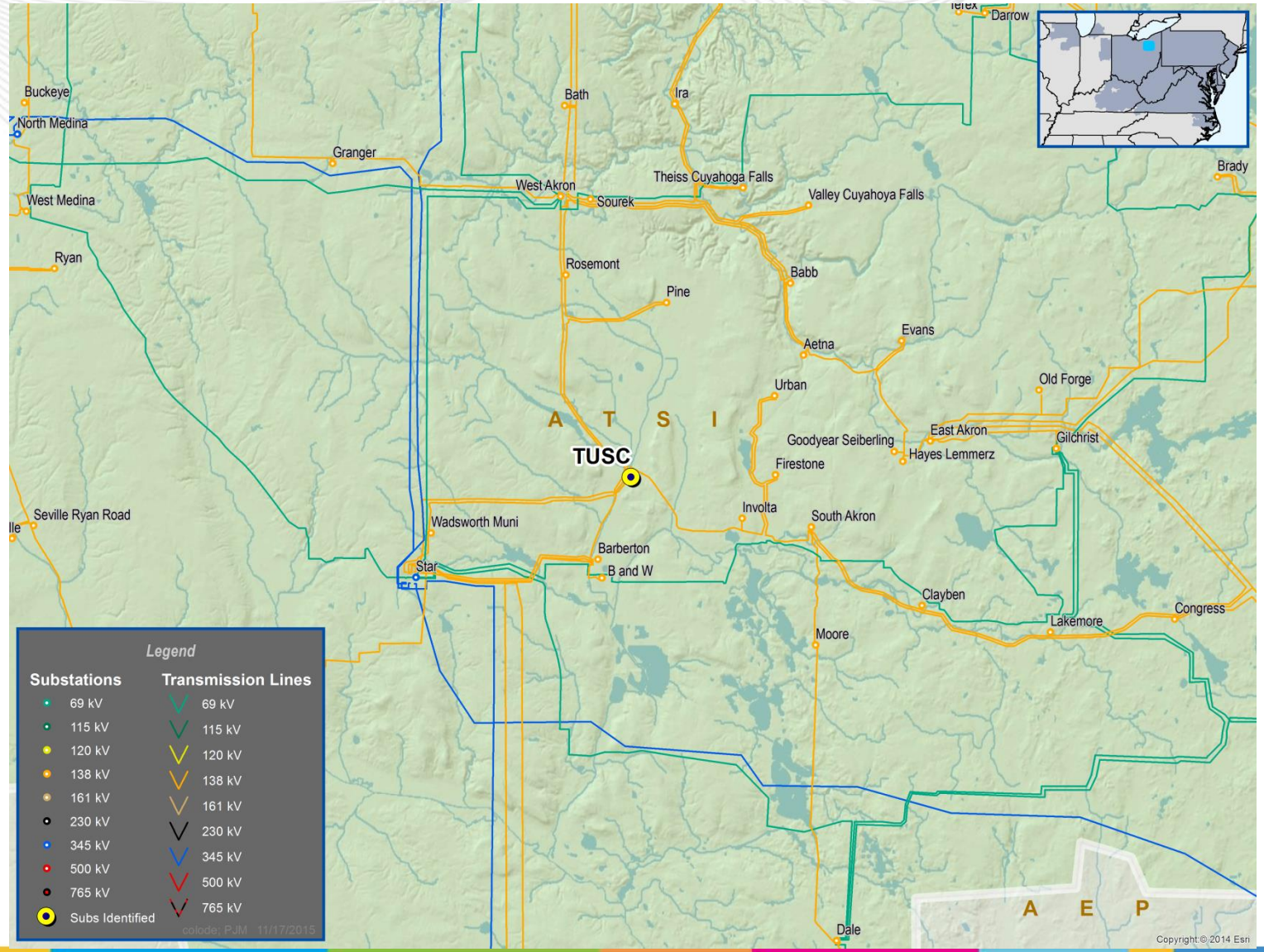
ATSI Transmission Area

- **Supplemental Project**
- Oakdale SS - Add 69kV Breakers to line exits (S1052)
- Reliability Enhancement - System Performance
- Estimated Project Cost: $2.4M
- Expected IS Date: 12/31/2016



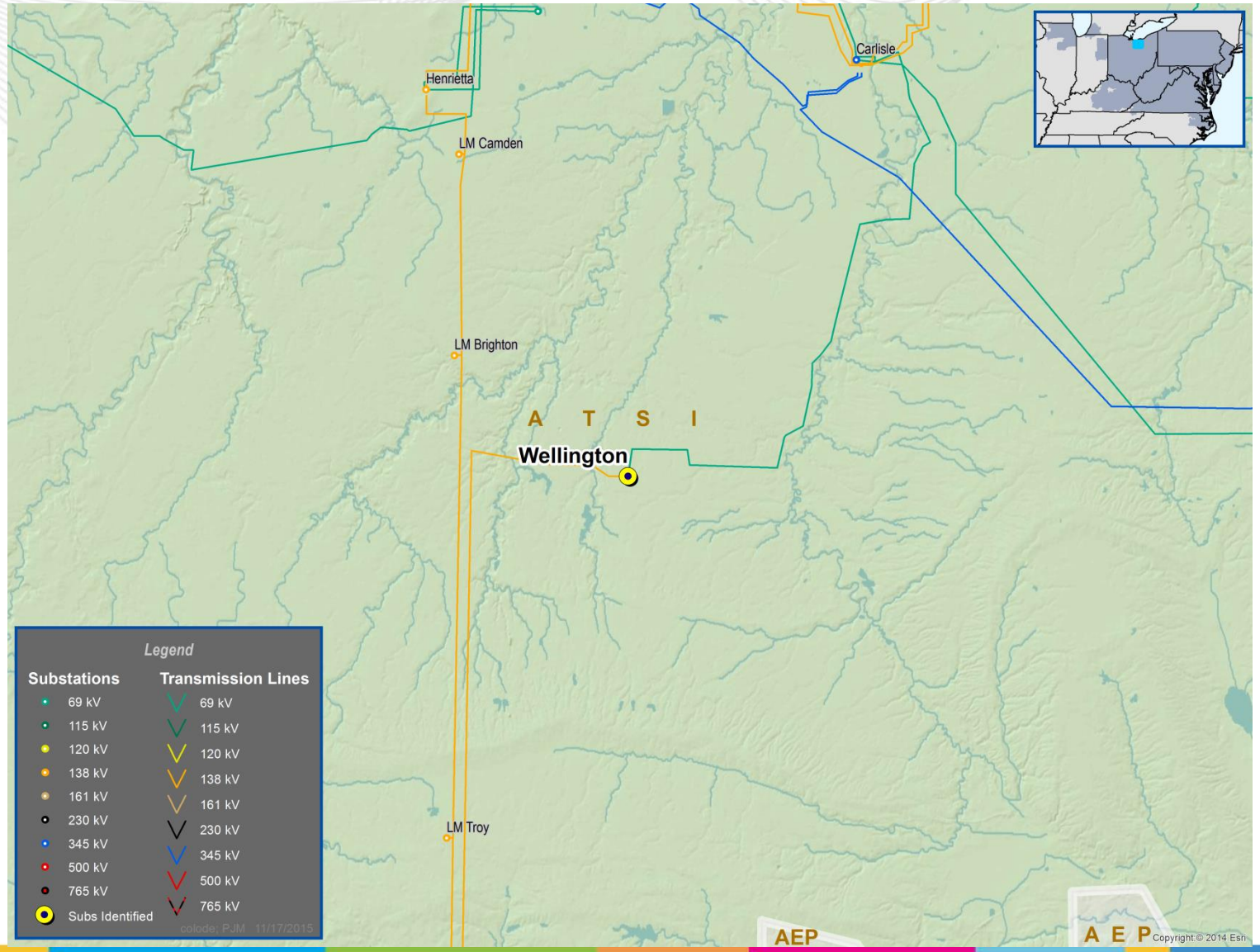
ATSI Transmission Area

- **Supplemental Project**
- Tusc 138kV SS - Build 4 Circuit Breaker Ring Bus (S1053)
- Reliability Enhancement - System Performance
- Estimated Project Cost: $3.9M
- Expected IS Date: 12/31/2016



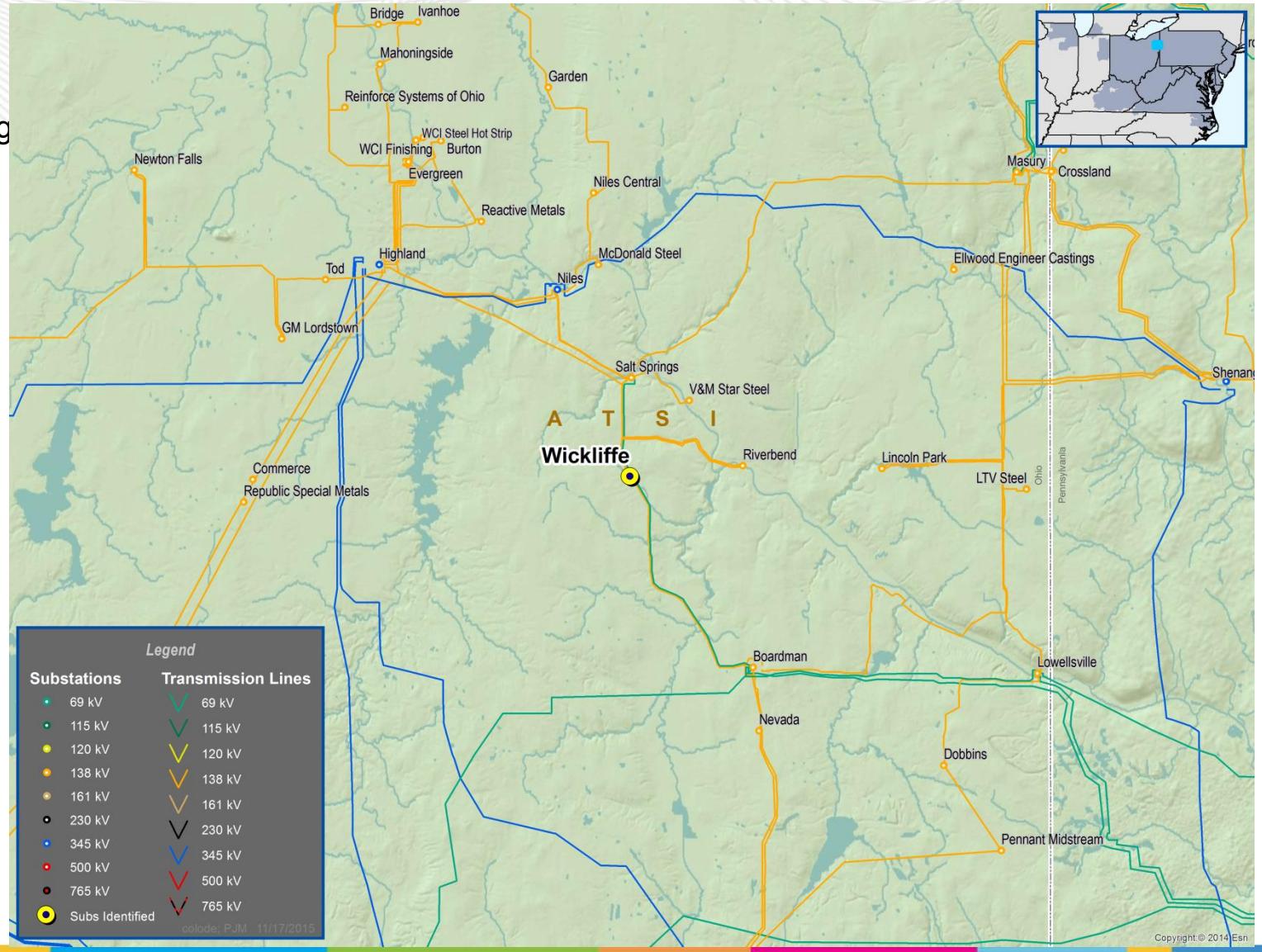
ATSI Transmission Area

- **Supplemental Project**
- Wellington Muni 69kV SS - Install Capacitor Bank (Includes SCADA Controlled Line Switches at Tap) (S1054)
- Reliability Enhancement - System Performance
- Estimated Project Cost: $2.5M
- Expected IS Date: 5/13/2016



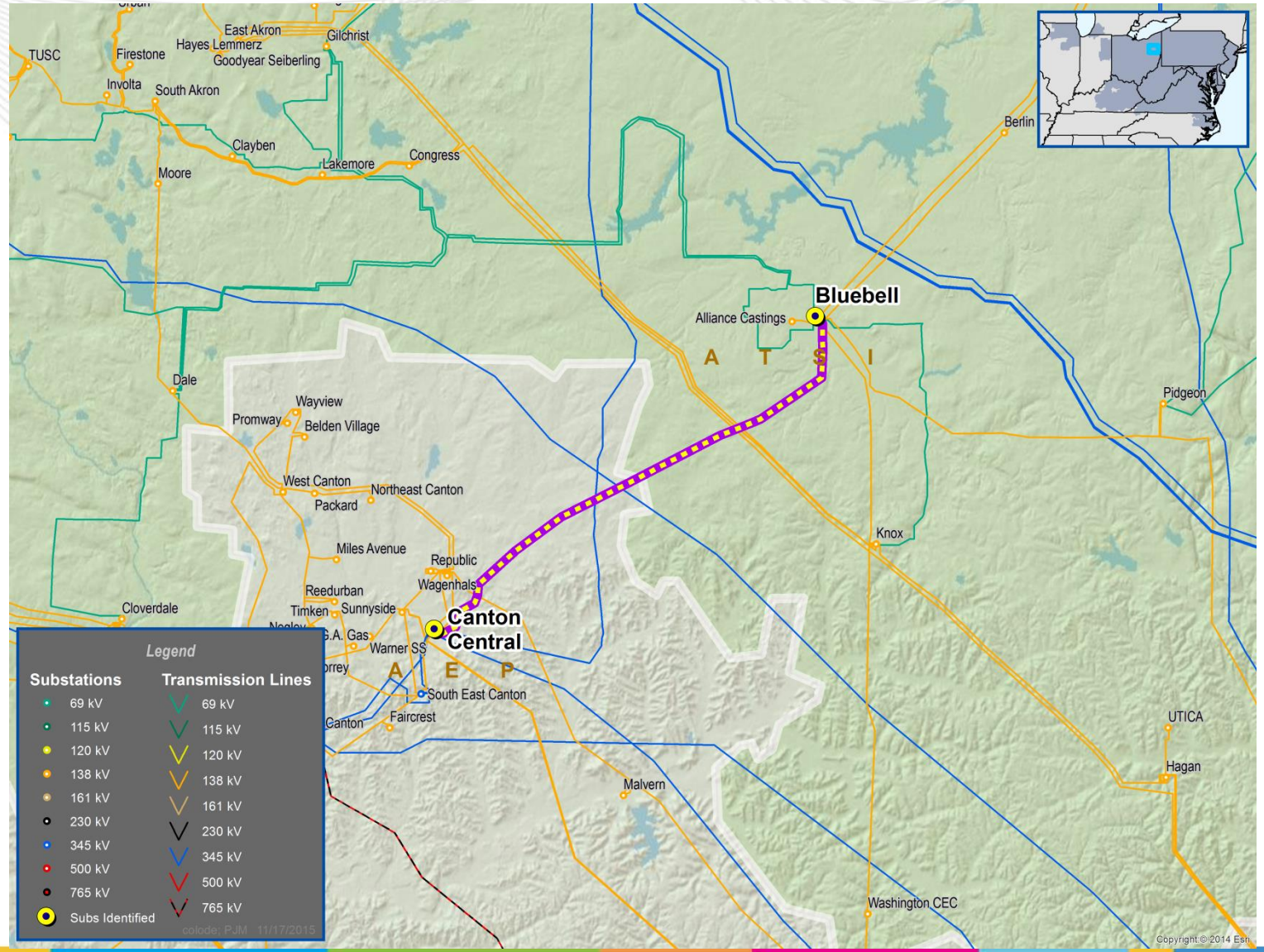
ATSI Transmission Area

- **Supplemental Project**
- Wickliffe 138kV SS - Build 3 Circuit Breaker Ring Bus (S1055)
- Reliability Enhancement - System Performance
- Estimated Project Cost: $3.0M
- Expected IS Date: 12/31/2016



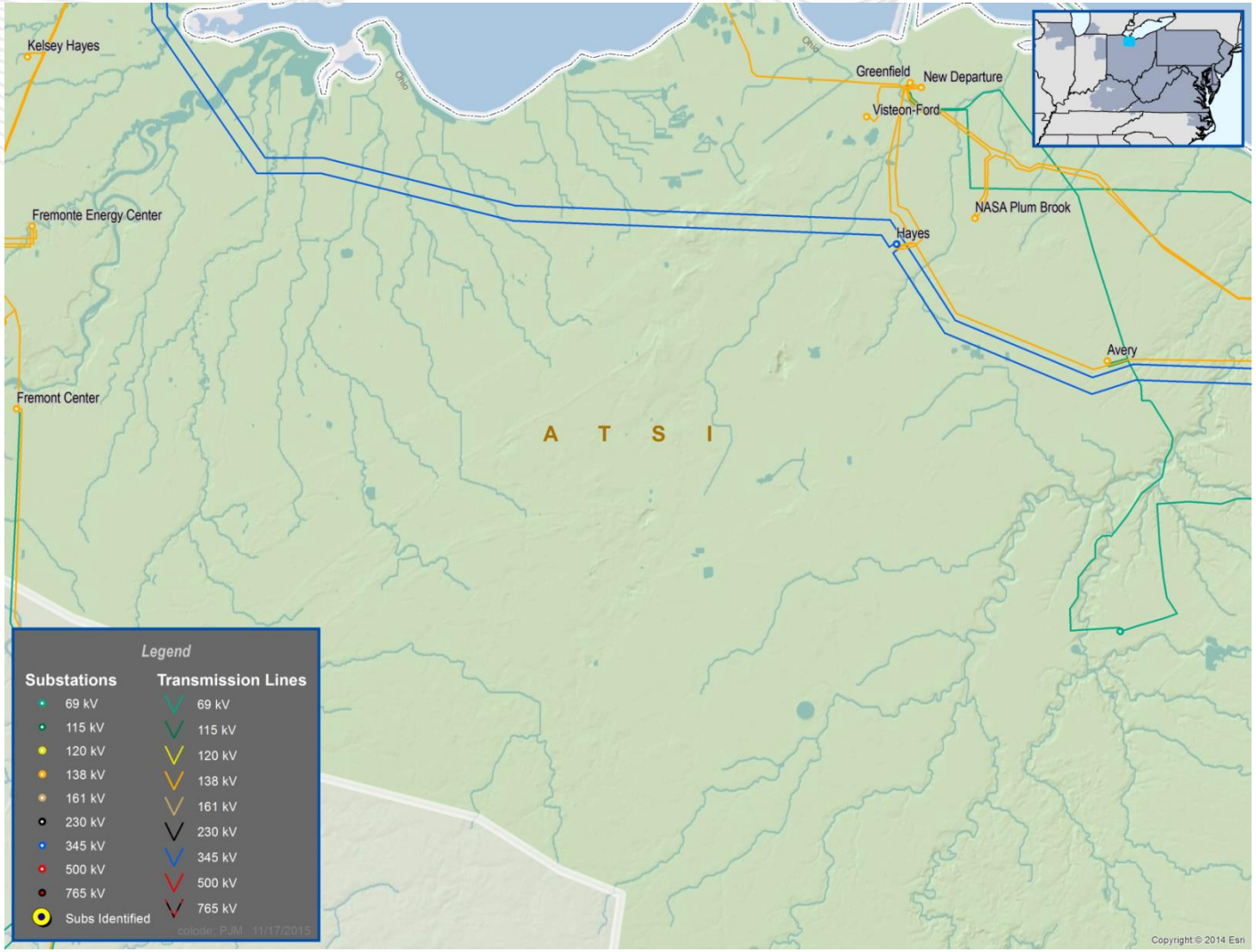
ATSI Transmission Area

- **Supplemental Project**
- Bluebell-Canton Central 138kV Line Reconductor / Rehab (18 Miles) (S1056)
- Old rating: SN/SE = 257/338 MVA
- New rating: SN/SE = 278/339 MVA
- Reliability Enhancement - System Performance
- Estimated Project Cost: $21.7M
- Expected IS Date: 12/31/2016



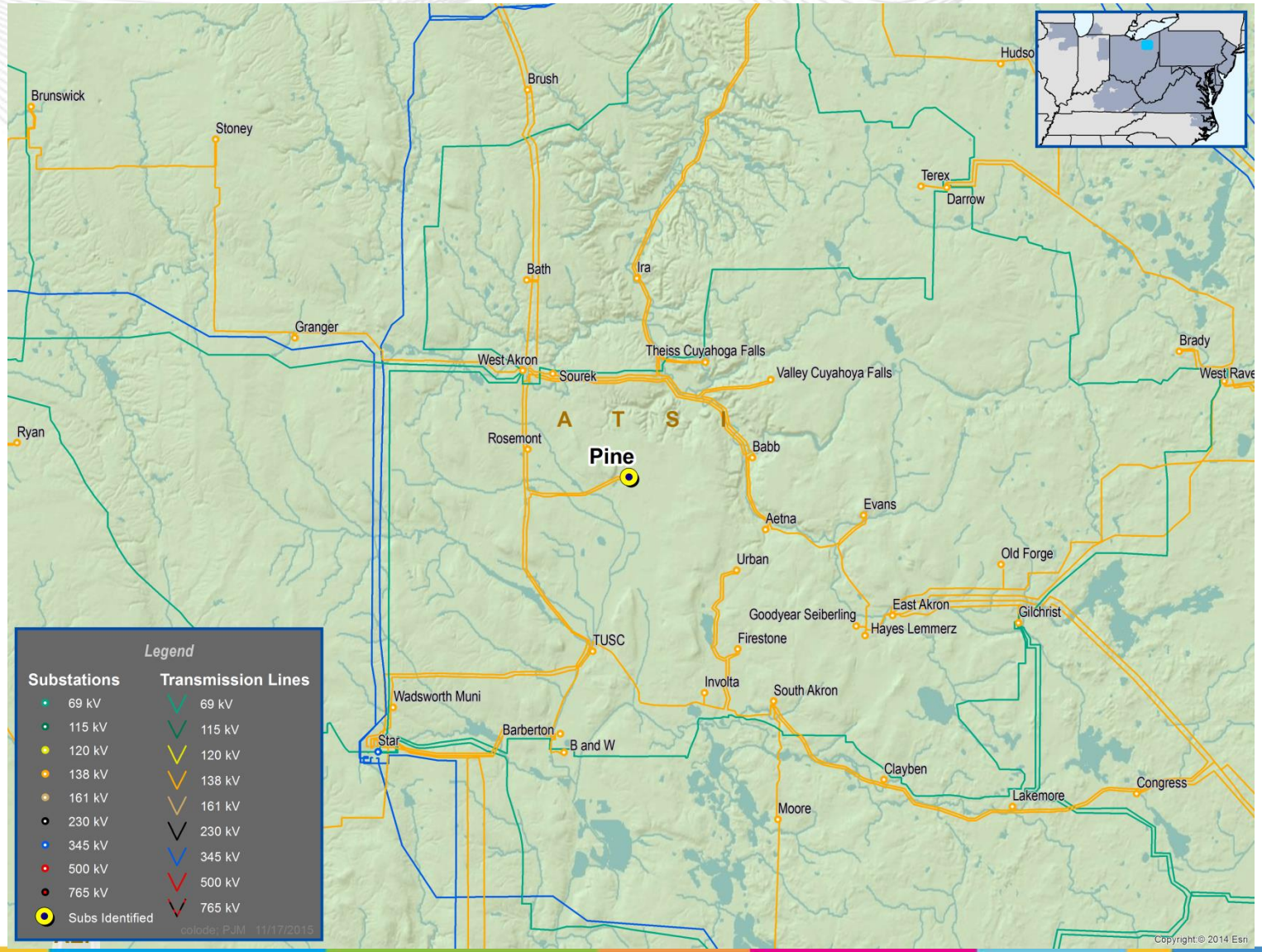
ATSI Transmission Area

- **Supplemental Project**
- Flatrock (Bellevue) 69kV Line Rehab (8.6 Miles) (S1057)
- No rating change
- Reliability Enhancement - System Performance
- Estimated Project Cost: $3.3M
- Expected IS Date: 12/31/2016



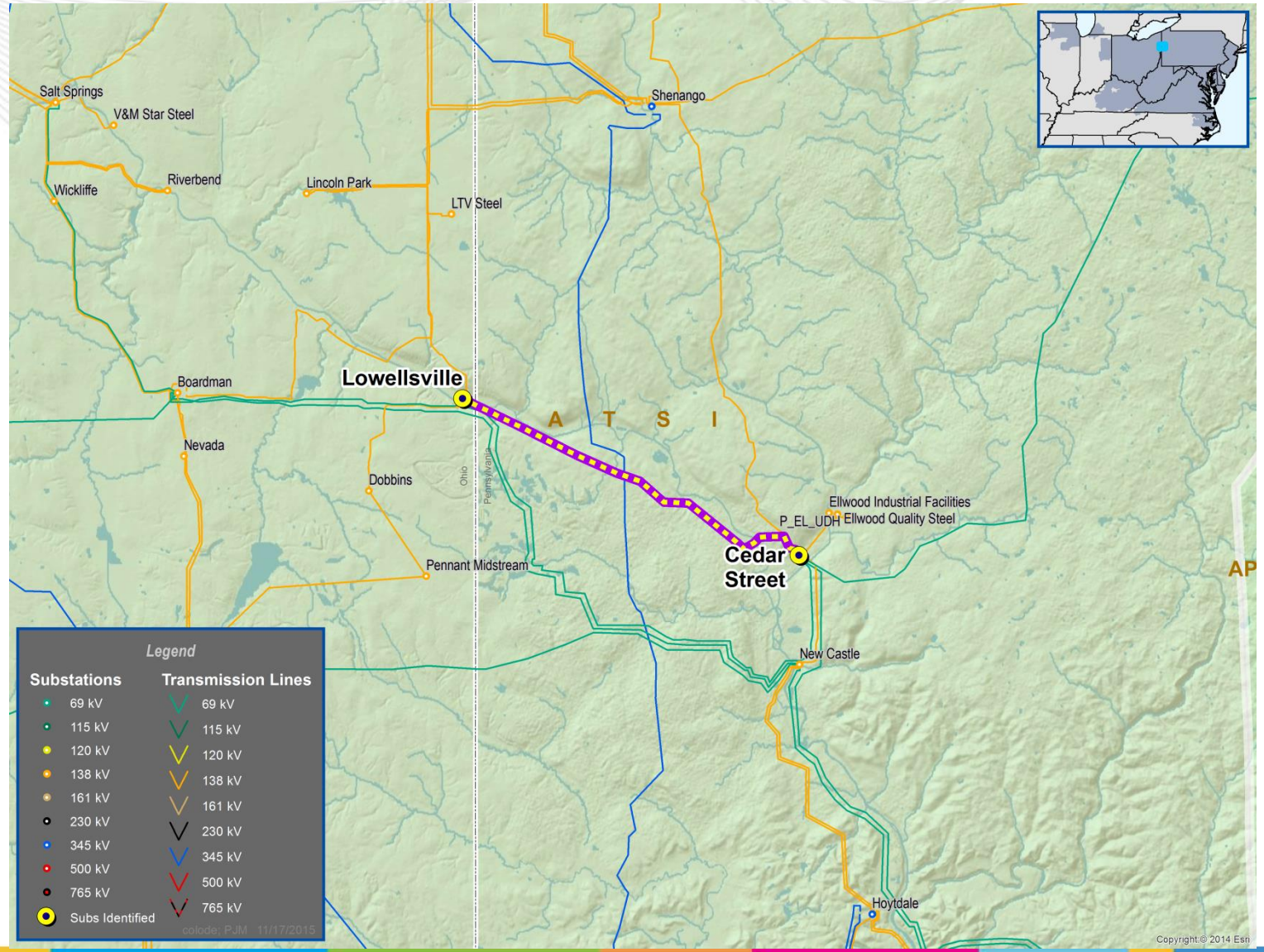
ATSI Transmission Area

- **Supplemental Project**
- Warrendale-Pine 69kV Line Rehab (3.8 Miles) (S1058)
- No rating change
- Reliability Enhancement - System Performance
- Estimated Project Cost: $4.6M
- Expected IS Date: 12/31/2016



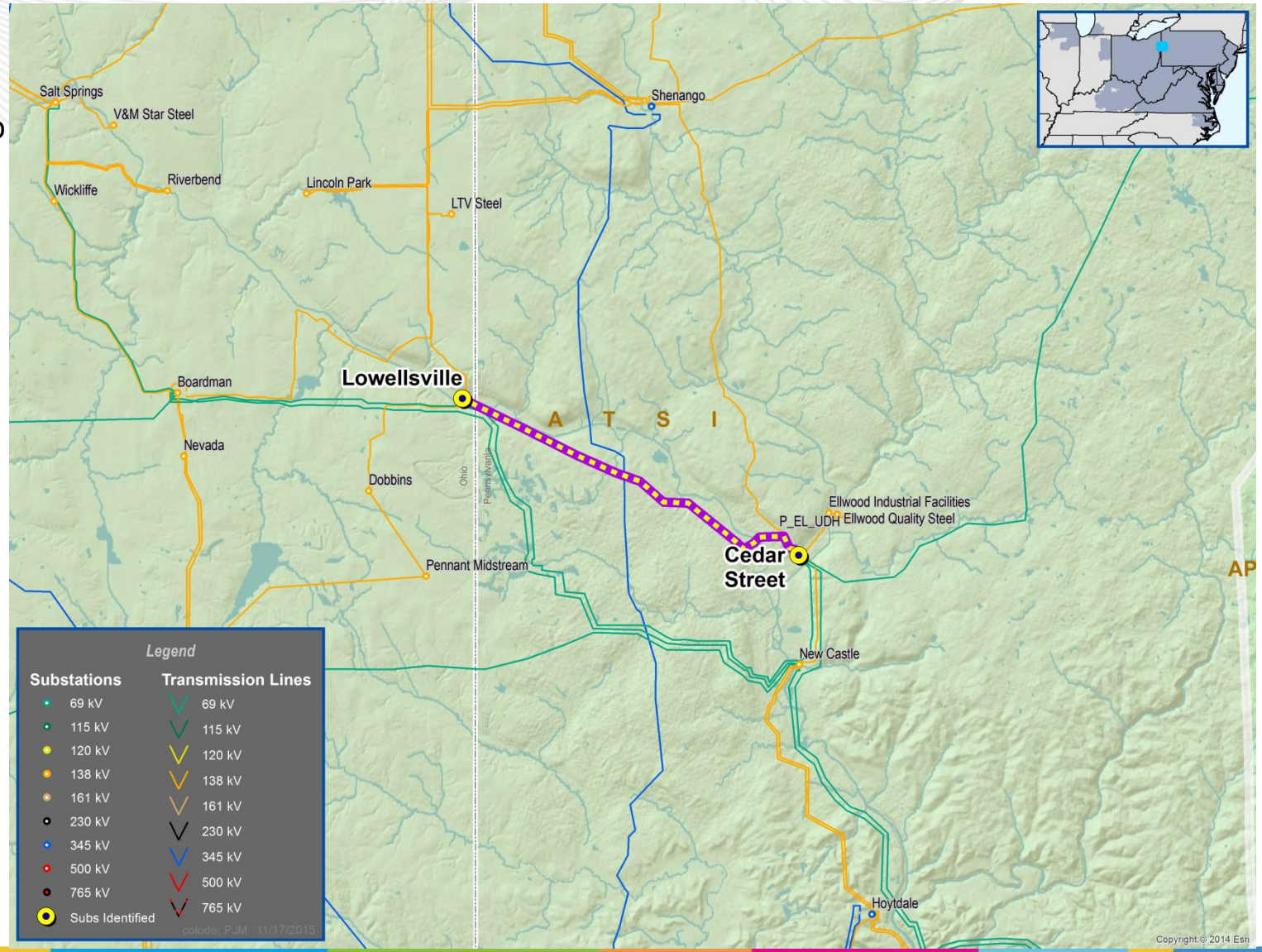
ATSI Transmission Area

- **Supplemental Project**
- Cedar Street-Lowellville North 69kV Line Rehab (9.3 Miles) (S1059)
- No Rating change
- Reliability Enhancement - System Performance
- Estimated Project Cost: $0.6M
- Expected IS Date: 12/31/2016



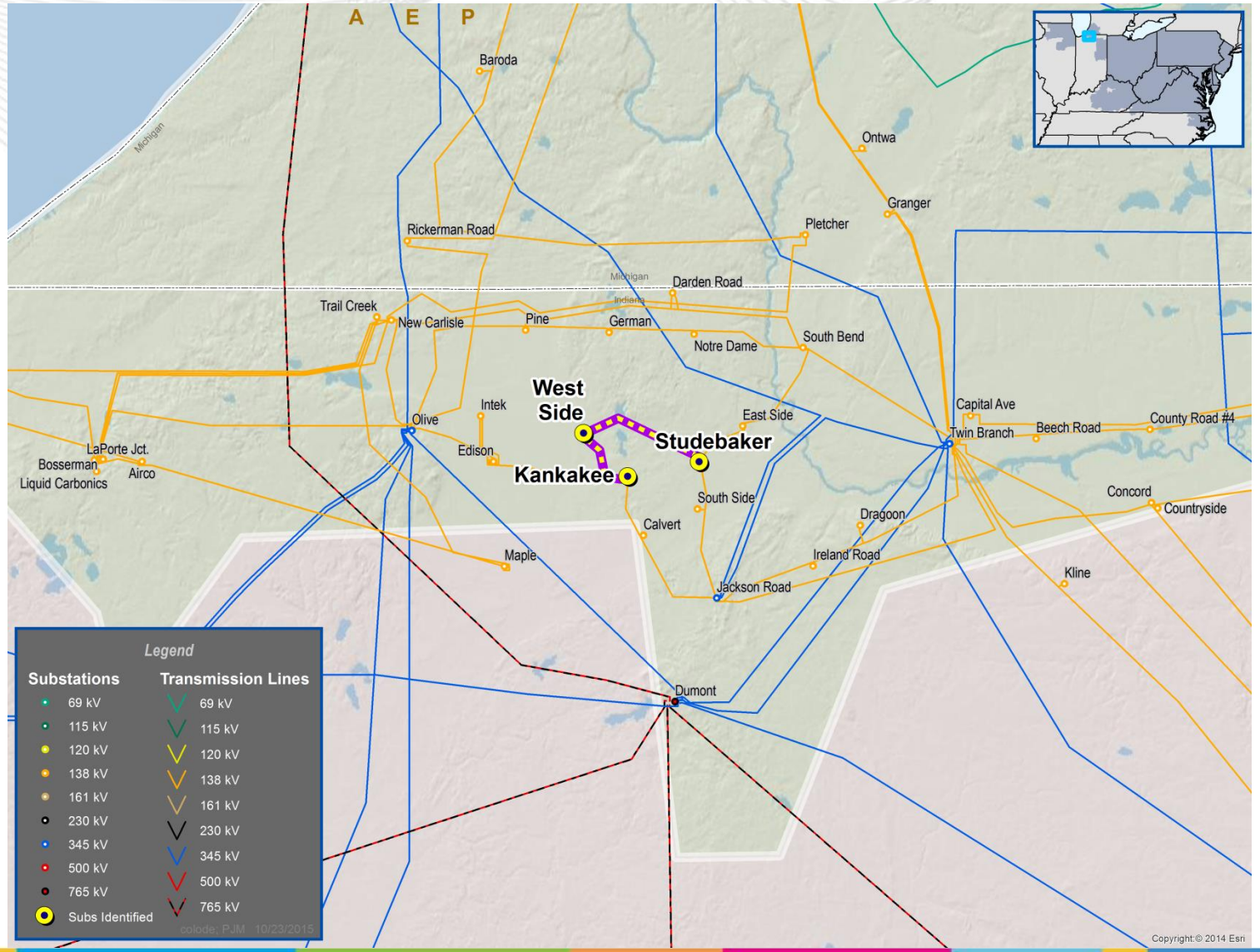
ATSI Transmission Area

- **Supplemental Project**
- Cedar Street-Lowellville South 69kV Line Rehab (9.3 Miles) (S1060)
- No Rating Change
- Reliability Enhancement - System Performance
- Estimated Project Cost: $1.2M
- Expected IS Date: 12/31/2016



AEP Transmission Area

- **Supplemental Project**
- Construction of a 138/12 kV station named as Oliver Plow in South Bend, IN on Studebaker-Kankakee 138 kV line between Studebaker and West Side stations (S1061)
- The station will serve approximately 10 MVA load as a start
- Estimated Project Cost: $8M
- Projected IS Date: 6/30/2016



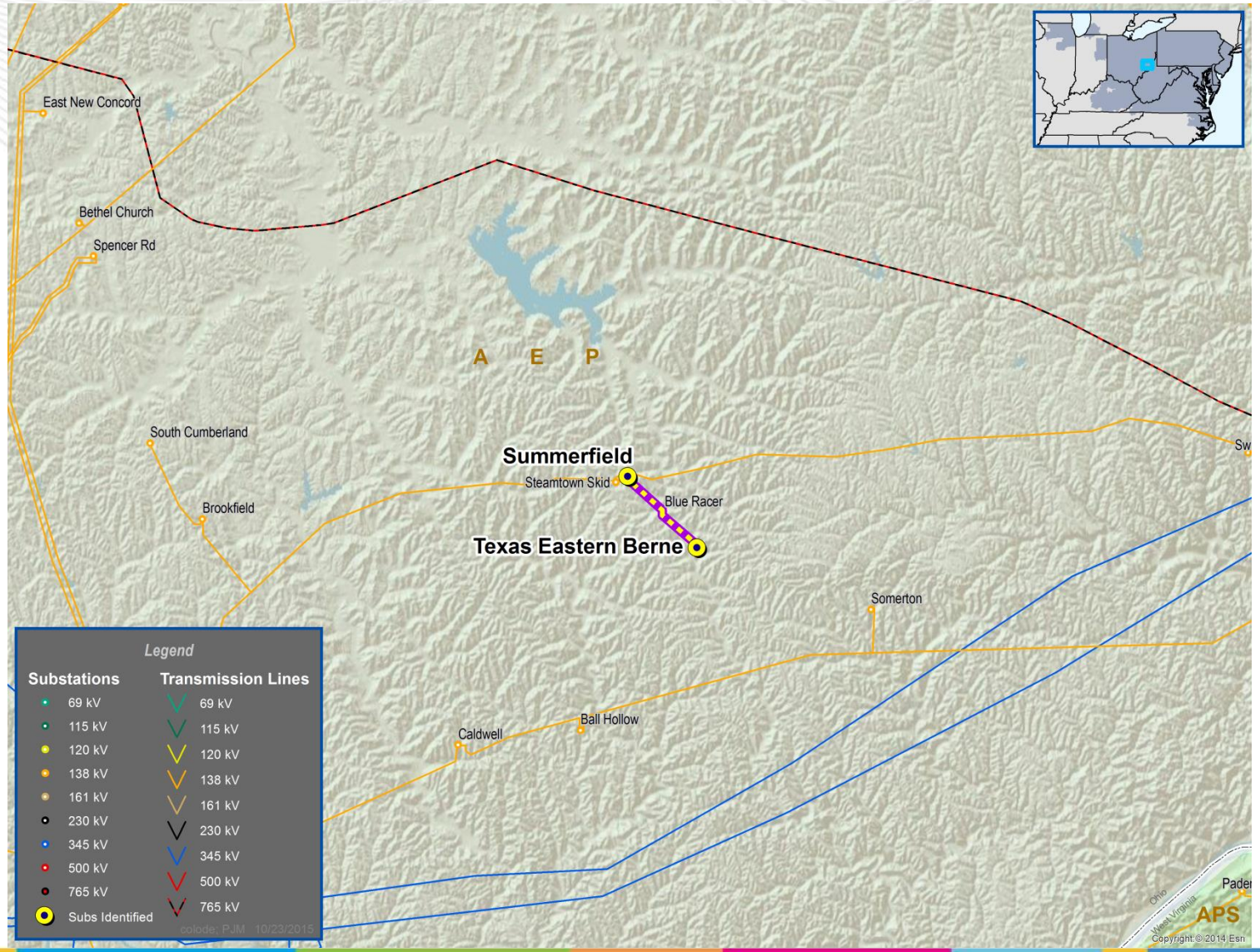
AEP Transmission Area

- **Supplemental Project**

- Rebuild Summerfield-Berne 138kV line with 3.47 miles of 1234 ACSS/TW Yukon and OPGW.(S1062.1)
- Upgrade Summerfield 138kV MOAB and terminal equipment. (S1062.2)

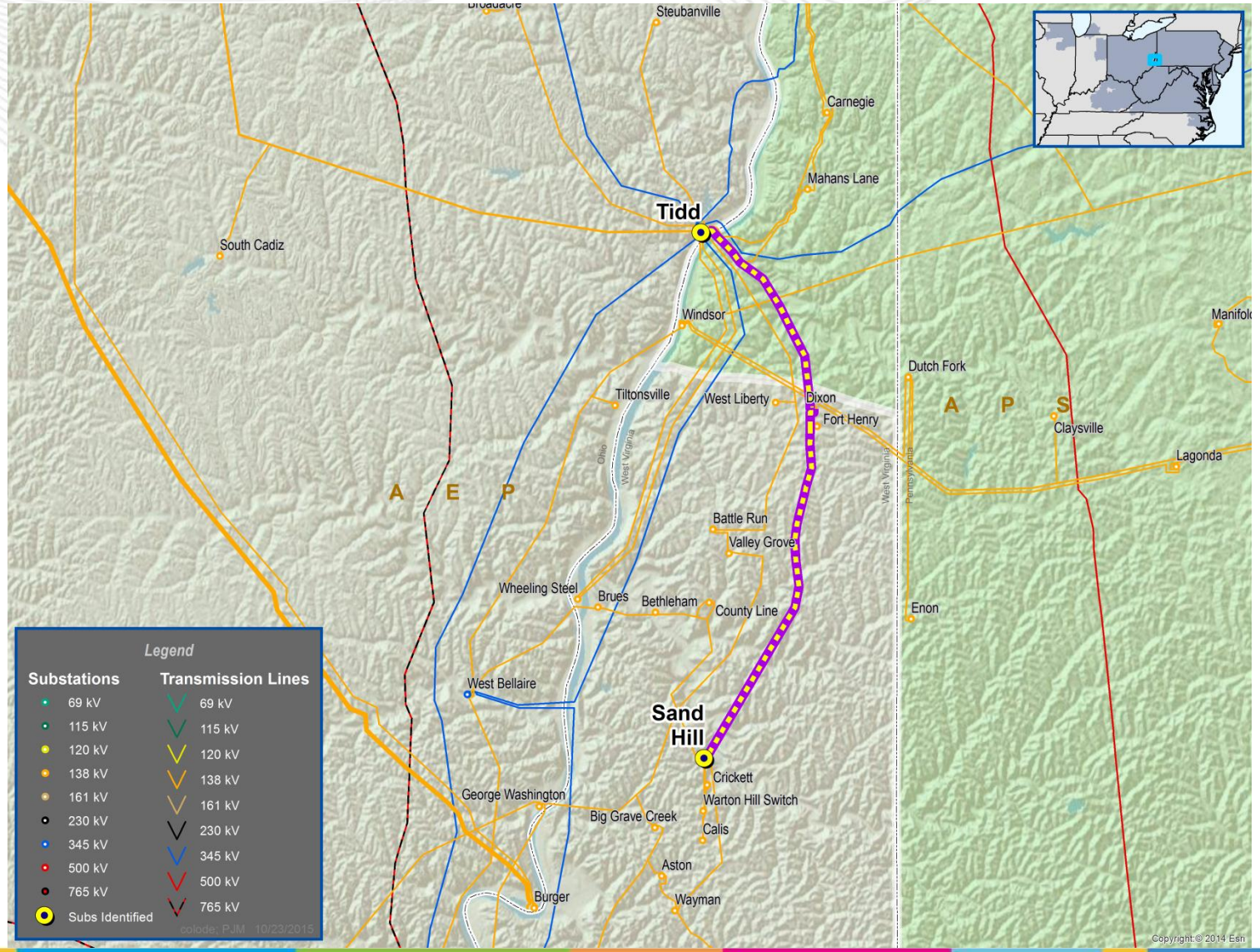
- Old ratings: SN/SE = 101/101 MVA
- New ratings: SN/SE = 608/608 MVA

- Improve the local voltage reliability
- Estimated Project Cost: $4.03M and $0.05M for (S1062.1 and S1062.2)
- Projected IS Date: 6/1/2020



AEP Transmission Area

- **Supplemental Project**
- Build a new 138 kV delivery point located between structures 38 and 39 on the Tidd – Sand Hill 138 kV line near Triadelphia, West Virginia. Transfer approximately 8 MVA of load from Battle Run to the new 138 kV delivery point (Dixon 138 kV station). (S1063)
- Obligation to Serve the new load
- Estimated Project Cost: $1.5M
- Projected IS Date: 7/1/2015



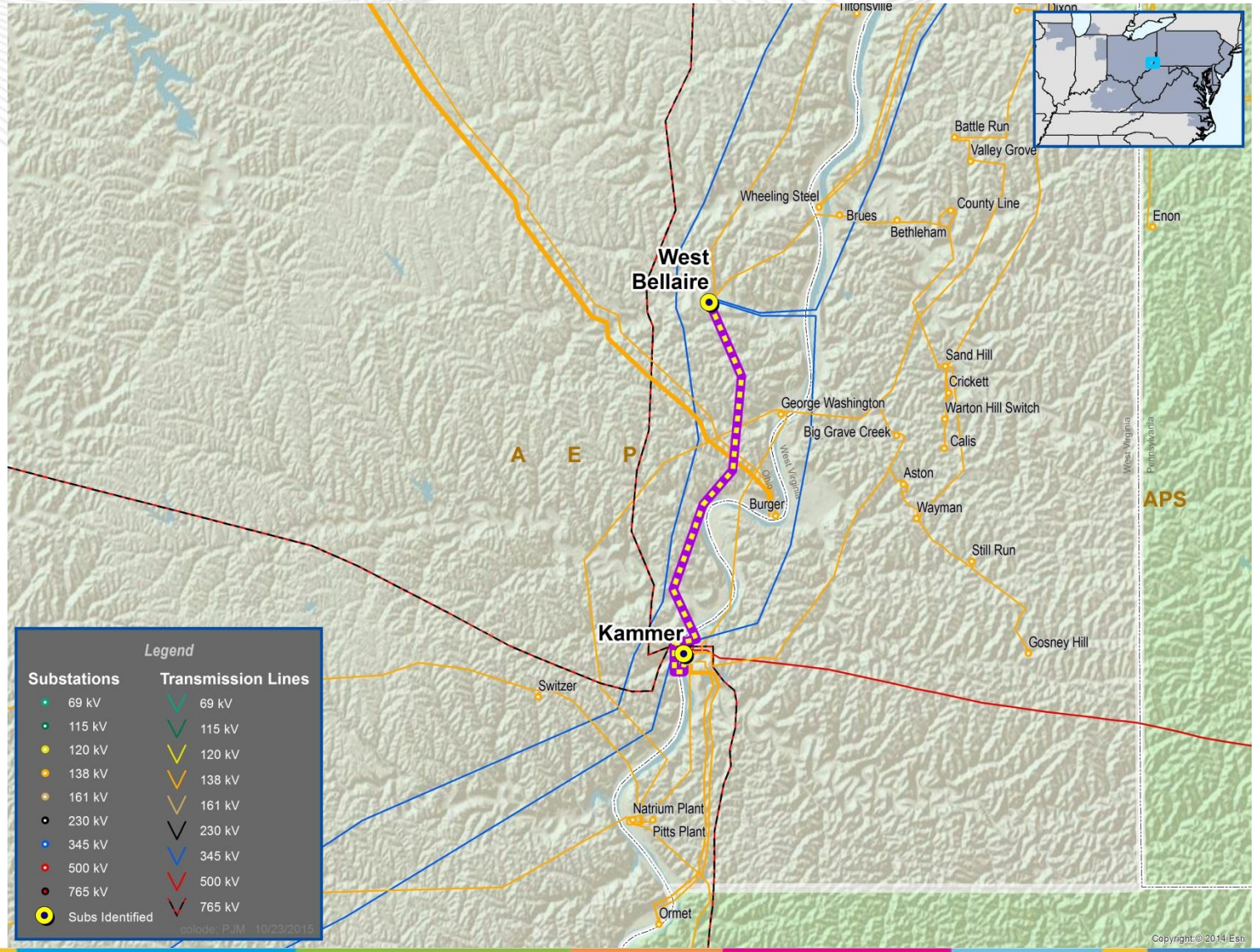
AEP Transmission Area

- **Supplemental Project**

- Re-rate the 13.6 mile Kammer-West Bellaire138kV via sag study and remediation.(S1064)

- Old ratings: SE = 296 MVA
- New ratings: SE = 398 MVA

- Improve reliability
- Estimated Project Cost: $0.11M
- Projected IS Date: 6/1/2018

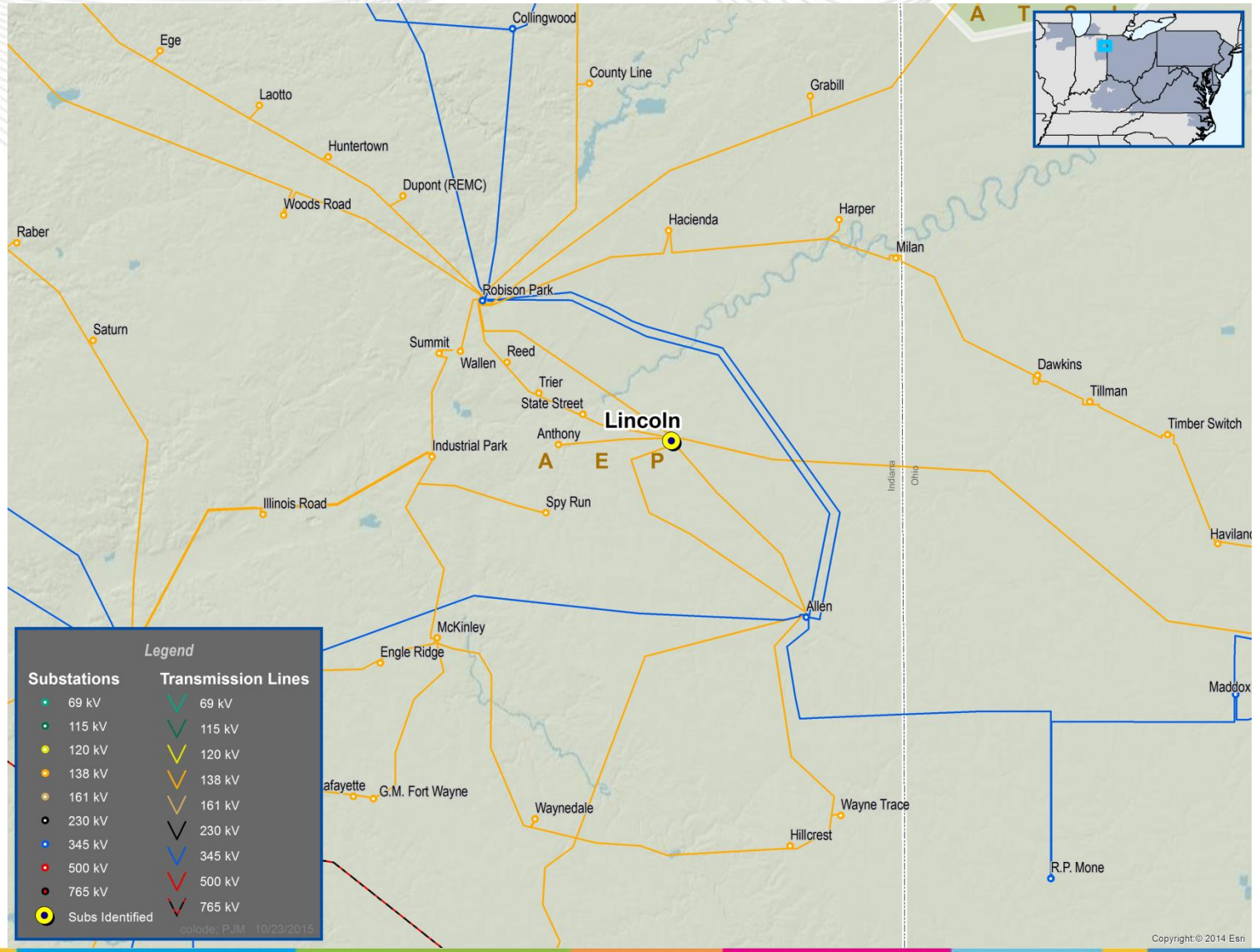


AEP Transmission Area

- **Supplemental Project**

- Convert the Lincoln – Decatur 34.5kV line to 69kV including retiring a portion of existing 34.5kV between Poe and Decatur Stations and re-routing the rest of the line to meet with the existing Decatur – Tillman 34.5kV line, which is built to 69kV standard.(S1065.1)
- Establish 69kV at Lincoln. All existing Lincoln 34.5kV equipment will be rebuilt to 69kV. Replace both 138kV transformers at Lincoln. (S1065.2)
- Rebuilt Poe 69KV Station (Muldoon Mill) at a nearby greenfield location to address the aging infrastructure. (S1065.3)
- Establish Yost Bridge 69KV station to better serve customer load. two area Co-op delivery points will also be converted to 69kV. (S1065.4)

- Simplify the system and Improve reliability
- Estimated Project Cost: $53M
- Projected IS Date: 12/1/2018

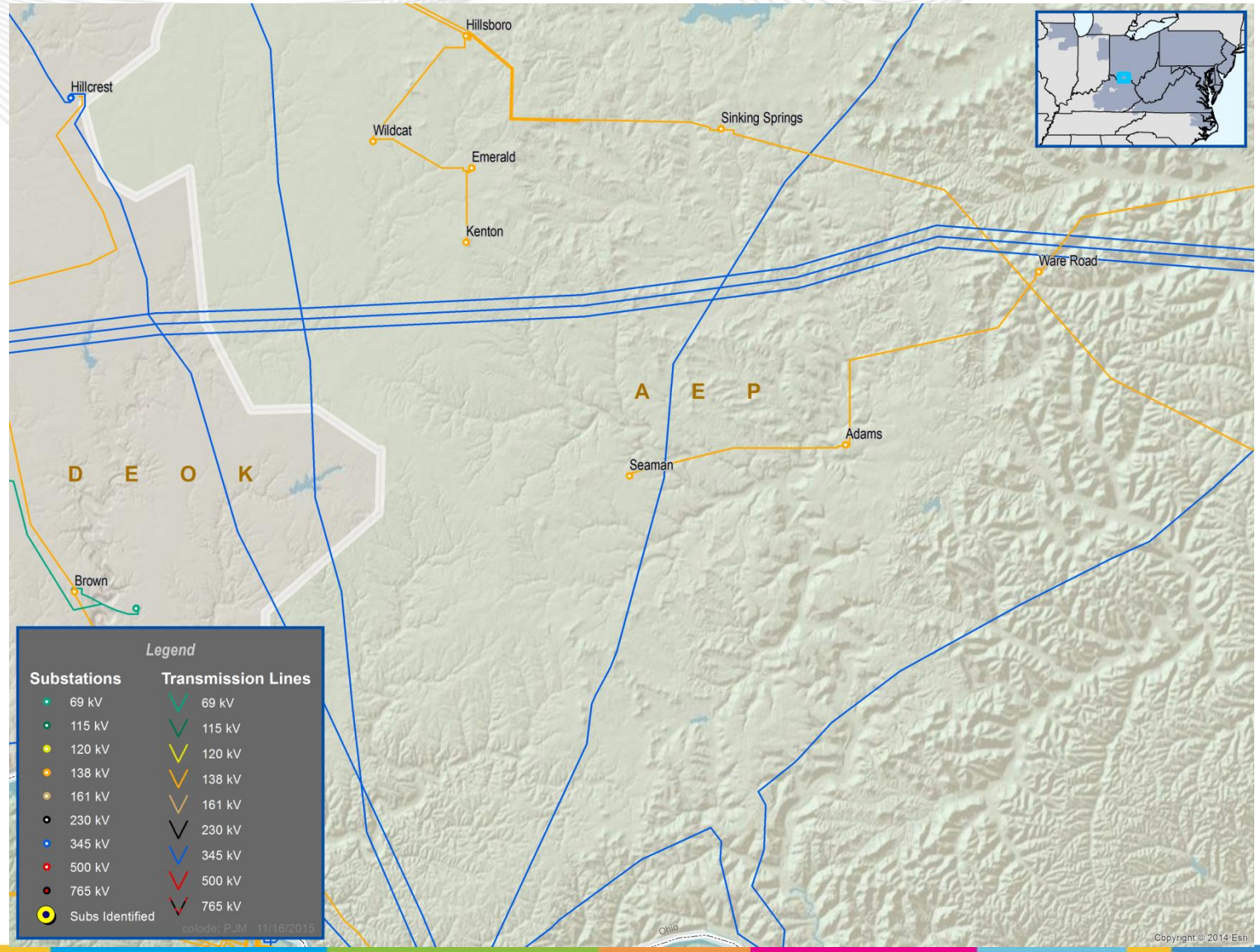


AEP Transmission Area

- **Supplemental Project**

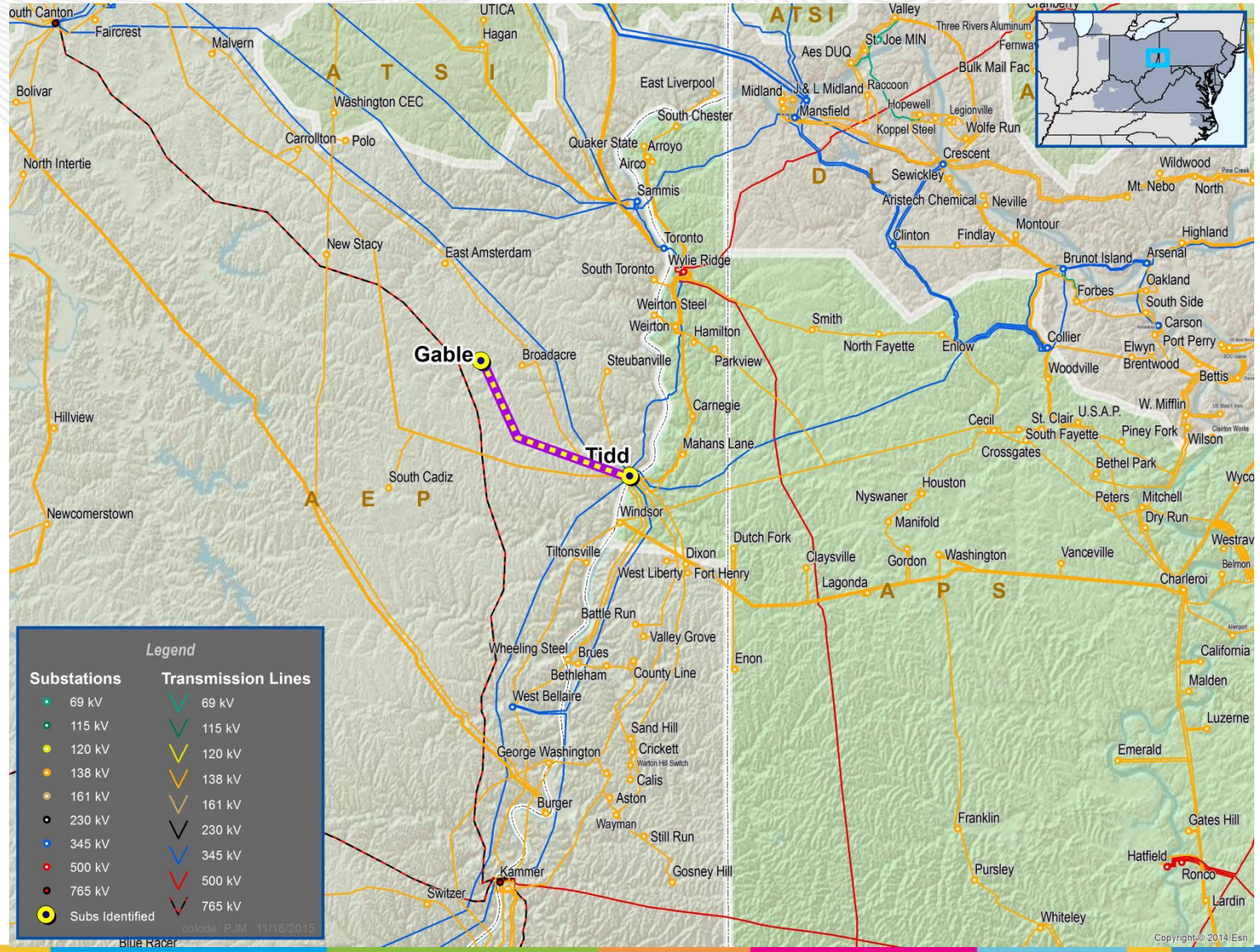
- Replace existing Raven 69KV phase over phase switch with a 3-way phase over phase switch with SCADA control. (S1066)

- Operation Performance
- Estimated Project Cost: $0.865M
- Projected IS Date: 6/1/2016



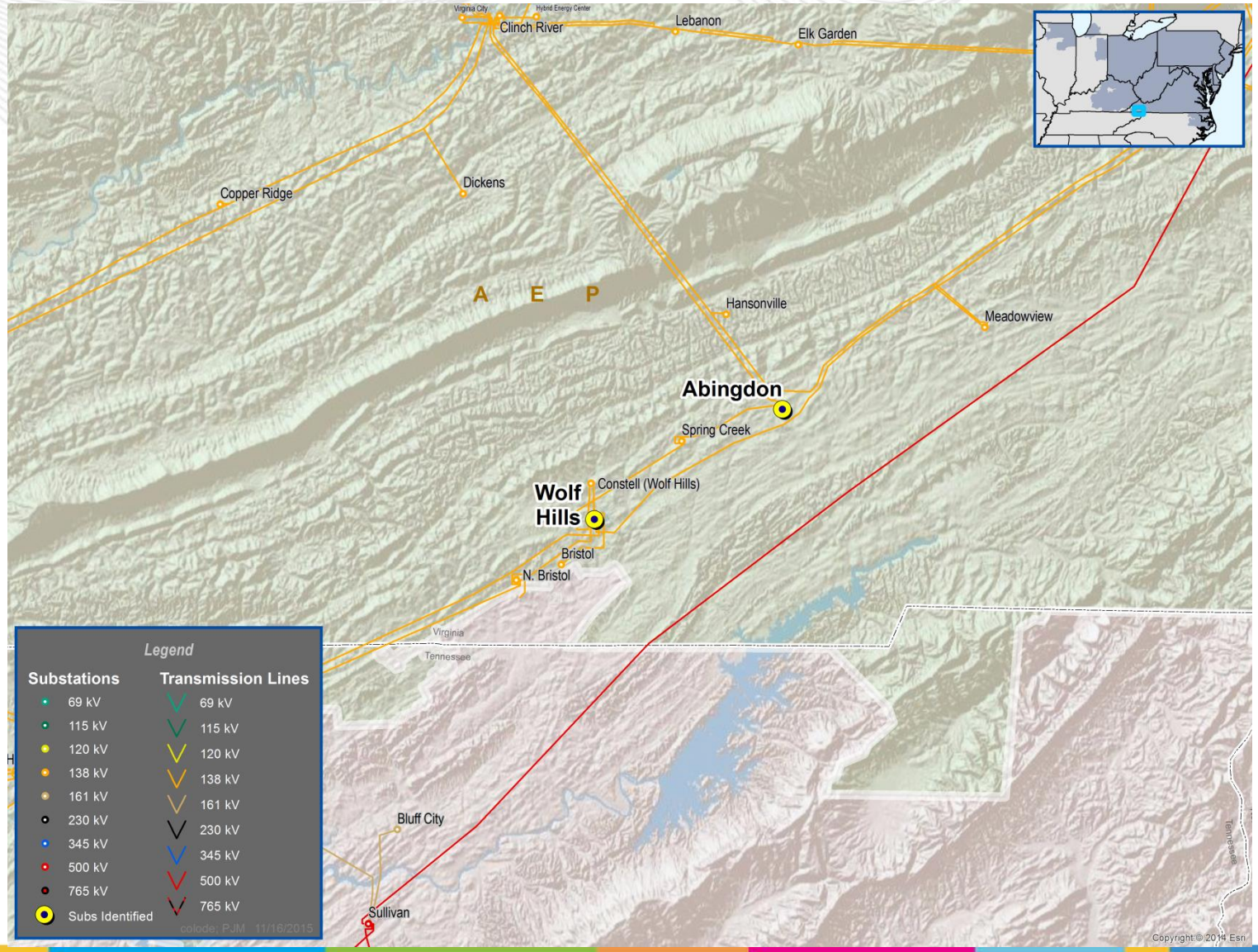
AEP Transmission Area

- **Supplemental Project**
- Rebuild Tidd-Gable 138kV circuit. (S1067)
- Aging facility
- Old Ratings: SN/SE = 221/221 MVA
- New Ratings: SN/SE = 287/337 MVA
- Estimated Project Cost: $10.585M
- Projected IS Date: 12/1/2018



AEP Transmission Area

- **Supplemental Project**
- Construct a new 138kV distribution station, which is energized via a new three mile 138kV double circuit transmission line (795 ACSR 45/7) tapping into the Abingdon – Wolf Hills 138kV circuit. The proposed distribution station will install two 138kV circuit breakers in a three breaker ring arrangement and one 138/12kV transformer. (S1068)
- Address distribution load serving issues associate with winter peak loading conditions
- Estimated Project Cost: $27.3M
- Projected IS Date: 10/1/2017



AEP Transmission Area

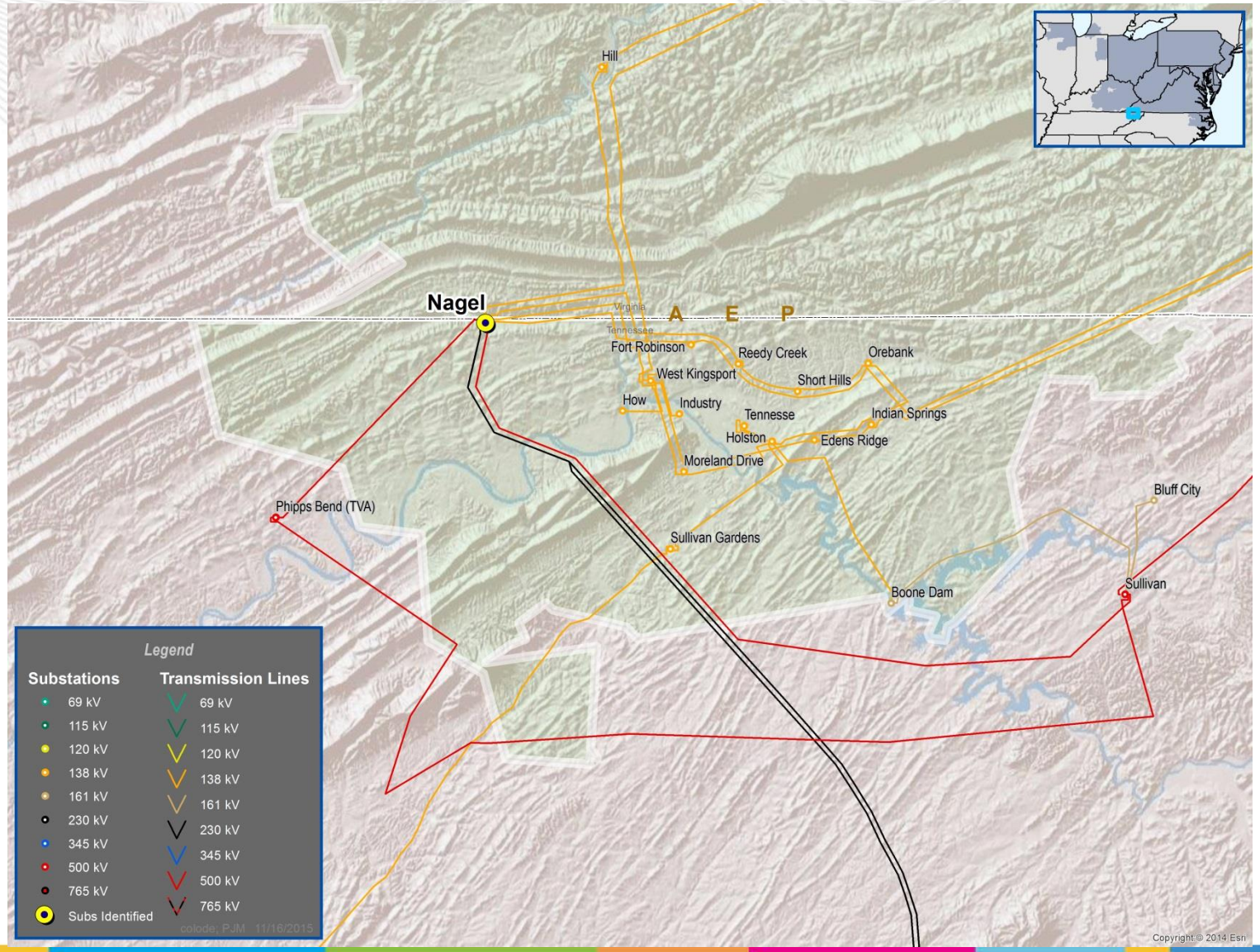
- **Supplemental Project**

- Retire existing 500/138kV GIS arrangement at the Nagel station. Replace 500/138kV arrangement with a new 500/138kV AIS station arrangement, installing 4-500kV breakers and 5-138kV circuit breakers. (S1069)

- Considerable risk of a moisture induced flashover in the winter months with gas system humidity levels

- Estimated Project Cost: $60M

- Projected IS Date: 11/16/2018

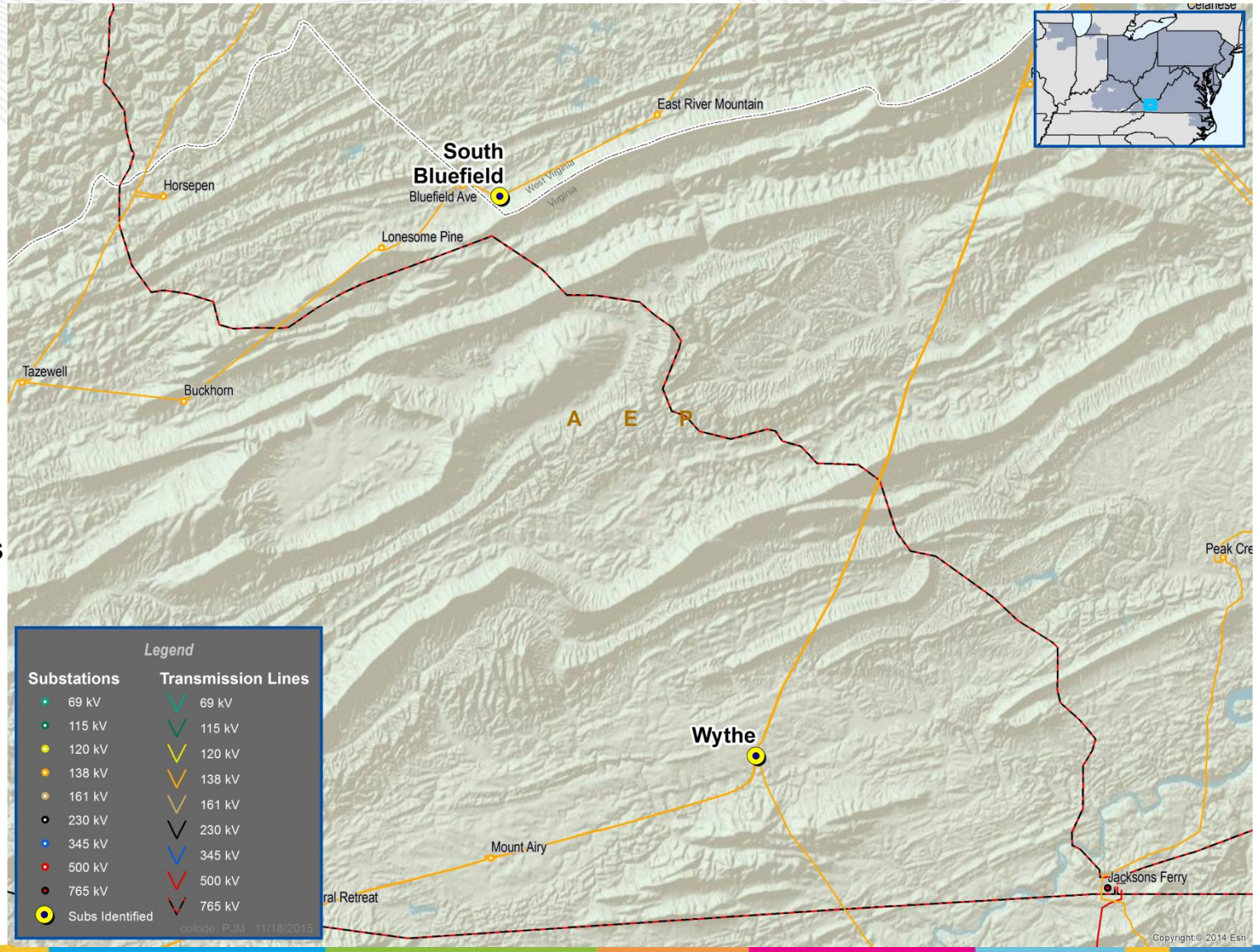


AEP Transmission Area

- **Supplemental Project**

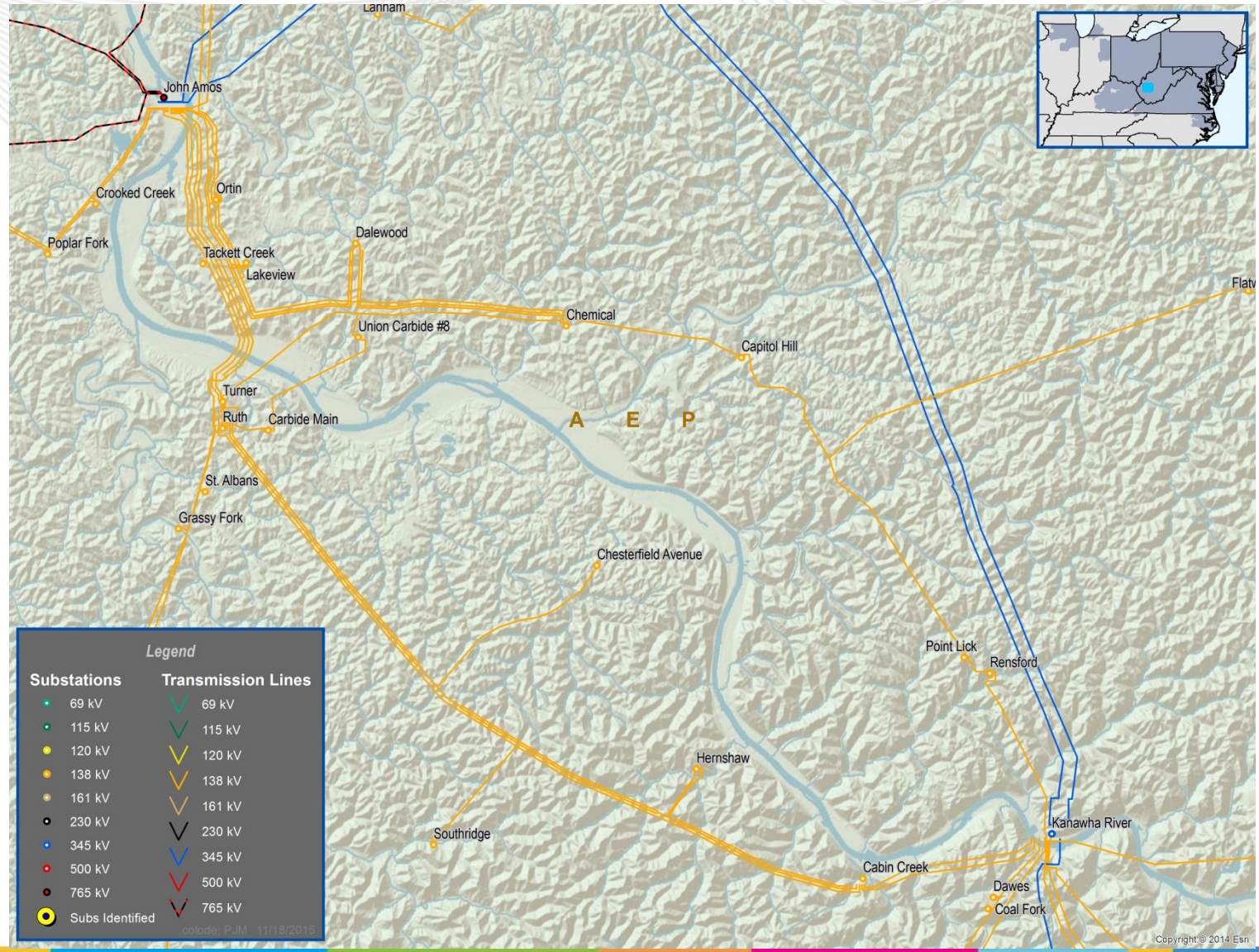
- Rebuild the South Bluefield – Bland – Wythe 69kV line to 138kV operation.
- Re-route the Wythe termination point into the Progress Park station and terminated into a single 138kV circuit breaker.
- Rebuild the existing Bland 69kV substation to 138kV with two 138kV MOAB and a new 138/12kV transformer.
- At South Bluefield, the new 138kV line will be terminated via a new 138kV circuit breaker.
- Add 57.6 MVAR capacitors with circuit switchers at the South Princeton and South Bluefield stations (S1070)

- Aging facility and Operation Performance
- Estimated Project Cost: $100M
- Projected IS Date: 11/1/2018



AEP Transmission Area

- **Supplemental Project**
- Construct a new 138/46 kV Bullitt Station; install one 138/46 kV 90 MVA transformer and 138 kV circuit switcher, three 138kV circuit breakers, four 46kV circuit breakers and a 46 kV grounding transformer. Install 2 - 25 MVA 138/12 kV transformers with circuit switchers and 3-12 kV circuit breakers. (S1071.1)
- Add new grounding Bank to 46 kV bus. (S1071.2)
- Construct approximately 5 miles of new transmission line, of which approximately 4 miles will be double circuit 138/69 kV from the Chesterfield Avenue Station to the Capitol Hill Station and 1 mile will be double circuit 138 kV from the Capitol Hill Station to the new Bullitt Station. (S1071.3)
- Construct approximately 1.0 mile of new 46 kV line between the proposed Bullitt Street Station and the existing Washington Street Station, which will transition from overhead to underground on approach to the Washington Street Station. (S1071.4)
- Expand and upgrade the existing Washington Street Station; install nine 69kV circuit breakers. (S1071.5)
- Expand the existing Chesterfield Avenue Station and install one new 138kV circuit breaker. (S1071.6)
- Install one new 138/46kV 90 MVA transformer, one 138 kV circuit switcher, two 138 kV circuit breakers, one 46 kV grounding transformer and one 69kV circuit breaker at the existing Capitol Hill Station. (S1071.7)
- Remove the46/12 kV transformers at Brooks Street Station(S1071.8)
- Reliability improvement and Operation Performance
- Estimated Project Cost: $109M
- Projected IS Date: 12/31/2019



ComEd Transmission Area

- **Supplemental Project**

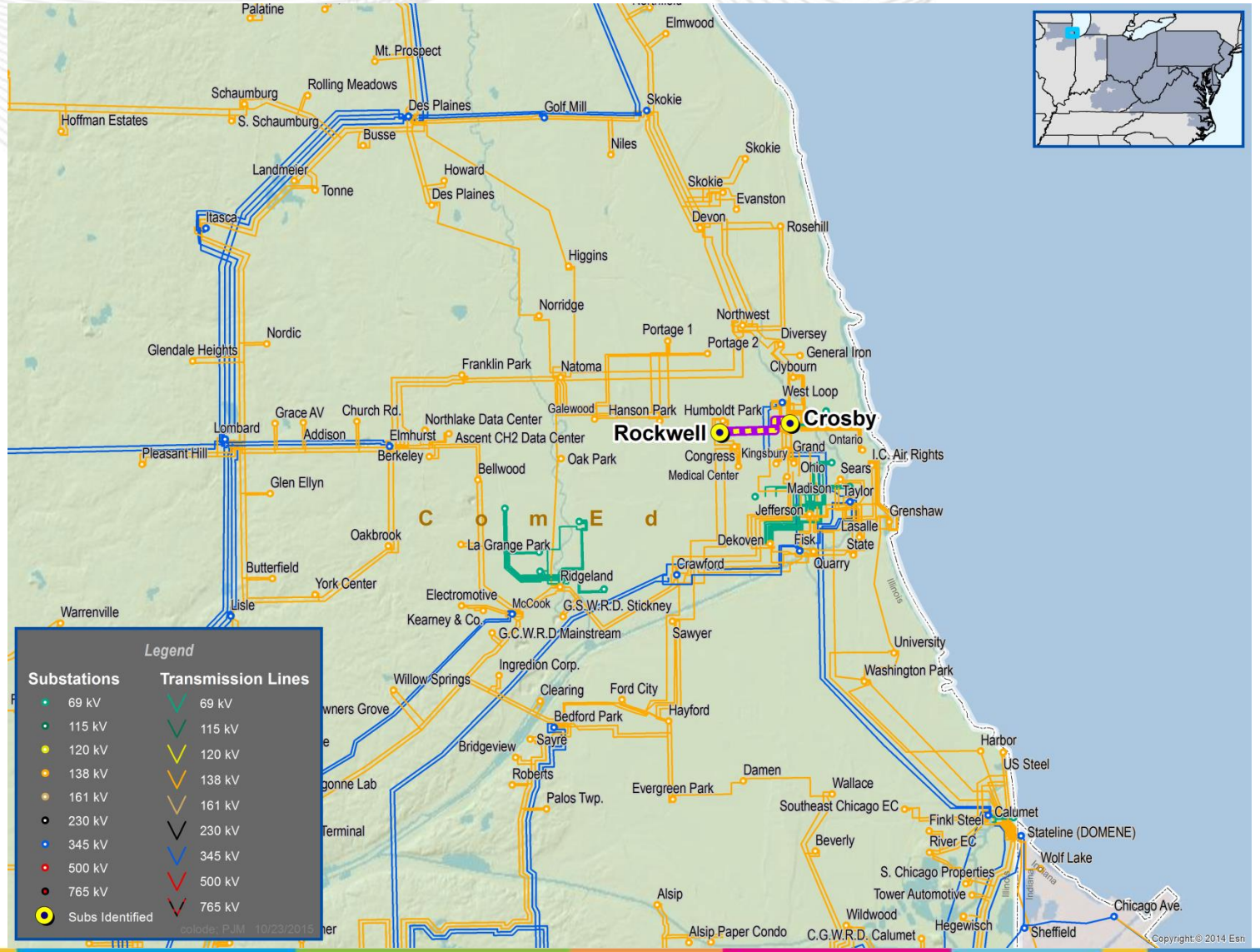
- Replace 2 miles of underground cable on 138 kV line 8223 between Crosby and Rockwell (S1072)

- Old Ratings: SN/SE = 220/249 MVA
- New Ratings: SN/SE = 300/386 MVA

- Material condition

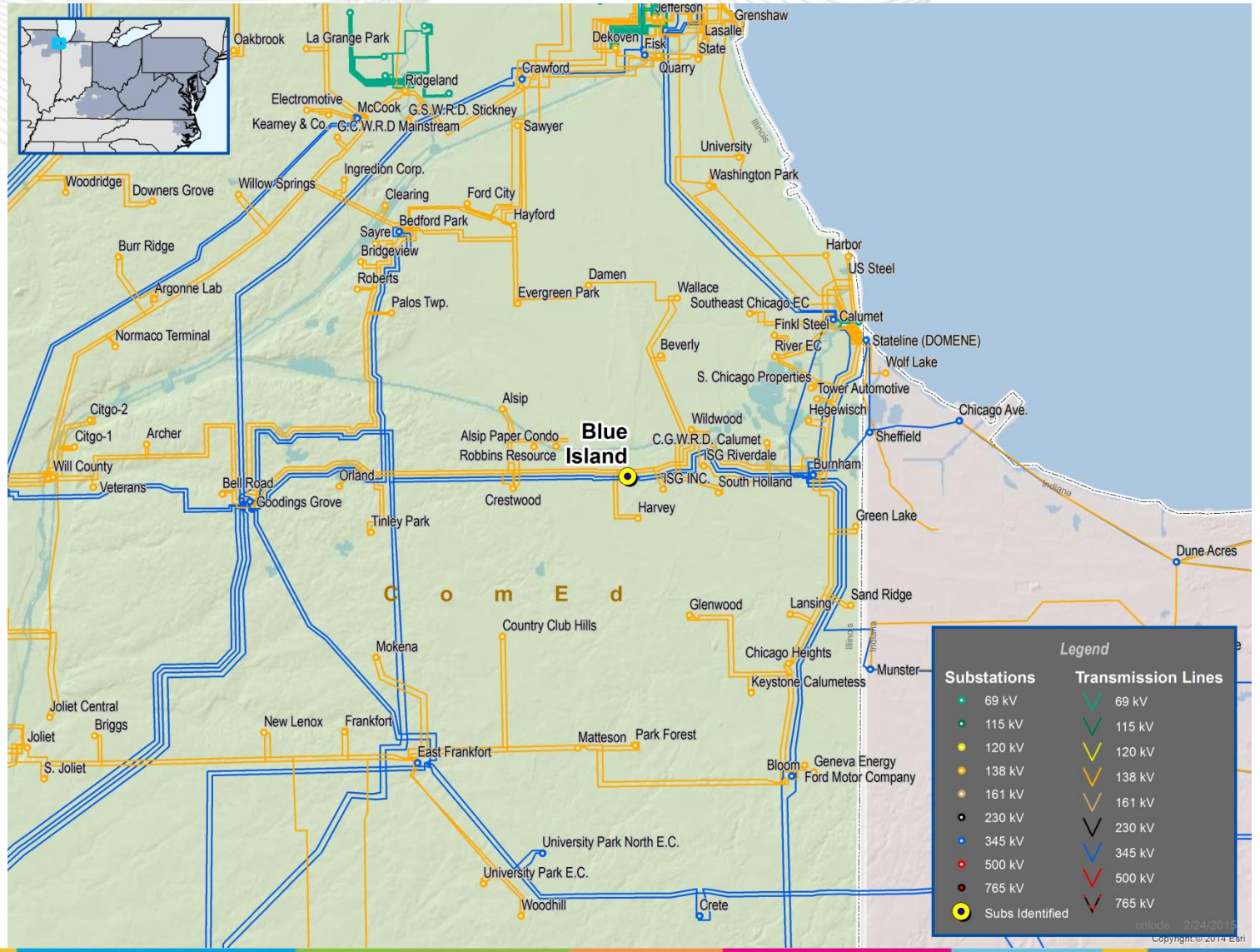
- Estimated Project Cost: $7.3M

- Projected IS Date: 12/31/2015



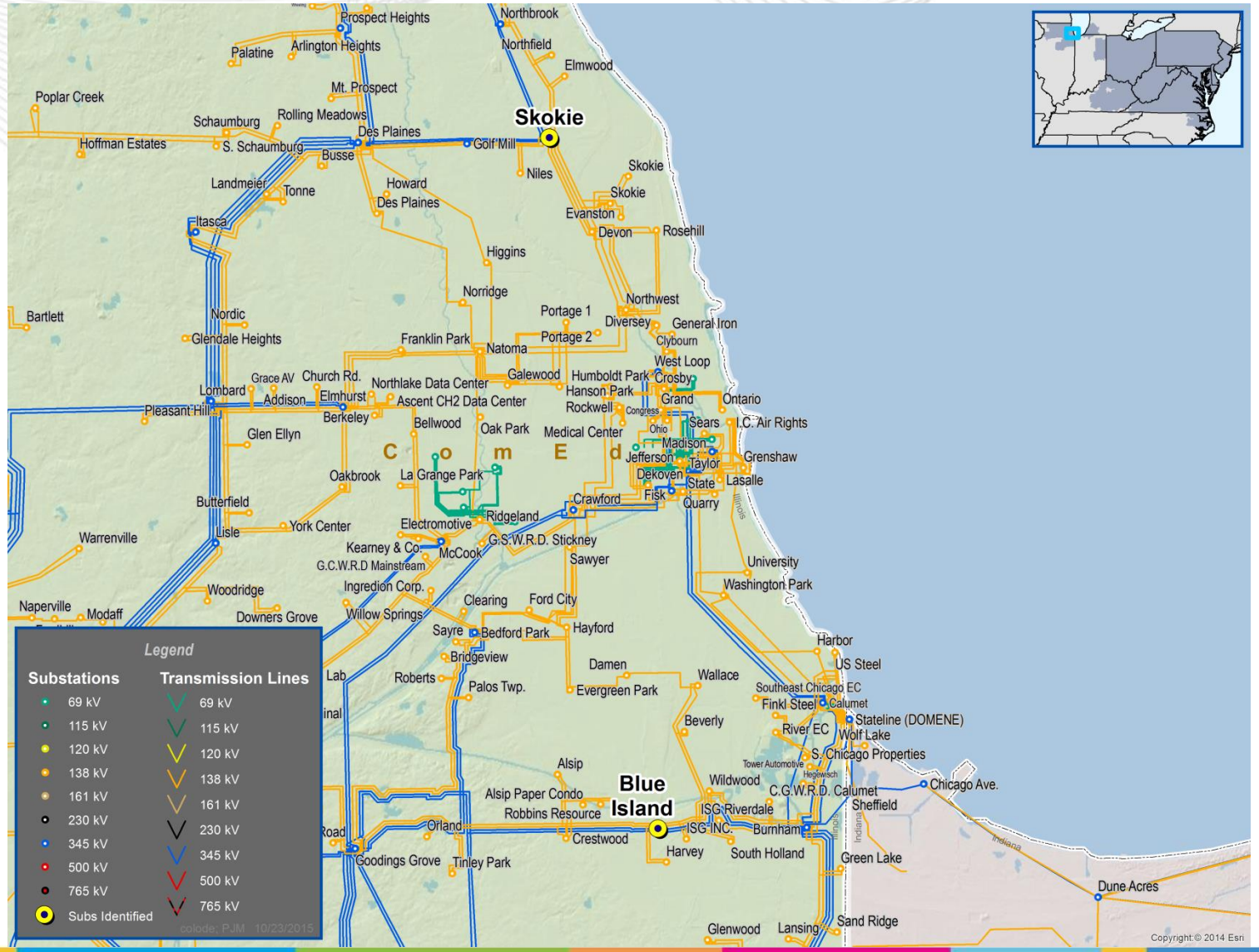
ComEd Transmission Area

- **Supplemental Project**
- At Blue Island, Transformer 83 108 MVAR tertiary capacitors will be removed and replaced by a 115.2 MVAR 138 kV bus cap. (S1073)
- Reliability Improvement
- Estimated Project Cost: $4M
- Projected IS Date: 6/1/2016



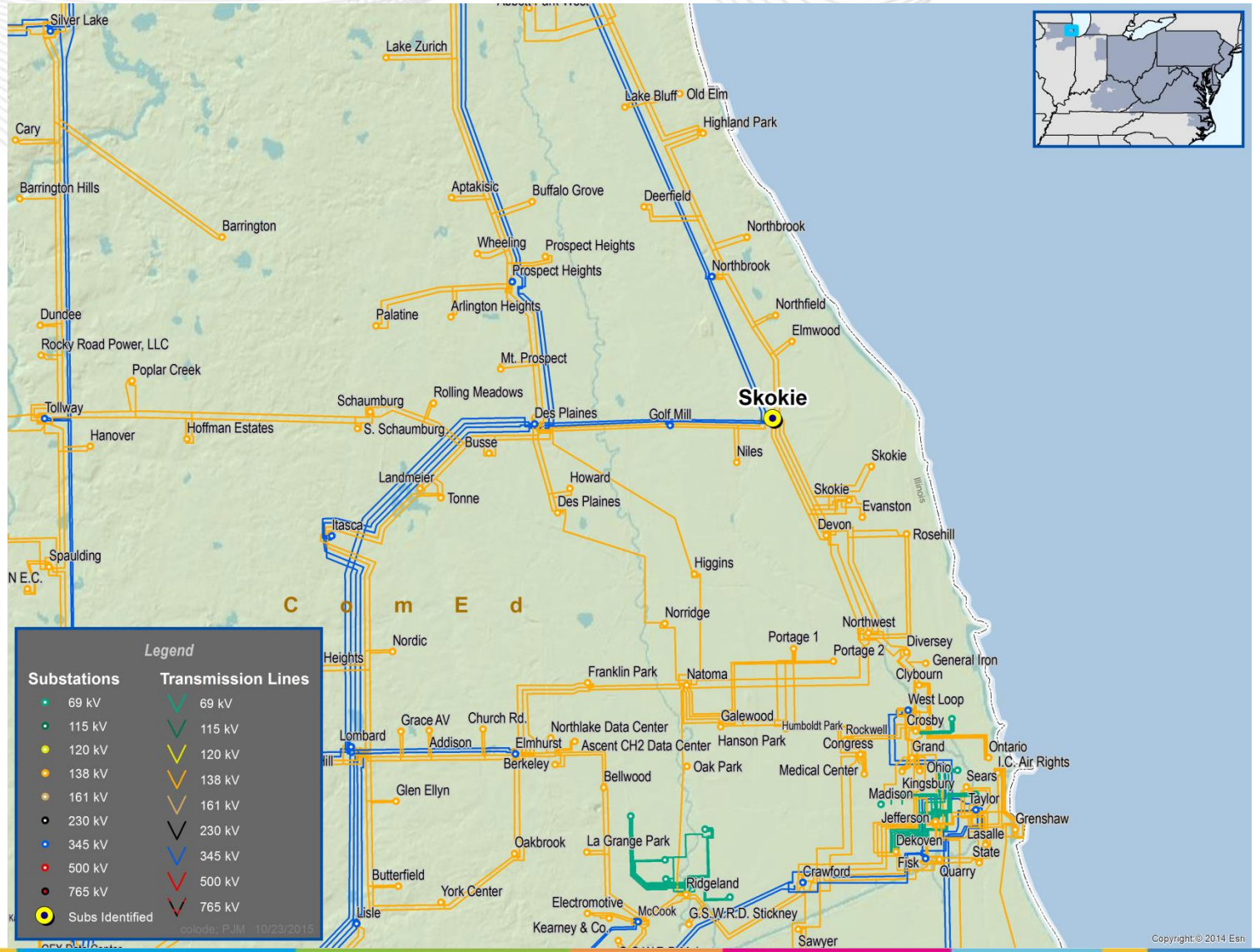
ComEd Transmission Area

- **Supplemental Project**
- At Skokie TSS 88, Transformer 83 108 MVAR tertiary capacitors will be removed and replaced by a 115.2 MVAR 138 kV bus cap. (S1074)
- Reliability Improvement
- Estimated Project Cost: $4M
- Projected IS Date: 6/1/2016



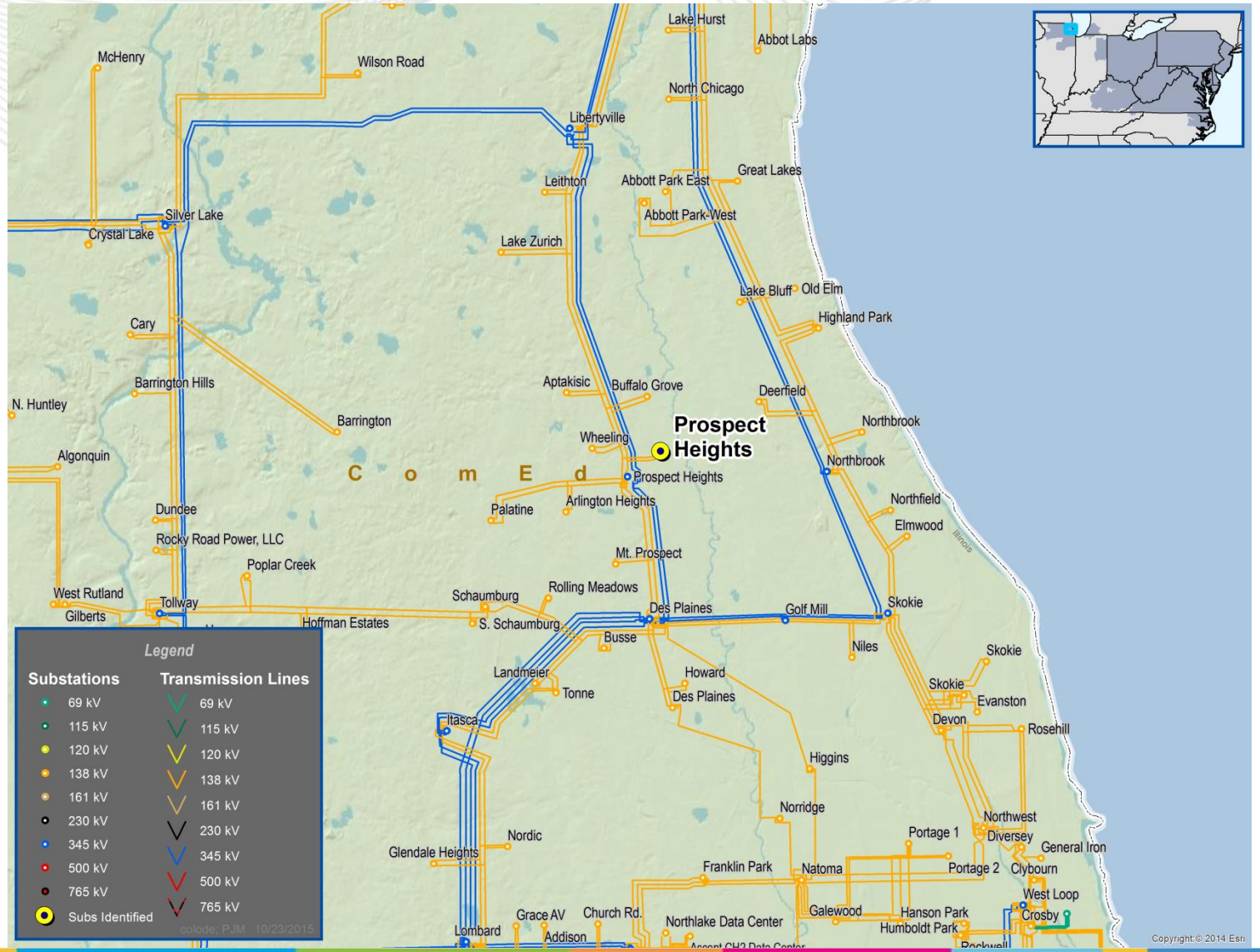
ComEd Transmission Area

- **Supplemental Project**
- At Skokie TSS 88, Transformer 81 and 82 high-side MODs will be replaced with 345 kV circuit breakers. Low side transformer lead conductor will also be replaced. (S1075)
- Reliability Improvement
- Estimated Project Cost: $8M
- Projected IS Date: 6/1/2016



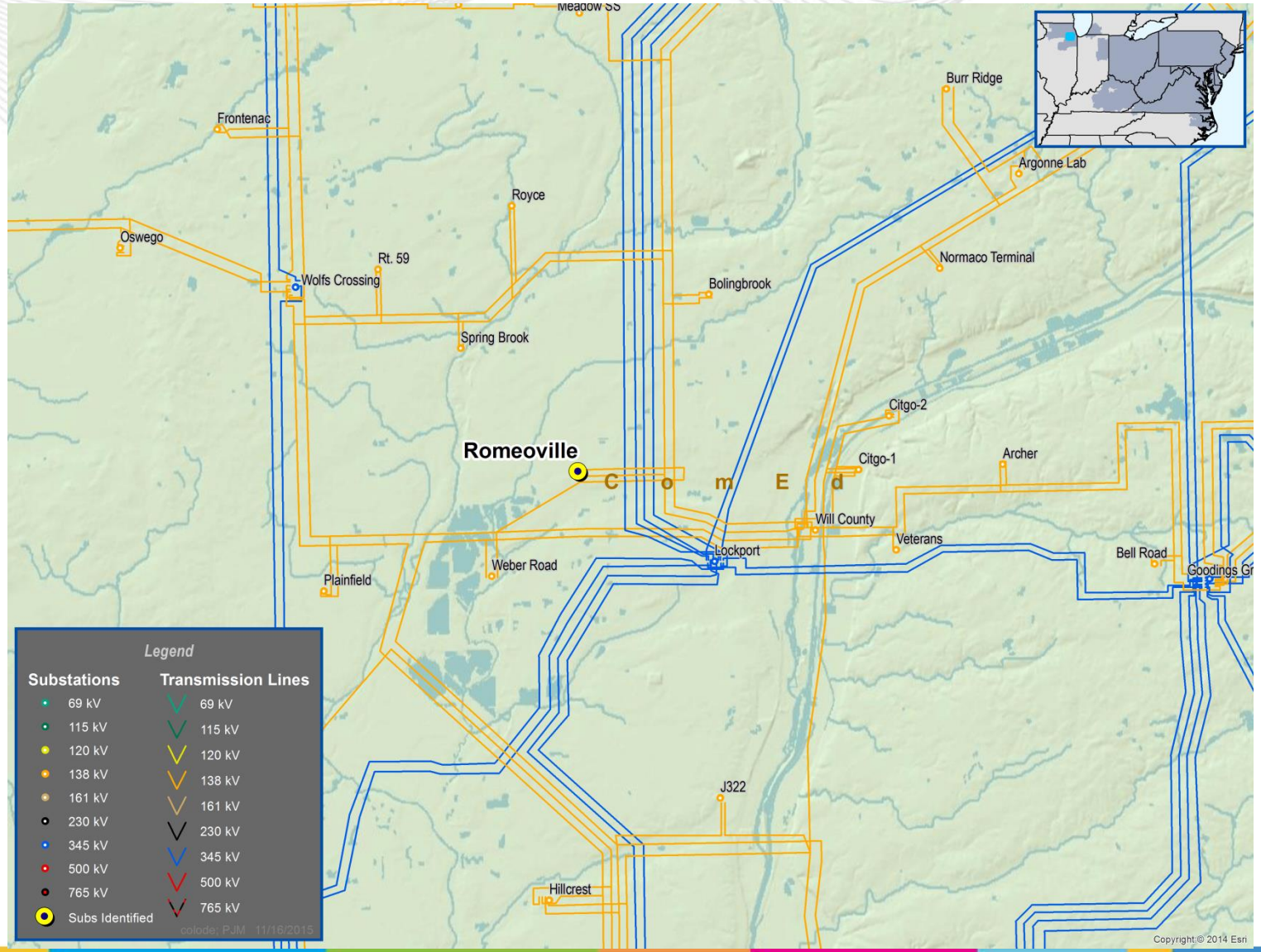
ComEd Transmission Area

- **Supplemental Project**
- Retire 4 banks at Prospect Heights on Transformer 84 (72 MVAR), leaving 2 banks in service; Retire 2 banks each (36 MVAR) on Transformer 81 and Transformer 83 at Elmhurst and the entire 108 MVAR tertiary on Transformer 84. (S1076)
- Reliability Improvement
- Estimated Project Cost: $0.5M
- Projected IS Date: 4/1/2016



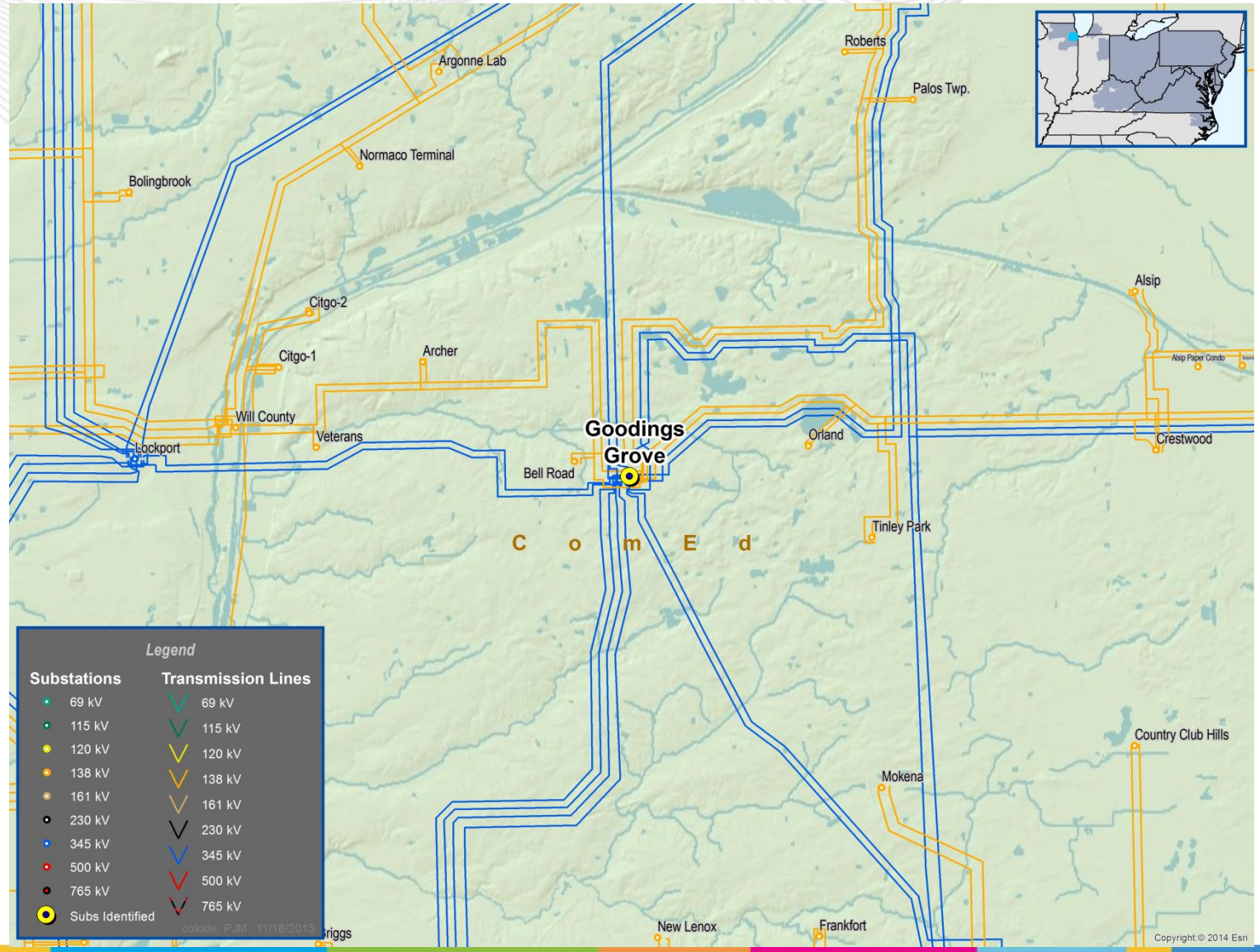
ComEd Transmission Area

- **Supplemental Project**
- Build a new 138kV distribution station at Normantown Road(S1077)
- Serve area load growth
- Estimated Project Cost: $34.9M
- Projected IS Date: 6/1/2016



ComEd Transmission Area

- **Supplemental Project**
- Add 4th 345/138 kV Transformer at Goodings Grove (S1078)
- For potential generation retirement
- Estimated Project Cost: $15.7M
- Projected IS Date: 6/1/2016



ComEd Transmission Area

- **Supplemental Project**

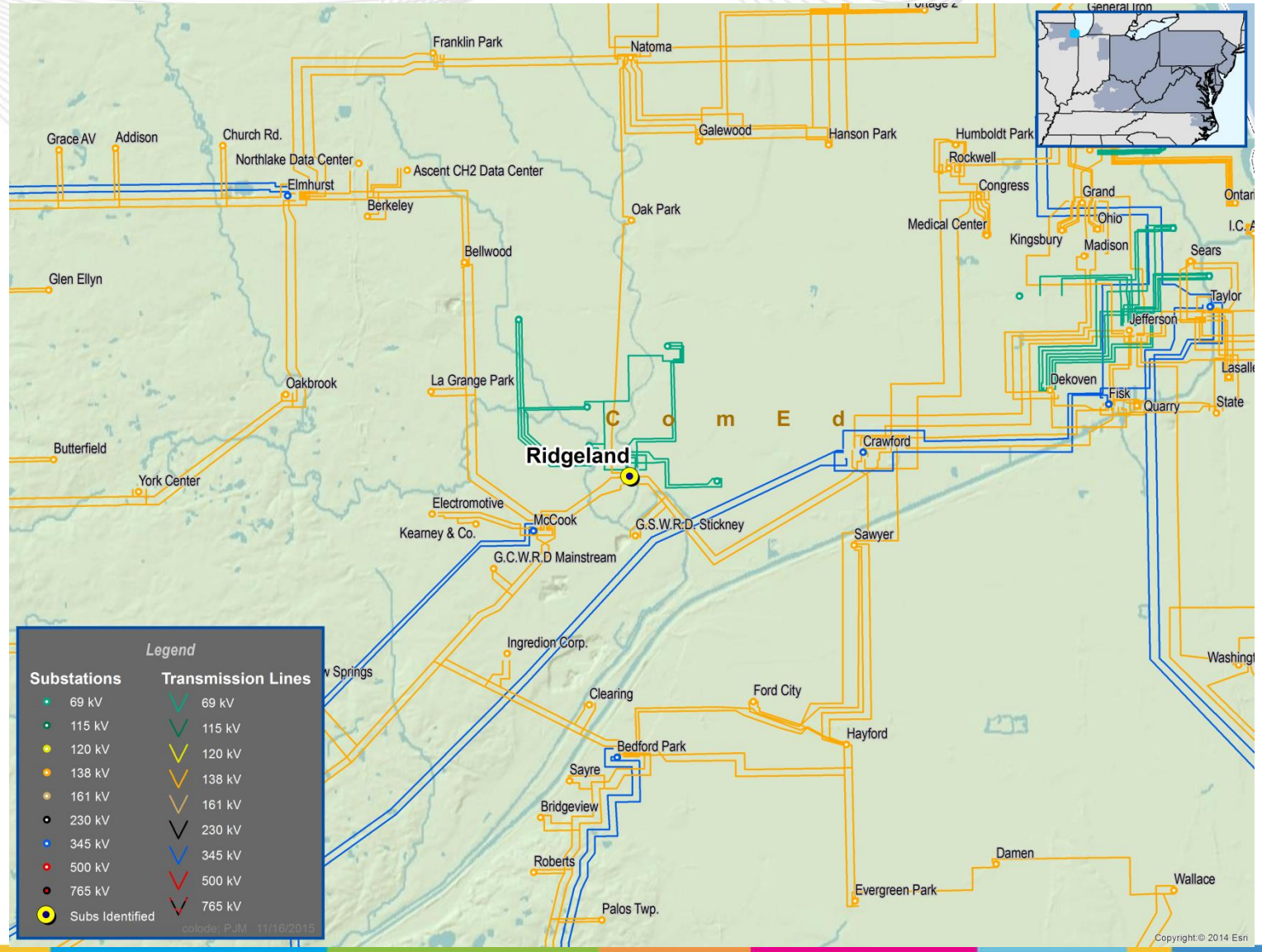
- Replace cable on Ridgeland – ESS D799 138 kV blue line 1306 (S1079)

- Old Ratings: SN/SE = 263/308 MVA
- New Ratings: SN/SE = 356/456 MVA

- Material condition

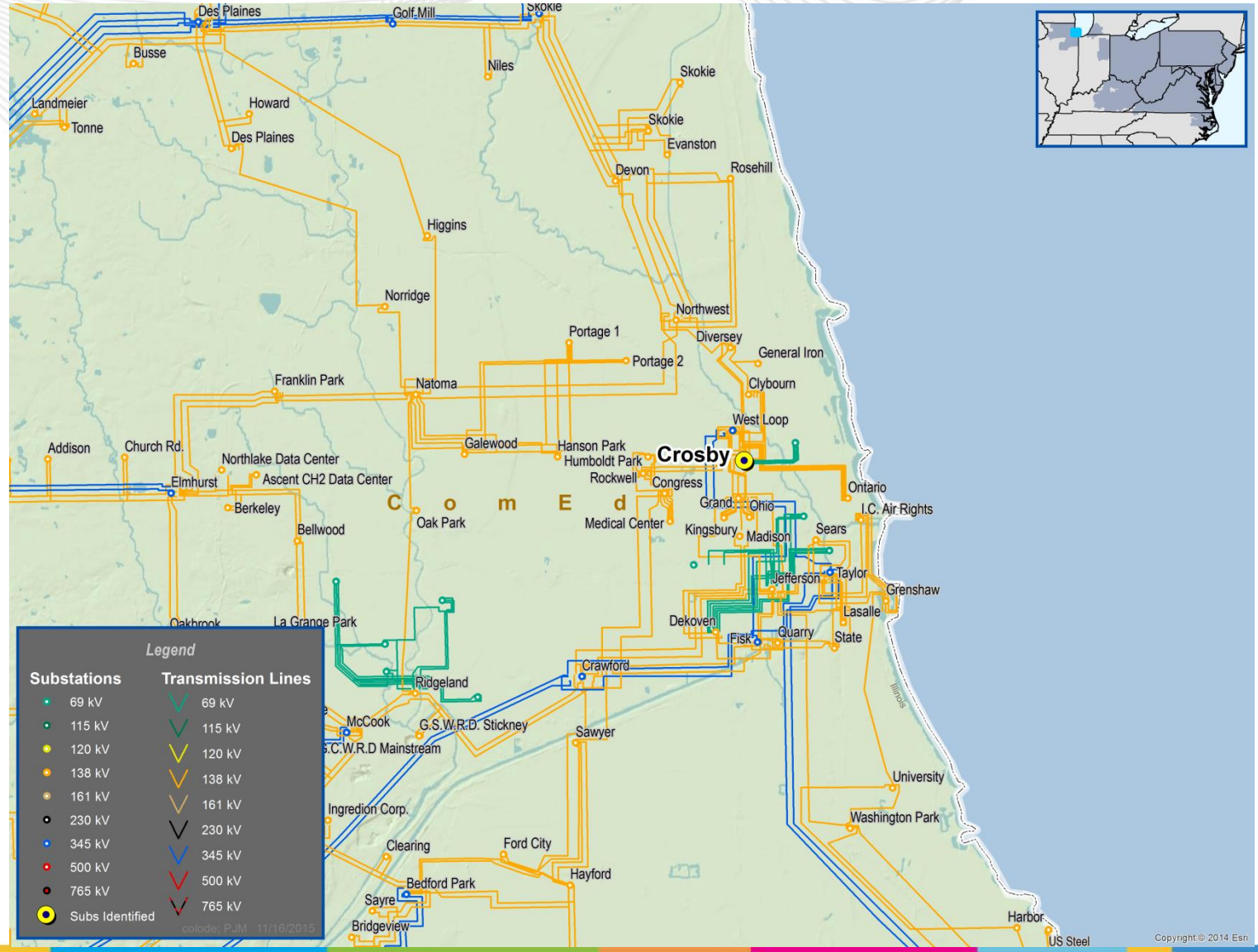
- Estimated Project Cost: $5.9M

- Projected IS Date: 3/1/2016



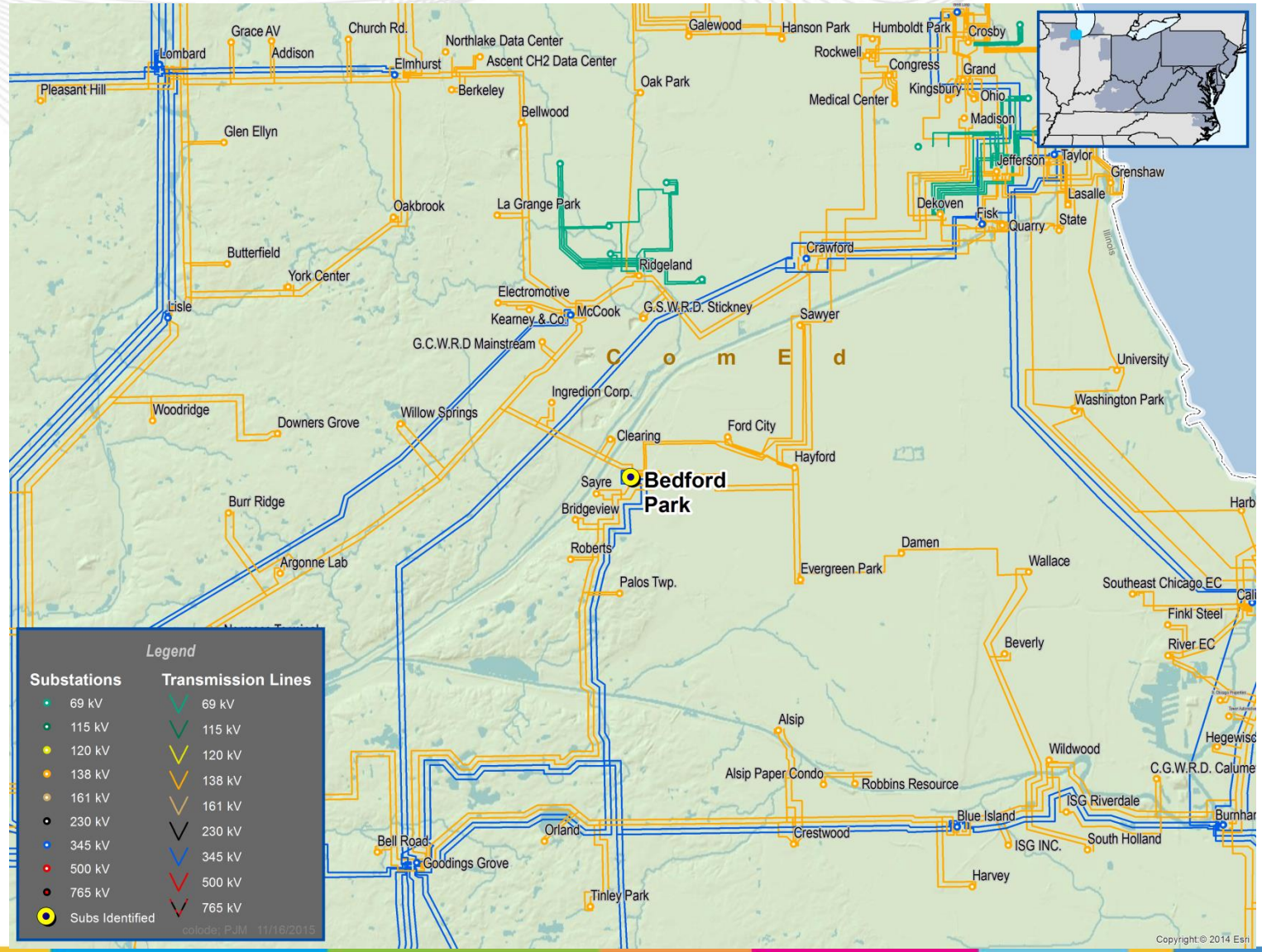
ComEd Transmission Area

- **Supplemental Project**
- Replace 138 kV CB 12-13 at Crosby (S1080)
- Material condition
- Estimated Project Cost: $1.4M
- Projected IS Date: 6/1/2016



ComEd Transmission Area

- **Supplemental Project**
- Bedford Park – install high-side 345 kV CB on TR 84, replace 138 kV BT 1-3 & BT 2-4 (S1081)
- reliability improvement and material condition
- Estimated Project Cost: $4.4M
- Projected IS Date: 6/1/2016



ComEd Transmission Area

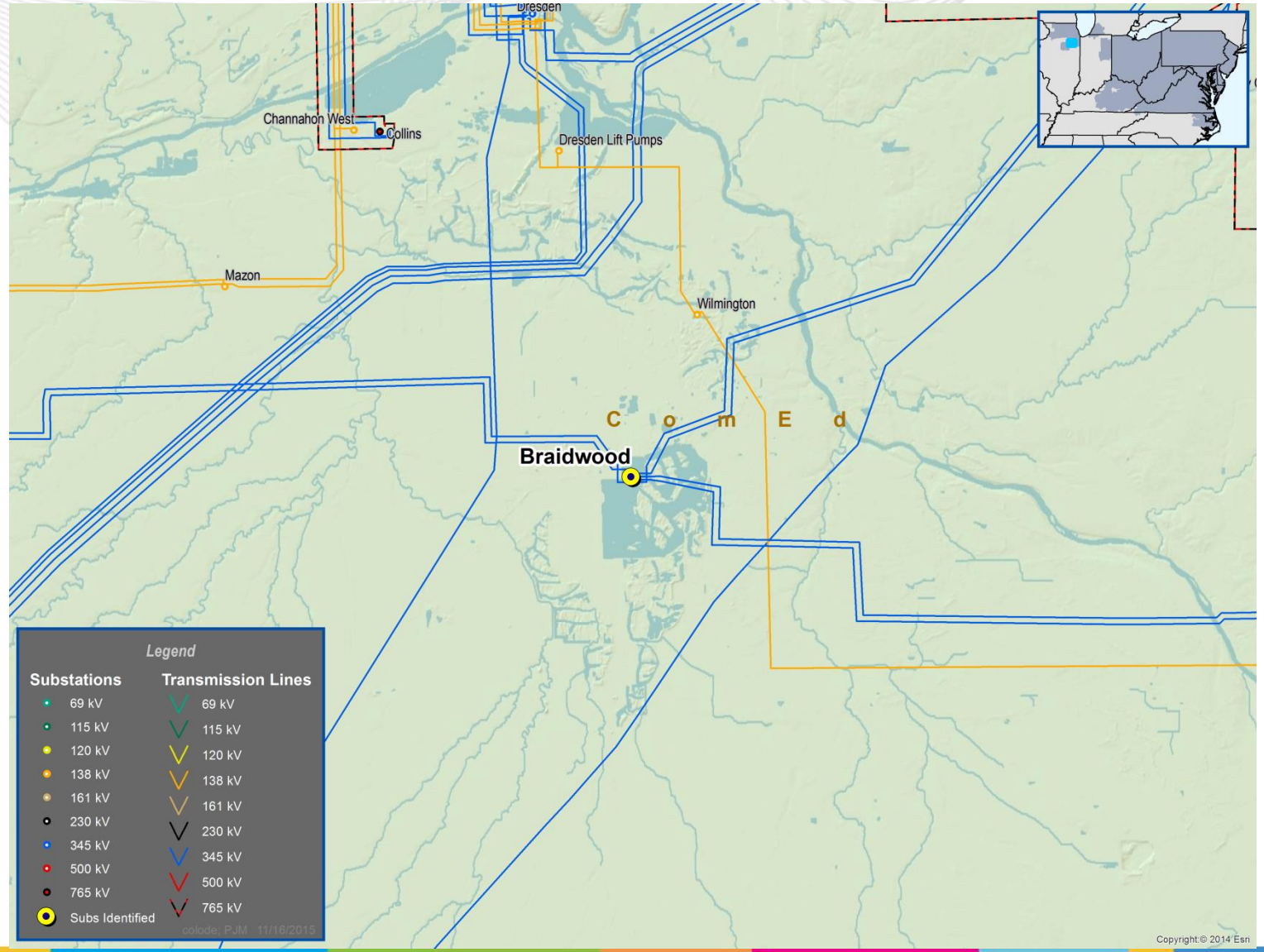
- **Supplemental Project**

- Replace Braidwood 345 kV CB 1-8 (S1082)

- Increases rating on line 0104 LaSalle - Braidwood
- Old Ratings: SN/SE = 1245/1341 MVA
- New Ratings: SN/SE = 1334/1528 MVA

- Material condition

- Estimated Project Cost: $2.6M
- Projected IS Date: 6/1/2016



DLCO Transmission Area

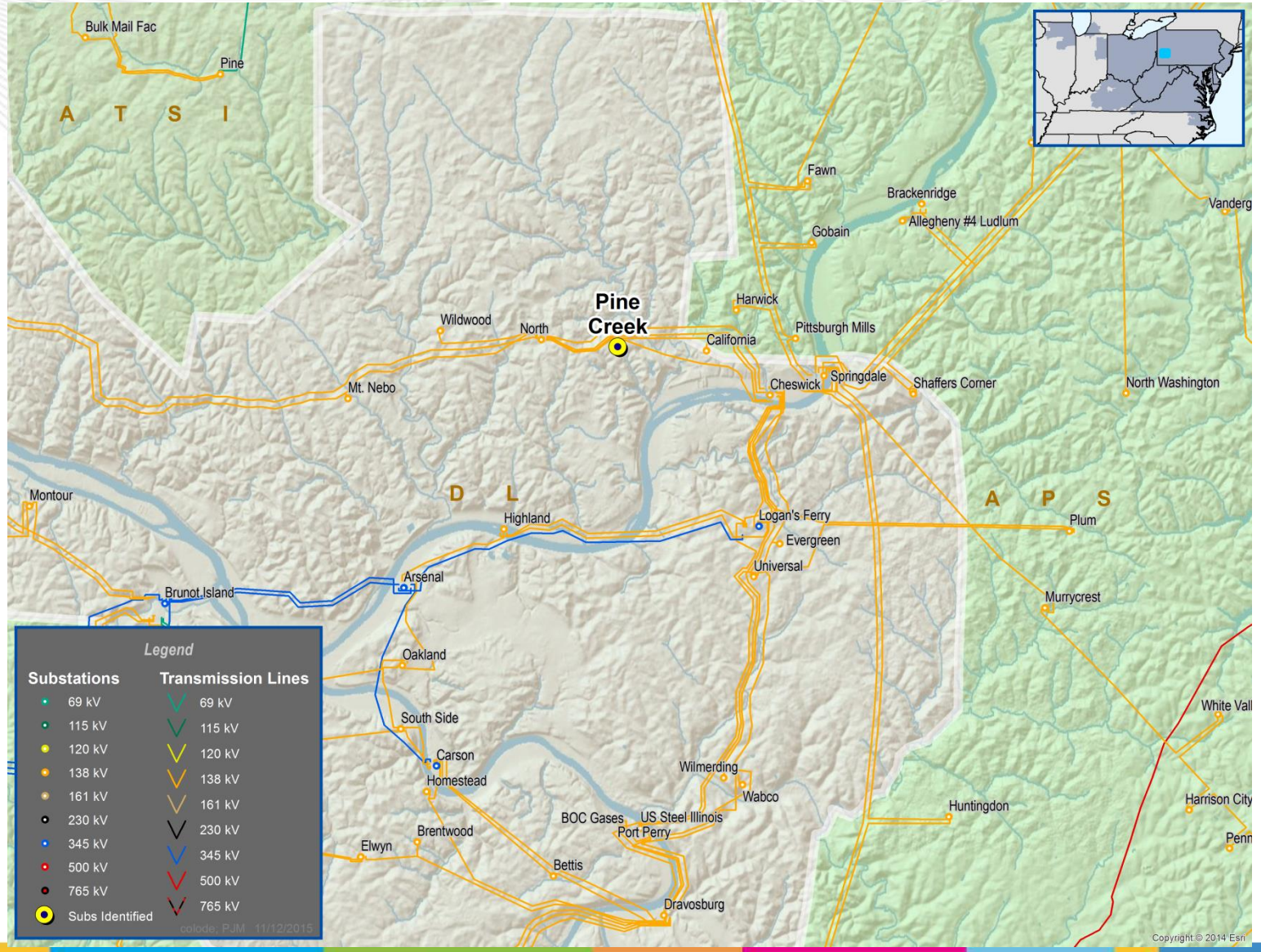
- **Supplemental Project**

- Construct a new West Deer 138/23 kV substation, which is radially fed from the Pine Creek substation and the newly constructed 138kV feed will be designated as Z-105. (S1083)

- Eliminate forecasted overloads on several distribution circuits existing in this area.

- Estimated Project Cost: $10.6M

- Projected IS Date: 6/1/2019



Change History

- Dec. 31, 2015
- Change “Required IS Date” to “Expected IS Date” for supplemental projects
- For slides #23 (S1056), list old and new ratings per member’s request
- For slides #27 (S1060), list old and new ratings per member’s request
- For slides #29 (S1062.1 and S1062.2), list old and new ratings per member’s request
- For slides #31 (S1064), list old and new ratings per member’s request
- For slides #34 (S1067), list old and new ratings per member’s request
- For slides #49 (S1082), list old and new ratings per member’s request