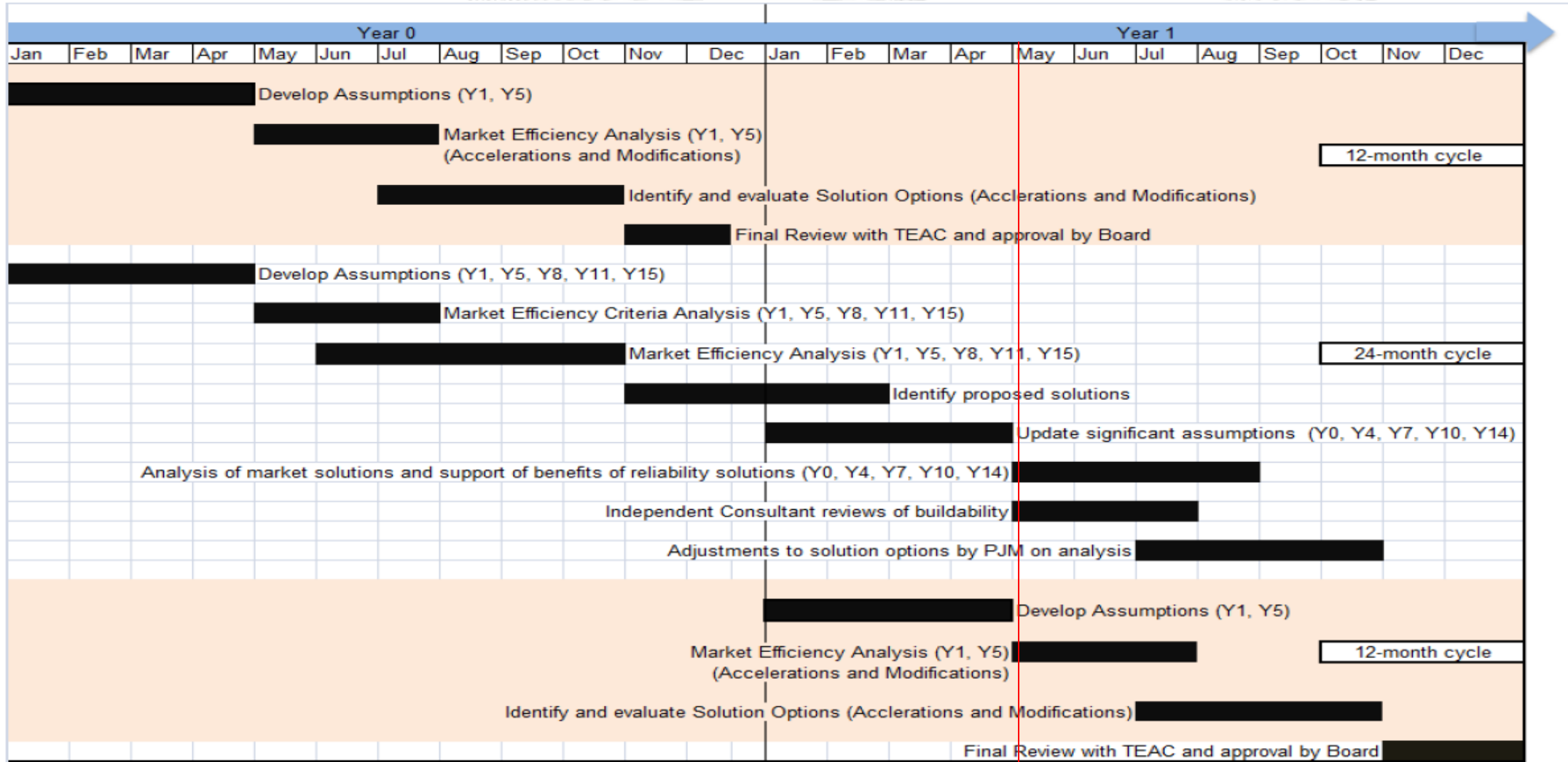




Market Efficiency Update

Transmission Expansion Advisory Committee
May 4, 2017





- Long term proposal window: Nov 2016 - Feb 2017 (completed)
- Mid-cycle update of major assumptions: Jan 2017 – Apr 2017 (completed)
 - Load forecast, Fuel and Emissions forecasts, Generation expansion, Network topology
 - Only updating the most significant changes, not full update.
 - Updated ME Base Scenarios to be posted in the following weeks
- Analysis of proposed solutions: May 2017 - Oct 2017 (in-progress)
 - Independent consultant review of cost and ability to build
 - Review of analysis with TEAC: Jun 2017 - Nov 2017
- Determination of final projects: Dec 2017
 - Final review with TEAC and Board approval
 - Projects may be approved earlier if analysis and review complete

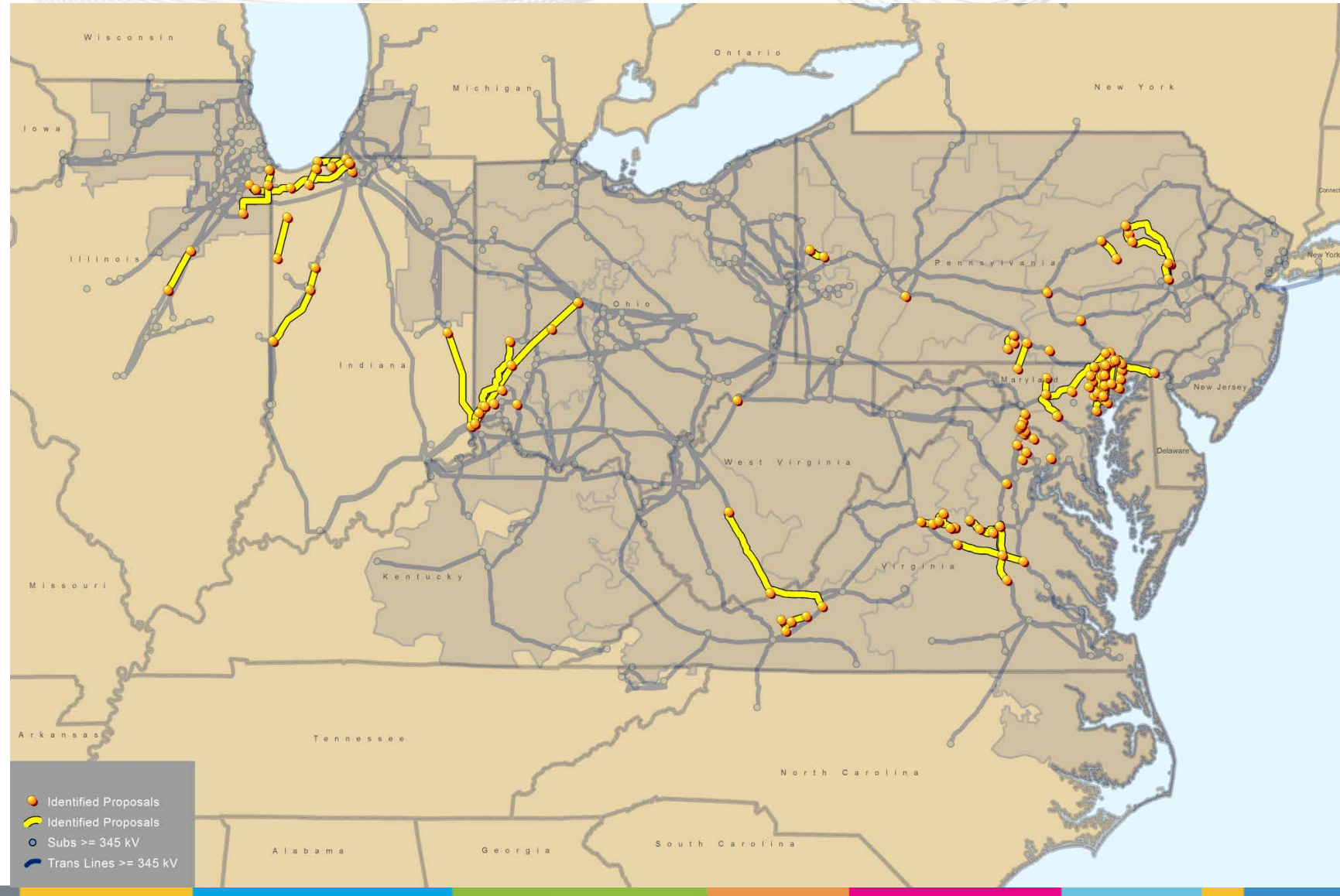
Market Efficiency Long Term Proposal Window Proposed Projects

2016-2017 Long Term Window – Projects Received

- **96 Market Efficiency Proposals**
 - 52 Greenfield
 - \$15.8M - \$371.3M
 - 44 Upgrades
 - \$0 - \$192.07M

- **20 proposing entities** (including 6 combinations of joint proposals)

- **8 Interregional proposals**



- **46 Projects:**

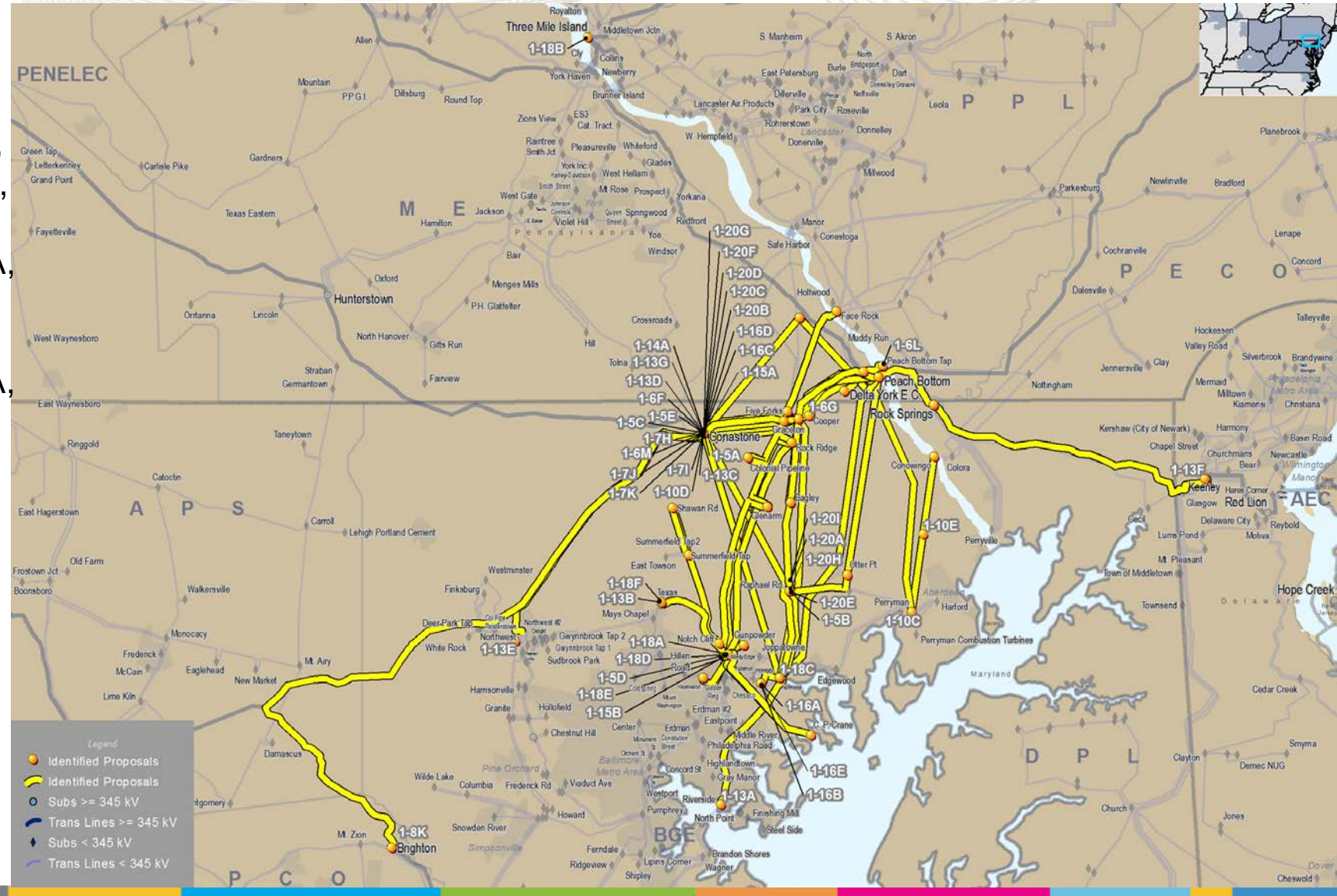
- 1-5A, 1-5B, 1-5C, 1-5D, 1-5E, 1-6F, 1-6G, 1-6L, 1-6M, 1-7H, 1-7I, 1-7J, 1-7K, 1-10C, 1-10D, 1-10E, 1-13A, 1-13B, 1-13C, 1-13D, 1-13E, 1-13F, 1-13G, 1-14A, 1-15A, 1-15B, 1-16A, 1-16B, 1-16C, 1-16D, 1-16E, 1-18A, 1-18B, 1-18C, 1-18D, 1-18E, 1-18F, 1-20A, 1-20B, 1-20C, 1-20D, 1-20E, 1-20F, 1-20G, 1-20H, 1-20I

- **Cost:**

- From \$5.97 M to \$371.30 M

- **ME Constraints:**

- CONASTONE - GRACETON - BAGLEY 230 kV
- CONASTONE - PEACH BOTTOM 500 kV

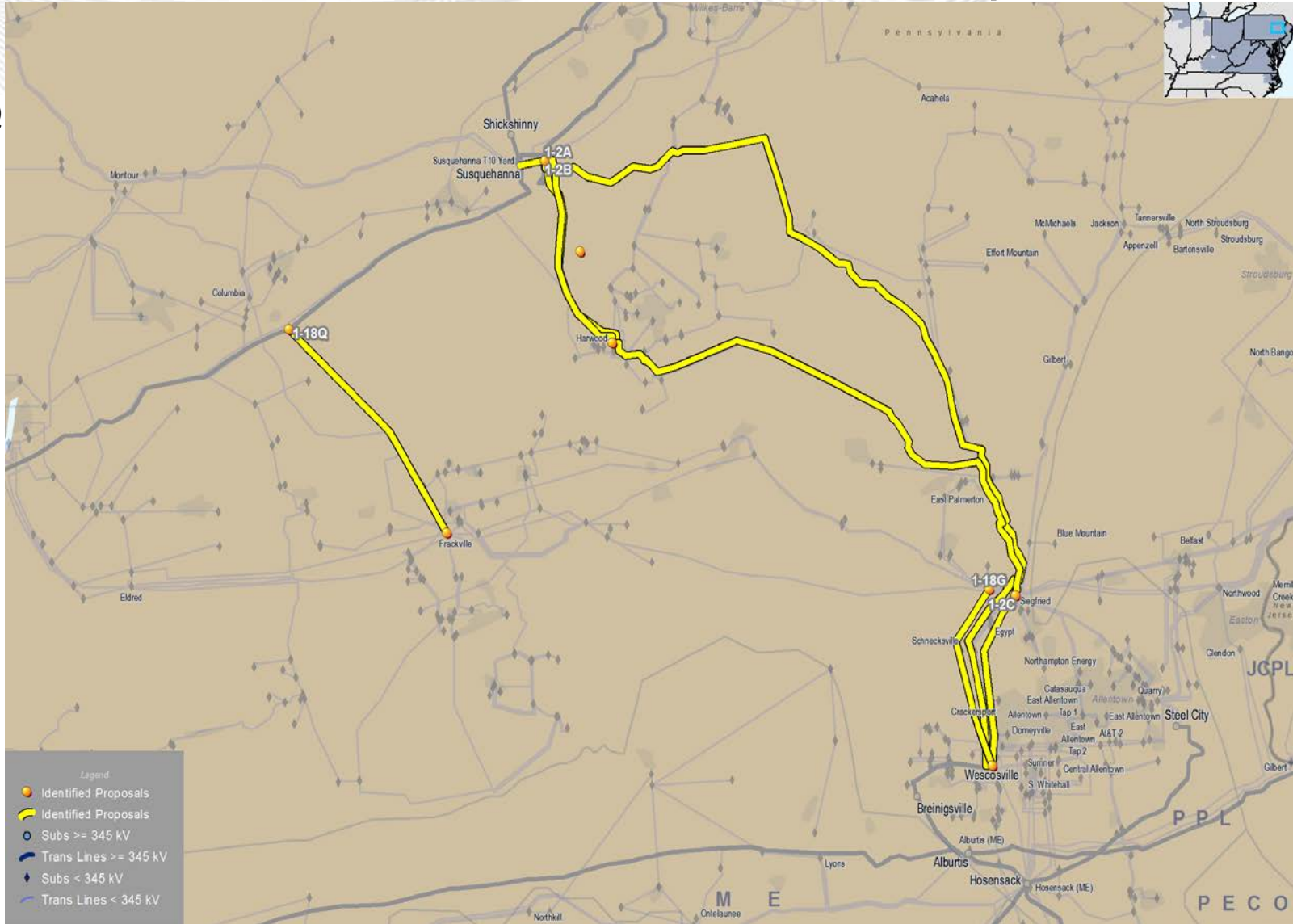




- **6 Projects:**
 - 1-2A, 1-2B, 1-2C, 1-10A, 1-18G, 1-18Q

- **Cost:**
 - From \$ 13.01 M to \$33.80 M

- **ME Constraint:**
 - SUSQUEHANNA - HARWOOD 230 kV





Group 03 - ComEd/AEP/NIPSCO Interregional

- **7 Projects:**

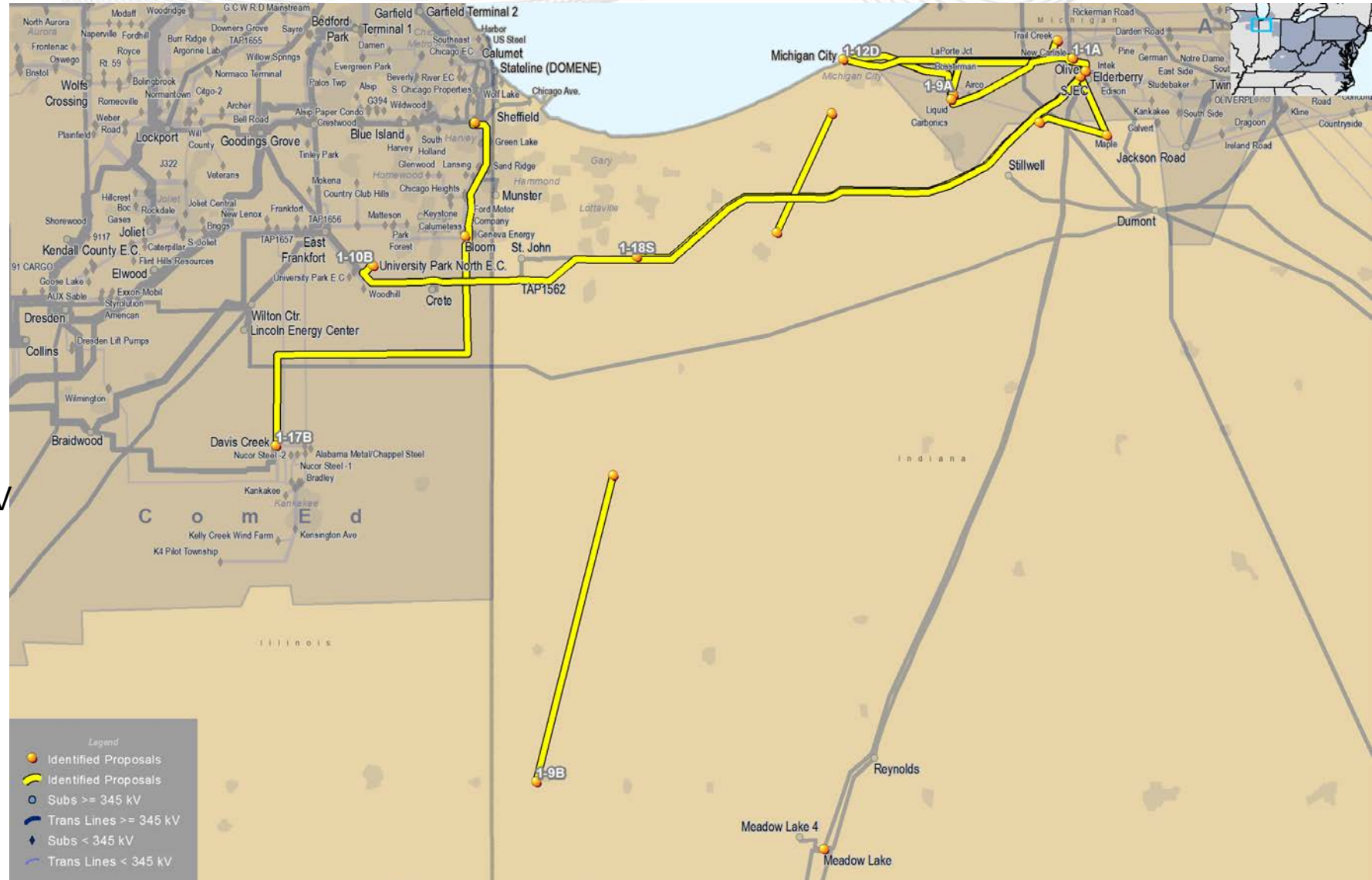
- 1-1A, 1-9A, 1-9B, 1-10B, 1-12D, 1-17B, 1-18S

- **Cost:**

- From \$1.00 M to \$197.97 M

- **ME Constraints:**

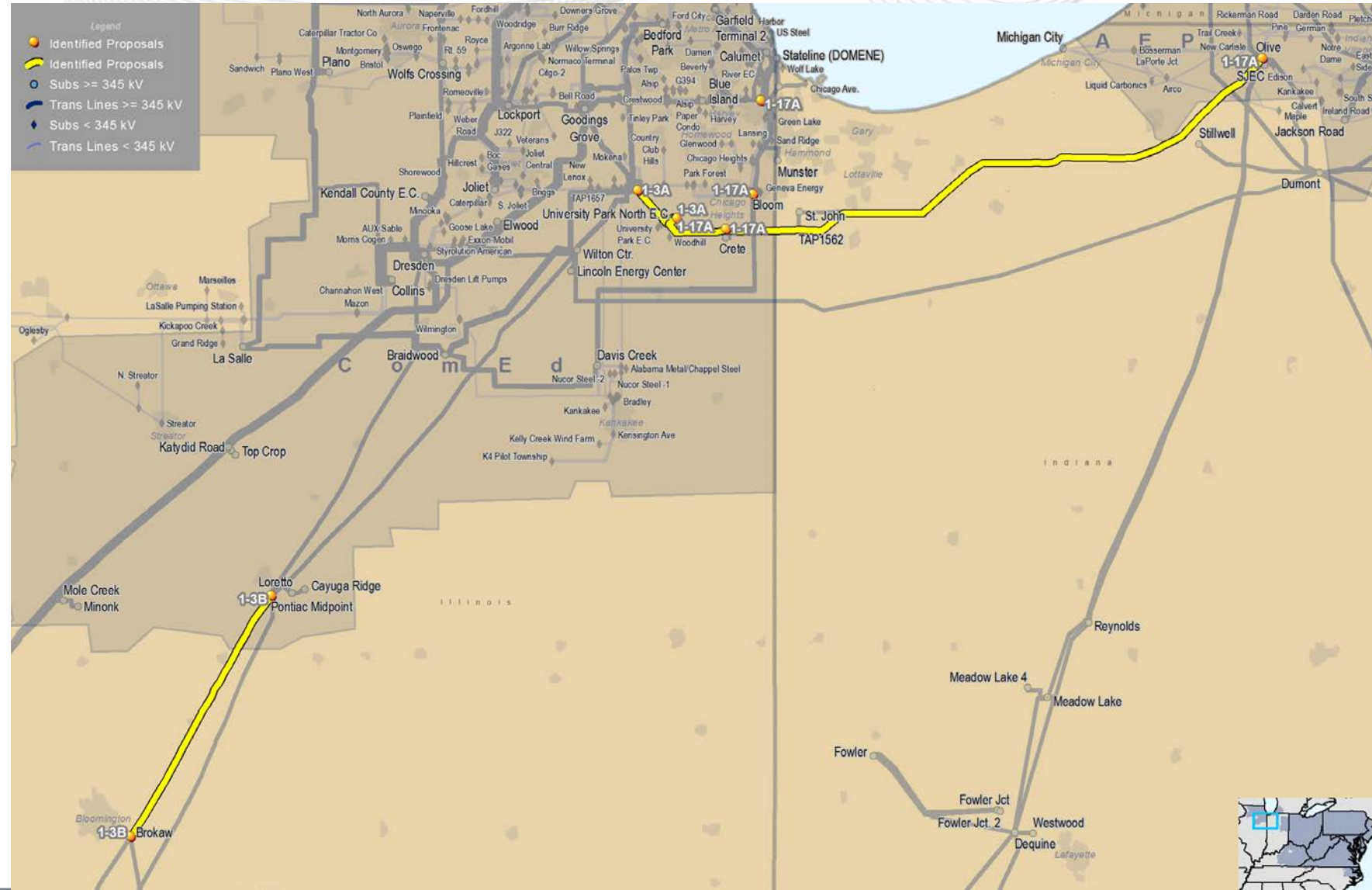
- PAXTON - GIFFORD 138 kV
- BOSSERMAN - OLIVE 138 kV



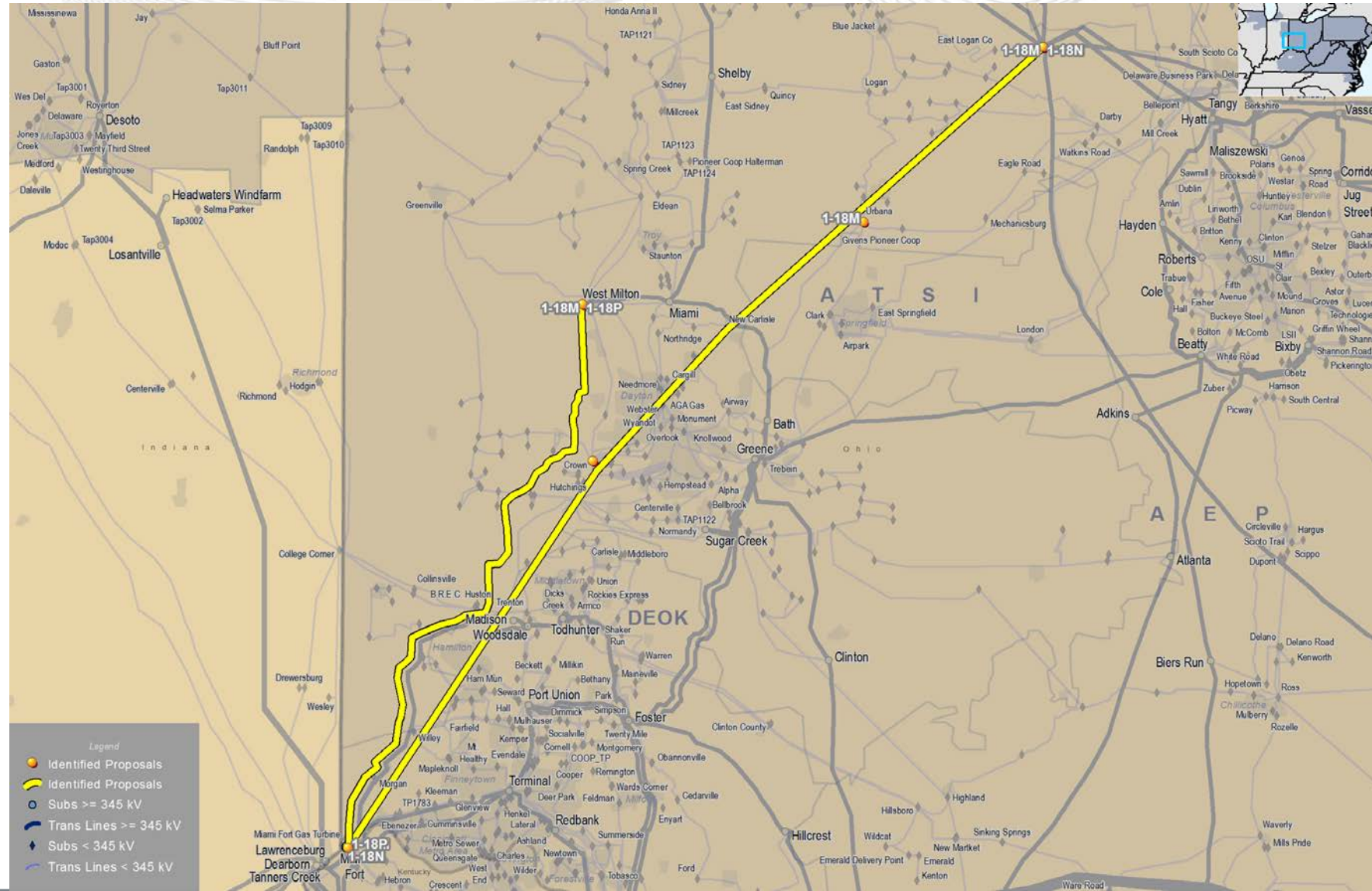
- **3 Projects:**
 - 1-3A, 1-3B, 1-17A

- **Cost:**
 - From \$0.84 M to \$66.90 M

- **RPM Constraints:**
 - E. FRANKFORT - UNIVERSITY PARK 345 KV
 - PONTIAC - BROKAW 345 KV



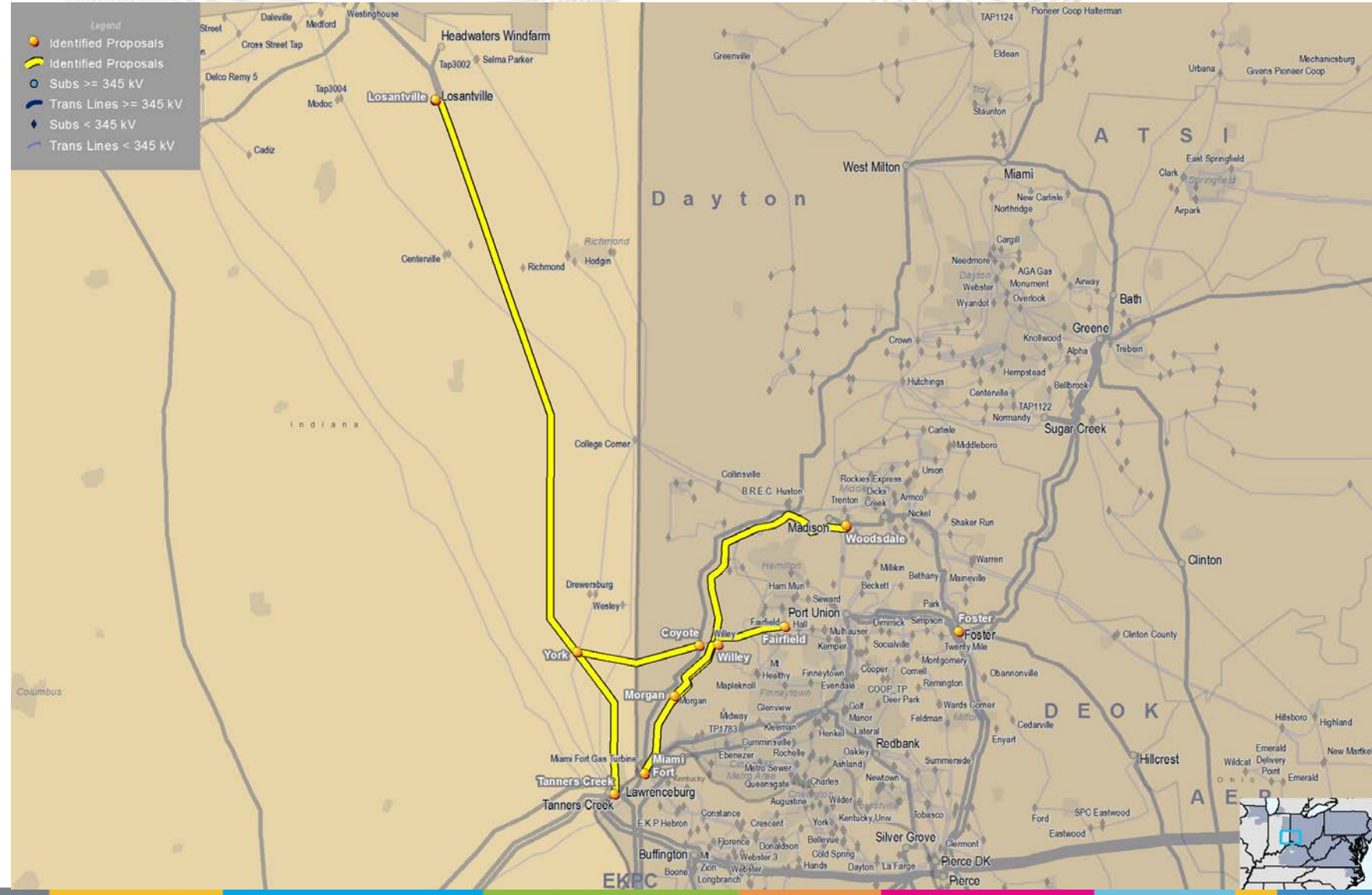
- **3 Projects:**
 - 1-18M, 1-18N, 1-18P
- **Cost:**
 - From \$19.70 M to \$117.30 M
- **RPM Constraints:**
 - Dayton LDA RPM



- **1 Project:**
 - 1-13H

- **Cost:**
 - \$71.88 M

- **ME Constraint:**
 - TANNERS CREEK - MIAMI FORT 345 kV





Group 07A – PJM Interfaces (Reactive Proposals)

- **14 Projects:**

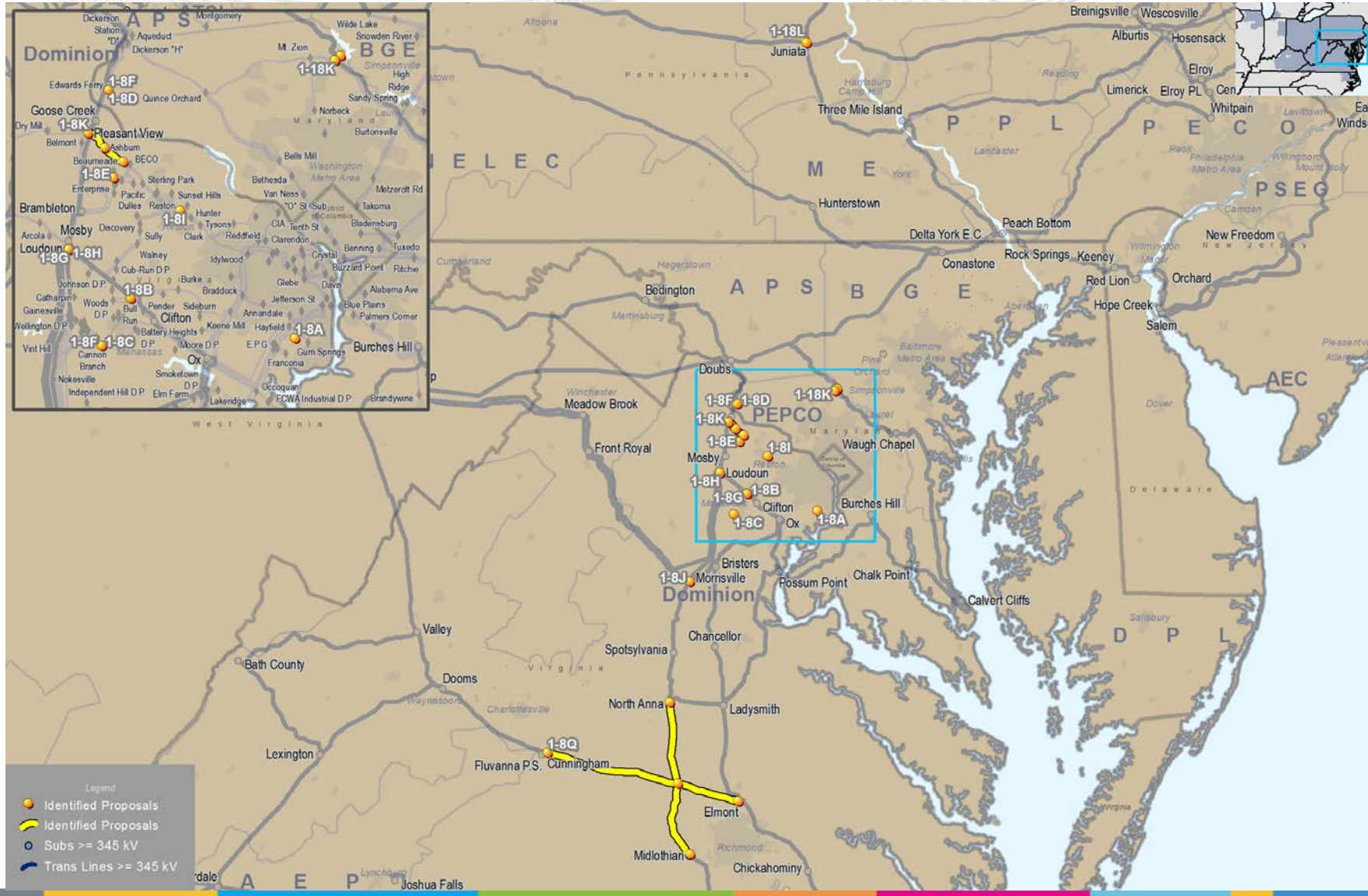
- 1-8A, 1-8B, 1-8C, 1-8D, 1-8E, 1-8F, 1-8G, 1-8H, 1-8I, 1-8J, 1-8K, 1-8Q, 1-18K, 1-18L

- **Cost:**

- From \$1.82 M to \$49.25 M

- **ME Constraints:**

- I:AP SOUTH
- I:AEP-DOM
- I:5004/5005
- I:BC_PEP
- I:CENTRAL





Group 07B – PJM Interfaces (Transmission Proposals)

- **9 Projects:**

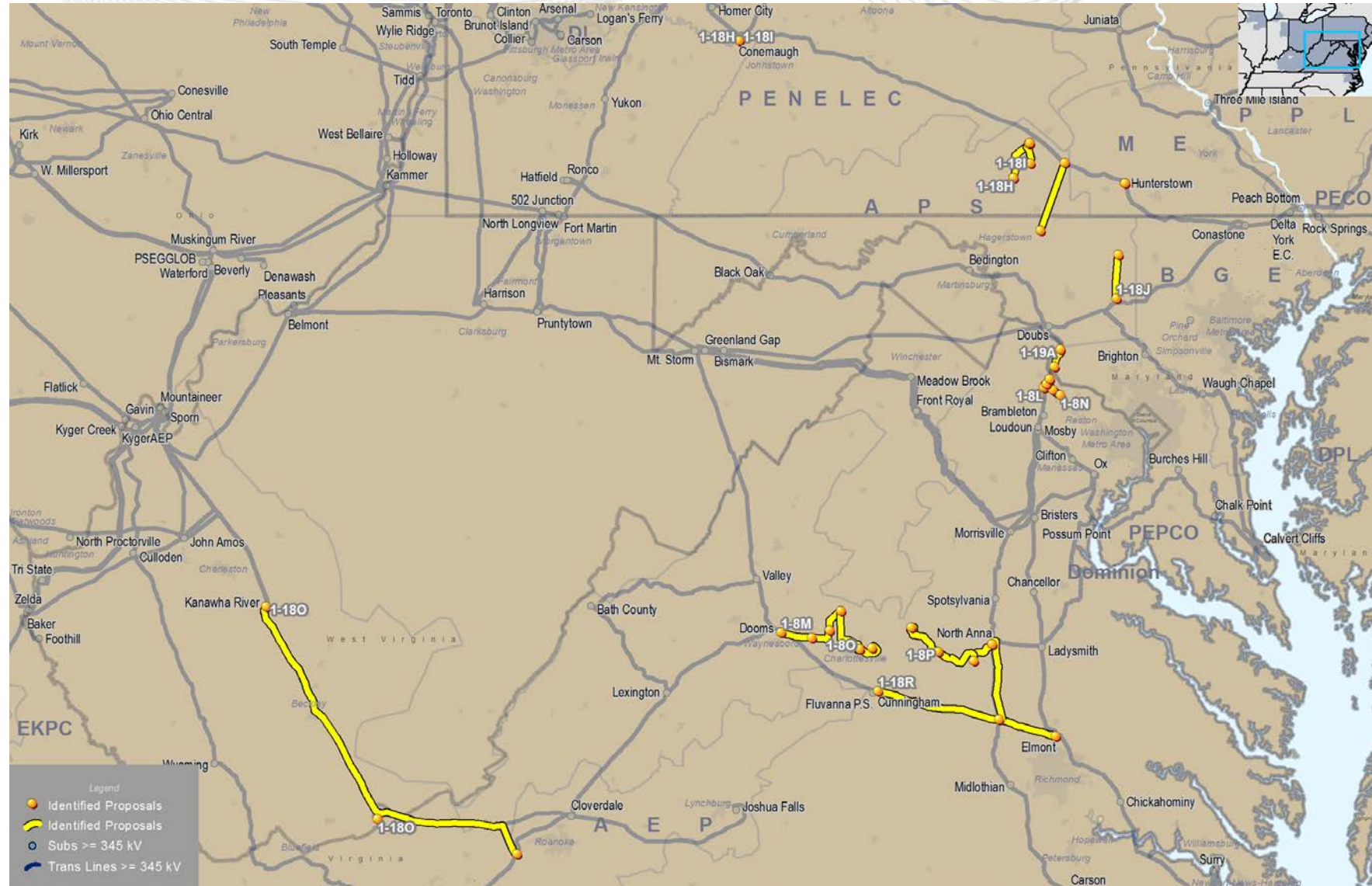
- 1-8L, 1-8M, 1-8N, 1-8O, 1-8P, 1-18H, 1-18I, 1-18J, 1-18O, 1-18R, 1-19A

- **Cost:**

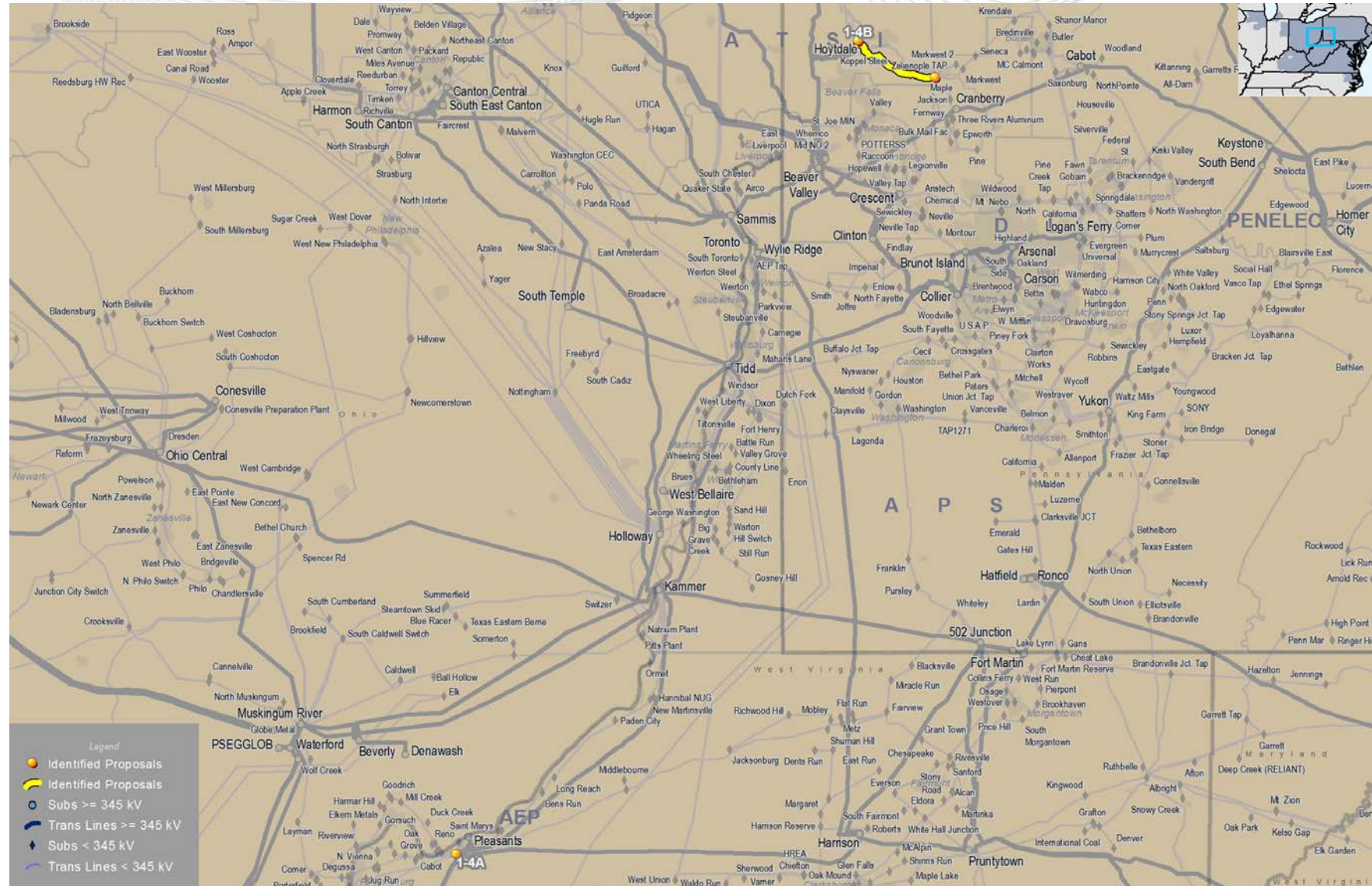
- From \$5.18 M to \$40.20 M

- **ME Constraints:**

- I:AP SOUTH
- I:AEP-DOM
- I:5004/5005
- I:BC_PEP
- I:CENTRAL



- **2 Projects:**
 - 1-4A, 1-4B
- **Cost:**
 - From \$0.48 M to \$2.79 M
- **ME Constraints:**
 - BELMONT TR 500/138 kV
 - HOYTDALE - MAPLE 138 kV



- **2 Projects:**

- 1-11B, 1-11C

- **Cost:**

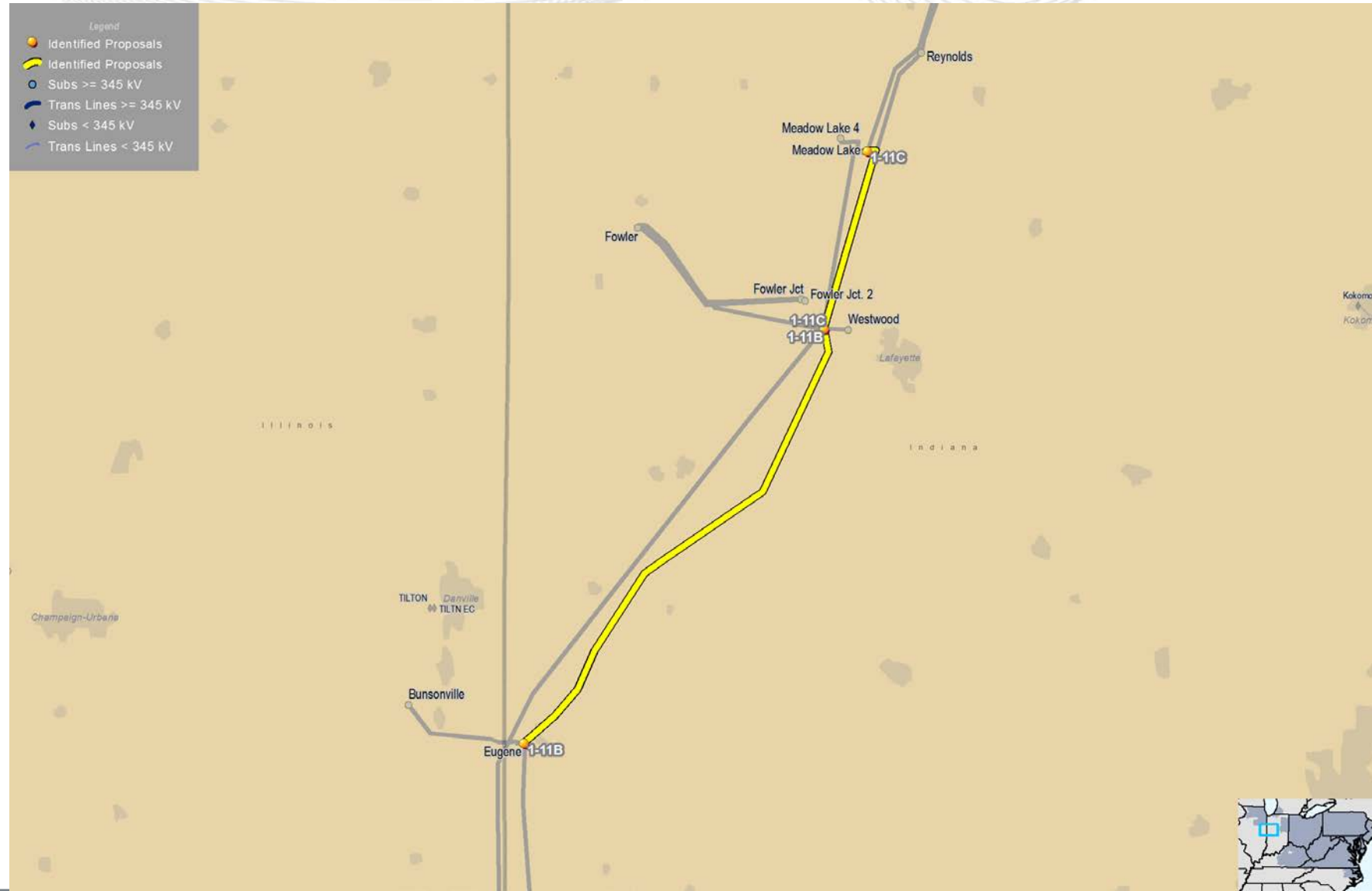
- Zero

- **ME Constraints:**

- EUGENE - DEQUIN 345 kV
- DEQUIN - MEADOW 345 kV

- **Note:**

- These proposals are accelerations the previously approved baseline projects b2776 and b2777



- **1 Project:**
 - 1-11A

- **Cost:**
 - \$3.35 M

- **ME Constraint:**
 - CHRIS - CLAYTOR 138 kV



- ✓ Step 1: Review submitted project data (completed)
 - ✓ PJM contacted project proposer if clarification of modeling needed.
 - ✓ Approved base line reliability and supplemental projects may eliminate congestion drivers.
- Step 2: First pass of project evaluations assuming proposer supplied data.
 - Using updated ME Base scenarios
- Step 3: Determine if there are any obvious optimal projects in focused areas.
 - Areas with quick fixes or lower cost reinforcements
- Step 4: Detailed Analysis in areas with many project submissions
 - Sensitivity analysis

Milestone	Schedule 2016 - 2017
Post Mid-Cycle Update Scenarios	May 2017
Reevaluation Approved Market Efficiency Projects	May – June 2017
Analysis of Proposed Solutions	May – October 2017
Acceleration Analysis	May – October 2017
Final TEAC Review and Board Approval	December 2017

Questions?

Email: RTEP@pjm.com

- Revision History
 - V1 – 5/2/2017 – Original Version Posted to PJM.com