Submission of Supplemental Projects for Inclusion in the Local Plan

ComEd Transmission Zone M-3 Process
Quad Cities

Need Number: ComEd-2019-006

Process Stage: Submission of Supplemental Project for inclusion in the Local Plan 01/28/2020

Previously Presented:

Need Meeting 10/17/2019

Solutions Meeting 11/14/2019

Project Driver:

Equipment Material Condition, Performance, and Risk

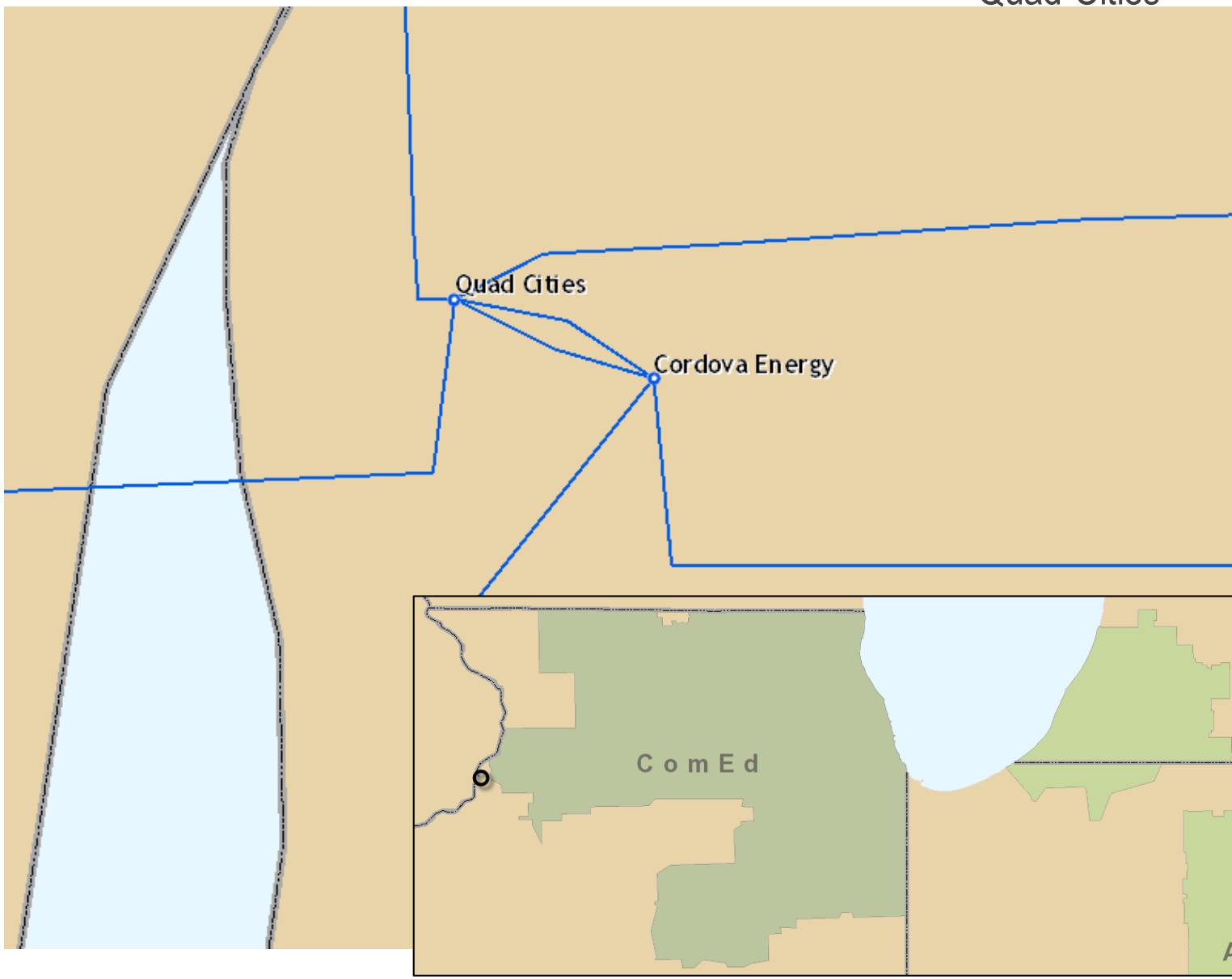
Specific Assumption Reference:

Transmission infrastructure replacements (EOL/condition/obsolescence) that are consistent with efficient asset management decisions

Problem Statement:

345 kV Line 0402 (Quad Cities – Cordova) has obsolete relays

- Becoming difficult to service REL352 phase comparison relays. They are being phased out of our system.
- Line is an intertie between PJM/MISO



Quad Cities

Need Number: ComEd-2019-006

Process Stage: Submission of Supplemental Project for inclusion in the Local Plan 01/28/2020

Selected Solution:

Replace 345 kV Line 0402 relays and upgrade communications equipment

Old ratings: (MVA) 973/1069/1193 SN/SE/SLD
1053/1143/1536 WN/WE/WLD

Projected ratings: 1173/1193/1193 SN/SE/SLD
1497/1569/1569 WN/WE/WLD

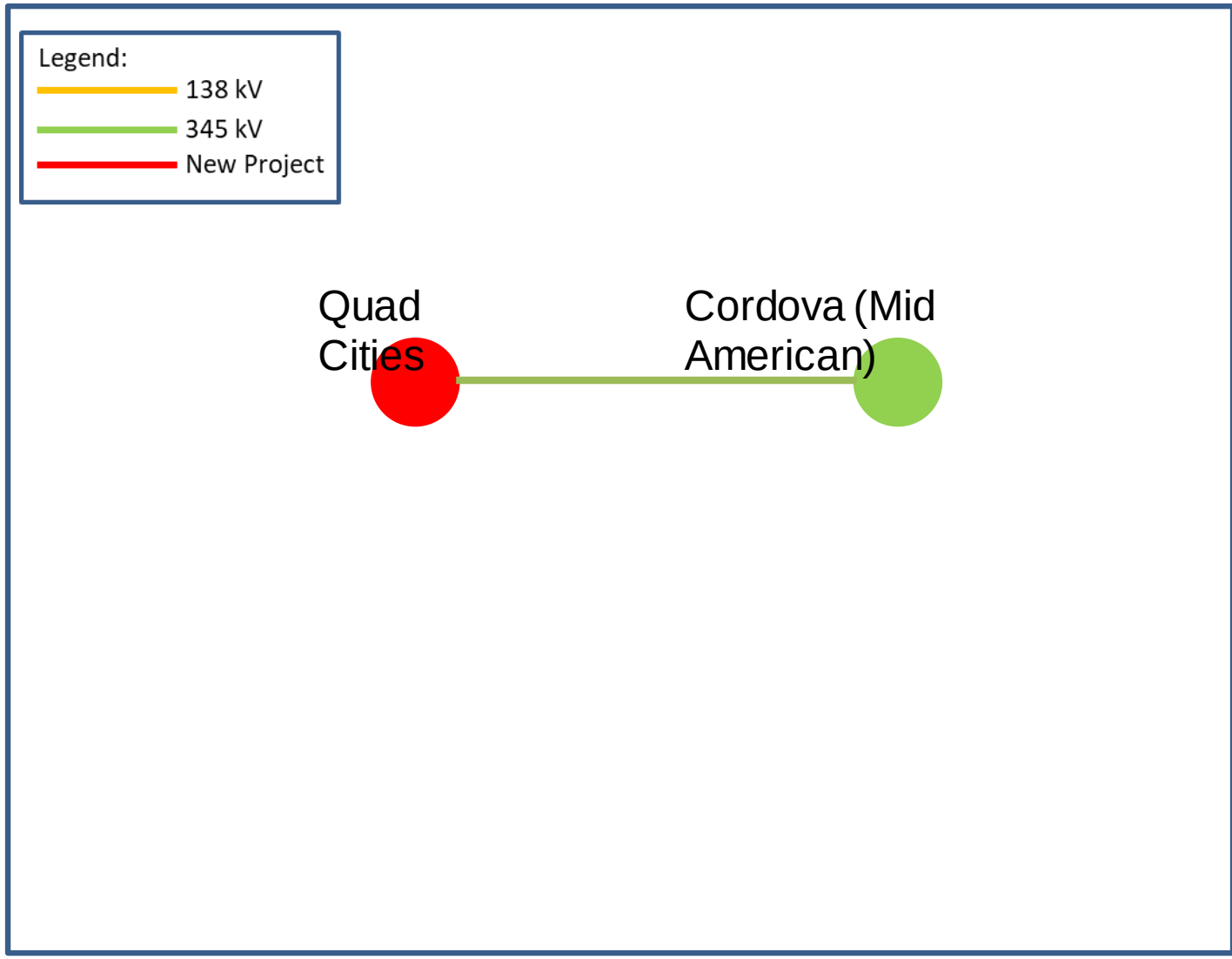
Estimated Cost: $0.2M

Projected In-Service: 6/1/2020

Supplemental Project ID: S2137

Project Status: Engineering

Model: PJM 2024 RTEP



ComEd Transmission Zone M-3 Process
Kendall - Lockport

Need Number: ComEd-2019-007

Process Stage: Submission of Supplemental Project for inclusion in the Local Plan 01/28/2019

Previously Presented:

Need Meeting 10/17/2019

Solutions Meeting 11/14/2019

Project Drivers:

Operational Flexibility and Efficiency

Equipment Material Condition, Performance, and Risk

Specific Assumption References:

Increasing system capacity

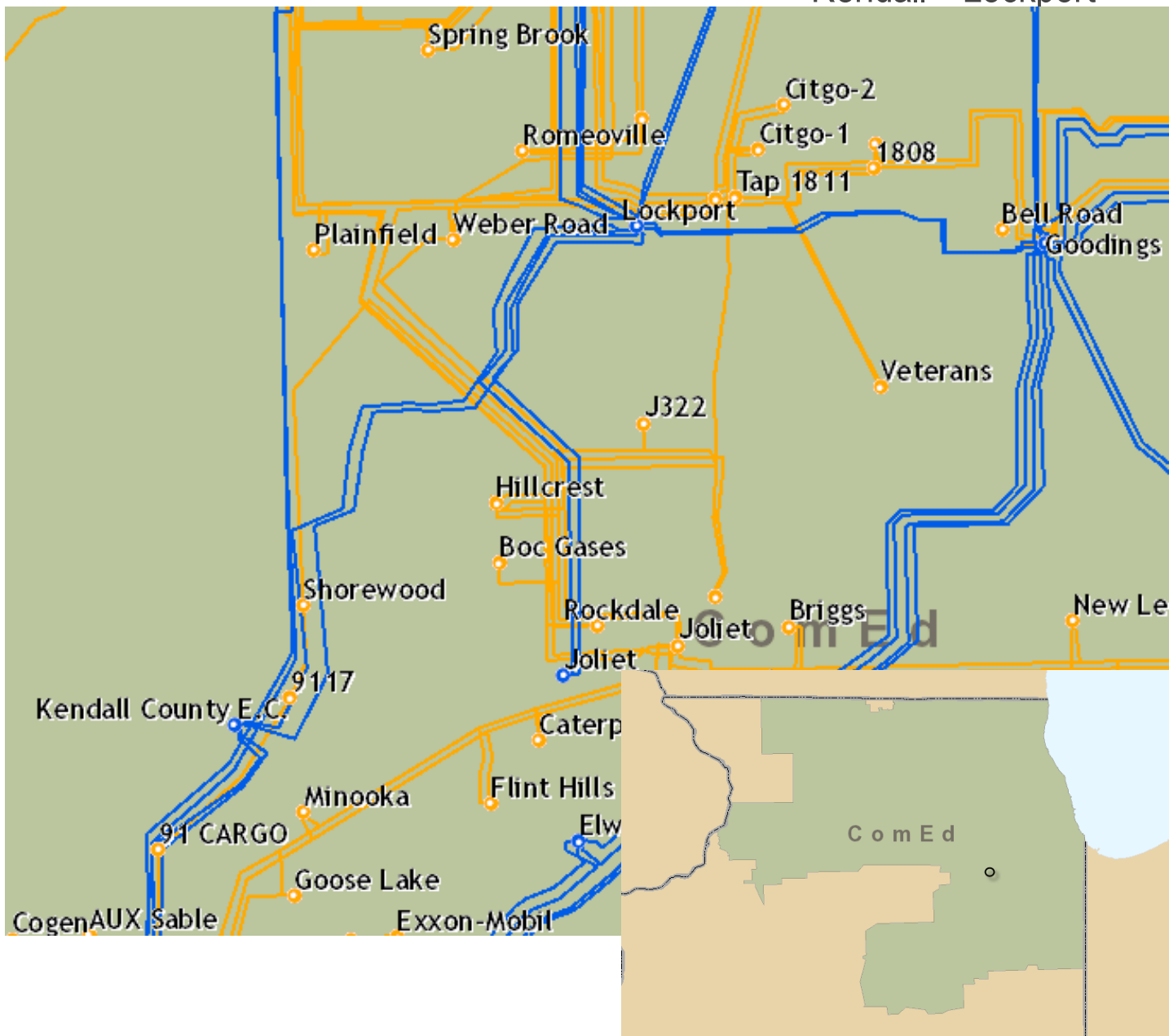
Programmatic replacement of breakers, relays, wood poles, cables, etc.

Supply strategy guidance resulting in standard conductor sizes and other standard equipment

Problem Statement:

Network project n5144 is rebuilding 345 kV Kendall – Lockport double circuit towers for 16 miles in 2022 to increase line 10805 rating. New conductor will be T2-1113 (1448 MVA SN/1863 MVA SE).

- 345 kV Line 10806 runs in parallel on the same towers. Existing conductor is 2156 kcm (1334 MVA SN/1726 MVA SE). The disconnect switch at Lockport is a non-standard 1600A switch.
- 138 kV lines 0908 (Joliet – Shorewood) and 9117 (Shorewood – Cargo Court) run along the same ROW for 10.5 miles on wood poles.
    - The wood poles are 59-60 years old
    - ComEd intends to eliminate wood poles on the transmission system.



ComEd Transmission Zone M-3 Process
Kendall - Lockport

Need Number: ComEd-2019-007

Process Stage: Submission of Supplemental Project for inclusion in the Local Plan 01/28/2020

Selected Solution:

- Install quad circuit towers for 10.5 miles between Kendall and Lockport. String 138 kV conductor and cut line 0908 (Rockdale - Hillcrest - Shorewood) and part of line 9117 (Cargo Court/J-402 - Shorewood) over to new towers. (**S2138.1) Estimated Cost: $12M**
- Install T2-1113 conductor on 345kV line 10806 (Kendall - Lockport) and OPGW static wire. Replace 10806 disconnect at Lockport. (**S2138.2) Estimated Cost: $1.1M**

Ancillary Benefits:

Risk to Shorewood and Cargo Court will be significantly reduced during construction due to shorter outage required.

Increased reliability of steel poles over wood

Estimated Cost: $13.1M

Projected In-Service: 6/1/2022

Supplemental Project ID: S2138.1-.2

Project Status: Engineering

Model: PJM 2019 RTEP

ComEd Transmission Zone M-3 Process
Lisle Transformer 83

Need Number: ComEd-2020-001

Process Stage: Submission of Supplemental Project for inclusion in the Local Plan 6/15/2020

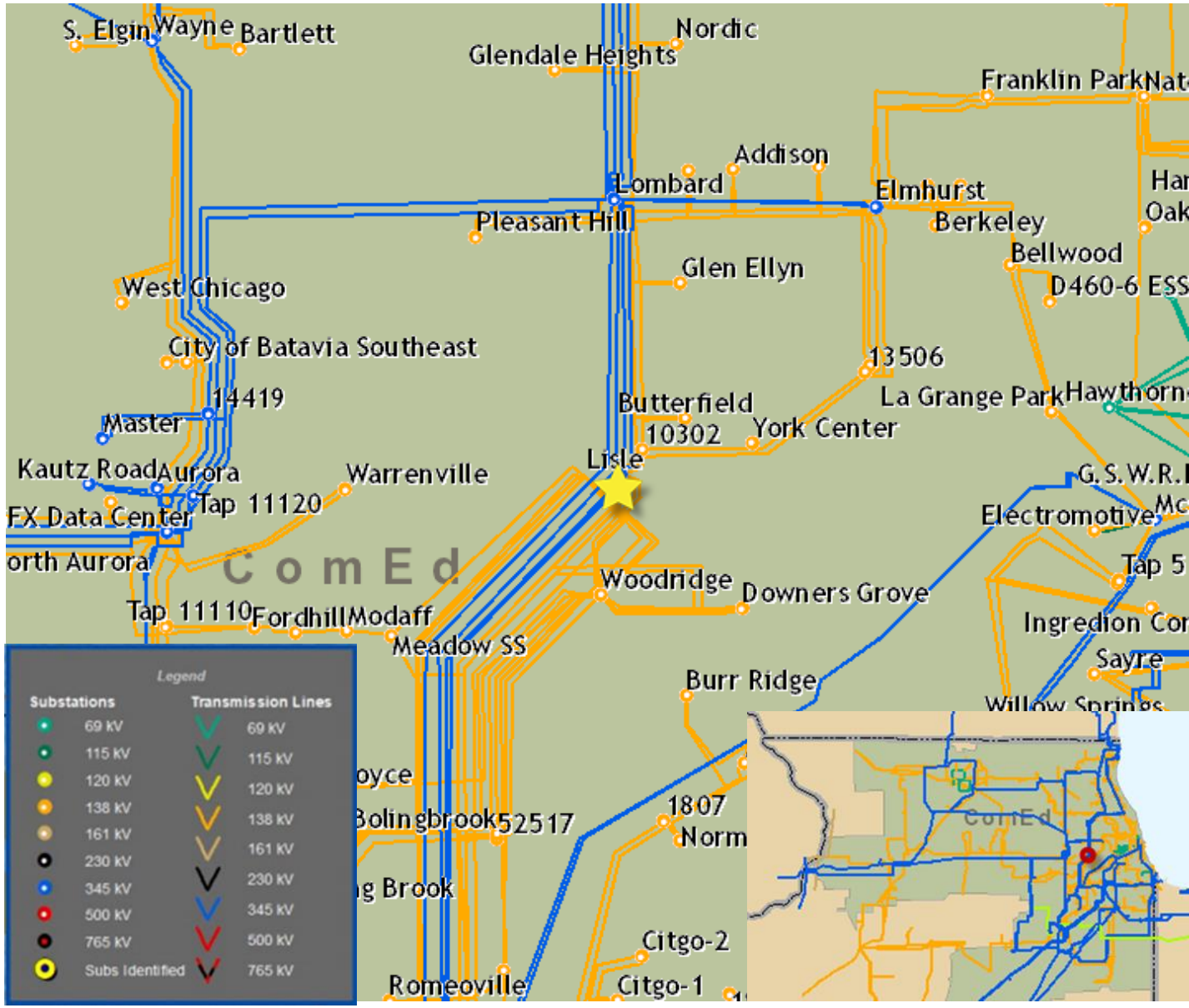
Previously Presented:
Needs Meeting 3/10/2020
Solutions Meeting 4/14/2020

Project Driver:
Equipment Material Condition, Performance and Risk

Specific Assumption Reference:
Transmission infrastructure replacements (EOL/condition/obsolescence) that are consistent with efficient asset management decisions

Problem Statement:
Lisle 345/138 kV Transformer #83 acoustic testing shows higher than expected vibration levels and increased frequencies associated with looseness in the core/coil assembly.

- Looseness has worsened since previous testing
- Shell form design that cannot be re-blocked
- Dissolved gas analysis shows insulation degradation.
- Last unit of 5 that were purchased with this design. 3 of the 5 failed catastrophically and one other was condemned before failure



ComEd Transmission Zone M-3 Process
Lisle Transformer 83

Need Number: ComEd-2020-001

Process Stage: Submission of Supplemental Project for inclusion in the Local Plan 6/15/2020

Selected Solution:

Replace Lisle Transformer 83, add high-side CB (S2247)

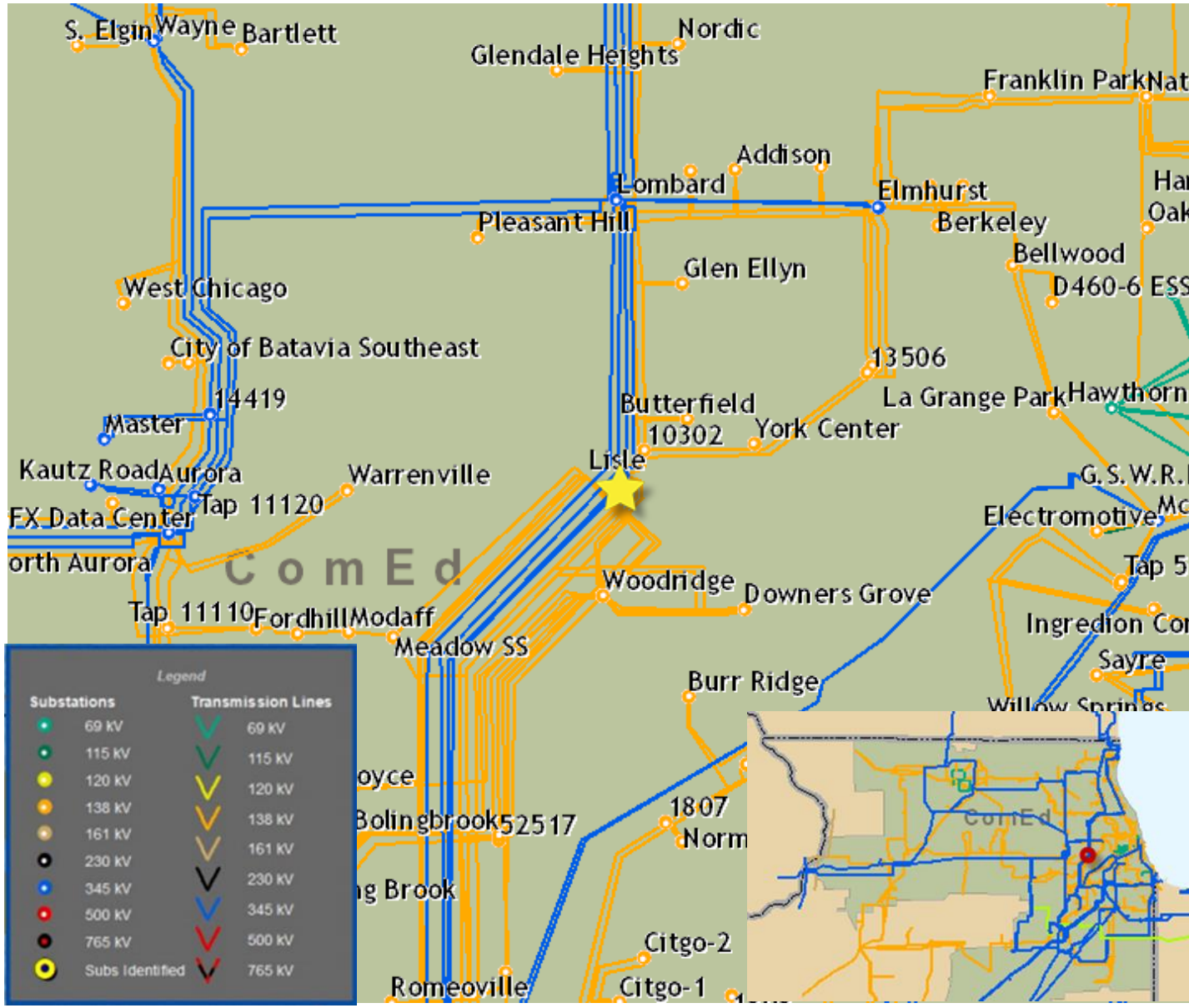
Estimated Cost: $8.5M

Projected In-Service: 12/31/2021

Supplemental Project ID: S2247

Project Status: Engineering & Procurement

Model: N/A



ComEd Transmission Zone M-3 Process
Itasca

Need Number: ComEd-2020-002

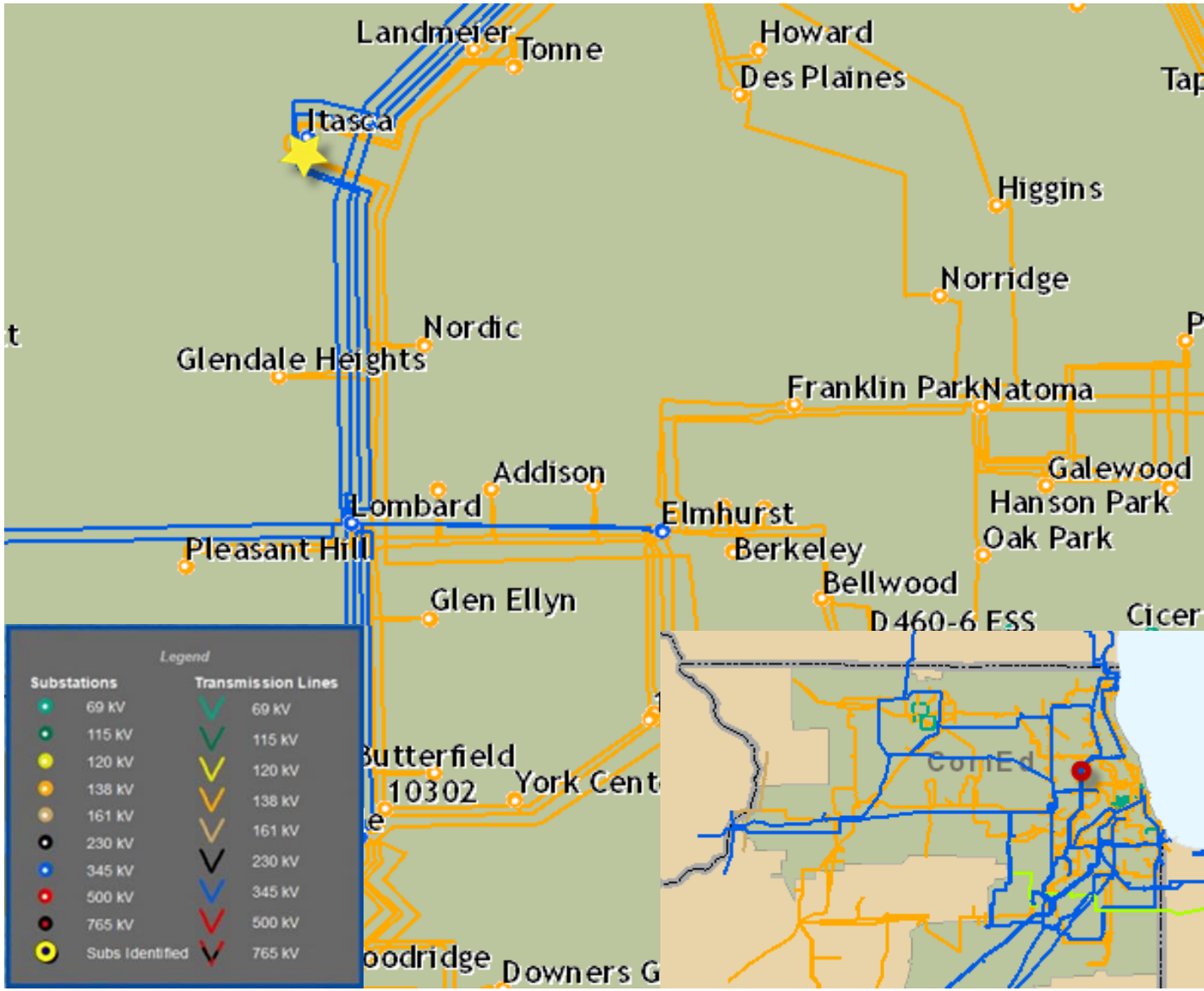
Process Stage: Submission of Supplemental Project for inclusion in the Local Plan, August 7, 2020

Previously Presented:
Needs Meeting April 14, 2020
Solutions Meeting May 12, 2020

Project Drivers:
- Equipment Material Condition, Performance, and Risk
- Operational Flexibility and Efficiency

Specific Assumption Reference:
- Transmission infrastructure replacements (EOL/condition/obsolescence) that are consistent with efficient asset management decisions
- Internal and/or regulatory design guidelines or PJM minimum design standards
- Enhancing system functionality, flexibility, or operability

Problem Statement:
Itasca 345 kV configuration does not comply with current standards. It is a straight bus design with four lines and two transformers with only two 345 kV circuit breakers, one of which is obsolete and has poor test scores. Two lines are connected directly to the bus with disconnect switches. Transformers do not have high side circuit breakers. 345 kV/138 kV Transformer 82 has partial discharge gassing due to a design deficiency and questionable acoustic test results. 2 out of 5 similar transformers have failed in service.



ComEd Transmission Zone M-3 Process

Itasca

Need Number: ComEd-2020-002

Process Stage: Submission of Supplemental Project for inclusion in the Local Plan, August 7, 2020

Selected Solution:

- Rebuild Itasca 345 kV bus as an indoor GIS double ring bus expandable to breaker-and-a-half connecting 4 lines and two transformers.
- Replace TR 82
- Retire tertiary cap bank

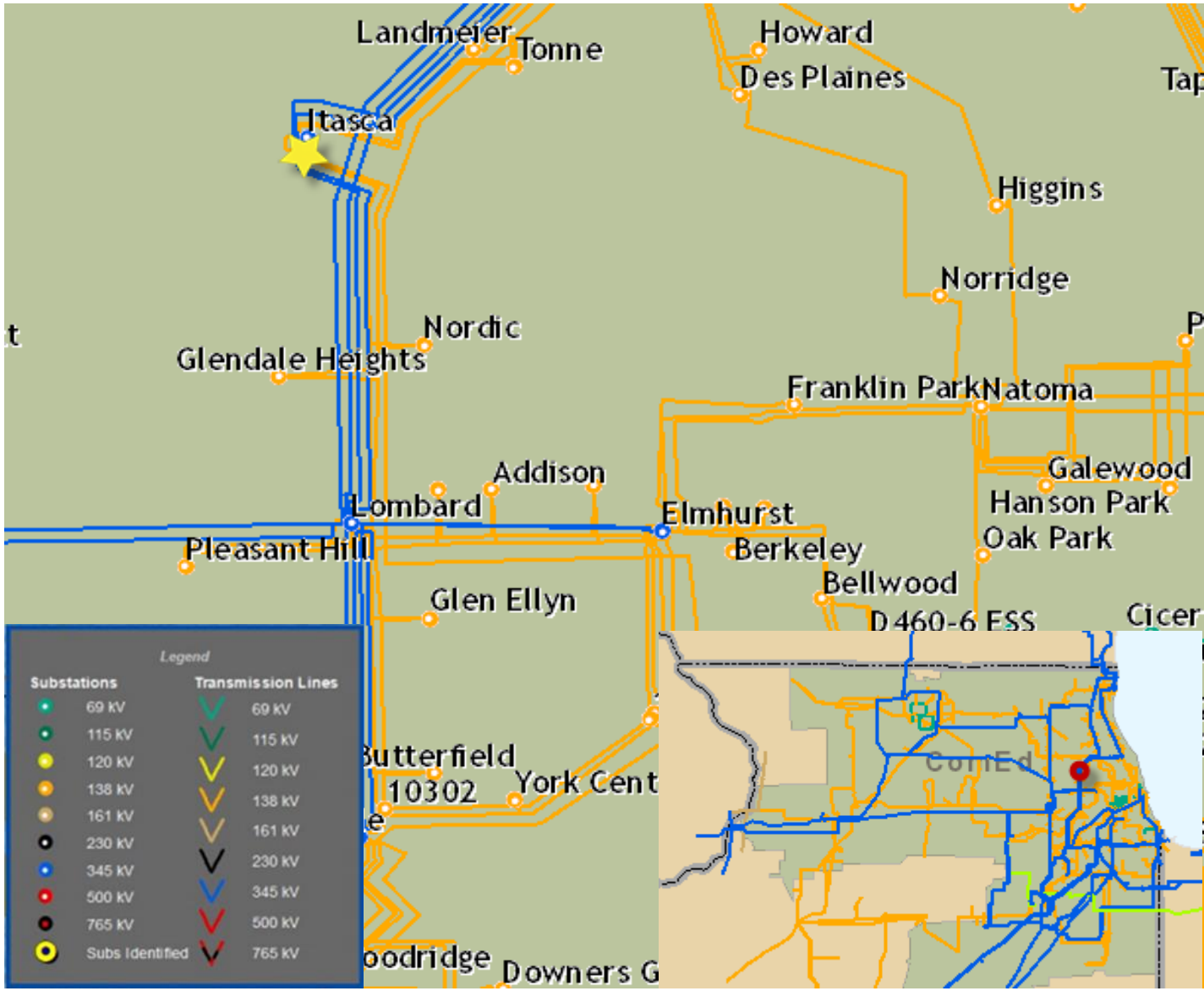
Estimated cost: $65M

Projected In-Service: 6/1/2024

Supplemental Project ID: S2266

Project Status: Conceptual

Model: 2025 RTEP



ComEd Transmission Zone M-3 Process
Elmhurst

Need Number: ComEd-2020-003

Process Stage: Submission of Supplemental Project for inclusion in the Local Plan, August 7, 2020

Previously Presented:

Needs Meeting April 14, 2020

Solutions Meeting May 12, 2020

Project Drivers:

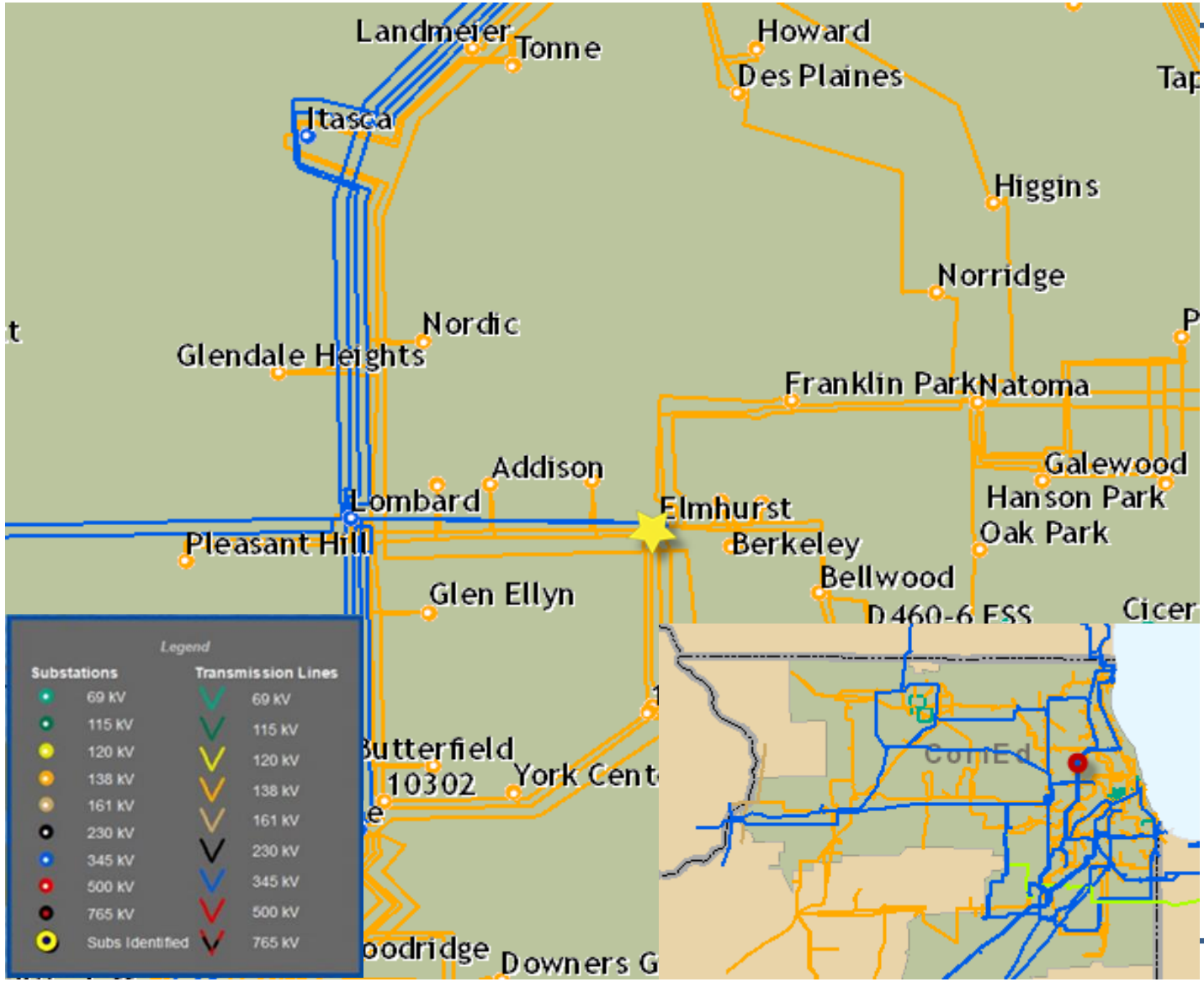
- Equipment Material Condition, Performance, and Risk
- Operational Flexibility and Efficiency

Specific Assumption References:

- Transmission infrastructure replacements (EOL/condition/obsolescence) that are consistent with efficient asset management decisions
- Internal and/or regulatory design guidelines or PJM minimum design standards
- Enhancing system functionality, flexibility, or operability

Problem Statement:

Elmhurst 345 kV configuration does not comply with current standards. It is a straight bus design with two 345 kV bus tie circuit breakers protecting two lines and three transformers. Lines and transformers are directly connected to the bus via switches. Lines and transformers trip together. Both 345 kV circuit breakers are obsolete and are in need of bushing replacements due to leaking oil.



ComEd Transmission Zone M-3 Process

Elmhurst

Need Number: ComEd-2020-003

Process Stage: Submission of Supplemental Project for inclusion in the Local Plan, August 7, 2020

Selected Solution:

Rebuild Elmhurst 345 kV bus as indoor GIS double ring bus expandable to breaker-and-a-half connecting two lines and three transformers

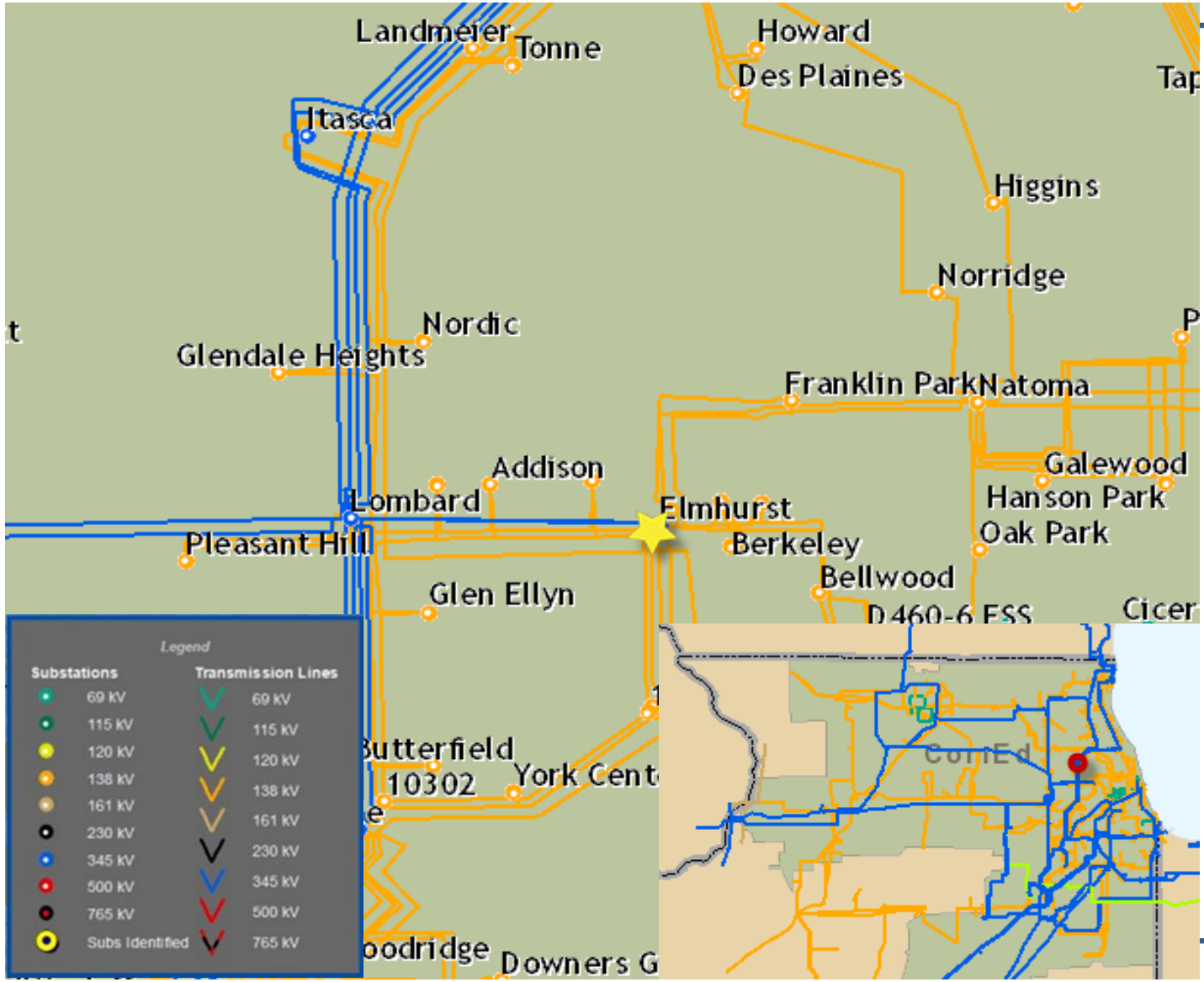
Estimated cost: $55M

Projected In-Service: 6/1/2024

Supplemental Project ID: S2267

Project Status: Conceptual

Model: 2025 RTEP



ComEd Transmission Zone M-3 Process
Line 15508

Need Number: ComEd-2020-005

Process Stage: Submission of Supplemental Project for inclusion in the Local Plan, August 7, 2020

Previously Presented:

Need Meeting April 20, 2020

Solutions Meeting May 22, 2020

Project Driver:

Operational Flexibility and Efficiency

Specific Assumption Reference:

Internal and/or regulatory design guidelines or PJM minimum design standards

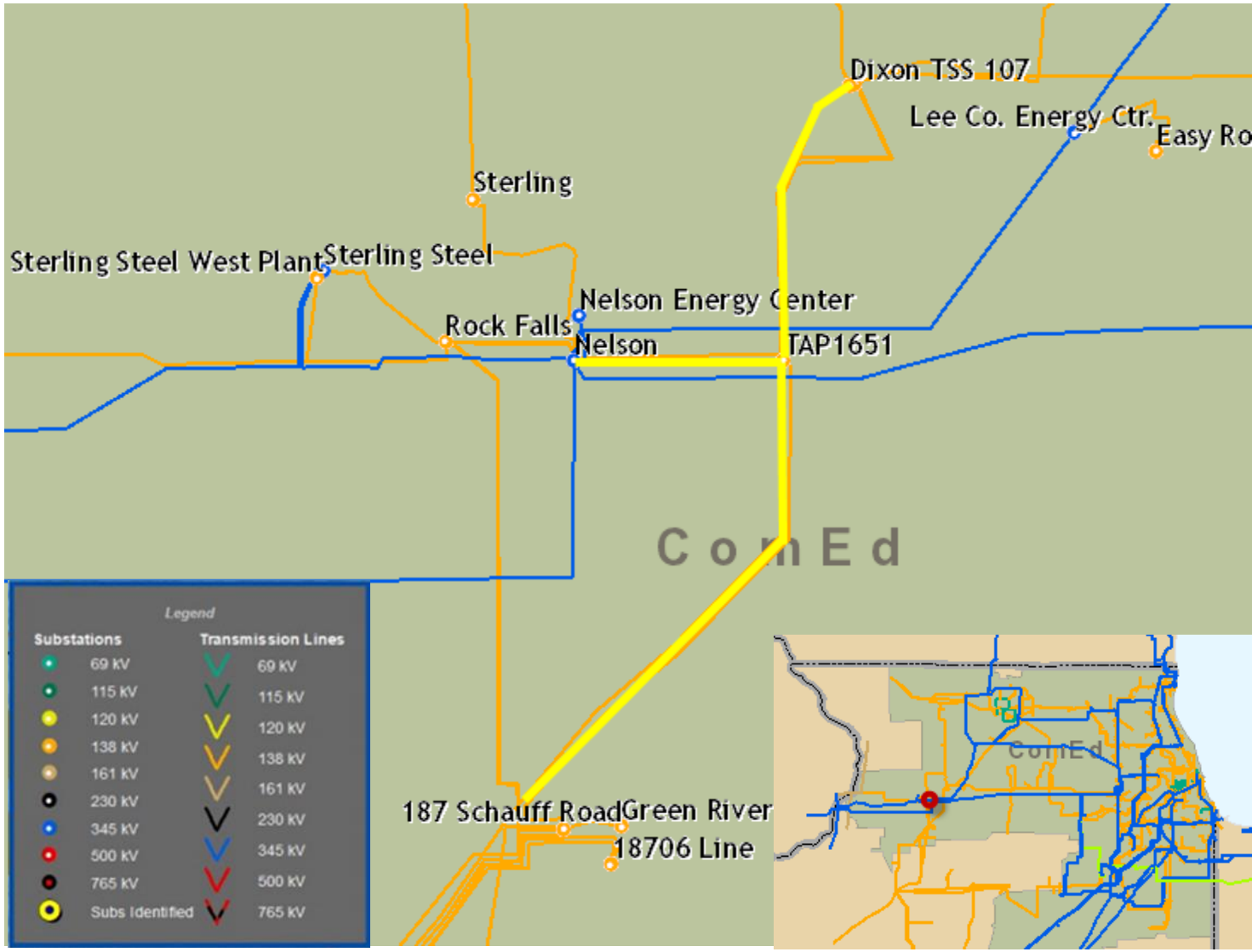
Enhancing system functionality, flexibility, or operability

Problem Statement:

138 kV Line 15508 is a three terminal line. The current configuration is difficult to relay properly due to unequal lengths of the three legs.

- Nelson (4.5 miles)
- Dixon (5.7 miles)
- Schauff Rd. (13.1 miles)

Project b2999 is rebuilding the Schauff Rd. leg with an 11/1/2021 projected in-service date.



Exelon

ComEd Transmission Zone M-3 Process
Line 15508

Need Number: ComEd-2020-005

Process Stage: Submission of Supplemental Project for inclusion in the Local Plan, August 7, 2020

Selected Solution:

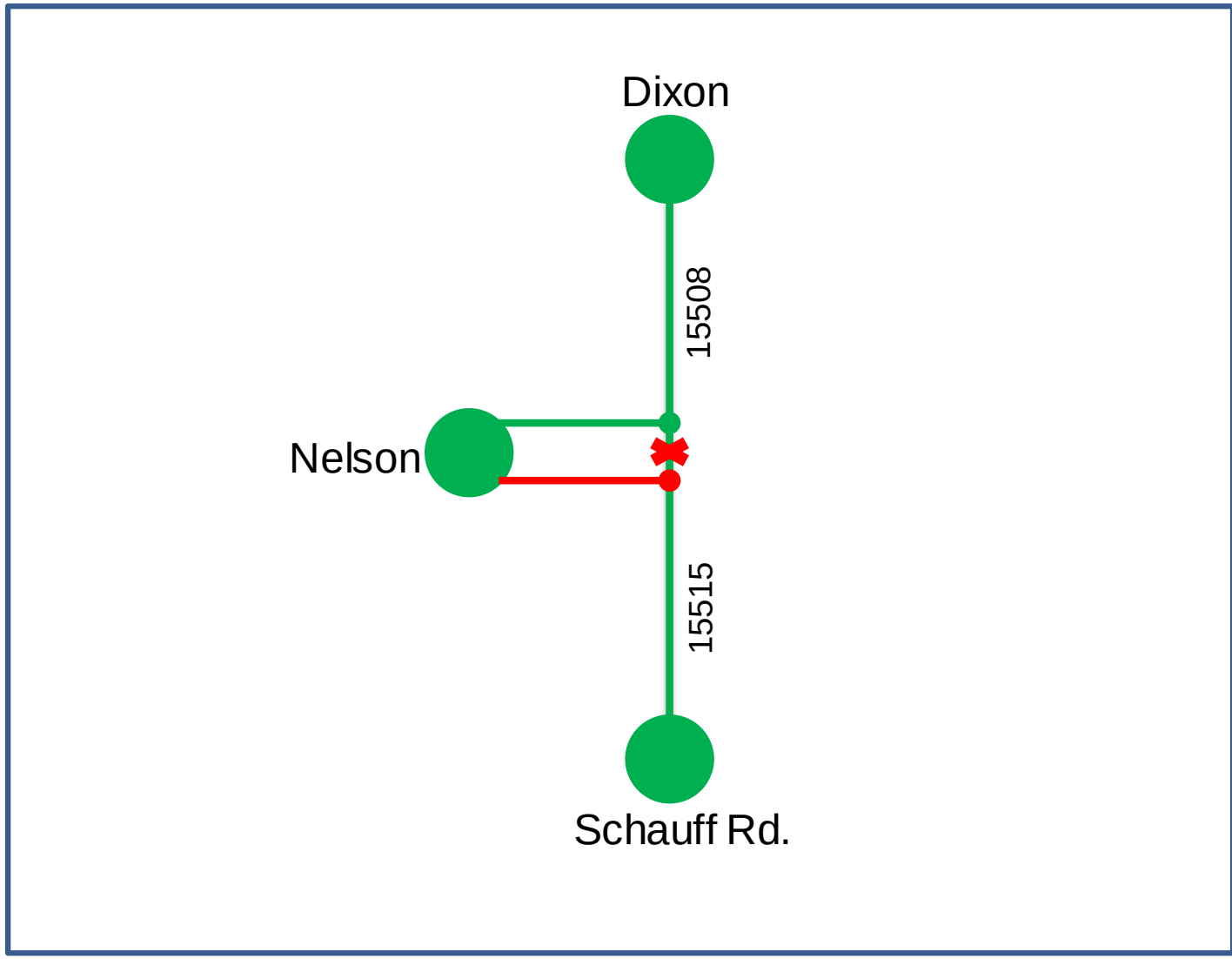
Build a 2nd circuit 4.5 miles in existing ROW from Nelson to tap point and split into two 2-terminal lines. Ratings on the new section will be 351/449 MVA SN/SLTE consistent with b2999 project. Estimated cost: $15.2M

Projected In-Service: 6/1/22

Supplemental Project ID: S2268

Project Status: Engineering

Model: 2024 RTEP



ComEd Transmission Zone M-3 Process
Lines 0905/0906

Need Number: ComEd-2020-006

Process Stage: Submission of Supplemental Project for inclusion in the Local Plan, August 7, 2020

Previously Presented:

Need Meeting April 20, 2020

Solutions Meeting May 22, 2020

Project Driver:

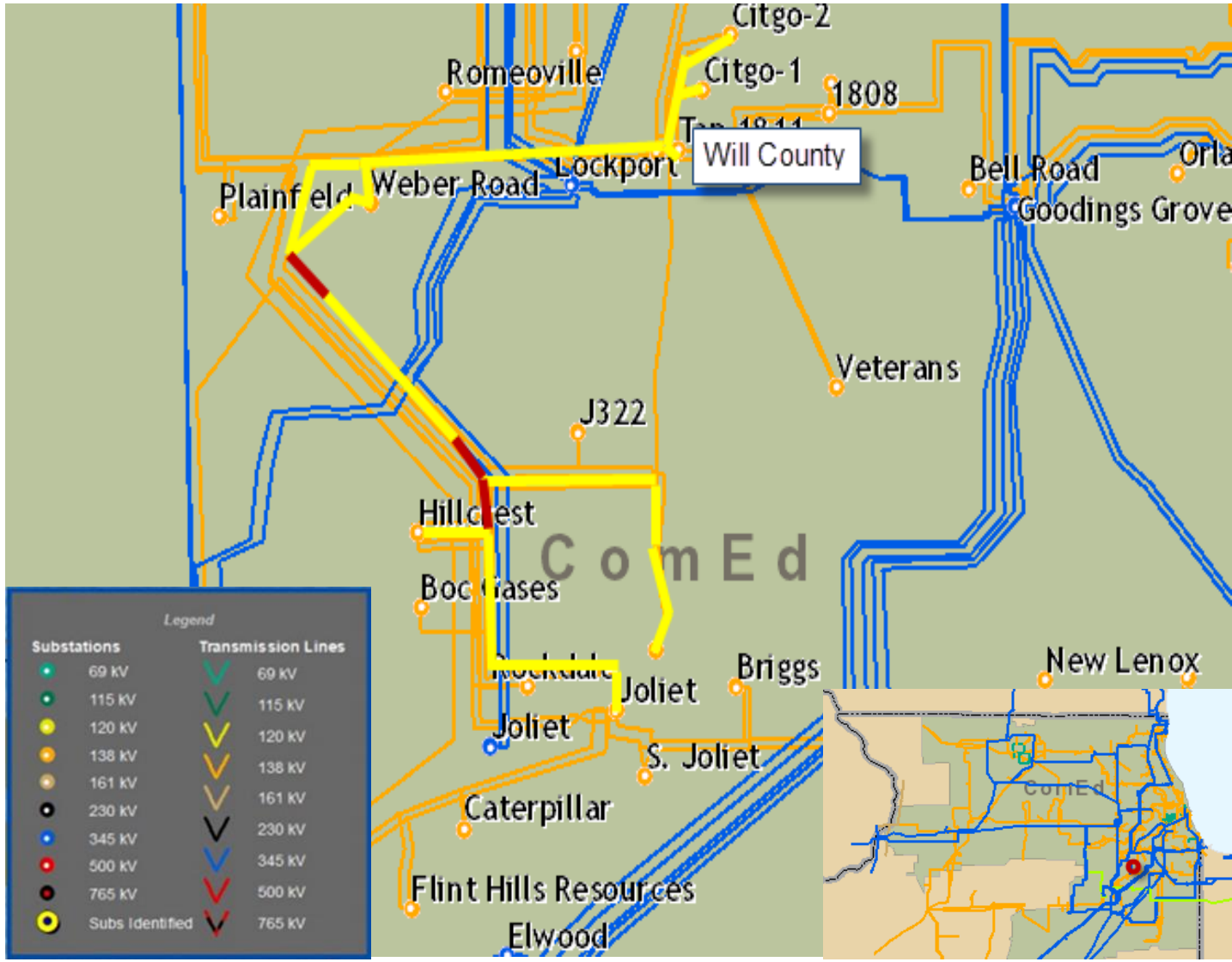
Equipment Material Condition, Performance, and Risk

Specific Assumption Reference:

Transmission infrastructure replacements (EOL/condition/obsolescence) that are consistent with efficient asset management decisions

Problem Statement:

- 138 kV Line 0905 (Joliet – Hillcrest – Joliet Central – Will County), 15 miles total, has 2.4 miles of 300 kcmil cu conductor. Conductor was installed in 1942.
- 138 kV Line 0906 (Joliet – Hillcrest – Joliet Central – Weber Rd. – ESS J332 tap – Will County), 16.5 miles total, has 3.0 miles of 300 kcmil cu conductor. Conductor was installed in 1942.
- 300 cu conductor has iron clamps that cause heating issues
- Attachments are made with aluminum clamps with a bi-metallic buffer between the clamps and the conductor which is difficult for the crews to handle.



ComEd Transmission Zone M-3 Process
Lines 0905/0906

Need Number: ComEd-2020-006

Process Stage: Submission of Supplemental Project for inclusion in the Local Plan, August 7, 2020

Selected Solution:

Reconductor a total of 5.4 miles of 300 cu Kcmil in sections of 138 kV lines 0905 and 0906 with 1113 ACSR or similar rating ACSS. Estimated cost: $4.5M

Ratings:

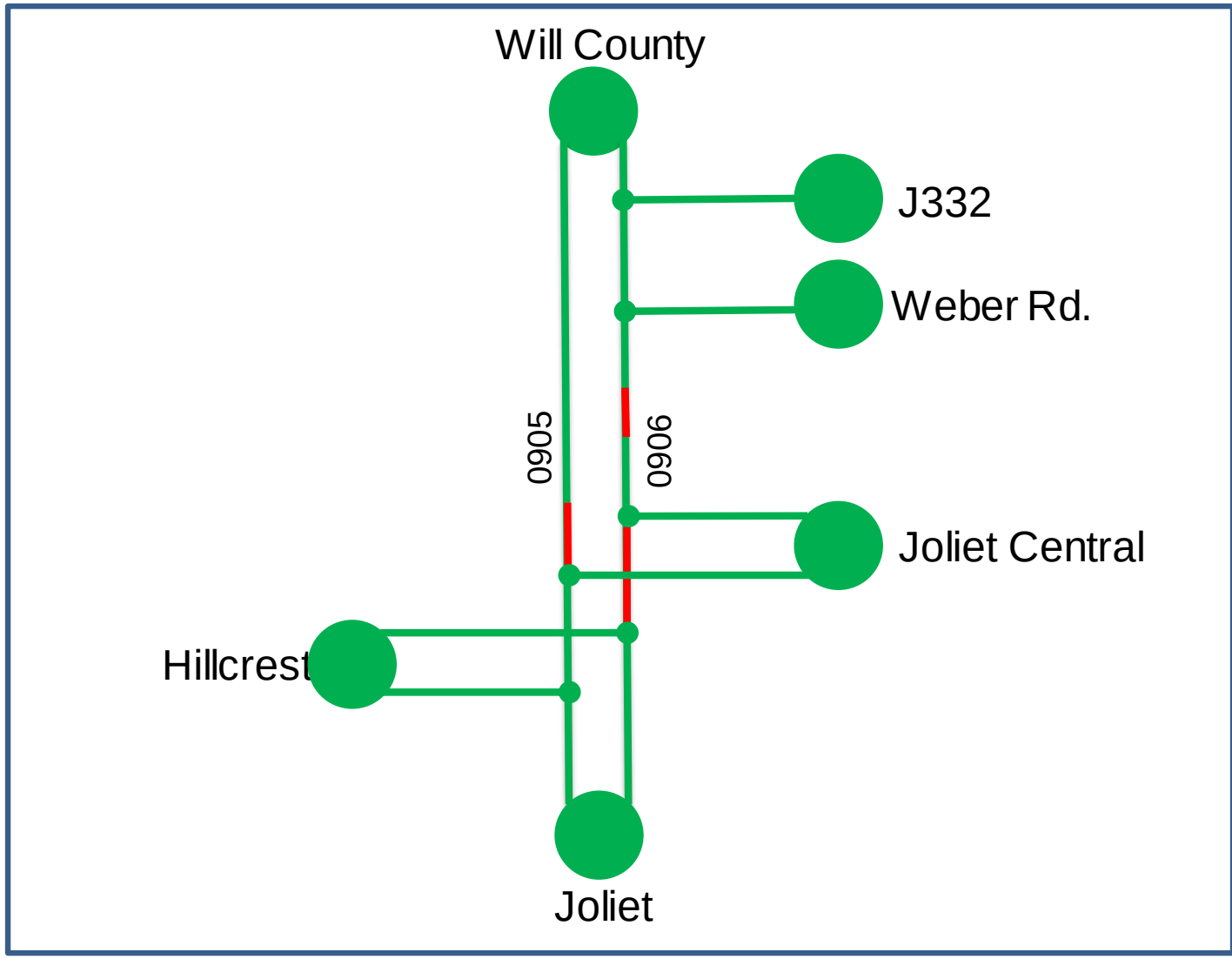
- 0905 Joliet Central – Will County
  - Old: 142/183 New: 208/264 MVA SN/SLTE
- 0906 Hillcrest – Joliet Central
  - Old: 173/223 New: 351/449 MVA SN/SLTE
- 0906 Joliet Central – Weber Rd.
  - Old: 173/223 New: 208/264 MVA SN/SLTE

Projected In-Service: 6/1/22

Supplemental Project ID: S2269

Project Status: Conceptual

Model: 2024 RTEP



ComEd Transmission Zone M-3 Process
McCook

Need Number: ComEd 2020-004

Process Stage: Submission of Supplemental Project for inclusion in the Local Plan September 14, 2020

Previously Presented:

Need Meeting April 14, 2020

Solutions Meeting June 2, 2020

Project Driver:

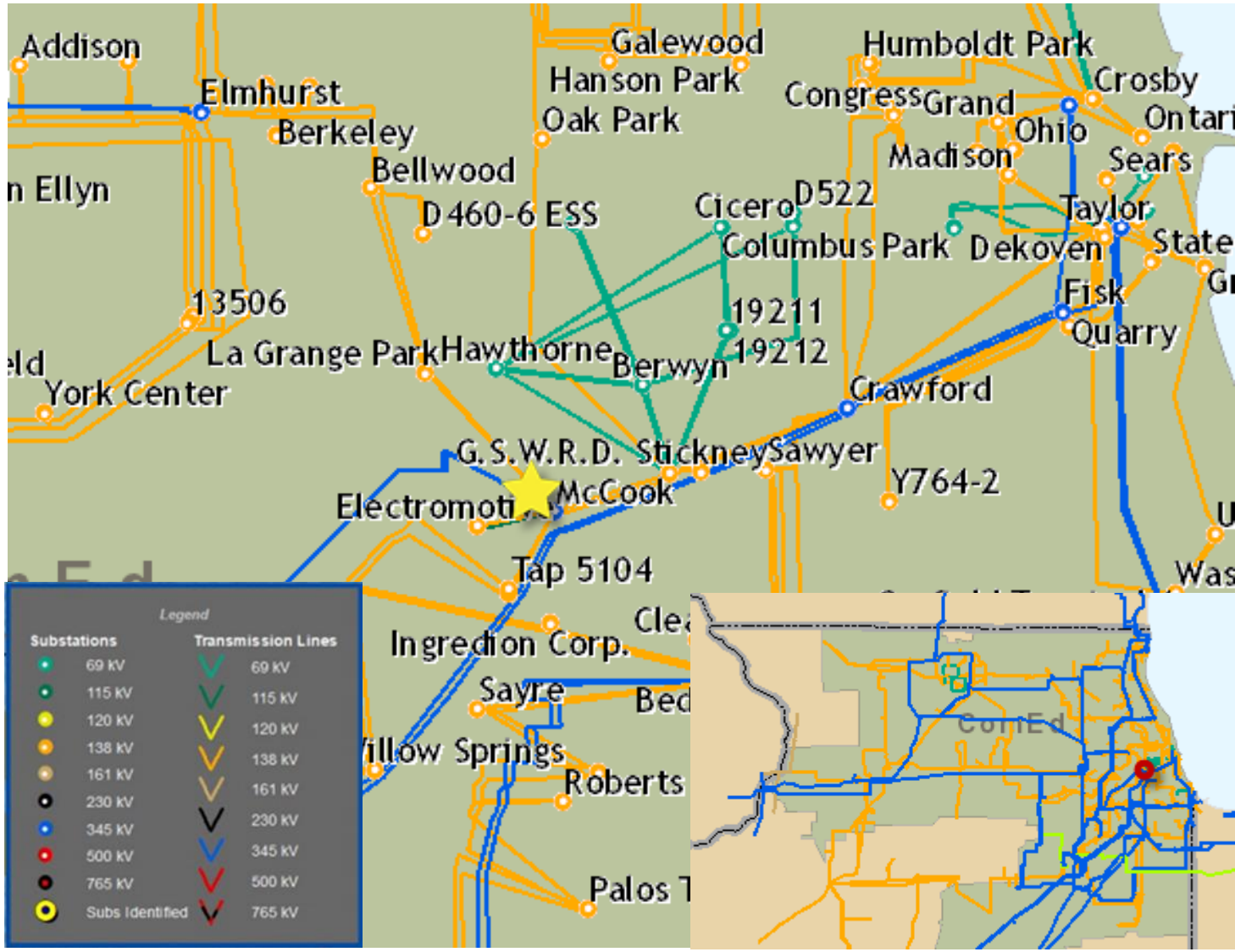
- Operational Flexibility and Efficiency

Specific Assumption References:

- Internal and/or regulatory design guidelines or PJM minimum design standards
- Enhancing system functionality, flexibility, or operability

Problem Statement:

McCook 345 kV bus does not comply with current standards. It is a straight bus design with two lines and two transformers with the lines directly connected to the bus via disconnects. Loss of a line also trips a transformer.



ComEd Transmission Zone M-3 Process

McCook

Need Number: ComEd 2020-004

Process Stage: Submission of Supplemental Project for inclusion in the Local Plan September 14, 2020

Selected Solution:

Rebuild McCook 345 kV bus as indoor GIS double ring bus expandable to breaker-and-a-half (BAAH). (**S2285**)

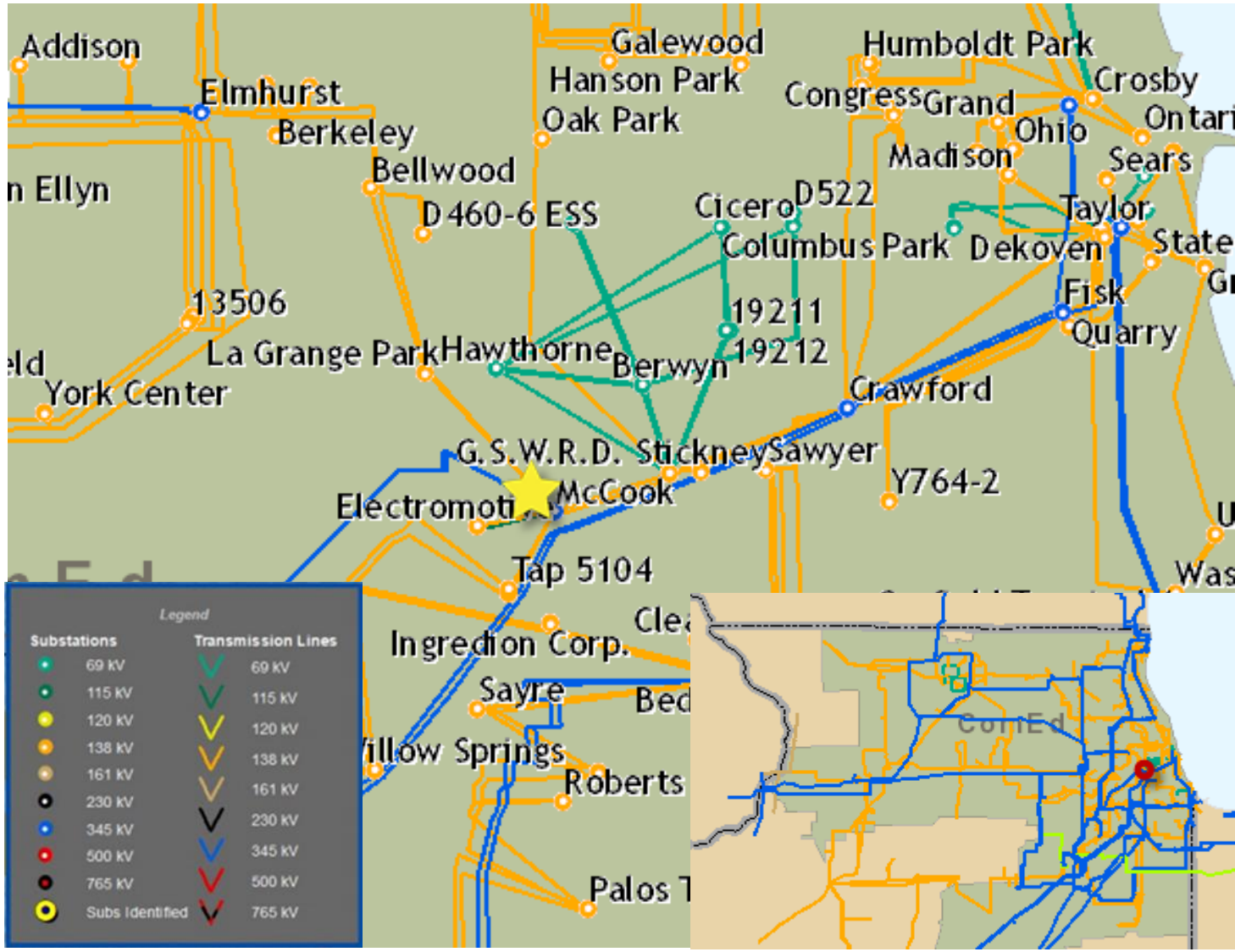
Estimated Cost: $64M

Projected In-Service: 12/31/2024

Supplemental Project ID: S2285

Project Status: Conceptual

Model: 2025 RTEP



ComEd Transmission Zone M-3 Process
Bellwood

Need Number: ComEd-2020-009

Process Stage: Submission of Supplemental Project for inclusion in the Local Plan September 14, 2020

Previously Presented:

Needs Meeting May 22, 2020

Solutions Meeting June 19, 2020

Project Drivers:

Customer Service

Operational Flexibility and Efficiency

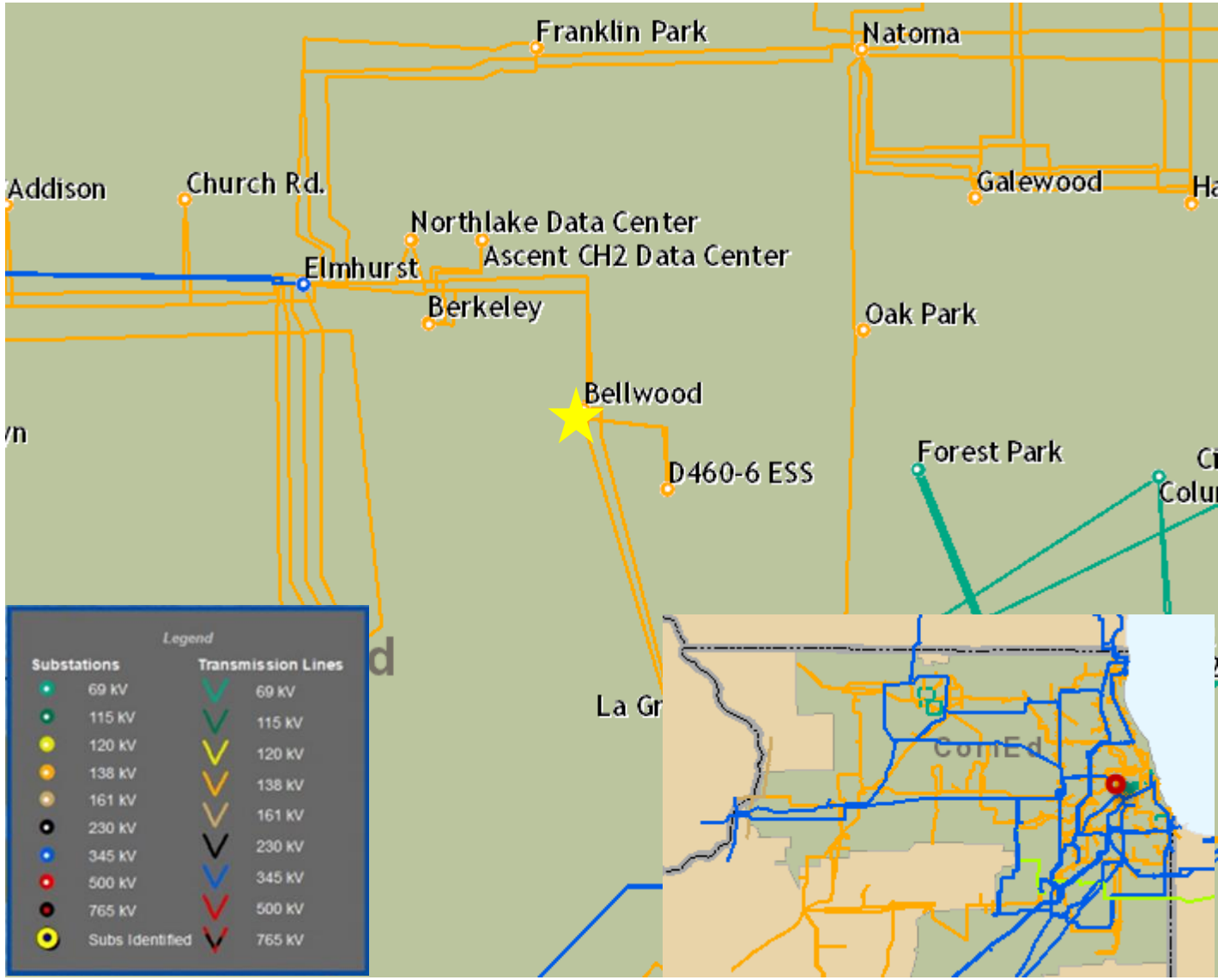
Specific Assumption References:

Transmission system configuration changes due to new or expansion of existing distribution substations

Enhancing system functionality, flexibility, or operability

Problem Statement:

ComEd Distribution is replacing 138/34 kV transformer 78 at Bellwood which is currently tapped from 138 kV line 13501 (Elmhurst – Bellwood). The transformer and the line trip together.



ComEd Transmission Zone M-3 Process
Bellwood

Need Number: ComEd-2020-009

Process Stage: Submission of Supplemental Project for inclusion in the Local Plan September 14, 2020

Selected Solution:

Reconnect Transformer 78 to the 138 kV bus through a high-side circuit breaker. Add a circuit breaker for line 13501. (**S2286**)

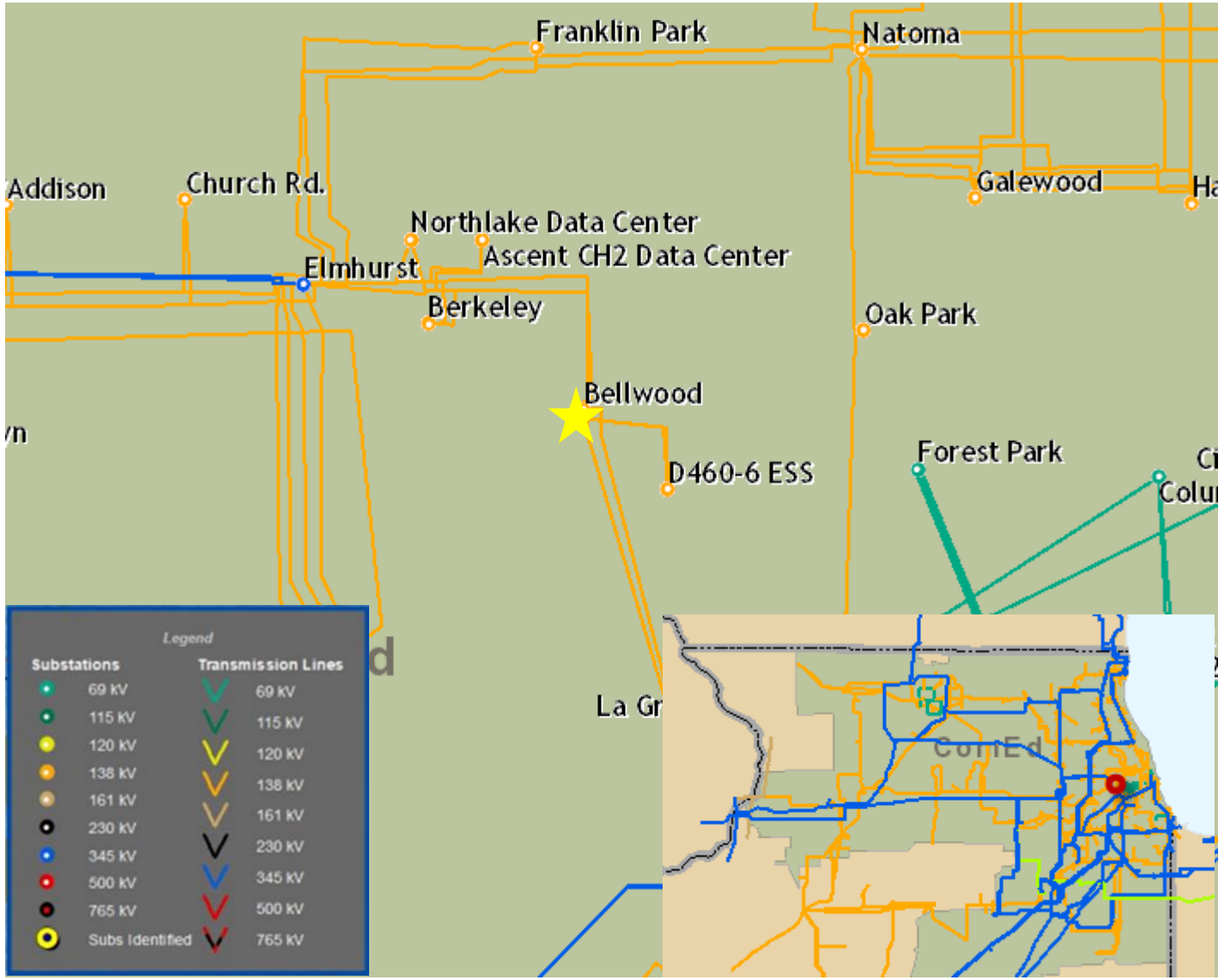
Estimated cost: $1.4M (Transmission only)

Projected In-Service: 12/31/2020

Supplemental Project ID: S2286

Project Status: Engineering

Model: 2025 RTEP



ComEd Transmission Zone M-3 Process
New Customer in Dekalb area

Need Number: ComEd-2020-007

Process Stage: Submission of Supplemental Project for inclusion in the Local Plan October 21, 2020

Previously Presented:

Need Meeting April 20, 2020

Solutions Meeting July 17, 2020

Project Driver:

Customer Service

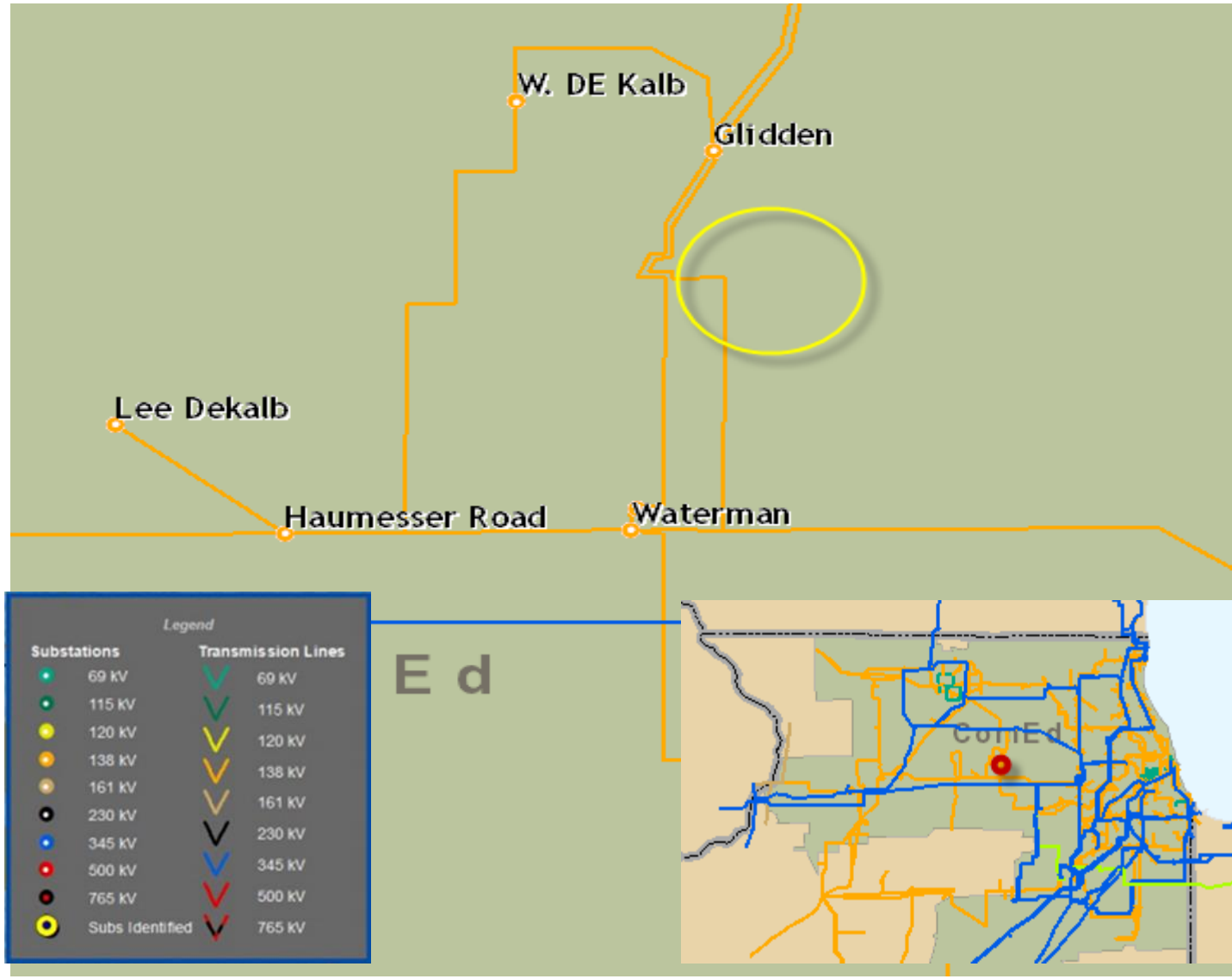
Specific Assumption Reference:

New transmission customer interconnection

Problem Statement:

New customer has requested service in the Dekalb area

- In service by 9/2021 with initial load < 5MW, growing to 200 MW by the end of 2026



ComEd Transmission Zone M-3 Process
New Customer in Dekalb area

Need Number: ComEd-2020-007

Process Stage: Submission of Supplemental Project for inclusion in the Local Plan October 21, 2020

Selected Solution:

- Cut into existing lines 11323 and 11106, Install new 138 kV breaker-and-a-half substation by 9/1/21
- Install two 138 kV 43.2 MVAR cap banks, 1st by 6/1/22, 2nd by 6/1/24

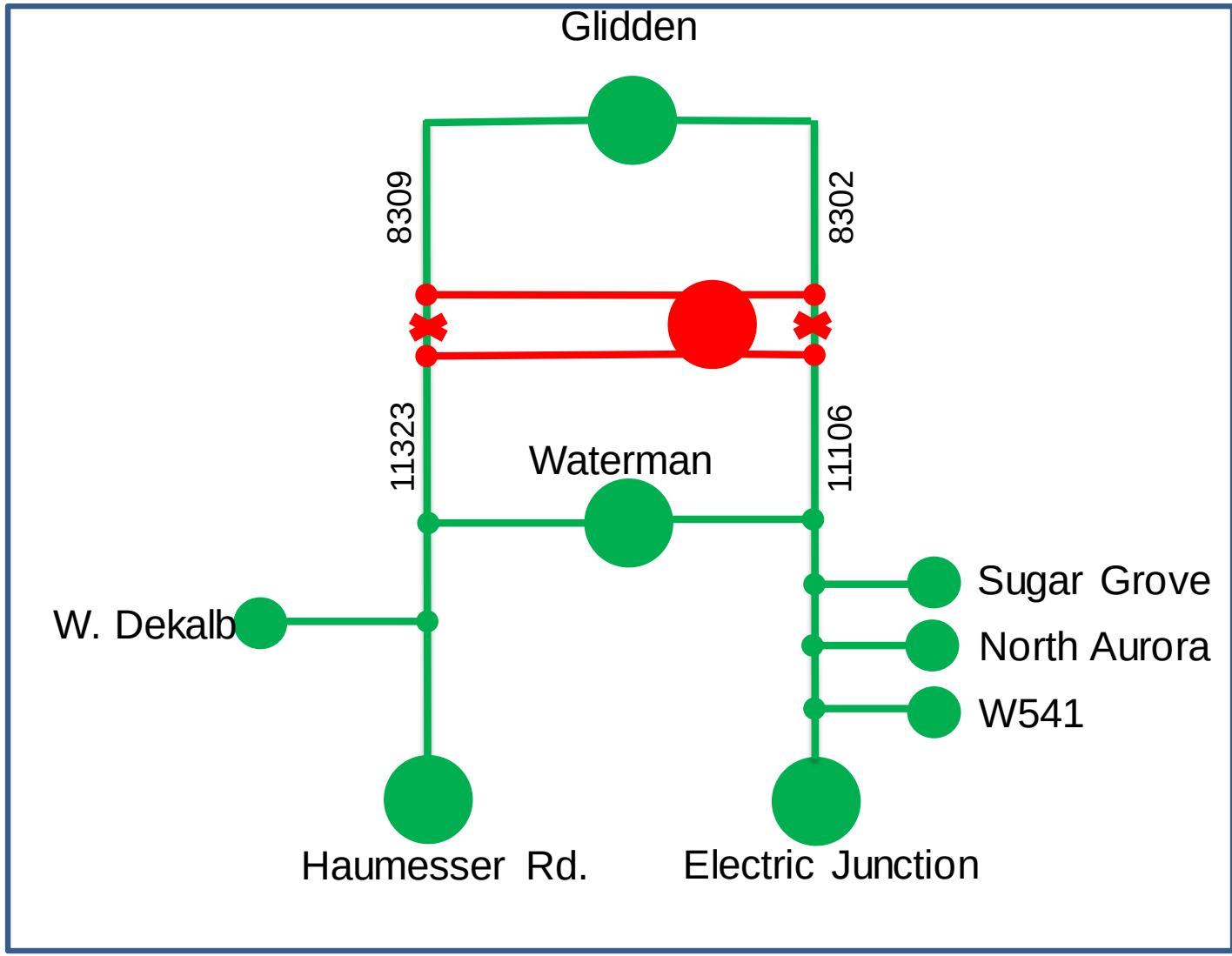
Estimated cost: $61.9M (increased from $45M previously presented due to higher grading, drainage, environmental, and civil costs)

Projected In-Service: 9/1/21

Supplemental Project ID: S2349

Project Status: Engineering & Procurement

Model: 2025 RTEP



ComEd Transmission Zone M-3 Process
Kincaid SPS

Need Number: ComEd-2020-008

Process Stage: Submission of Supplemental Project for inclusion in the Local Plan October 21, 2020

Previously Presented:

Need Meeting May 12, 2020

Solutions Meeting July 7, 2020

Project Drivers:

- Operational Flexibility and Efficiency
- Equipment Material Condition, Performance, and Risk

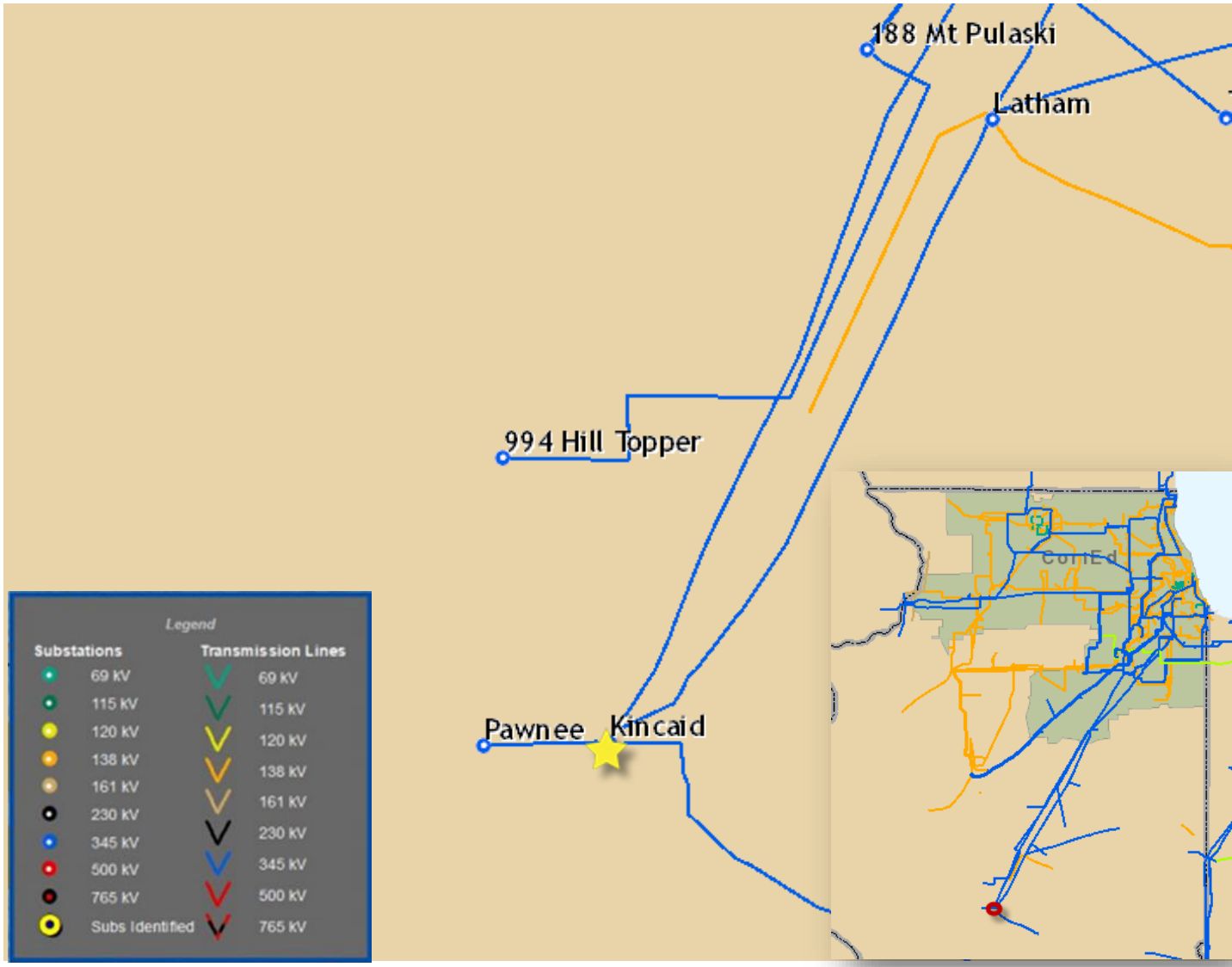
Specific Assumption References:

- Removal of existing SPS/RAS/LPS
- Transmission infrastructure replacements (EOL/condition/obsolescence) that are consistent with efficient asset management decisions

Problem Statement:

To prevent first swing and/or oscillatory instability of either unit, a multi-phase fault high-speed sectionalizing scheme and a multiple line outage scheme are in place at Kincaid.

345 kV circuit breakers are all 1966 vintage and have had increased maintenance required over the past several years.



ComEd Transmission Zone M-3 Process
Kincaid SPS

Need Number: ComEd-2020-008

Process Stage: Submission of Supplemental Project for inclusion in the Local Plan October 21, 2020

Proposed Solution:

- Replace five 345 kV oil circuit breakers with 2-cycle IPO SF6 circuit breakers
- Change timer settings for breaker failure relays
- Remove Kincaid SPS

Expected ratings changes:

L2102 Kincaid – Latham SN from 1364 to 1434 MVA

L2106 Kincaid – Austin WN from 1486 to 1507 MVA

Interrupting capability will go from 42 kA to 63 kA

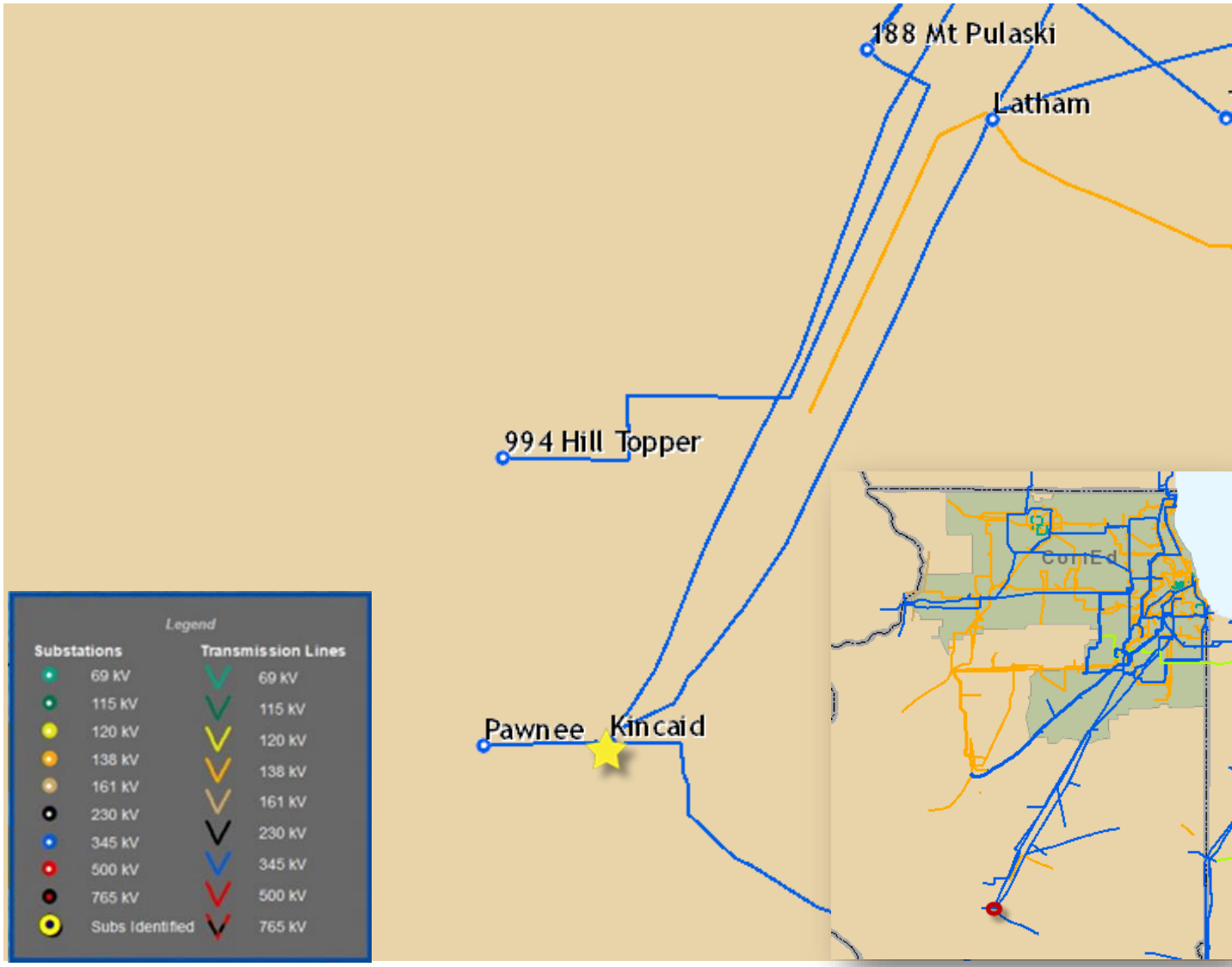
Estimated cost: $15.7M

Supplemental Project ID: S2350

Projected In-Service: 12/31/2024

Project Status: Engineering

Model: 2025 RTEP



ComEd Transmission Zone M-3 Process
Load Addition in Burr Ridge Area

Need Number: ComEd-2020-010

Process Stage: Submission of Supplemental Project for inclusion in the Local Plan October 21, 2020

Previously Presented:

Need Meeting July 17, 2020

Solutions Meeting August 14, 2020

Project Driver:

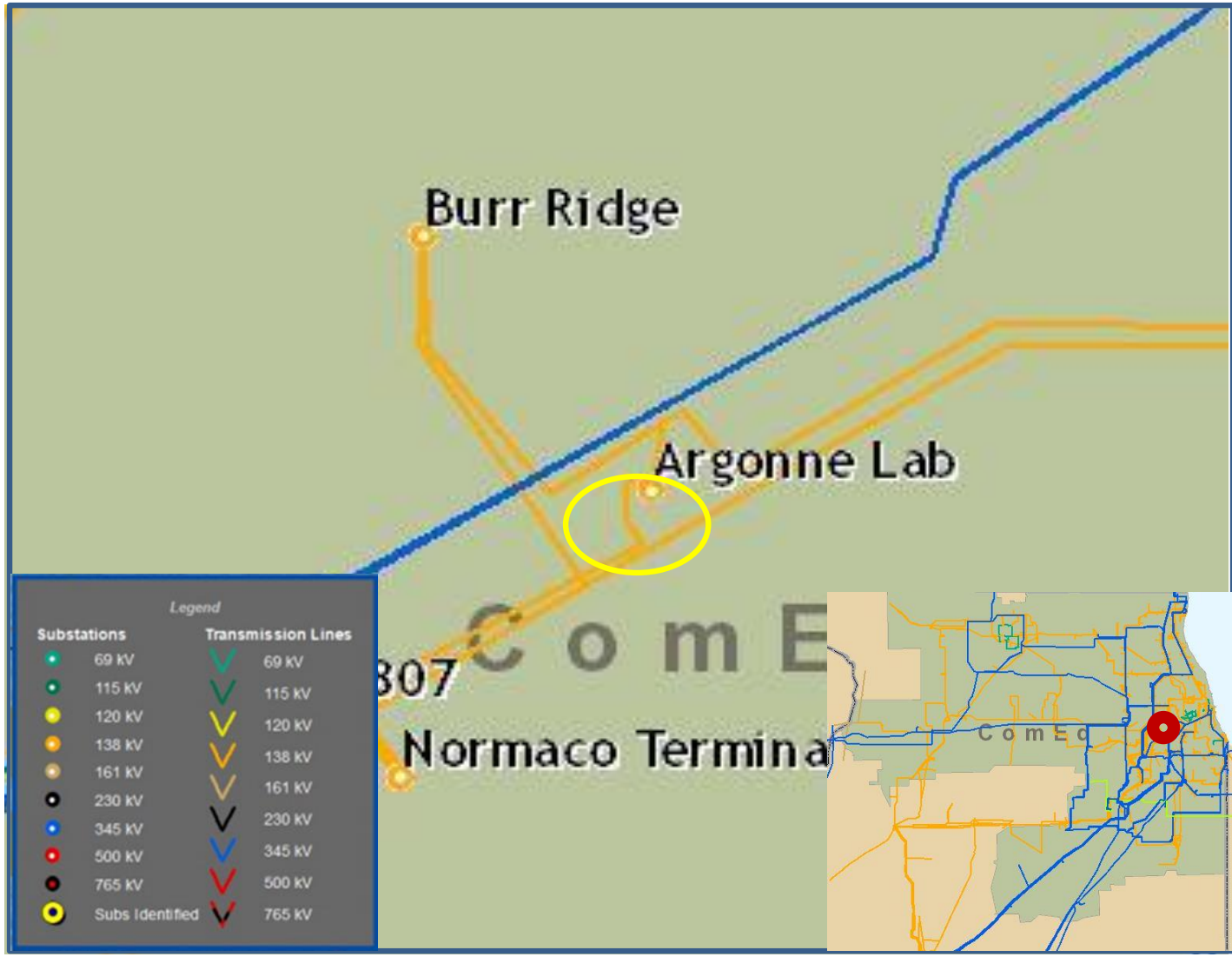
Customer Service

Specific Assumption Reference:

Modification to an existing customer

Problem Statement:

An existing customer has requested an additional 43 MW by 06/2022 with a total increase of 77 MW by the end of 2030.



ComEd Transmission Zone M-3 Process Load Addition in Burr Ridge Area

Need Number: ComEd-2020-010

Process Stage: Submission of Supplemental Project for inclusion in the Local Plan October 21, 2020

Proposed Solution:

- Cut into existing line 1802, Install new 138 kV 4 breaker ring bus substation by 6/30/22

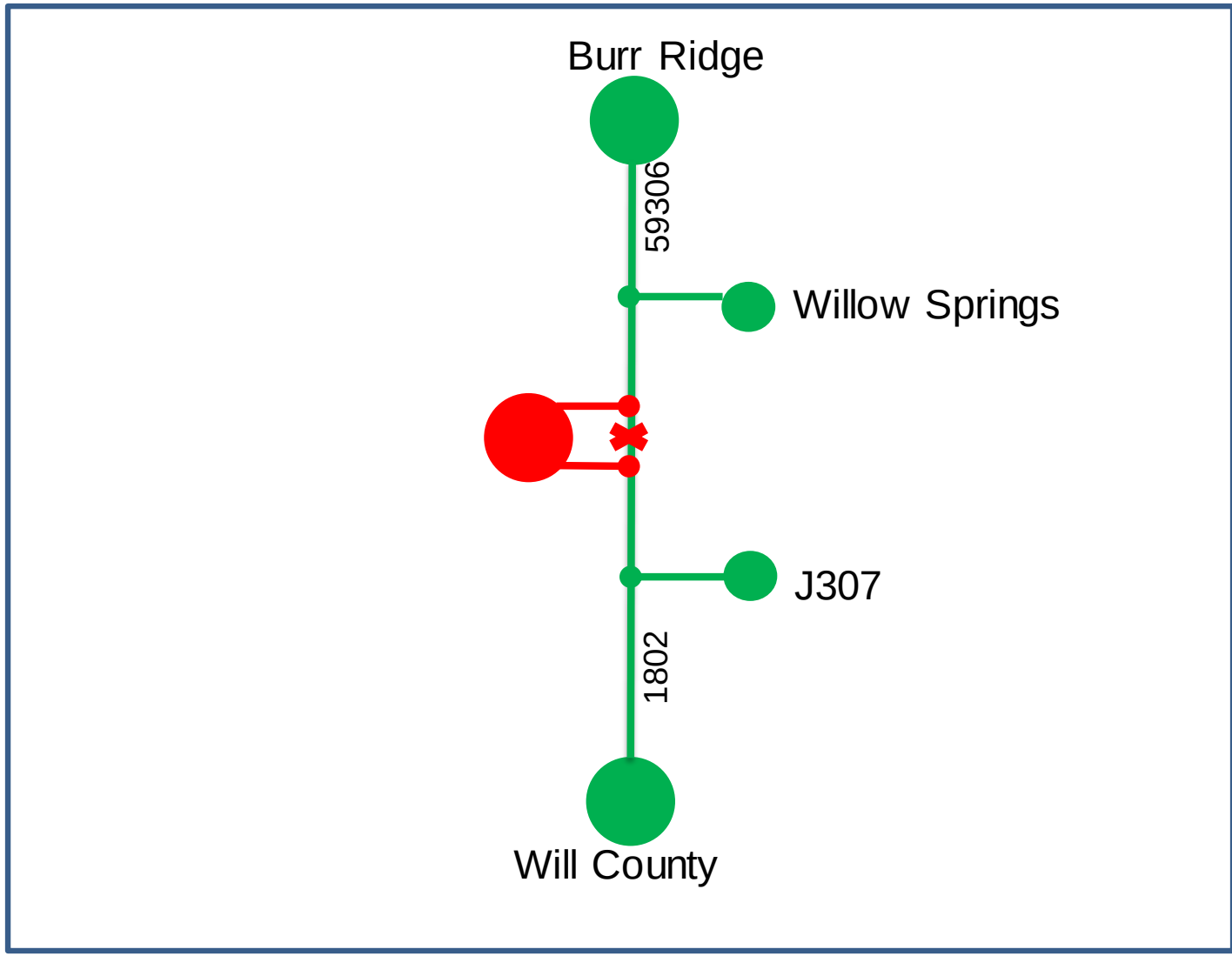
Estimated cost: $18.7M

Supplemental Project ID: S2353

Projected In-Service: 6/30/22

Project Status: Engineering

Model: 2025 RTEP



ComEd Transmission Zone M-3 Process
New Customer in Rochelle Area

Need Number: ComEd-2020-011

Process Stage: Submission of Supplemental Project for inclusion in the Local Plan October 21, 2020

Previously Presented:

Need Meeting July 17, 2020

Solutions Meeting August 14, 2020

Project Driver:

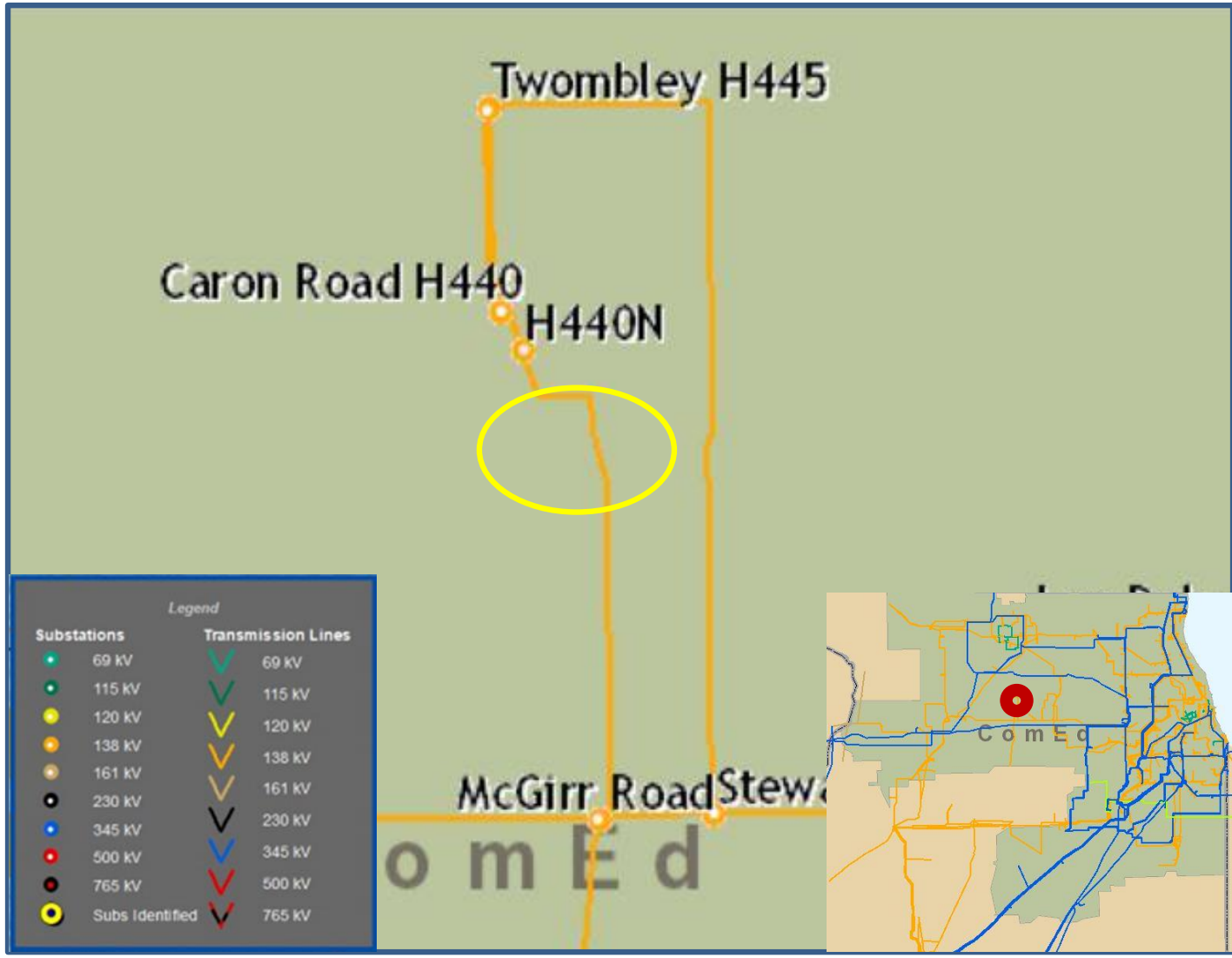
Customer Service

Specific Assumption Reference:

New transmission customer interconnection

Problem Statement:

Customer has requested new service by 12/2021 with a load of 20 MW.



ComEd Transmission Zone M-3 Process
New Customer in Rochelle Area

Need Number: ComEd-2020-011

Process Stage: Submission of Supplemental Project for inclusion in the Local Plan October 21, 2020

Proposed Solution:

- Cut into existing 138 kV line 16914. Install new 138 kV, 3 breaker ring substation by 12/31/21

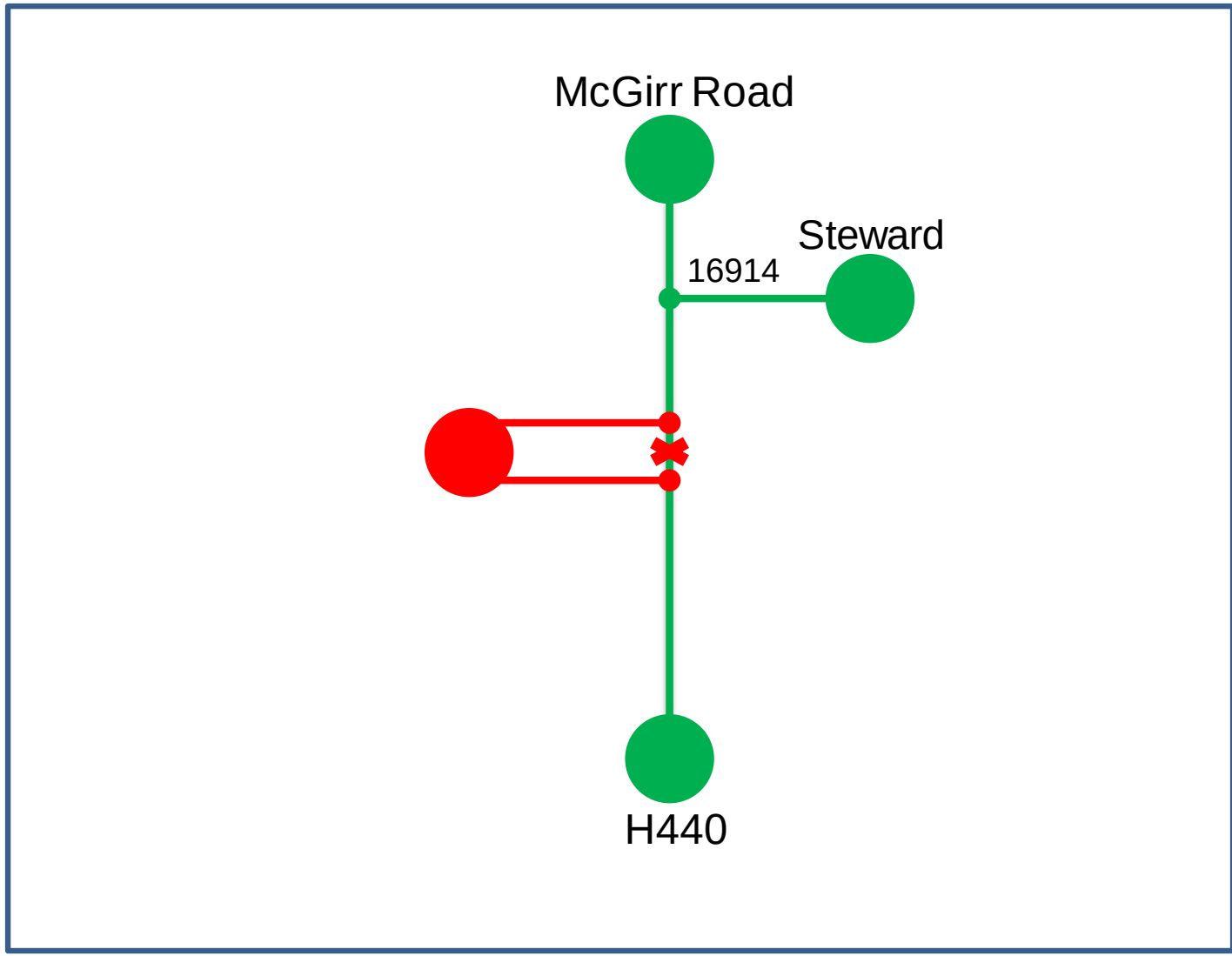
Estimated cost: $15.3M

Supplemental Project ID: S2354

Projected In-Service: 12/31/21

Project Status: Conceptual

Model: 2025 RTEP



Revision History

1/28/2019 – V1 – Added S2137 and S2138.1-.2

6/15/2020 – V2 – Added S2247

8/7/2020 – V3 – Added Slides # 9-15, S2266 – S2269

9/15/2020 – V4 – Added Slides # 16-19, S2285 – S2286

10/21/2020 – V5 – Added Slides # 20-27, S2349, S2350, S2353 and S2354