



**Status Update: Texas City Transmission  
Improvement Project - ERCOT Independent  
Review**

Md Moinul Islam  
Transmission Planning, ERCOT

RPG Meeting  
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# Current Status

- ❖ ERCOT provided status update on TNMP Texas City Transmission Improvement Project at the May 2020 RPG meeting.

[http://www.ercot.com/content/wcm/key\\_documents\\_lists/189719/Texas\\_City\\_Transmission\\_Improvement\\_Project\\_-\\_May\\_19\\_RPG.pdf](http://www.ercot.com/content/wcm/key_documents_lists/189719/Texas_City_Transmission_Improvement_Project_-_May_19_RPG.pdf)

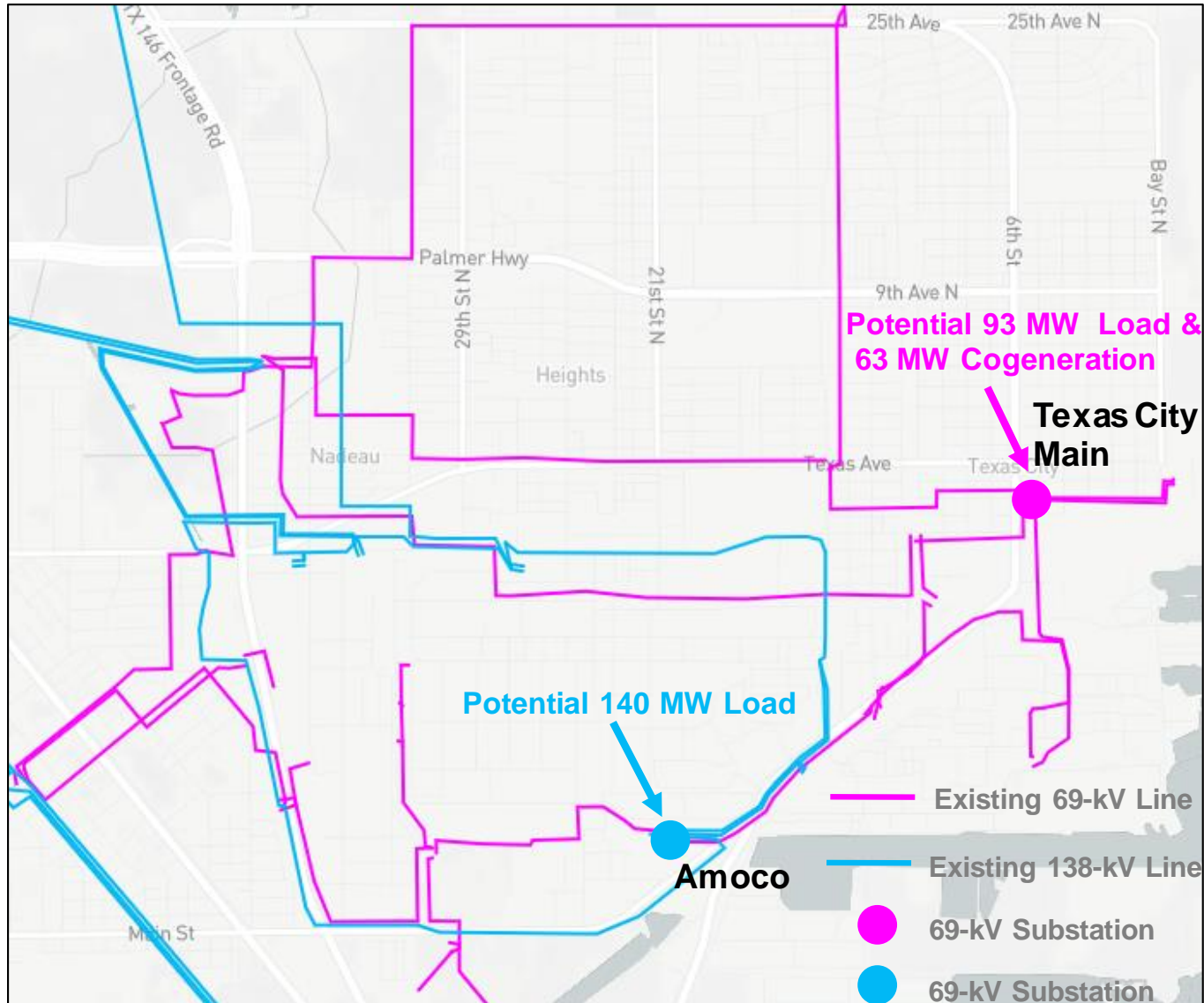
- ❖ ERCOT performed reliability analysis based on the updated information provided by TSP associated with planned cogeneration plant (63 MW) and internal load (93 MW) in Texas City to be in service in May 2022 <sup>(1)</sup>.
- ❖ ERCOT further conducted sensitivity analysis for additional potential 140 MW industrial load in Texas City which is expected to be integrated on or before summer peak of 2022 <sup>(1)</sup>.

(1) ERCOT will not recommend a project until a customer meets the agreement, notice to proceed and financial security requirements in accordance with Protocol Section 3.11.4.9(3).

# Outline

- ❖ Overview of Steady-State Study Assumptions
- ❖ Reliability Analysis for Potential 93 MW Load Associated with Cogeneration Plant in Texas City
- ❖ Sensitivity Analysis for Additional Potential 140 MW Load in Texas City
- ❖ Next Steps

# Map of Study Area



# Study Assumptions (Steady-State)

## ❖ Steady Region

- Coast Weather Zone in ERCOT system

## ❖ Steady-State Base Case

- Final 2019 RTP 2022 East/Coast (EC) summer peak case were updated to construct the study base case.

<https://mis.ercot.com/misapp/GetReports.do?reportTypeId=15764>

# Study Assumptions

## ❖ Generation Update

- The following generators that met Planning Guide Section 6.9(1) for inclusion in the planning models at the time of the study were added to the case based on GIS published in April 2020 as <http://mis.ercot.com/misapp/GetReports.do?reportTypeId=15933&reportTitle=GIS%20Report&showHTMLView=&mimicKey>

GINR	Project Name	Fuel	Projected COD	MW Capacity
18INR0050	Mustang Creek Solar	SOLAR	05/01/2021	150
18INR0062	Wagyu Solar	SOLAR	06/03/2020	120
19INR0014	Formosa Increase	GAS	08/03/2020	240
19INR0041	Myrtle Solar	SOLAR	06/01/2021	240
20INR0069	Danish Fields Solar	SOLAR	06/01/2021	201
20INR0206	PES1	GAS	12/01/2020	363
20INR0287	STP Unit 1 repower	NUCLEAR	04/30/2020	13
20INR0308	Gibbons Creek TEERP	COAL	07/27/2020	493
21INR0016	Danish Fields II	SOLAR	06/01/2021	201
21INR0017	Danish Fields III	SOLAR	06/01/2021	201

- The new renewable generations in the table were dispatched consistent with the 2020 RTP methodology.

# Study Assumptions

## ❖ Generation Update

- Retired and mothballed units were consistent with the 2020 RTP.

## ❖ Load Update

- Loads in the study area were adjusted based on the 2020 RTP.

## ❖ Cogeneration Plant and Internal Load

- In the preliminary study base case, 63 MW cogeneration plant and 93 MW internal load were connected to the existing Texas City Main 69-kV substation.

# Study Assumptions

## ❖ Transmission Update

The following Tier 4 projects that are expected to be in-service within the study region by June 1, 2022, were added to the study base case based on February 2020 TPIT published on MIS as

<http://www.ercot.com/gridinfo/planning>

TPIT Number	Project Title
4010	Rebuild Magnolia – Seminole 138-kV Line
52181	ENCO (ENC) 138-kV Substation
52183	EXTER 69-kV Substation Removal
54118	Rebuild Alvin-Mainland-Freeway Park (795 ACSS)*

\*Based on the latest June 2020 TPIT, this additional Tier 4 project is added.

## ❖ Reserve

Load outside the study weather zone were adjusted to make up for 3,000 MW reserve to be consistent with the 2020 RTP.



# Study Methodology

## ❖ Contingencies

- NERC TPL-001-4 and ERCOT Planning Criteria ([http://www.ercot.com/content/wcm/current\\_guides/53526/04-070118.doc](http://www.ercot.com/content/wcm/current_guides/53526/04-070118.doc)):
  - Normal system condition (P0)
  - N-1 conditions (P1, P2-1, P7)
  - P2-2 to 2-4, P4, and P5 (EHV only)
  - P3: G-1 + N-1 (G-1 represents generator outage)
  - P6: X-1 + N-1 (X-1 represents transformer outage)

## ❖ Criteria

- Thermal: Monitor all transmission lines and transformers in the study region
  - Use Rate A for normal conditions
  - Use Rate B for emergency conditions
- Voltage: Monitor all buses 69-kV and above in the study region
  - Voltages exceeding their pre-contingency and post-contingency limits
  - Voltage deviations exceeding 8% on non-radial load buses

# Preliminary Results of Reliability Analysis

- ❖ ERCOT performed reliability analysis for 93 MW internal load associated with 63 MW cogeneration plant in Texas City.
- ❖ No voltage violations were observed in the study area.
- ❖ Following two 69-kV lines were overloaded in the study area.

Overloaded Line	Contingency	Overload (%)
Texas City Main - Northside Tap 69-kV line (1.09 mi)	P3	109.64
Choctaw Tap - Texas City Main 69-kV line (0.48 mi)	P3	106.23

# Six Options Evaluated

❖ ERCOT evaluated following six options to address the reliability issues.

Upgrades	Transmission Line	Option #					
		1	2	3	4	5	6
Existing 69- kV line upgrades	Heights - Northside (3.49 mi)	✓					
	Heights - Northside Tap (2.58 mi)	✓					
	Northside Tap - Texas City Main (1.09 mi)	✓					
	Choctaw Tap - Texas City Main (0.48 mi)	✓					
138-kV conversion of the existing 69-kV lines and substations	Heights - Northside (3.49 mi)			✓			
	Heights - Northside Tap (2.58 mi)			✓			
	Northside Tap - Texas City Main/Cattail* (1.09 mi)			✓			
	Northside Tap and Northside substations			✓			
New 138-kV line	Cherokee - Cattail* (1.50 mi)			✓		✓	
	Greenbelt - Cattail* (2.50 mi)		✓		✓	✓	✓
	Comanche - Cattail* (1.03 mi)				✓		
	Amoco - Cattail* (2.23 mi)						✓

\*Cattail is a new 138/69-kV substation near Texas City Main

Maps are available in Appendix

# Results of Reliability Analysis for Initial Six Options

- ❖ All six options addressed the reliability issues driven by 93 MW internal load associated with 63 MW cogeneration plant in Texas City.

# Analysis of Planned Maintenance Outage Scenarios

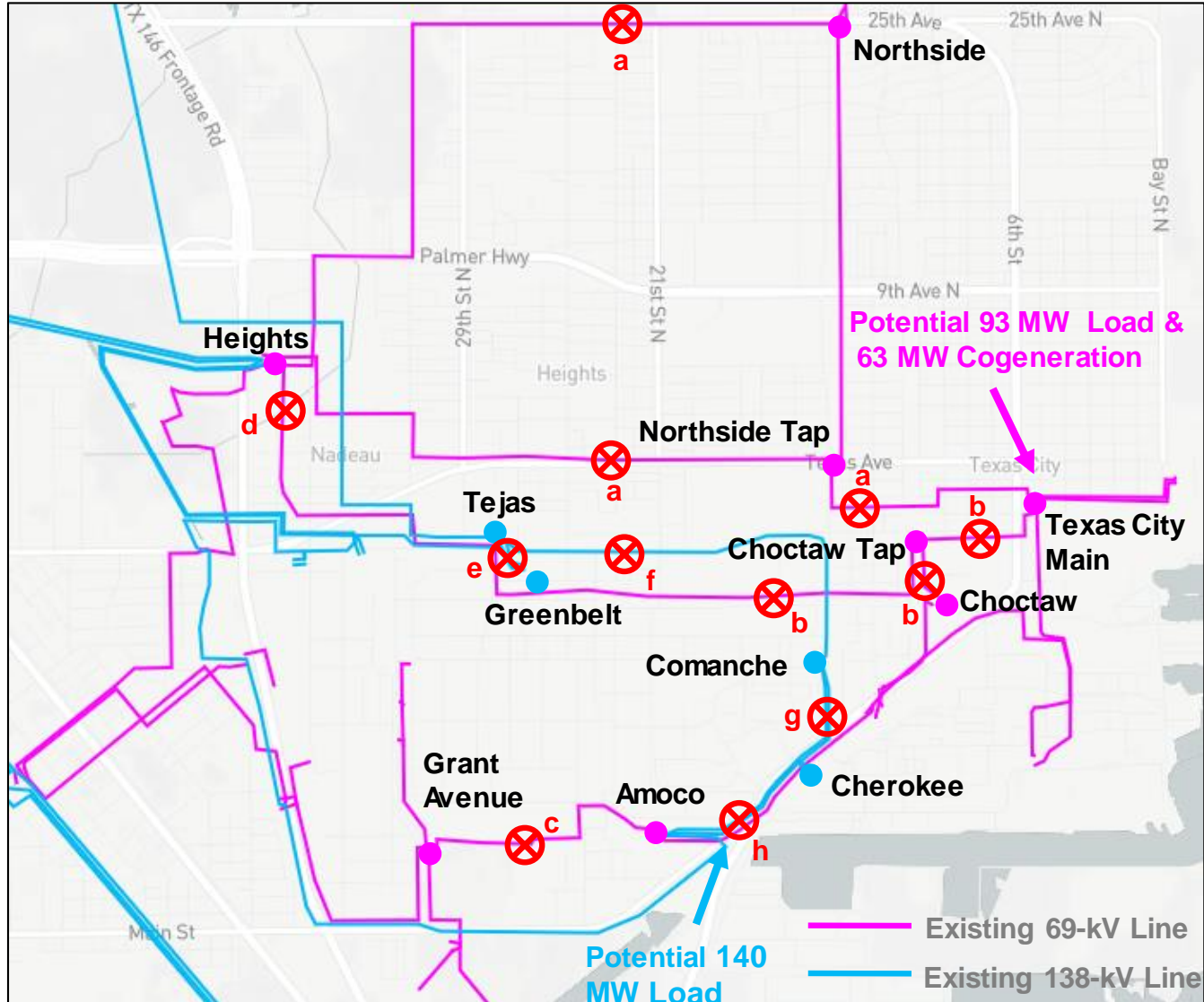
- ❖ ERCOT conducted an analysis for planned maintenance outage scenarios based on the input from TSP.
- ❖ N-1-1 analysis were performed lower than summer peak load level in Coast weather zone based on the historical non-summer peak data. The load level in the study area were scaled down to mimic the non-summer peak load condition.
- ❖ Maintenance outage scenarios provided by TSP were evaluated.

# Planned Maintenance Outage Scenarios

- ❖ The maintenance outage conditions are associated with the 69-kV and 138-kV lines in the study area.

No.	Prior Outage (N-1)
a.	Heights - Northside Tap 69-kV line Heights - Northside 69-kV line Northside Tap - Texas City Main 69- kV line
b.	Heights - Choctaw Tap 69-kV line Choctaw Tap - Choctaw 69-kV line Choctaw Tap - Texas City Main 69-kV line
c.	Amoco - Grant Avenue 69-kV line
d.	138/69-kV Transformer at Heights
e.	Tejas - Greenbelt 138-kV line
f.	Tejas - Comanche 138-kV line
g.	Comanche - Cherokee 138-kV line
h.	Comanche - Amoco 138-kV line

# Map of Planned Maintenance Outage Scenarios



# Results of Planned Maintenance Outage Scenarios

- ❖ Results of planned maintenance outage scenarios in the study area are
  - No voltage violations were observed with all six options
  - Thermal overload(s) were observed with Options 1 and 2
  - No reliability issues were observed with Options 3, 4, 5 and 6

Overloaded Line/Transformer	Maximum Overload (%)					
	Opt 1	Opt 2	Opt 3	Opt 4	Opt 5	Opt 6
Choctaw Tap - Choctaw 69-kV line (0.28 mi)	107.47	114.49	-	-	-	-
Heights - Choctaw Tap 69-kV line (3.80 mi)	126.92	-	-	-	-	-
Heights 138/69-kV Transformers T1 & T2	102.72	-	-	-	-	-



# Short-Listed Options

- ❖ Options 3, 4, 5 and 6 were selected as short-listed options.
  - All four options addressed the reliability issues in the study area according to NERC and ERCOT planning criteria
  - No reliability issues were observed with all four options under planned maintenance outage scenarios in the study area

Upgrades	Lines	Short-Listed Option #			
		3	4	5	6
138-kV conversion of the existing 69-kV lines and substations	Heights - Northside (3.49 mi)	✓			
	Heights - Northside Tap (2.58 mi)	✓			
	Northside Tap - Texas City Main/Cattail* (1.09 mi)	✓			
	Northside Tap and Northside substations	✓			
New 138-kV line	Cherokee - Cattail* (1.50 mi)	✓		✓	
	Greenbelt - Cattail* (2.50 mi)		✓	✓	✓
	Comanche - Cattail* (1.03 mi)		✓		
	Amoco - Cattail* (2.23 mi)				✓

\*Cattail is a new 138/69-kV substation near Texas City Main

# Results of Sensitivity Analysis of Short-Listed Options

- ❖ ERCOT performed a sensitivity analysis to assess the load serving capability of short-listed options for potential additional 140 MW load at Amoco in Texas City.
  - No NERC and ERCOT reliability issues were observed in the study area
  - Planned maintenance outage scenarios.
    - No voltage violations were observed in the study area
    - Similar thermal loading issues were observed for Options 4, 5 and 6

Overloaded Line	Maximum Overload (%)			
	Opt 3	Opt 4	Opt 5	Opt 6
Amoco - Apache 138-kV line (4.13 mi)	101.65	101.22	101.06	101.22
Caddo SW STA - Apache 138-kV line (0.22 mi)	100.46	99.99	99.83	100.00
Tejas - Comanche Switch 138-kV line (0.95 mi)	102.34	-	-	-

## Next Steps

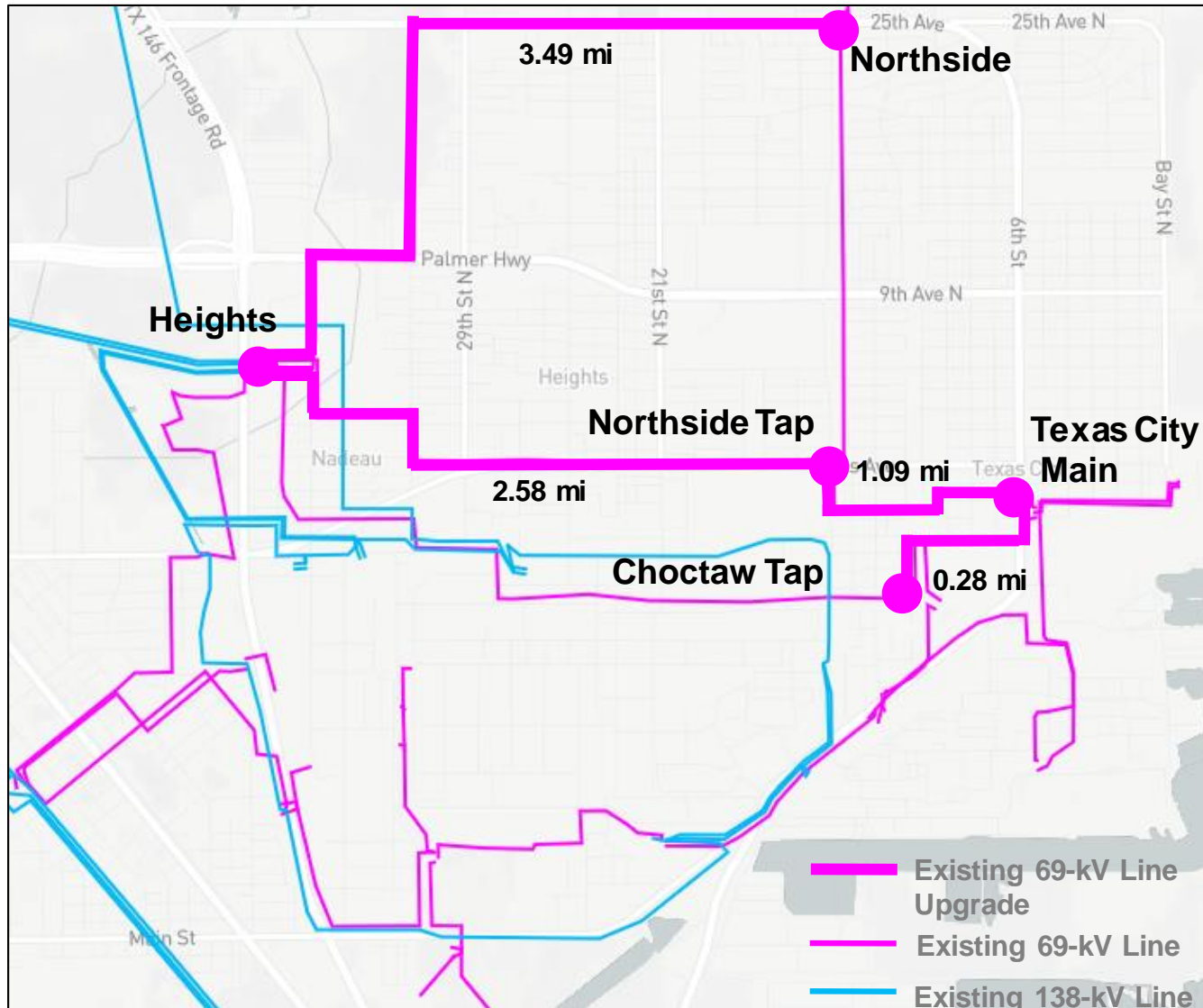
- ❖ ERCOT will work with TSP for feasibility and cost estimate of the short-listed Options 3, 4, 5 and 6 for 93 MW load associated with 63 MW cogeneration plant in Texas City.
- ❖ In accordance with Protocol Section 3.11.4.9(3), ERCOT will not issue the independent review recommending a project to meet needs identified for the load until a customer meets the agreement, notice to proceed and financial security requirements.



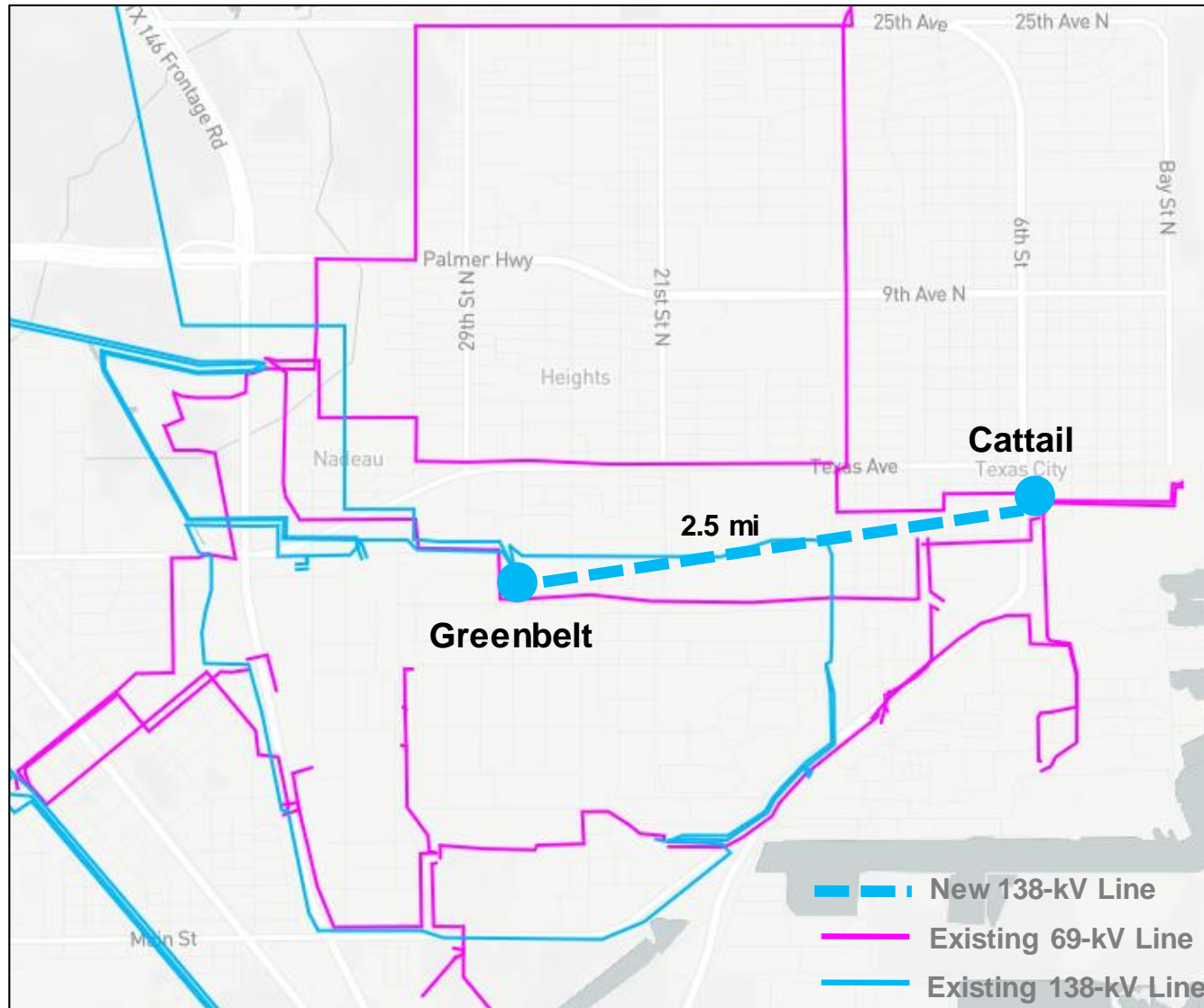
Stakeholder Comments Also Welcomed Through:

[SunWook.Kang@ercot.com](mailto:SunWook.Kang@ercot.com)

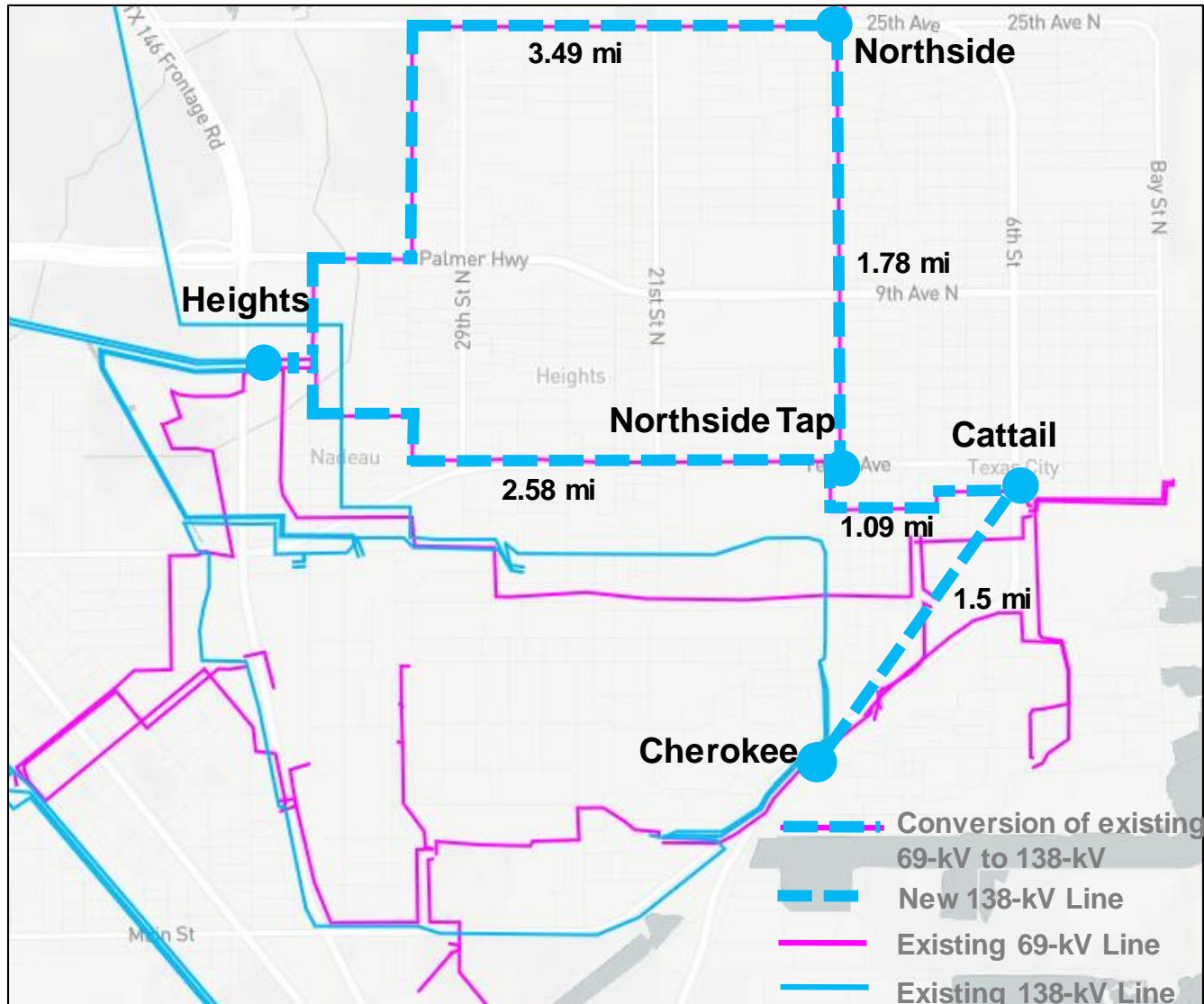
# Appendix: Map of Option 1



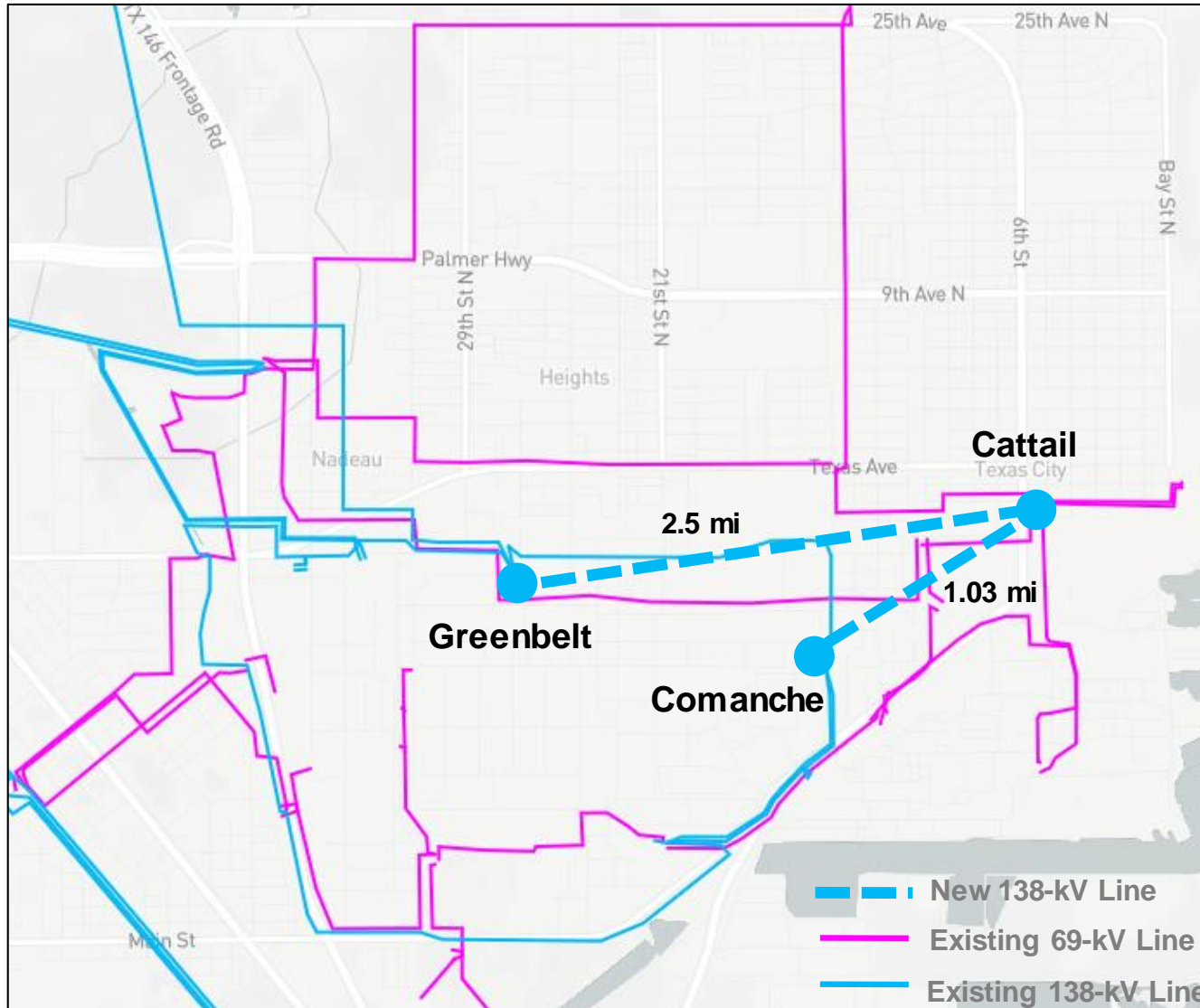
# Appendix: Map of Option 2



# Appendix: Map of Option 3

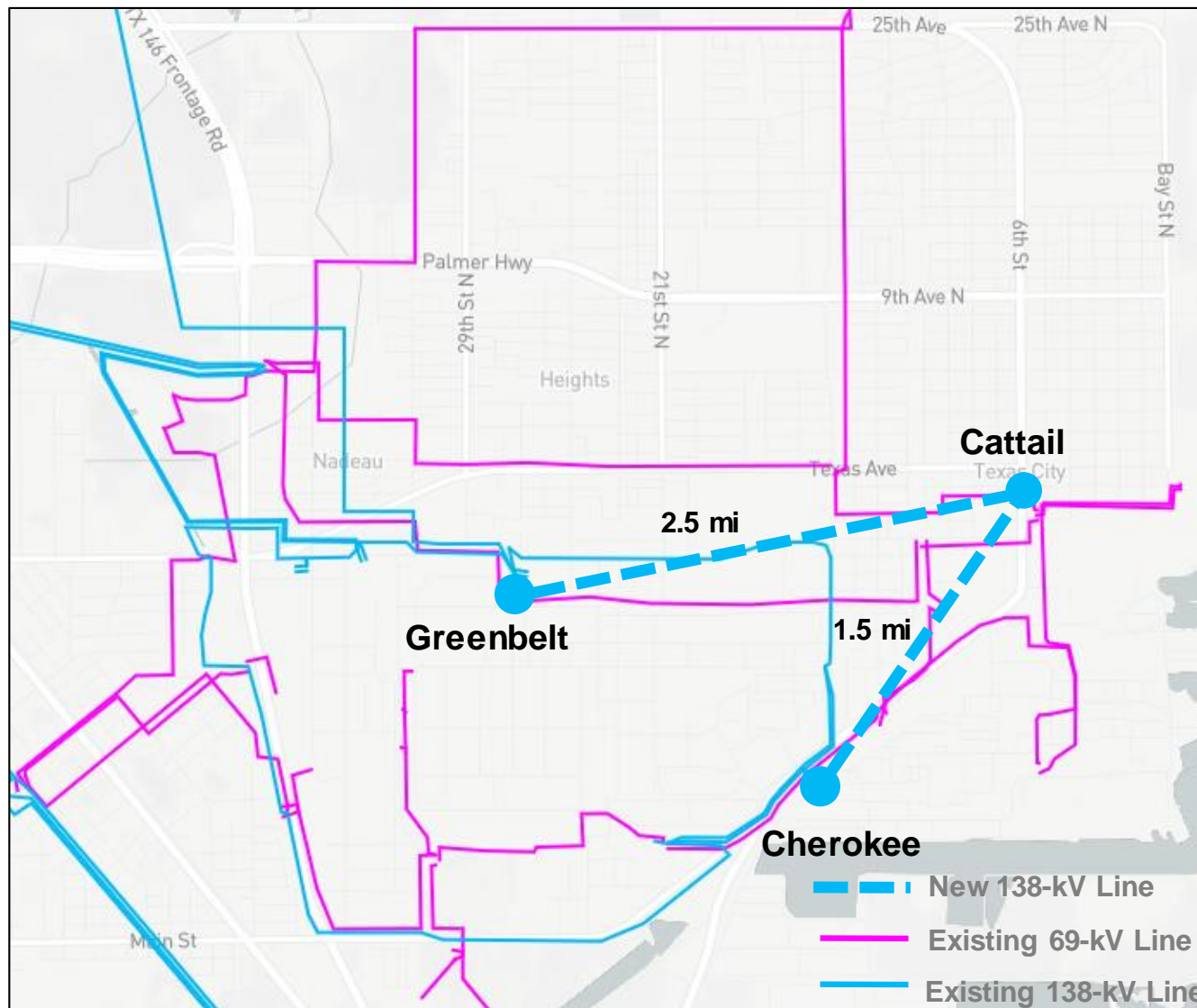


# Appendix: Map of Option 4





# Appendix: Map of Option 5



# Appendix: Map of Option 6

