

# Overhead to Underground Conversion Program

## Administrative Board

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# “System Undergrounding”

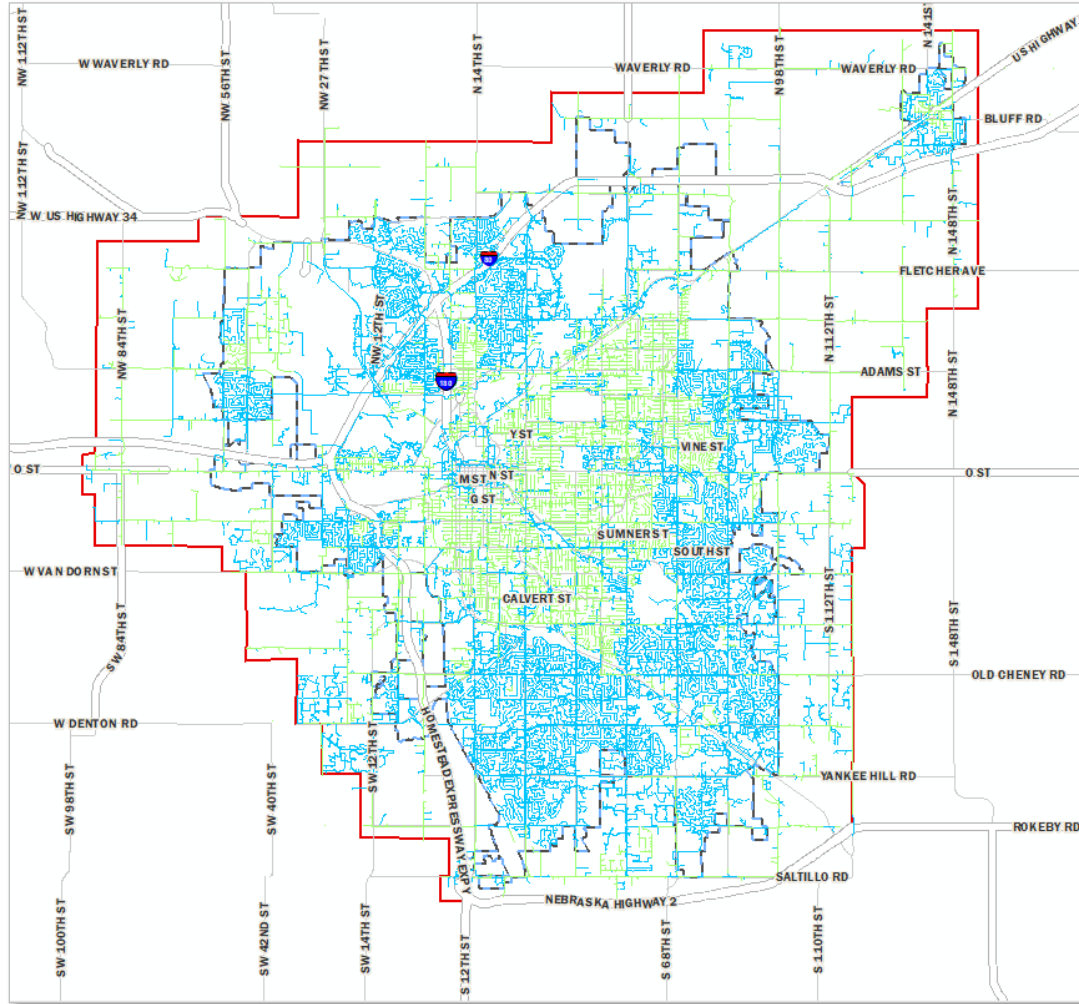
- Underground system status
- Is undergrounding more reliability and resiliency?
- Programs – Discretionary Update
- Next Steps

# LES 12kV Overhead vs Underground\* ...which is more reliable?

➤ Overhead  
Lines (31%)

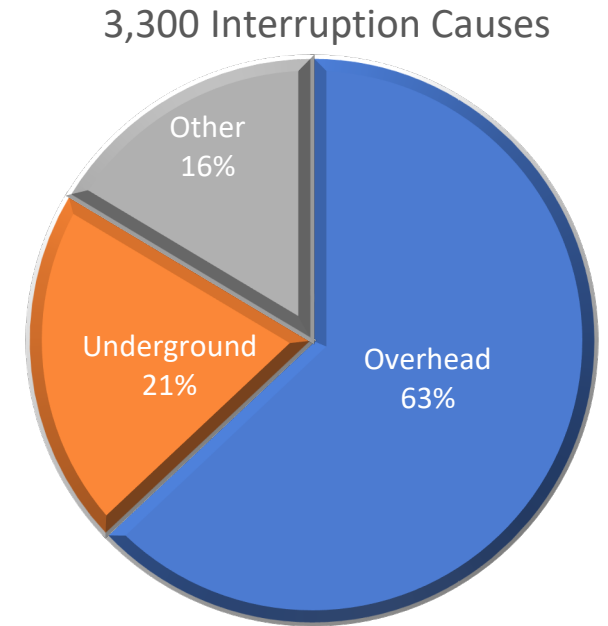


➤ Underground  
Lines (69%)



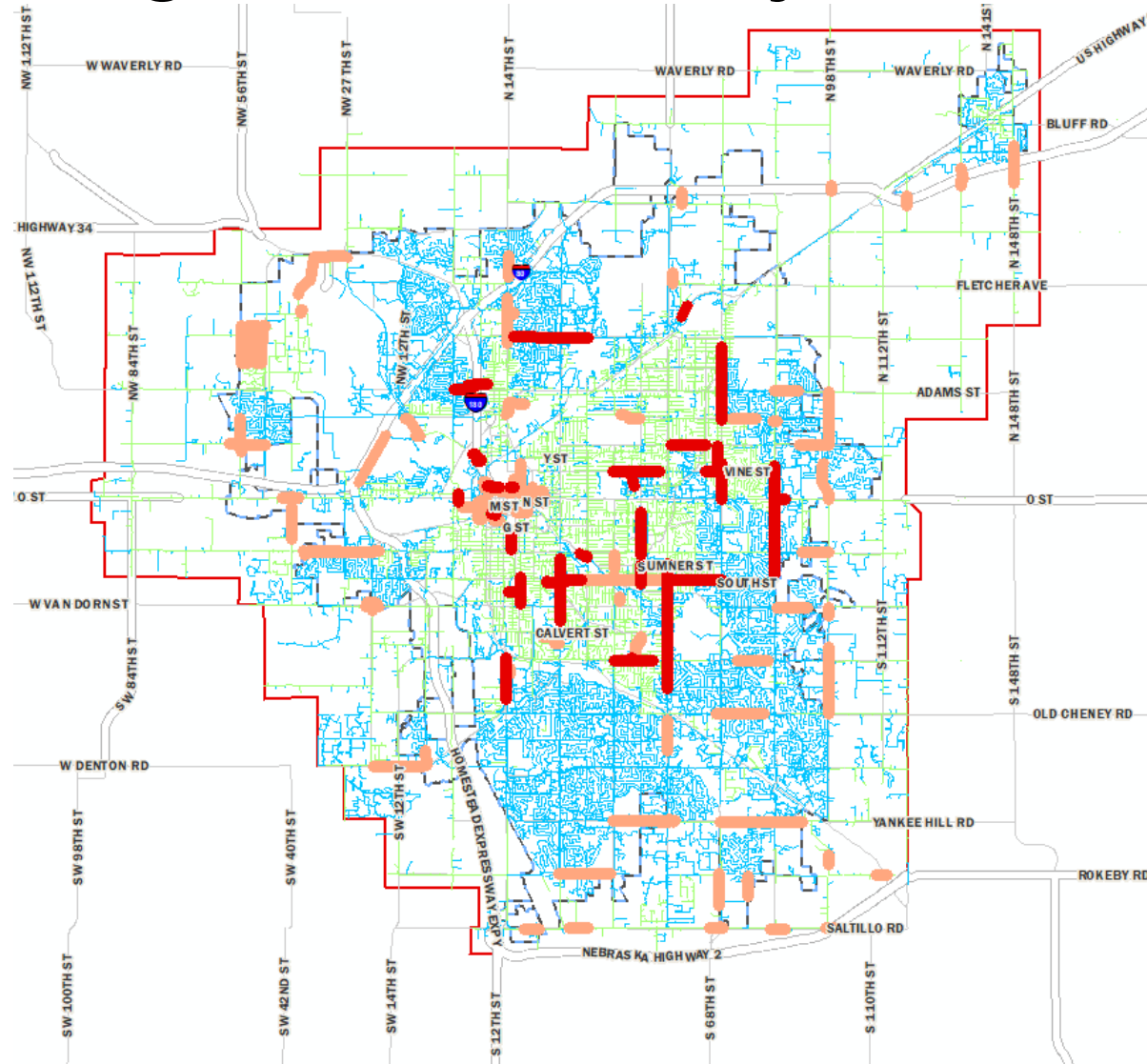
# Reliability Study Conclusions

- From 2016 to 2022 – LES experienced 3,300 incidents
- 63% of all incidents are due to Overhead causes (25% vegetation related)
- 20% of all incidents are due to UG causes (11% UG Cables/Splices)
- One feeder experienced more incidents (2.3% of total)
- Direct correlation to distance to source & percentage underground in circuit
- 99% of all customers are located within 3.62 circuit miles from source
- Resiliency Point - Customers that have 90-100% of UG experienced about ½ of the outage restoration time (56 min vs. 105 min on average) compared to customers with a higher percentage of OH, possibly due to redundancy
- **Underground distribution does improve reliability & resiliency.**



# Overhead to Underground All Projects 2006 – 2024

- Discretionary Program  
18 miles (31%)
- Other OH-UG  
40 miles (69%)

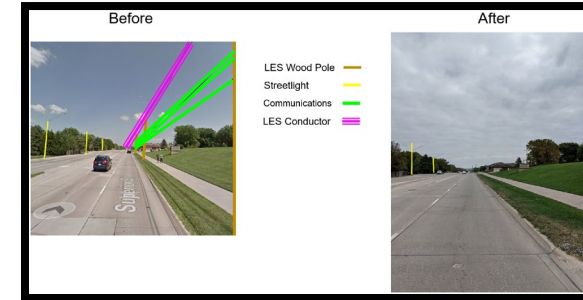


Take advantage of associated roadway, customer or other reliability projects to underground circuits

# Underground Program Toolbox Options



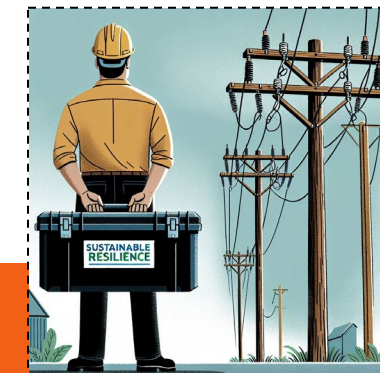
**1** Main arterial feeder **“Discretionary”** undergrounding



**2** **“Precision Undergrounding Program” (PUP)** is a targeting underground (UG) conversion program using reliability data analytics to identify candidates



**3** **“Sustainable Resilience”** is maximizing service to the City’s most critical support services through undergrounding, hardening or improved delivery automation that “dove-tails” the City’s Climate Action Plan



In development

# Underground Conversion Offerings?

1

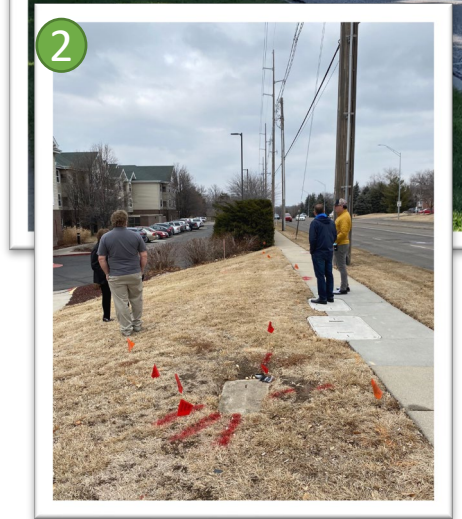
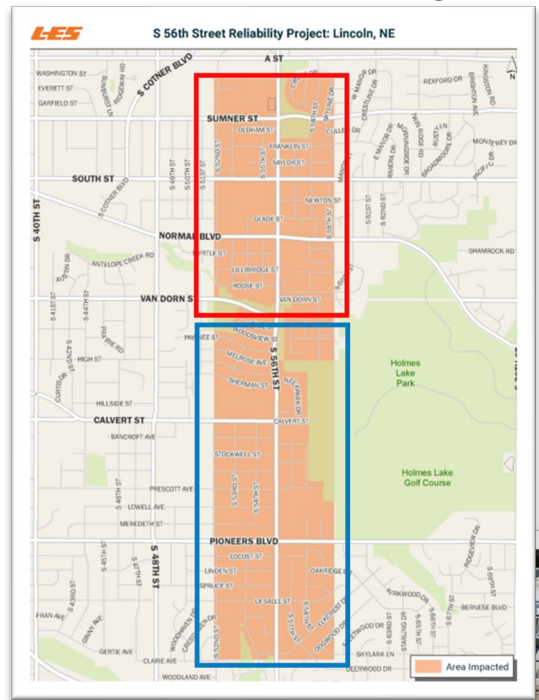
2

3

	Discretionary	PUP	Sustainable Resilience
Meets provision in the Lincoln-Lancaster County Comprehensive Plan to “within the City of Lincoln, wherever feasible and affordable, implement a phased program to relocate overhead utility lines underground.”	Yes	Yes	Yes
Project Identification & Scope Methodology	Roadway Design Standards, Coordination with City projects, Traffic Count, Aesthetics, Coordination with other utilities, Equity, Economic Considerations, Ease of construction	Historical outage & interruption data, feasibility review	Improving service to the City’s most critical support services through undergrounding, hardening or improved delivery automation that “dove-tails” the City’s Climate Action Plan
Aesthetic Factor	Yes	Partial	Partial
Joint trench participation	Required	Preferred	Preferred
Customer service conversion to UG	Limited	Required	Limited
Cost per circuit mile	\$1.3 – \$1.7 M	\$0.5 – \$0.9 M	\$0.5 – \$1.5 M
Historical Spend	\$24.0 M	\$0.5 M	-

# 2024 Project- 56<sup>th</sup>, Everett – Elkcrest

2024 Continued Progress...





# Discretionary Project Process

- Relative Value/Weighted Scales Attributes:
  - Roadway design standards (Arterial Only)
  - Condition of poles and conductor
  - Aesthetics/Traffic Counts
  - Pole line age/stranded assets
  - Vegetation management
  - Cost of conversion, “constructability”
  - Equity Component (Environmental Justice/Place Matters )
- Other Drivers:
  - Coordination with City or County projects
  - Construction economics of new UG facilities
  - Reduced line losses or thermal capacity upgrade
  - Levelized constraints (workforce and/or capital budget)

# Six Year Discretionary Portfolio Plan Costs

(Total Cost - Thousands of Dollars)

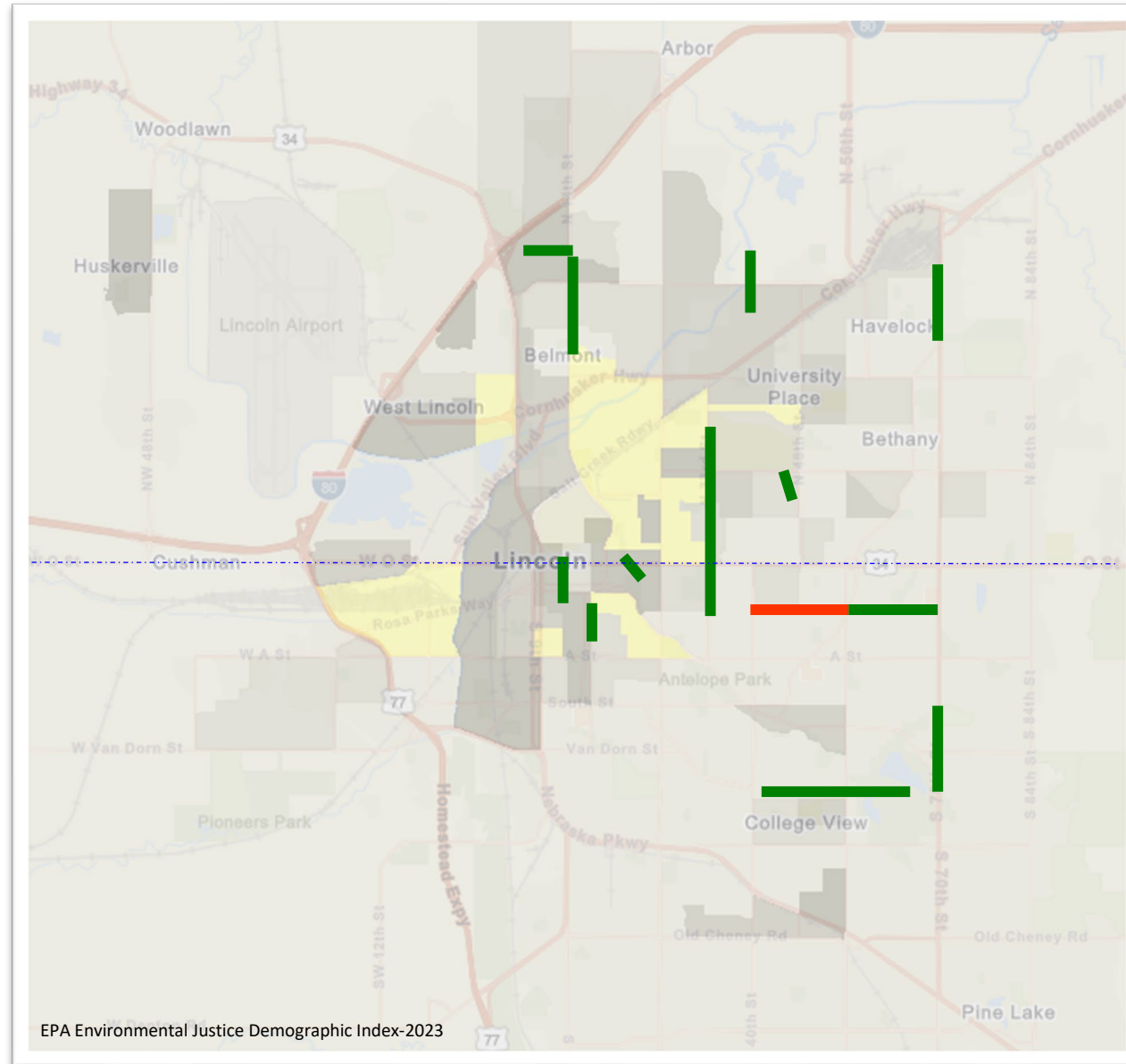
Year	Description	Cost	2025	2026	2027	2028	2029	2030
2025	Complete 56 <sup>th</sup> , Everett – Elkcrest	\$2	\$2					
2026	A St., 40 <sup>th</sup> – 68 <sup>th</sup>	\$2,100	\$1,250	\$850				
2026	70th, Van Dorn – Pioneers	\$1,272		\$1,272				
2026	13 <sup>th</sup> , E – C	\$20		\$20				
2026	Avery, 12 <sup>th</sup> -17 <sup>th</sup>	\$799		\$799				
2027	17 <sup>th</sup> , South – A	\$711	\$11		\$700			
2027	33 <sup>rd</sup> , O - Holdrege	\$1,632		\$83	\$1,549			
2027	A, 70 <sup>th</sup> – 84 <sup>th</sup>	\$957	\$28	\$28	\$901			
2027	Superior, 7th - 13th	\$554			\$554			
	**** Potential List of Future Projects ****					\$1,500	\$1,500	\$1,500
2028	56th, Garland - Q	\$0						
2028	33 <sup>rd</sup> , Everett - Pioneers	\$0						
2028	4 <sup>th</sup> , D - Lee - Woodland	\$0						
2028	1 <sup>st</sup> , E - S - O	\$0						
2029	14 <sup>th</sup> , Adams - Cornhusker	\$0						
2029	16 <sup>th</sup> , E - G	\$0						
2029	Capital Pkwy, 21 <sup>st</sup> - J	\$0						
2029	98th, A - Q	\$0						
2029	Adams, 14th - Cornhusker	\$0						
2029	33 <sup>rd</sup> , Smith - High	\$0						
2030	40th, Superior - Cornhusker	\$0						
2030	56th, Q - Everett	\$0						
	<b>Totals</b>	<b>\$8,047</b>	<b>\$1,291</b>	<b>\$3,052</b>	<b>\$3,704</b>	<b>\$1,500</b>	<b>\$1,500</b>	<b>\$1,500</b>

Reprioritize

# Proposed Projects Inclusion

2025 —

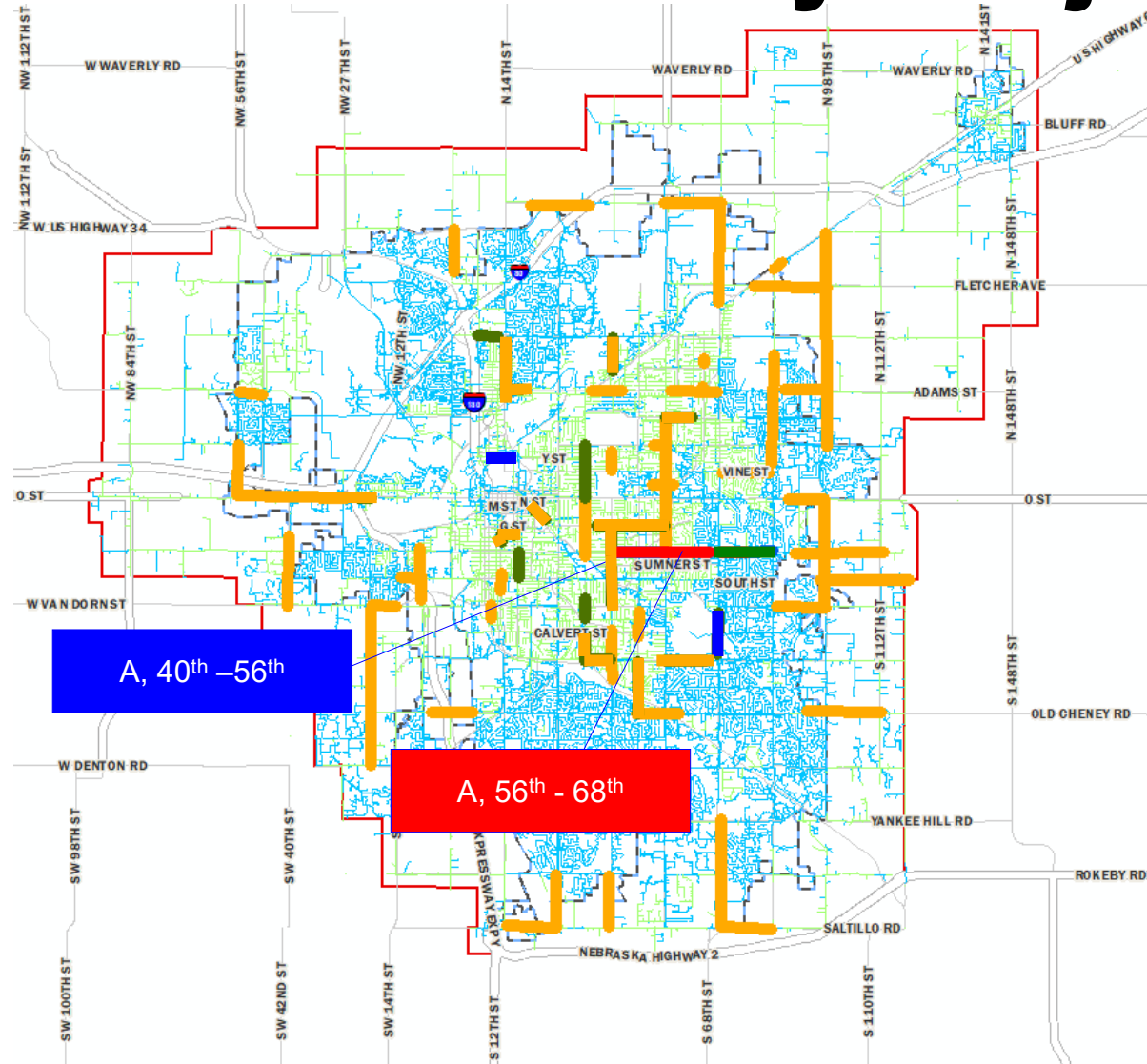
2026-2028 —



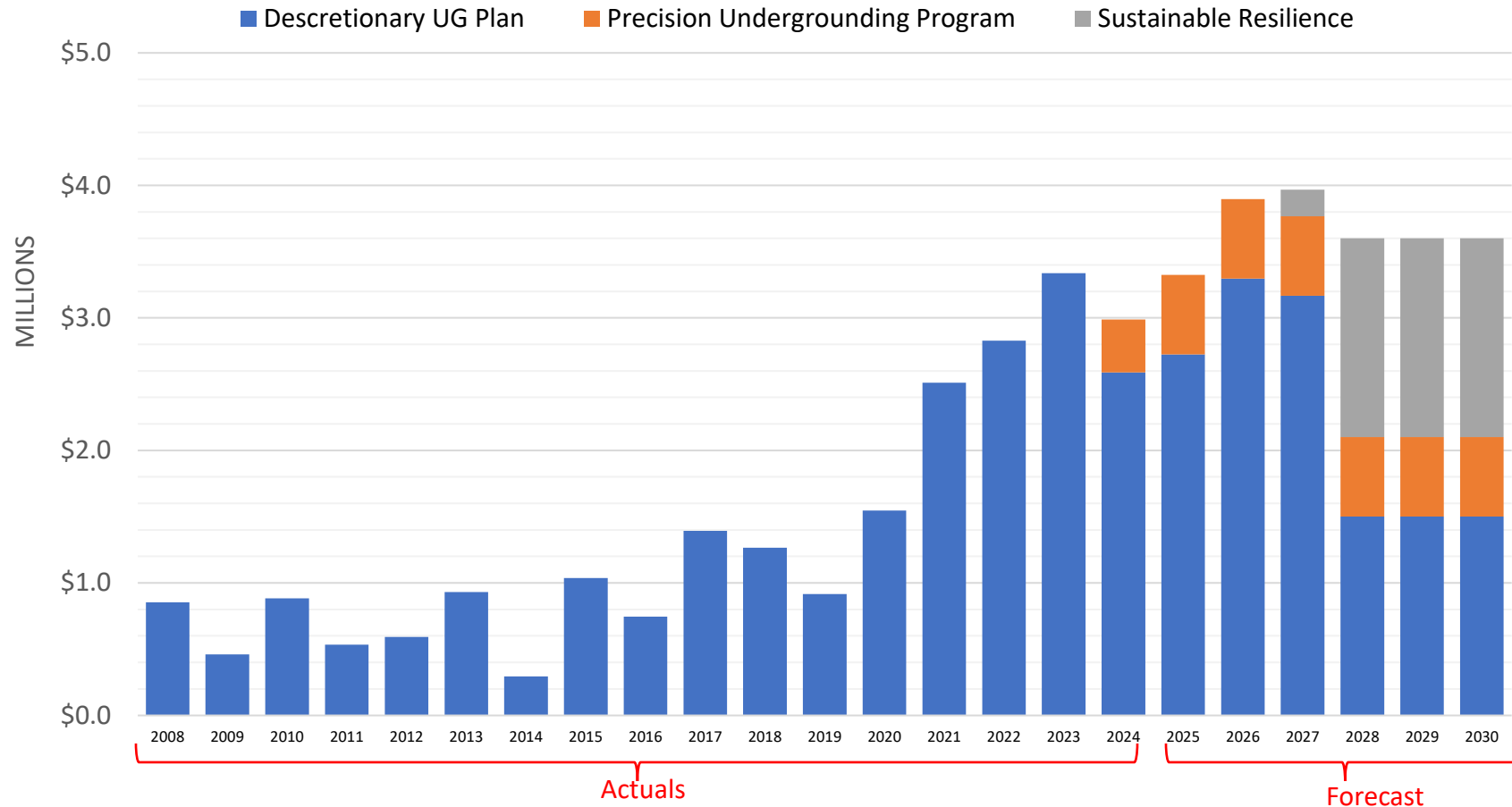
**Demographic Index** is based on the average of two socioeconomic indicators; low-income and people of color.

# 2024-2030 Discretionary Projects

- Overhead Lines —
- Underground Lines —
- Remaining Eligible Discretionary Lines —
- 2025 —
- 2026 —
- 2027- —



# Distribution Overhead to Underground Discretionary Spending



# Underground/Hardening Plan Summary

- Discretionary program
  - Consistent with Lincoln Comprehensive Plan
  - 19+ years ~\$24M to date on 18 miles distribution feeders
  - Project identification drivers use both qualitative & quantitative data
  - Project selection affects other “attached” utilities and should be beneficial to LES and LES’ Customers
  - Reprioritize beyond 2028
- Continue Precision Undergrounding Program
- Develop Sustainable Resilience Program to optimize City wide services
- Maintain underground/hardening project spend ~\$2.5-3.5M per year

Specific Project  
Photo's to  
follow, as  
needed



# An Example: 84<sup>th</sup> Street, Pinedale - Vine

Before



- LES Wood Pole ———
- Streetlight ———
- Communications ———
- LES Conductor ———

After

