

Final Presentation

Utility Evaluation and Replacement

Makenna Schneider, Nicole Barcenas, Reggie Porter

April 29, 2026

Our Team



Makenna Schneider
Project Manager



Reggie Porter
Design Engineer



Nicole Barcenas
Design Engineer



Paul Hanley
Faculty Advisor

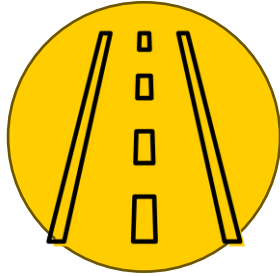
Summary



Intro



Multi-Utility
Decision
Analysis
Overview



Existing Site
Conditions



Site Selection
& Design



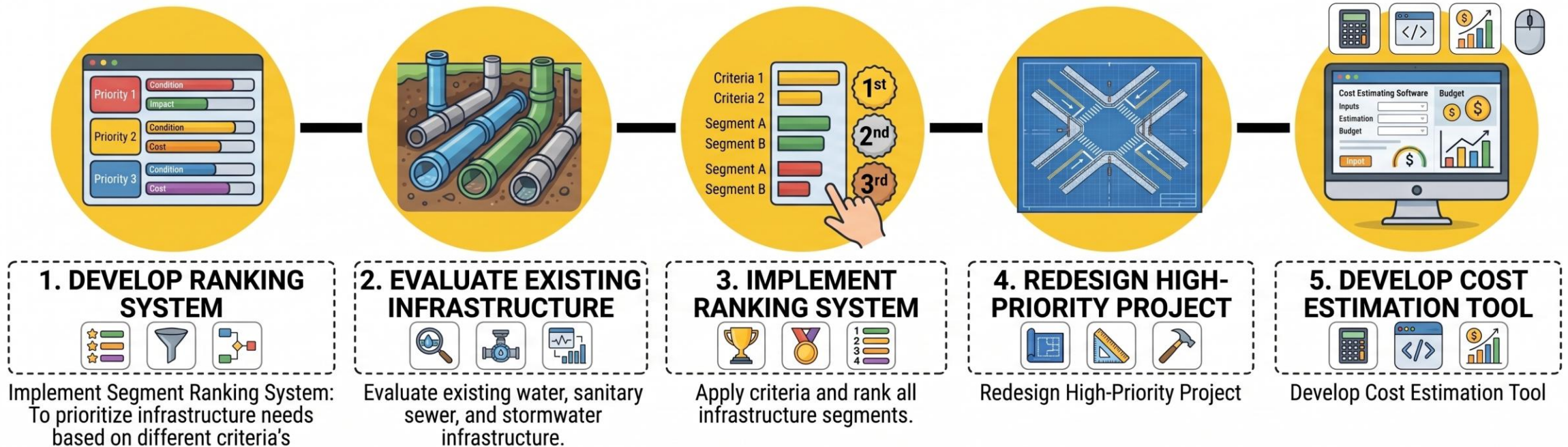
Challenges



Utility Cost Tool
and Overall Cost

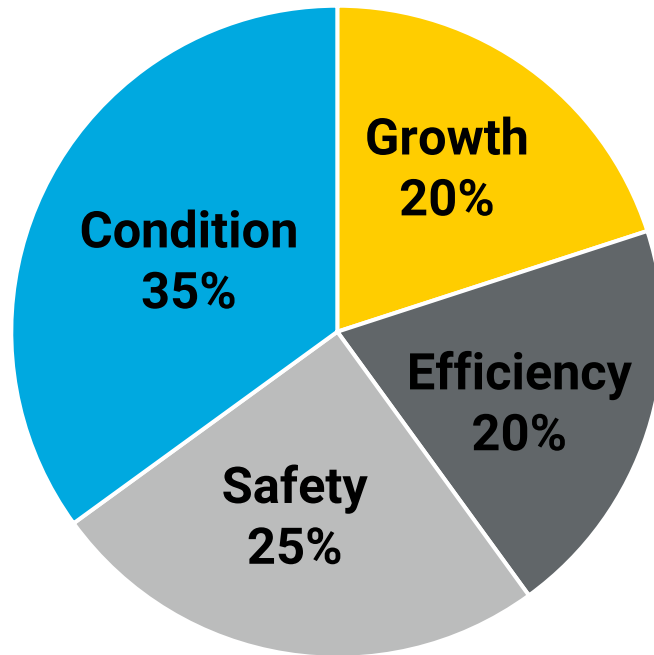
Project Objectives

INFRASTRUCTURE OPTIMIZATION PROCESS



Multi-Utility Decision Analysis

Utility Scoring



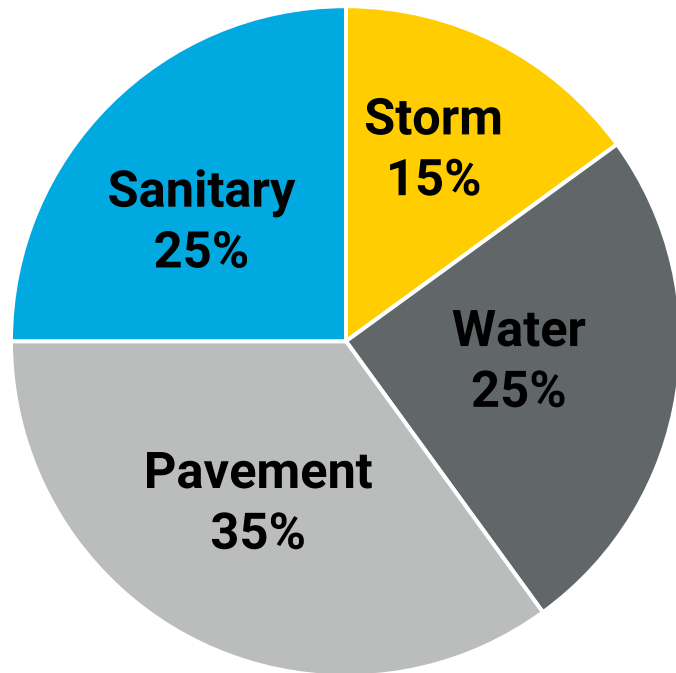
Criteria Weights

Condition	5 (Critical)	3 (Fair)	1 (Good)
Road	PCI < 40, deep rutting, extensive potholes	PCI 55-70, routine maintenance failing	PCI > 90, smooth surface, no visible distress
Water	Pipe > 80 years, history of >3 breaks/mile/per	Aging but functional, routine maintenance effective	No break history, new installation
Storm	Corrugated metal pipe, collapsed culverts causing sinkholes	Aging basin, moderate vegetation	Pipe material in stable condition
Sanitary	Root intrusion, severely corroded pipe	Aging but functional, moderate structural defects	New pipe material, no signs of wear

1,3,5 Criteria Scoring

Multi- Utility Decision Analysis

Weighing and Asset Condition

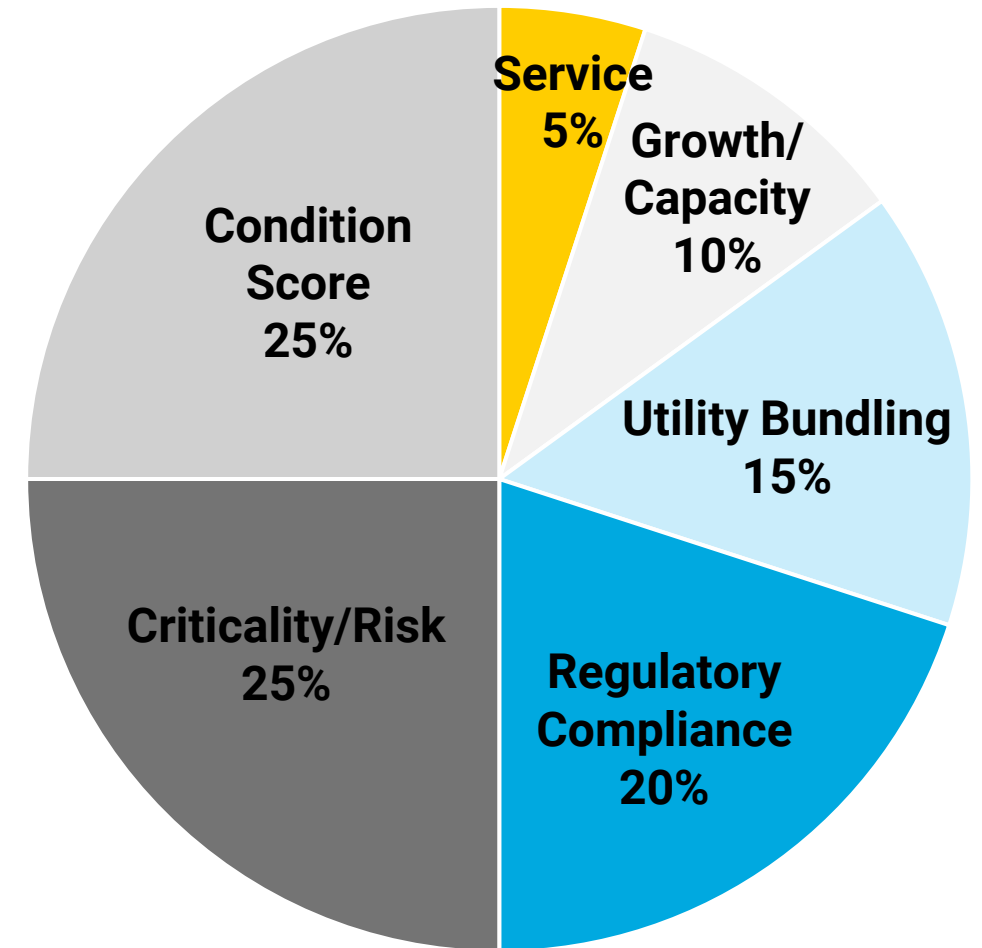


Asset Weights

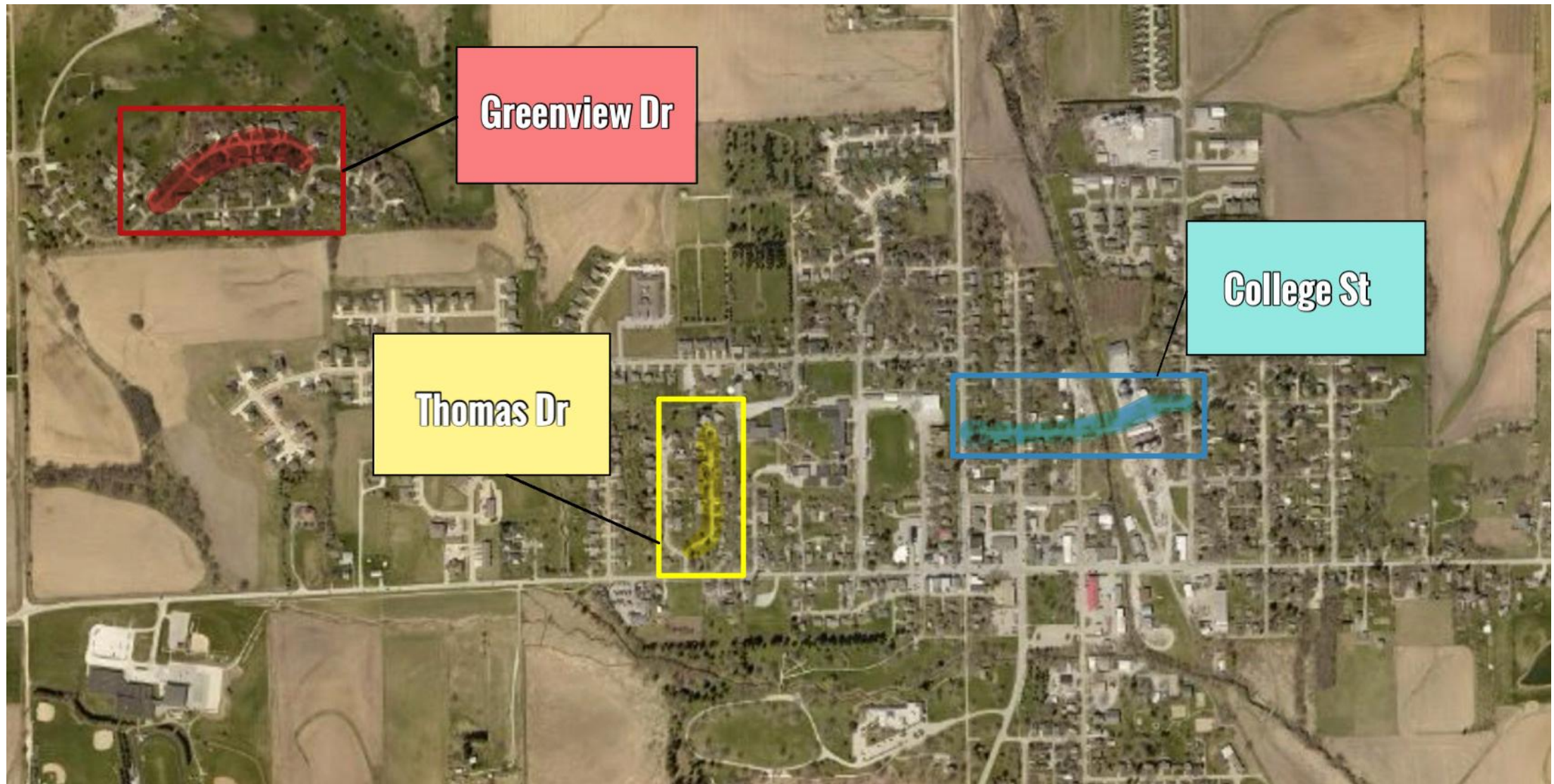


Multi- Utility Decision Analysis (Corridor Bundling)

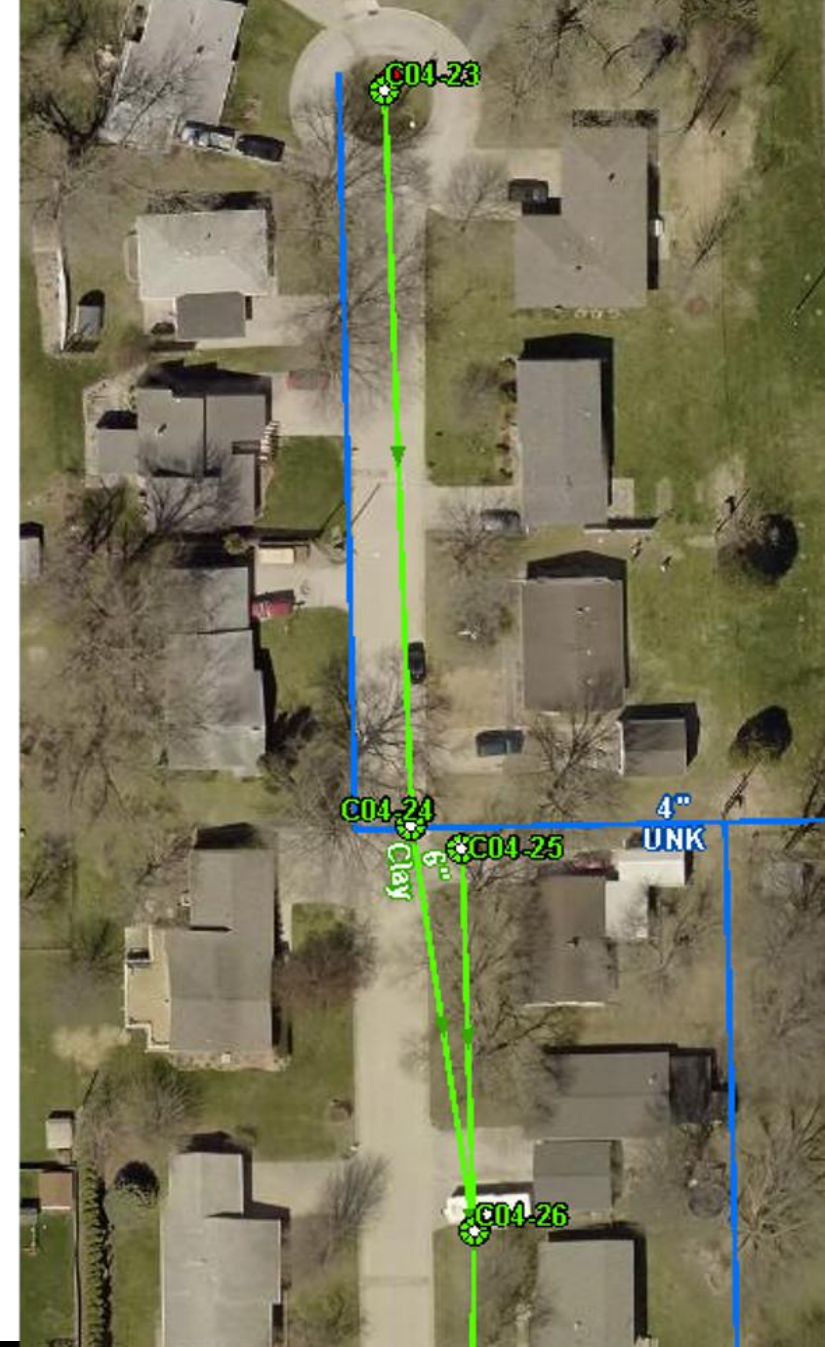
Criteria	5 (Critical)	3 (Fair)	1 (Good)
Asset Condition	Failing / >80 yrs	Moderate / 40-60 yrs	New / Zero Defects
Criticality/Risk	Schools & Downtown	Residential Block	Isolated / Vacant
Synergy	Triple Bundle	Dual Bundle	Isolated Fix
Growth	Immediate Need	Future (5-10 yr)	20-yr Capacity



Criteria Weights



Existing Sites- Thomas Drive



Thomas Drive Utility Scoring

Water				
Criteria	Condition	Safety	Efficiency	Growth
Thomas Dr	1	3	3	3

Sanitary				
Criteria	Condition	Safety	Efficiency	Growth
Thomas Dr	3	3	3	3

Road				
Criteria	Condition	Safety	Efficiency	Growth
Thomas Dr	3	3	3	3

Utility Score			
Utility	Road	Sanitary	Water
Thomas Dr	3	3	2

Existing Sites- College Street



College Street Utility Scoring

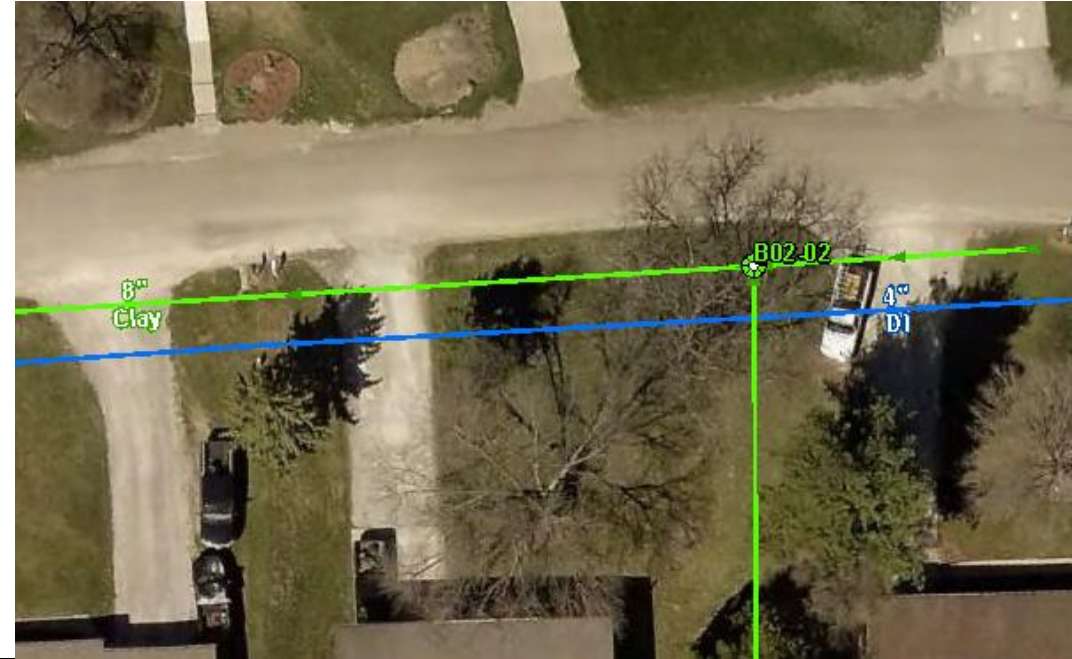
Water				
Criteria	Condition	Safety	Efficiency	Growth
College St	1	1	1	1

Sanitary				
Criteria	Condition	Safety	Efficiency	Growth
College St	3	3	3	3

Road				
Criteria	Condition	Safety	Efficiency	Growth
College St	3	3	3	3

Utility Score			
Utility	Road	Sanitary	Water
College St	3	3	1

Existing Sites- Greenview Dr.



Greenview Dr. Utility Scoring

Water				
Criteria	Condition	Safety	Efficiency	Growth
Greenview Dr	5	5	3	3

Sanitary				
Criteria	Condition	Safety	Efficiency	Growth
Greenview Dr	5	5	3	3

Road				
Criteria	Condition	Safety	Efficiency	Growth
Greenview Dr	5	3	3	3

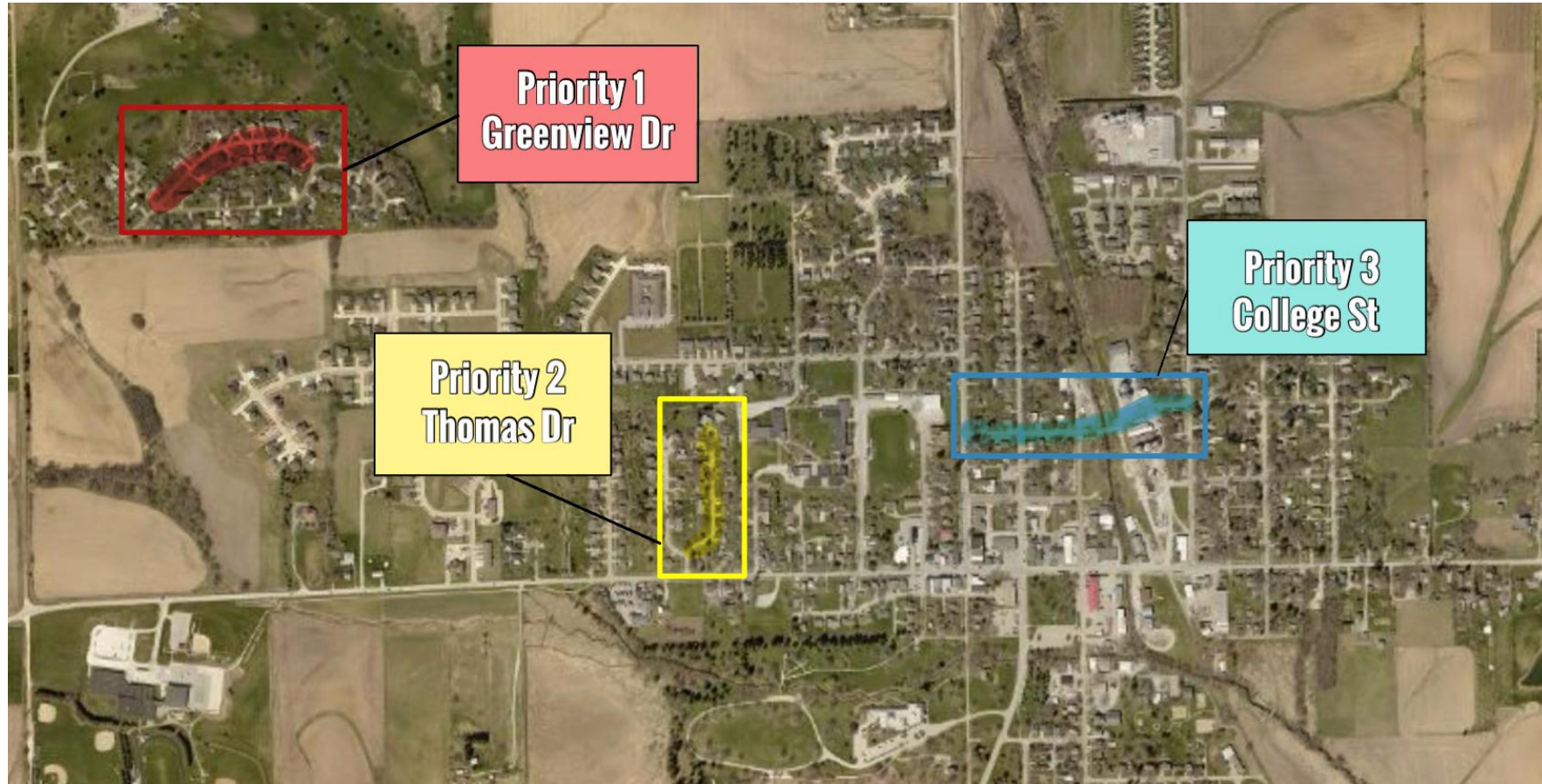
Utility Score			
Utility	Road	Sanitary	Water
Greenview Dr	3	4	4

Multi- Utility Decision Analysis (All Together)

Street Name	Overall Asset Condition
Thomas Dr.	2.3
Greenview Dr.	3.05
College St.	2.05

Street Name	Asset Condition Score	Criticality (1-5)	Regulatory (1,3,5)	Growth (1,3,5)	Utility Bundling (1,3,5)	Final Bundling (1,3,5)
Thomas Dr.	2.3	4	3	2	5	3.07
Greenview Dr.	3.05	5	1	3	2	3.12
College St.	2.05	2	2	4	3	2.32

Project Priority

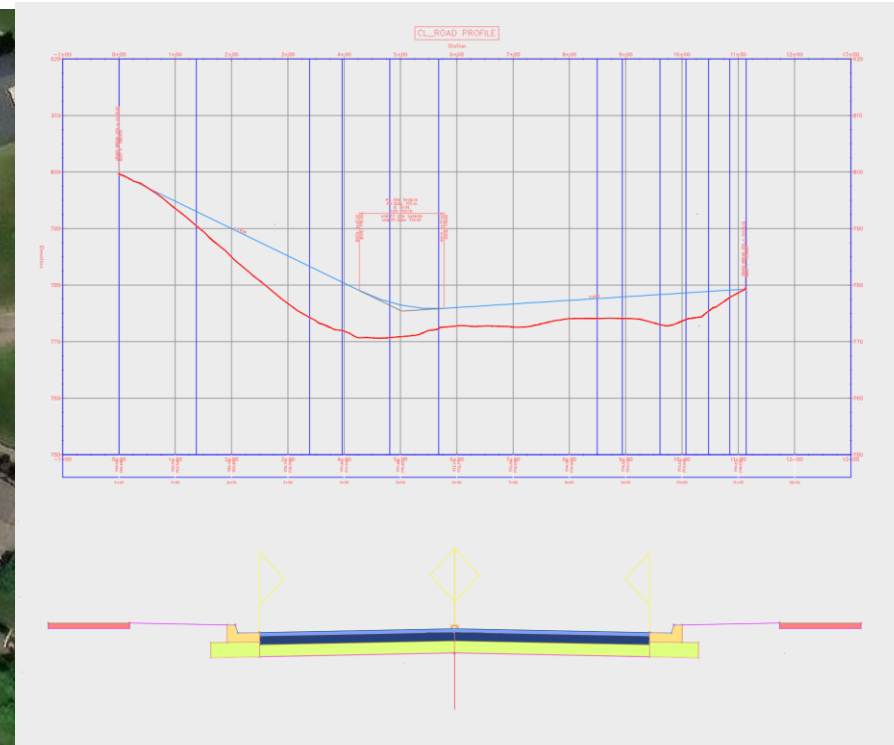


Greenview Design - Curb, Gutter, and Street

 Street Design



Street Profile



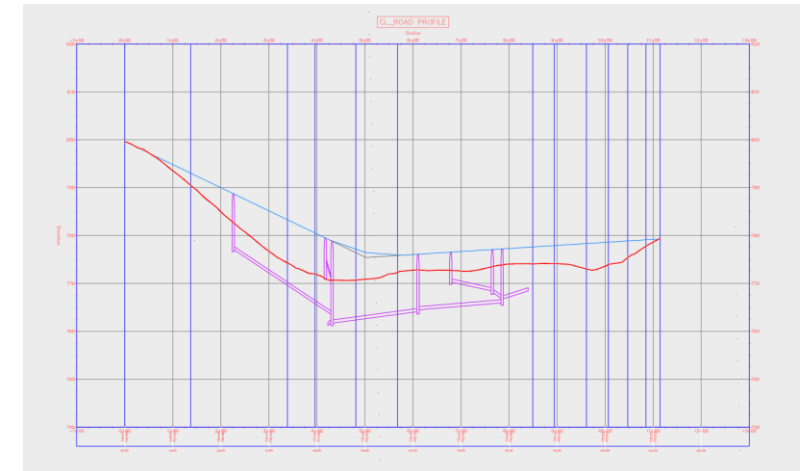
Cross Section

Greenview Design - Sanitary Sewer Main

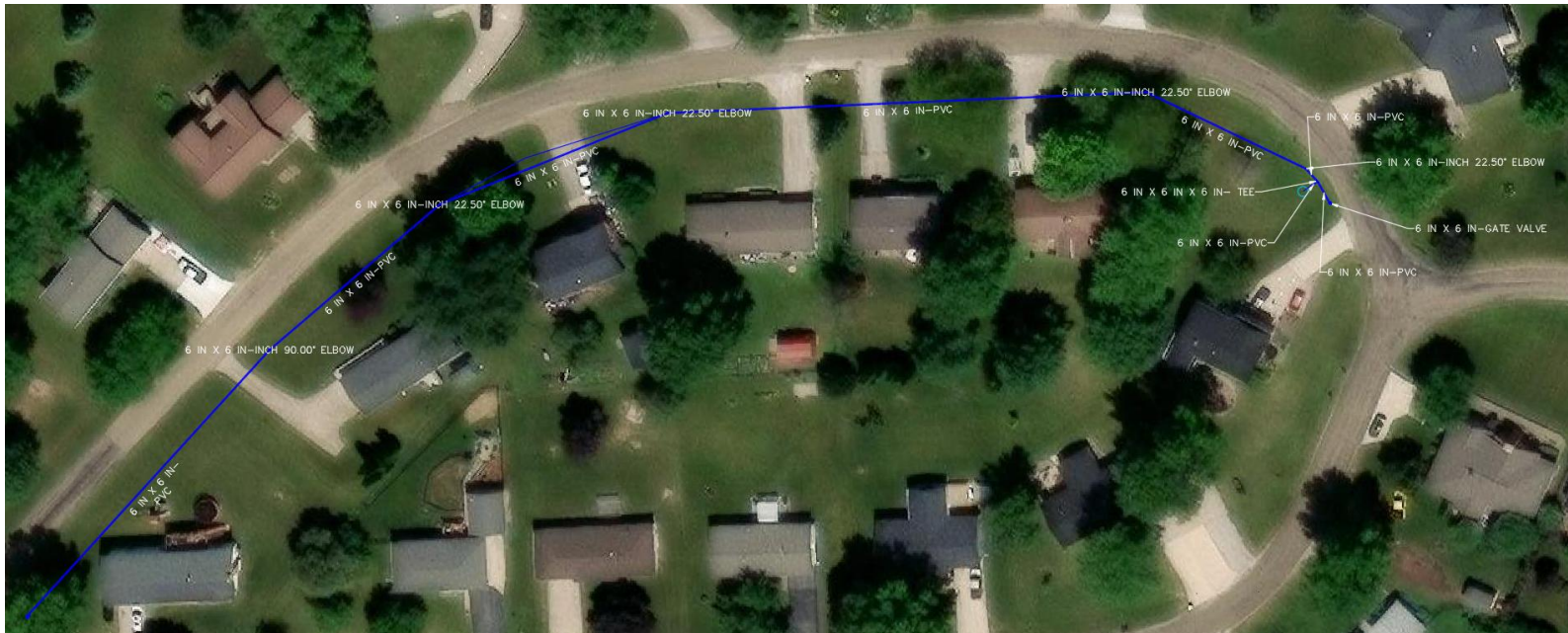
Sanitary Sewer Design



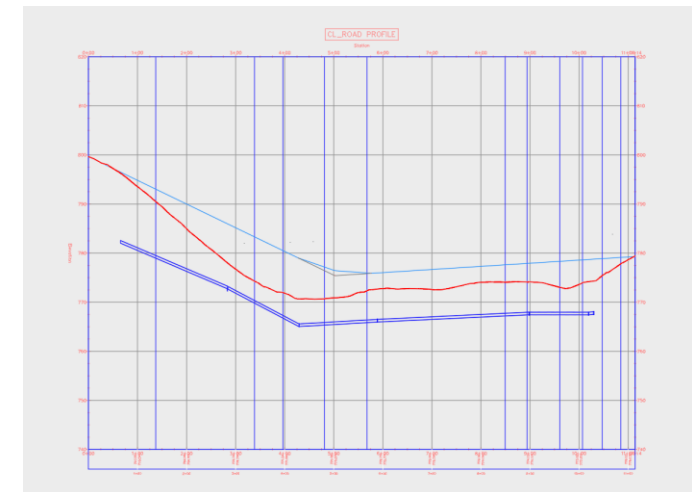
Sanitary Sewer Profile



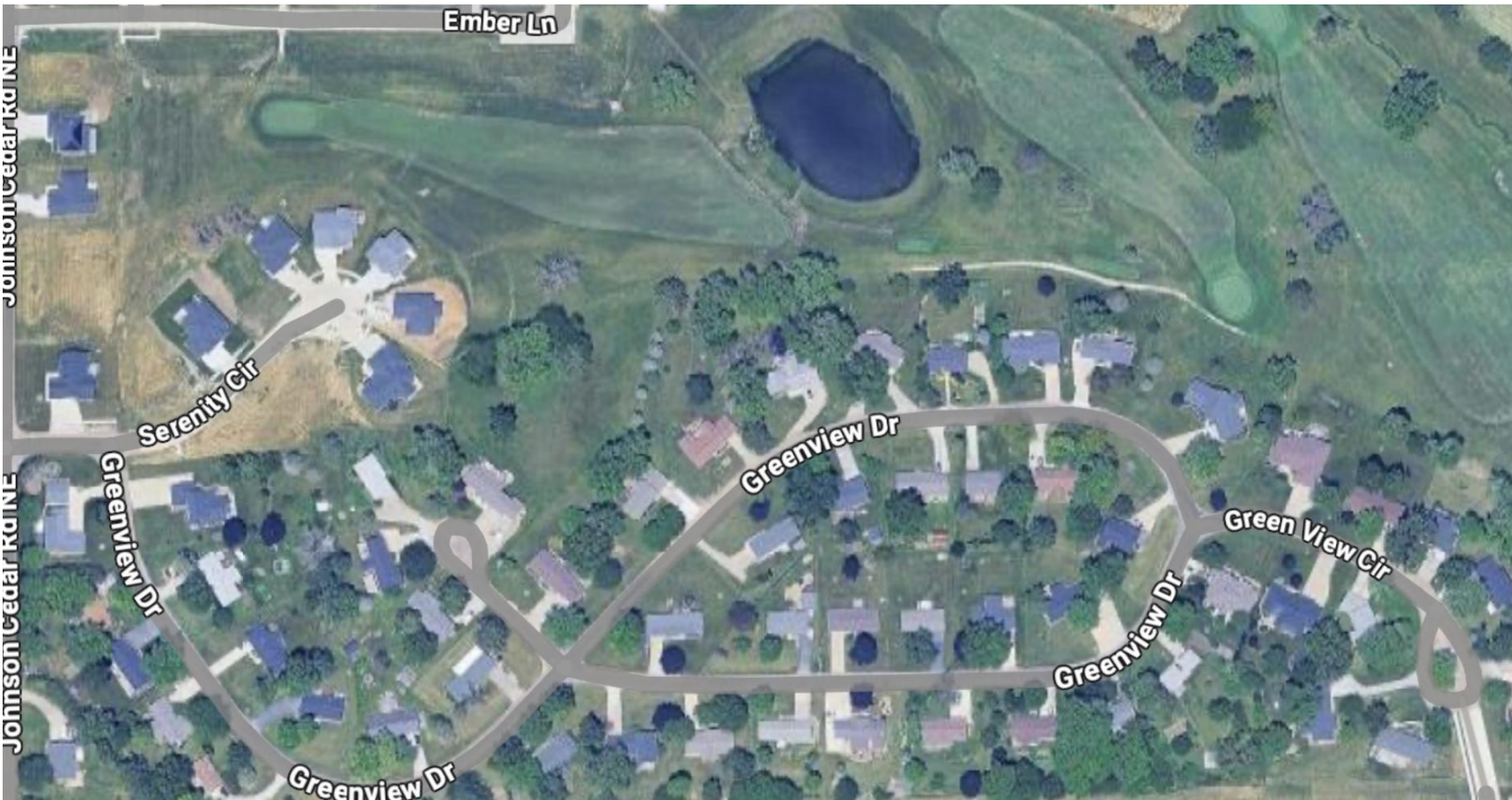
Water Main Design



Water Main Profile



Challenges



- Storm Sewer
- Limited CCTV Footage/ Historical data

Utility Cost Tool

Wet Utilities	Pipe Material	Length of Pipe Needed (ft)	Cost
Water Main Pipe Diameter (in)	Pipe Material	Length of Pipe Needed (ft)	Calculated Cost
6	PVC	940	14100
Sanitary Sewer Pipe Diameter (in)	Pipe Material	Length of Pipe Needed (ft)	Calculated Cost
8	PVC	1100	17930
Storm Sewer Pipe Diameter (in)	Pipe Material	Length of Pipe Needed (ft)	Calculated Cost
12	RCP	800	11760

Water Main Pipe Diameter (in)
6
6
8
12
14
16
19

Pipe Material
PVC
Ductile Iron
PVC

Utility Cost Tool Cont.

Pavement (HMA)							
Length of Road (ft)	Width of Road (ft)	Base Course (in)	Binder Coarse (in)	Wearing Coarse (in)	Prime Coat (in)	Tack Coat	Calculated Cost
1115	24	6	4	3	\$ 3.80	\$ 1.90	\$ 163,830.67

Pavement (PCC)					
Slip Form					
Length of Road (ft)	Width of Road (ft)	Base Course (in)	Form (in)	Reinforcing Steel (lb)	Calculated Cost
1115	24	6	8	12	\$ 231,920.00
Fixed Form					
1115	24	6	8	12	\$ 243,813.33

Curb & Gutter	
Length of Road (ft)	Calculated Cost
1130	\$ 45,200.00
1130	\$ 45,200.00

Cost Estimate

Type	Material	Cost
Water Main	6" PVC	\$97,844
Sanitary	8" PVC	\$166,820
Street	1,130' HMA	\$385,135
Engineering Fee	5%	\$32,400
Contingency	25%	\$162,450
Total Cost		\$850,000