TRWD Asset Management

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trwd Tarrant Regional Water District

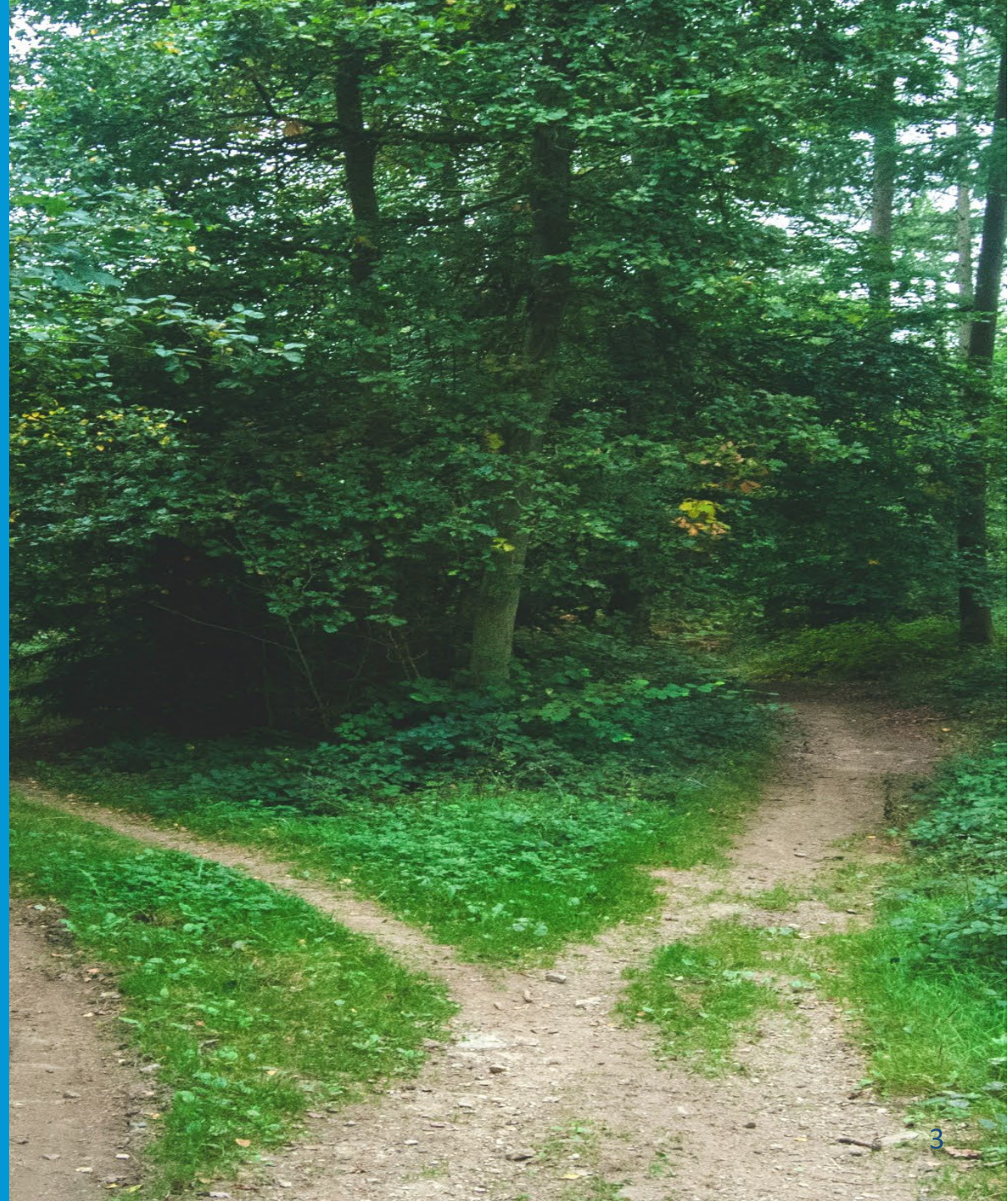
Agenda

- Overview of TRWD System and the Asset Management Program
- Vertical Assets
- Horizontal Assets
- Creating a 3D Visualization of Assets

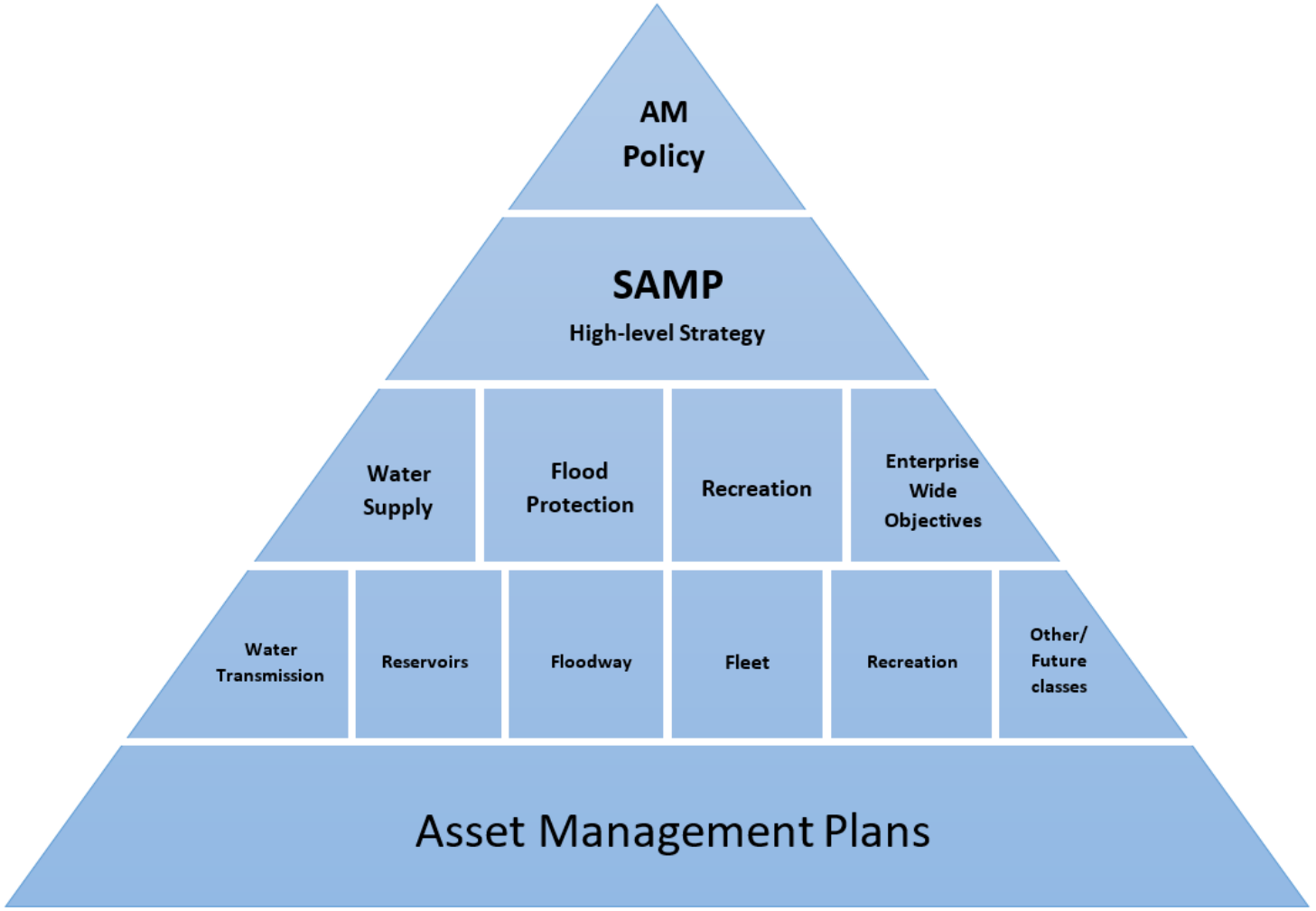
Bridgeport Reservoir
Eagle Mountain Reservoir
Eagle Mountain Balancing Reservoir
Benbrook Pump Station
Benbrook Lake
Kennedale Balancing Reservoir
Rolling Hills Pump Station
Joe Pool Lake
Waxahachie Pump Station
Ennis Pump Station
Midlothian Balancing Reservoir
JB3 Pump Station
Cedar Creek Reservoir
Cedar Creek Lake Pump Station
Lake Palestine
Richland Chambers Lake Pump Station
Richland Chambers Reservoir
Dallas
Fort Worth
Lake Whitney

TRWD's Asset Management Journey

- Top-down decision made in 2014
- Two years into the program – still resistance from groups
- Bottom-up approach started – supervisors wrote the criteria and drove condition assessment efforts
- Data was analyzed to show how it would be leveraged to inform budgeting decisions
- The program was aligned with our Strategic Plan
- Expansion to other asset classes – achieve some successes instead of trying to "boil the ocean"



Aligning Asset Management with Your Strategic Plan



VISION

MISSION

TENETS

2020-2022 Strategic Objectives

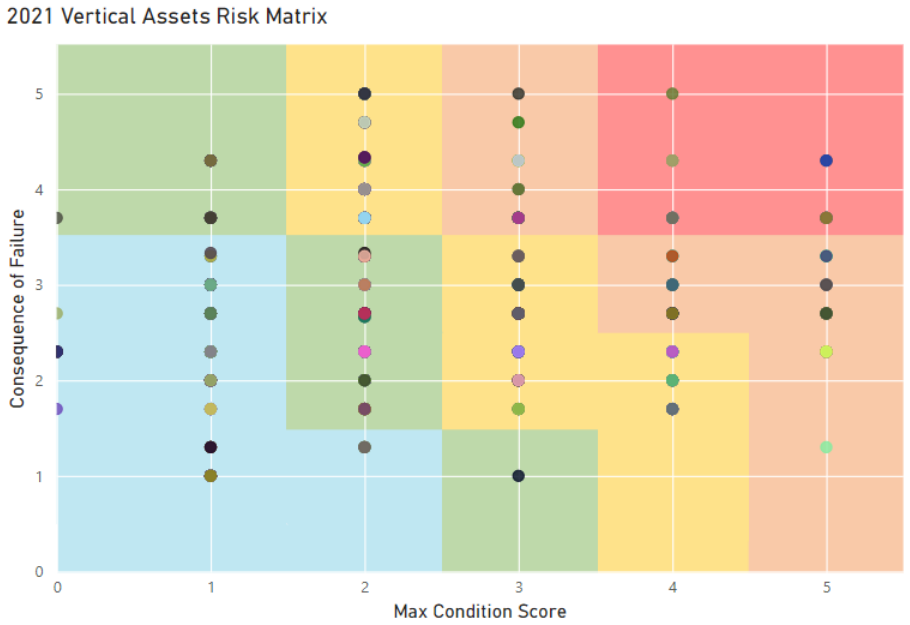
TACTICS

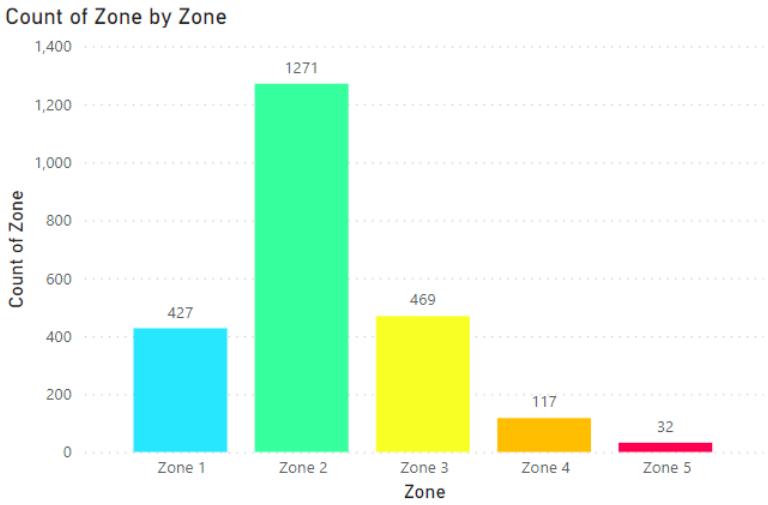
Vertical Water Transmission Assets

Key Aspects of Vertical WT Asset Management

- Create a consistent approach to assess the condition of all critical assets on an annual basis
- Evaluate the consequence of failure in conjunction with condition to determine a risk score for every critical asset
- Analyze yearly results to justify replacement or refurbishments to be included into annual budgets or capital improvement projects
- Calculate remaining useful life based on current condition to plan out future replacements and major maintenance

How we analyze risk





assetnum	description	Count of Max of numvalue	Count of TRWD_COF_AVGSCORE
11023	ACTUA,ACTUA,ELECT, AUMA, 2SA7053-9DE20-4BA4Z, 6302203500102, BF0-0007, S1X10	1	1
11025	ACTUA,ACTUA,ELECT, AUMA, 2SA7053-9DE20-4BAQ4-Z, 6302203300102, BFO0006, S1X10	1	1
12760	ACTUA,ACTUA,ELECT, EIM, DCFA-3, 112130D01, BBO	1	1
12758	ACTUA,ACTUA,ELECT, EIM, DCMA-3, 11213A01, BBO	1	1
12759	ACTUA,ACTUA,ELECT, EIM, DDGA-3, 112130C01, BBO	1	1
Total		**2303**	**2316**

Facility
- Select all
- (Blank)
- AO1
- BB1
- BB2
- BO1
- CC1
- CC2
- CC3
- CFO
- EMBR

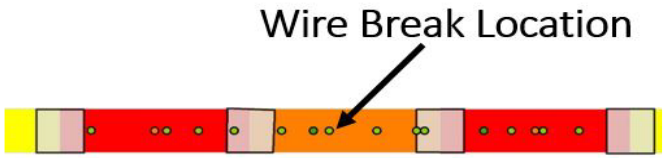
Asset Group
- Select all
- Electrical
- HVAC
- Mechanical
- Process Structures
- Structures
- Valve

Asset Class
- Select all
- Aeration System
- Air Compressor
- Air Handling Unit
- Air Valve
- Alarm System
- Bridge
- Building
- Capacitor
- Central A/C Unit an...
- Charger

Horizontal Assets

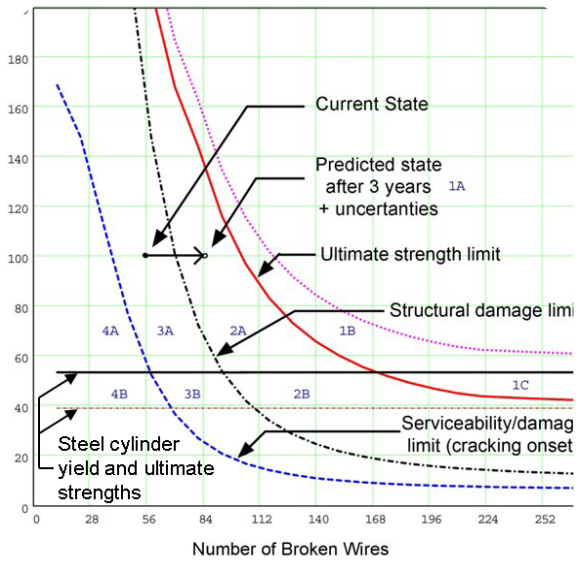
TRWD Asset Management Goals for the Pipeline System

- Determine the current state of the system and how reliable it is at this time.
- Keep a history of all issues, repair data, and catastrophic failures.
- Use a risk based approach with consequences incorporated to determine pipeline maintenance activities. (Structural Evaluation and New Century Software, GIS tools).
- Use a 3 to 5 year horizon for expected pipeline inspections and replacements.
- Provide long-term vision and facilitate planning/budgeting. This is reflected in TRWD's Capital Improvement Program.



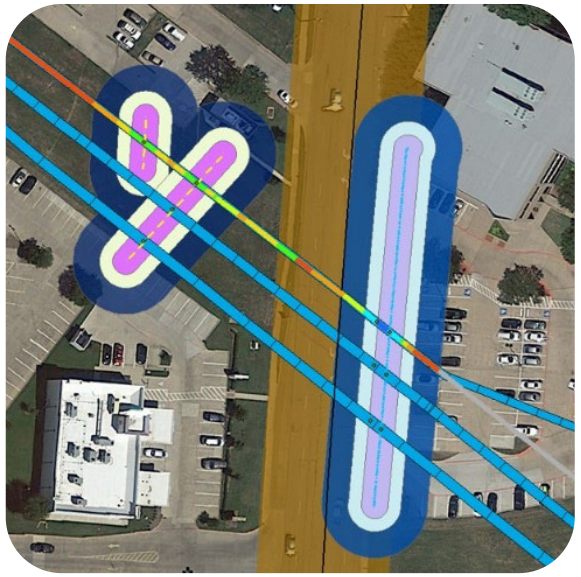
Electromagnetic Inspection Data

- 1999-2022



Structural Evaluation

- Two different evaluations - Corrosion and Hydrogen Embrittlement



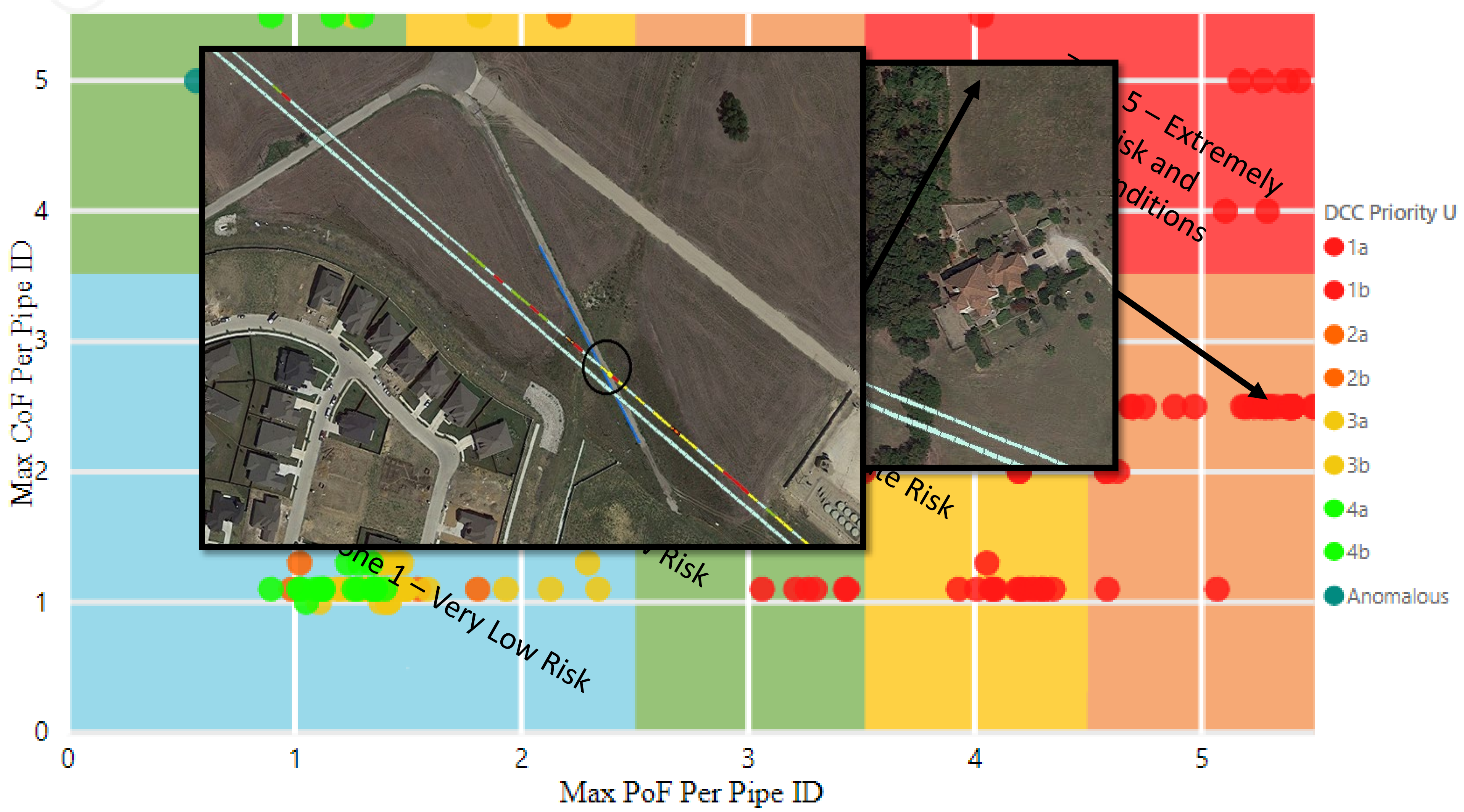
Risk Modeling

- PoF x CoF

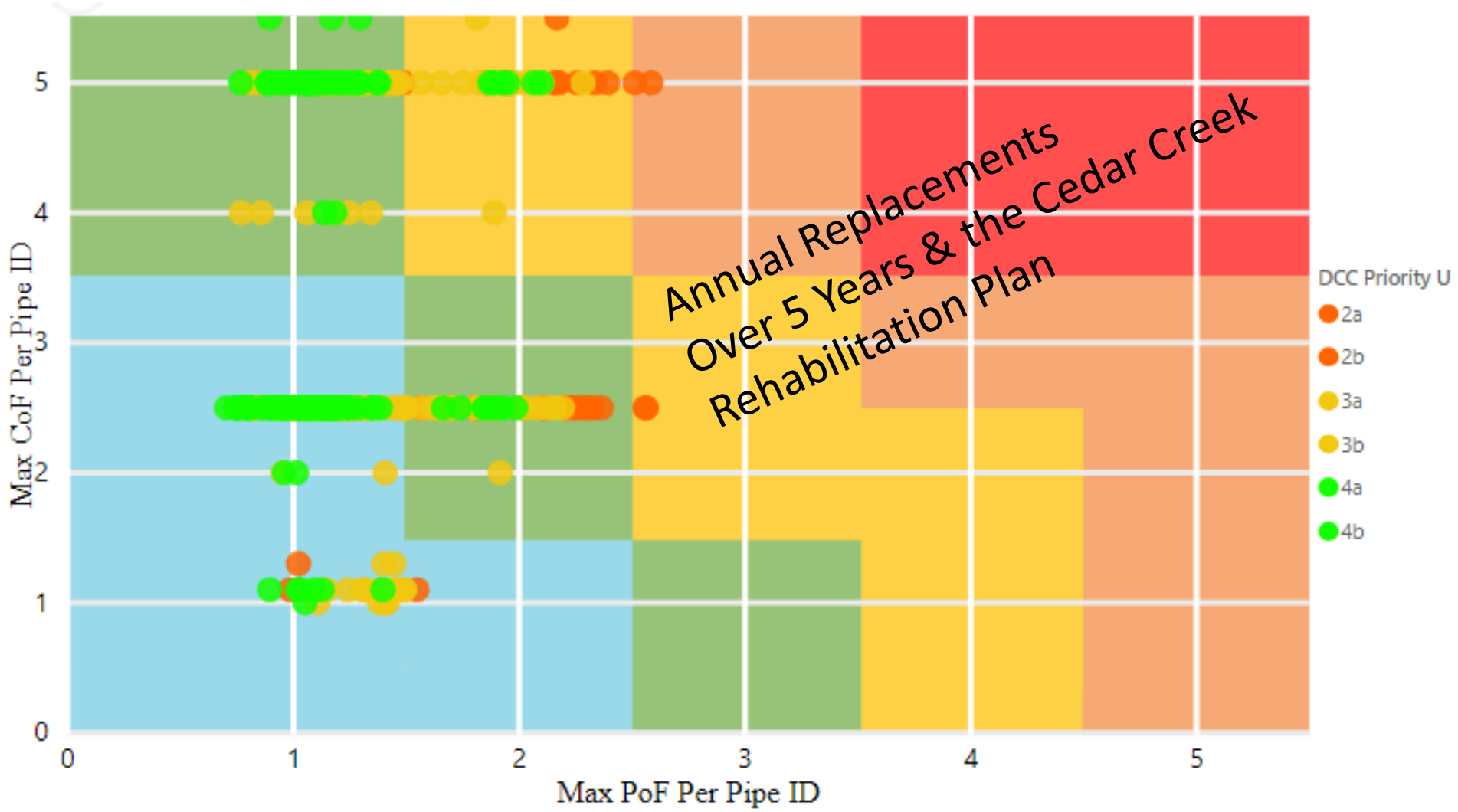
Risk Model Scoring (PoF x CoF)

- Structural Evaluation Tool Repair Priority + Repair Priority Index
- Proximity to High Priority Pipes
- High Pressure Areas
- Inspection Age Score
- Proximity to Past Failures or Damage
- Defect Distance Score

- Accessibility
- Damage to Property
- Damage to Utilities
- Disruption to Traffic
- Disruption to Railroad



Max CoF Per Pipe ID
Max PoF Per Pipe ID
0
1
2
3
4
5
DCC Priority U
1a
1b
2a
2b
3a
3b
4a
4b
Anomalous
5 – Extremely
isk and
nditions
te Risk
Risk
ne 1 – Very Low Risk

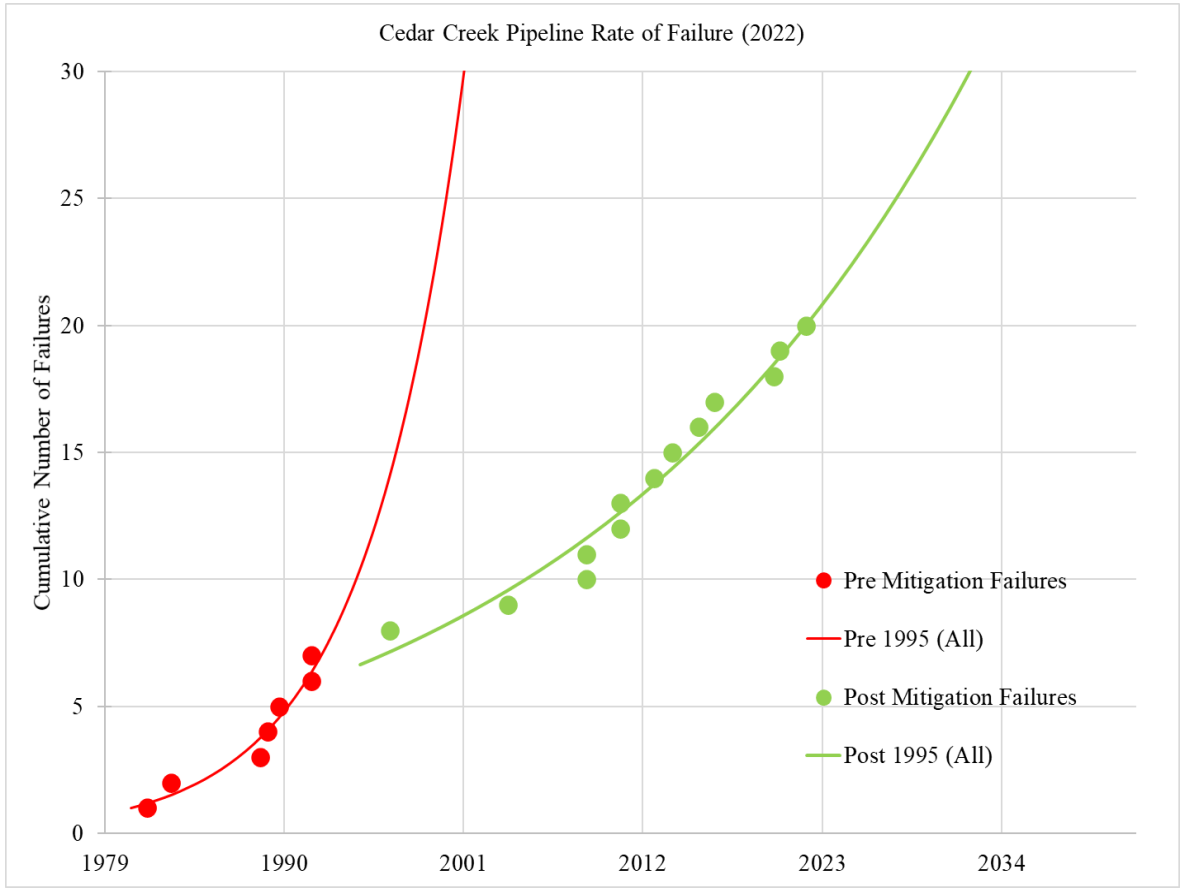

Annual Replacements
Over 5 Years & the Cedar Creek
Rehabilitation Plan
Max CoF Per Pipe ID
Max PoF Per Pipe ID
0
1
2
3
4
5
DCC Priority U
2a
2b
3a
3b
4a
4b

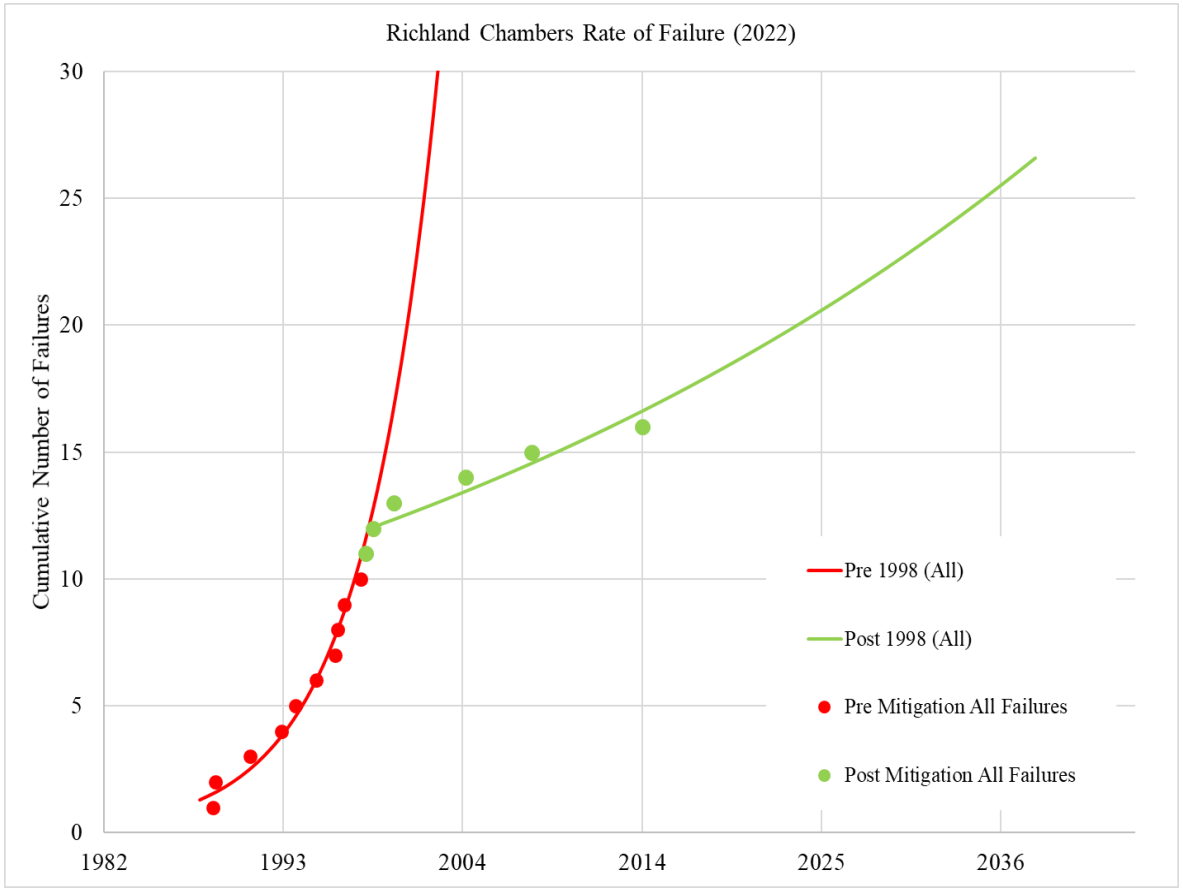
Horizontal Assets
Four Paths for Mitigation on the Transmission System

- Risk-based Prioritization and Replacement/Rehab of Individual PCCP Segments of Pipe
- Cathodic Protection System
- Hydraulic Pressure Transients Reduction (Pump Control Valve Closing Times)
- Pipeline protection measures from external loads & other 3rd Party Damage (Dig Tess and Texas 811)

Mitigation costs have been approximately 4% of replacement costs.

Pipeline Integrity Program Impact





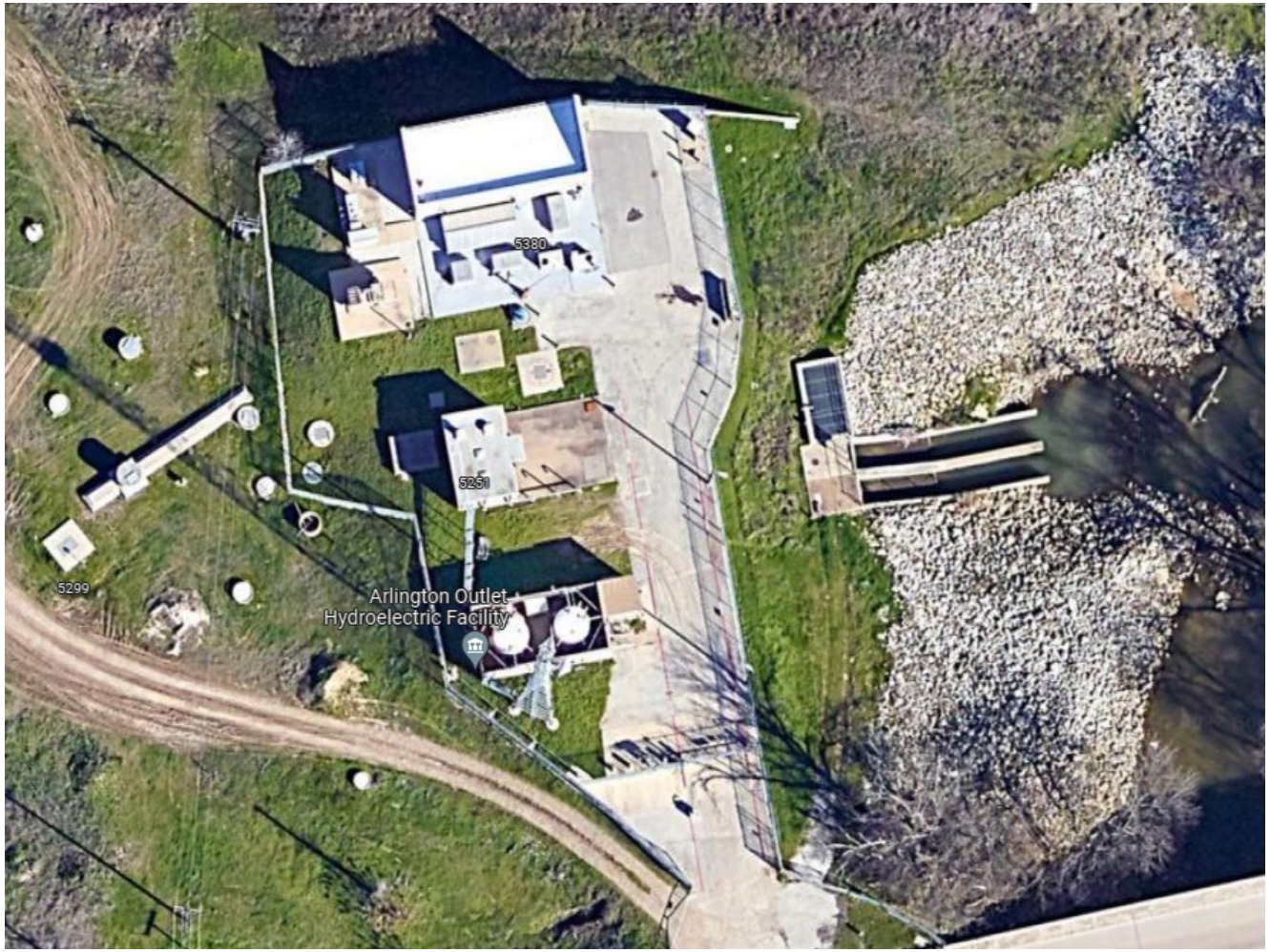
Creating a 3D Visualization of Vertical and Horizontal Assets

Why?

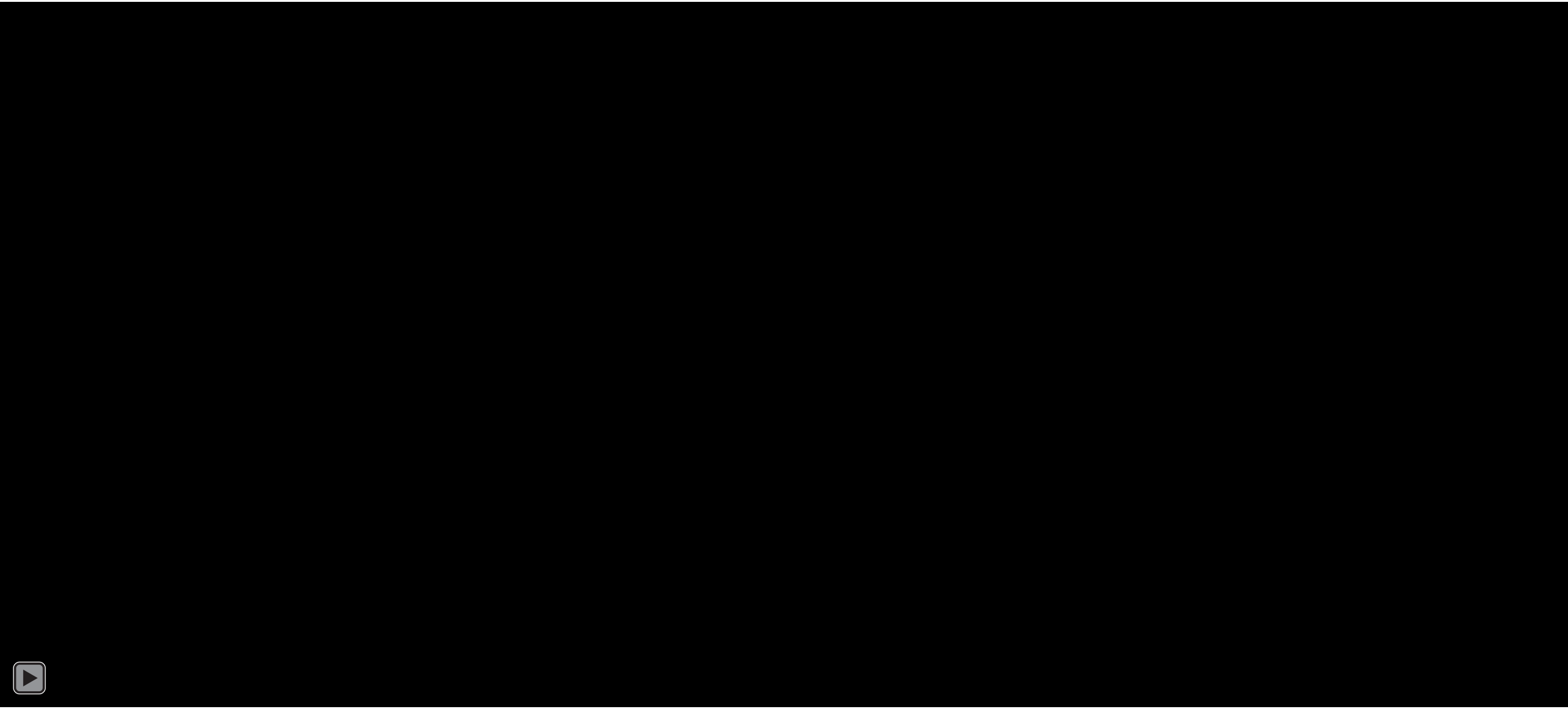
To provide context to 2D assets that allows for better decision making.

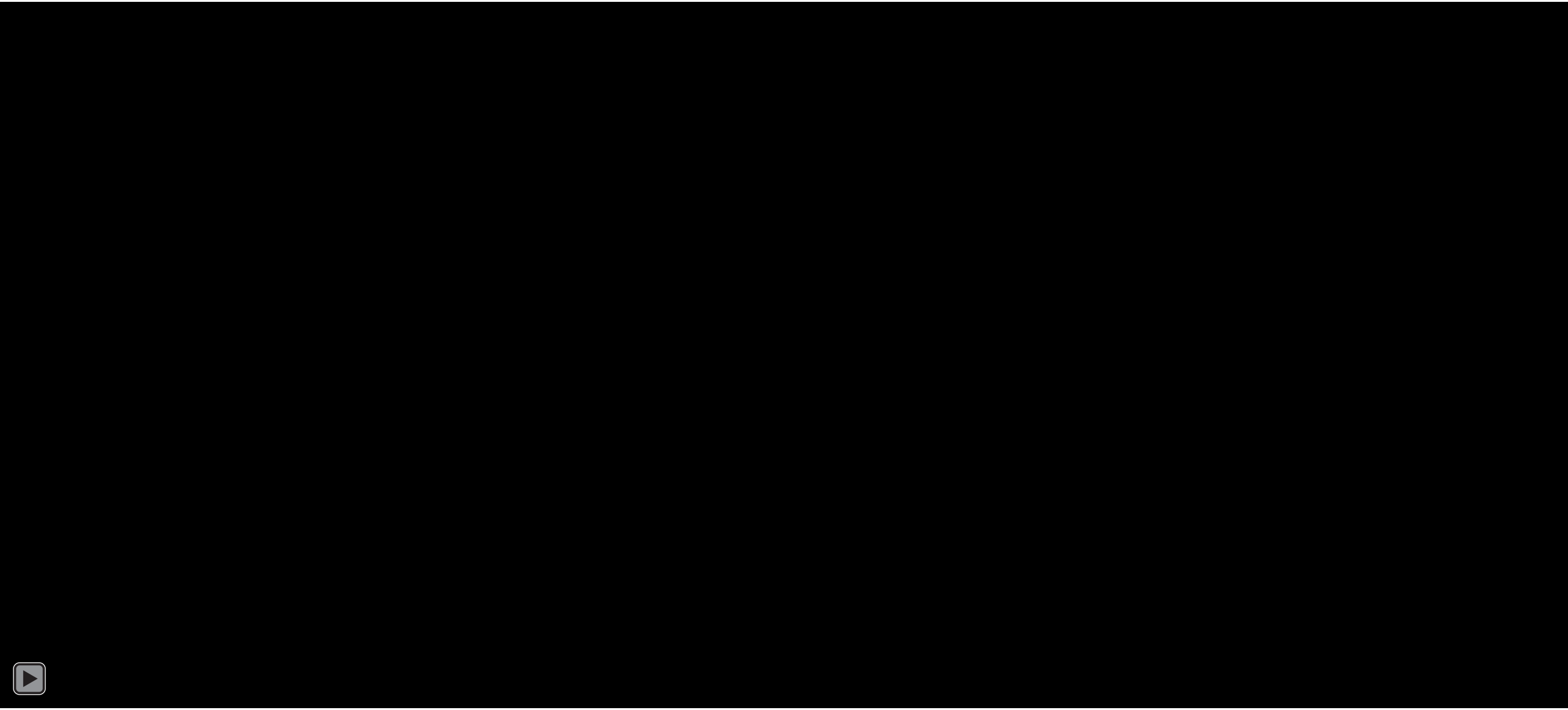
Workflow

- Combine GIS, survey, and CAD data
- Create multipatch features in ArcGIS Pro
- Publish a scene to Portal



Arlington Outlet Facility





Lessons Learned

- Difficult to combine data from multiple sources
- Need more powerful hardware
- Editing 3D features in ArcGIS Pro is not easy

Questions?

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Thank you!