

City of Fort Worth TPW Asset Management Journey



Presented by: Michael Owen, P.E., PMP and Elizabeth Young, GISP

City of Fort Worth TPW

September 17, 2020

Asset Management in City of Fort Worth – Keeping it Simple and Bringing Folks Along for the Ride

Presented by:

Michael Owen, P.E., PMP

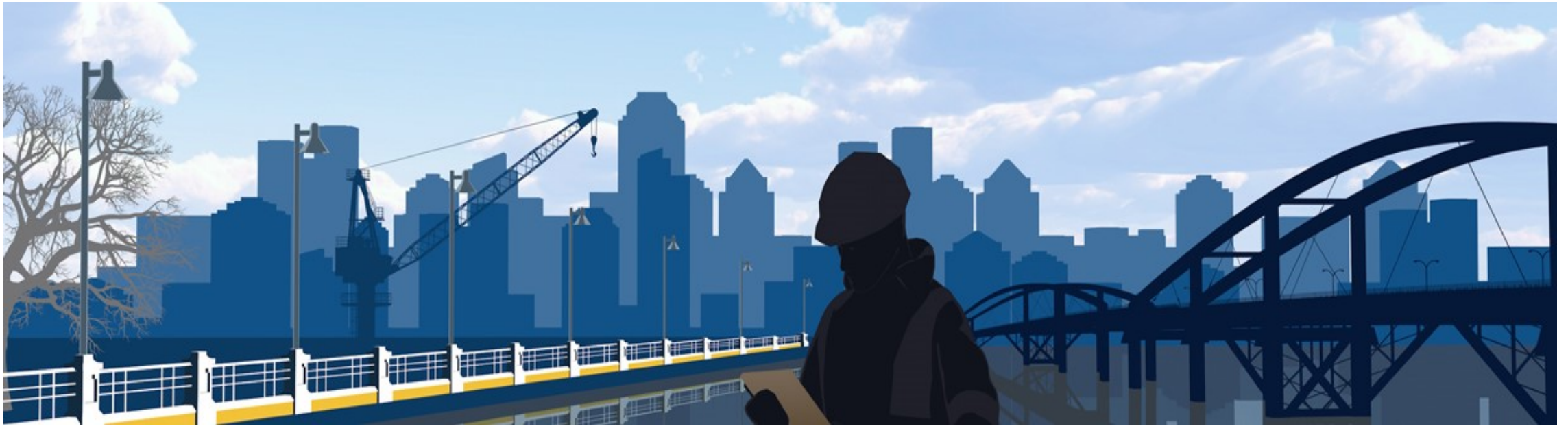
City of Fort Worth TPW Department

May 21, 2019



Last Year's Topics

- Benefits of Asset Management
- Key definitions
- Asset Management Framework
- Obstacles/pitfalls we had encountered
- How to keep it simple
- How to get others to come along for the ride



Continuation of TPW's Asset Mgmt JOURNEY

Focus on the following:

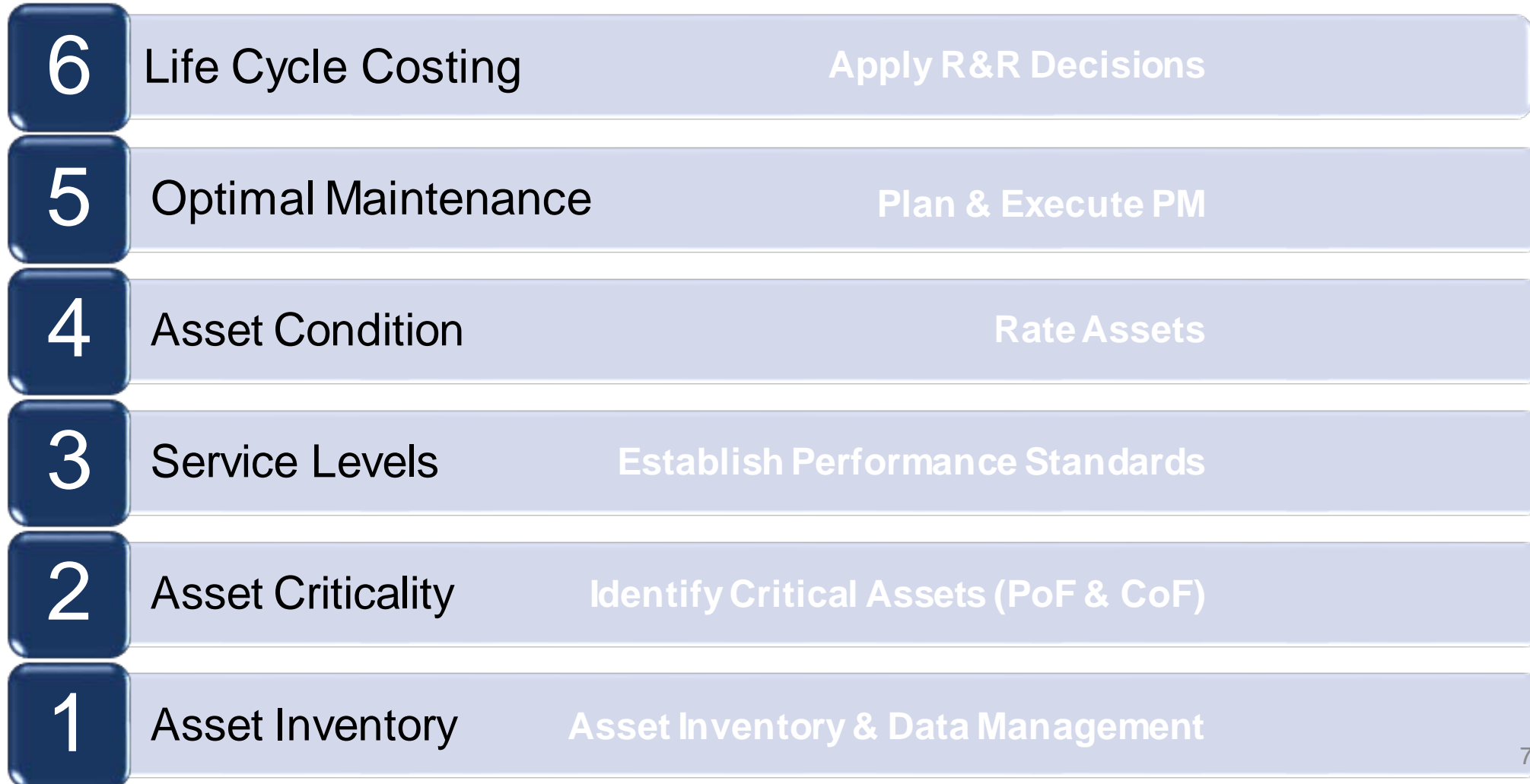
- Asset Mgmt impact in TPW
- TPW “Asset Management” efforts to date
- Practical Applications
- Next steps



Asset Management Impact



Elements of an Asset Management Program



Asset Management Timeline in TPW



TPW Asset Management Efforts to Date

- Asset Inventories/Data Management - GIS
- Work Order Systems – CMMS (Accela and VueWorks)
- Condition Assessments (Ex. Pvmt Maint Program)
- Initiatives (Ex. SD Rehab Program)
- Education/Training
 - 23 City/12 TPW staff - attended 5-day AM IAM Cert Course
 - 21 City/16 TPW staff - attended 1-day AM Overview Course

TPW Asset Management Data - Inventory

Streets



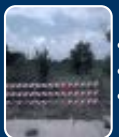
Bridges

- 437 Assets
- 0 Attributes
- 437 Data Elements



Curb & Gutters

- 300,138 Assets
- 23 Attributes
- 6,894,388 Data Elements



End of Road Barricades

- 1,112 Assets
- 22 Attributes
- 24,288 Data Elements



Guardrails

- 166 Assets
- 19 Attributes
- 3,54 Data Elements



Pavement

- 34,110 Assets
- 83 Attributes
- 2,810,380 Data Elements

Traffic Management



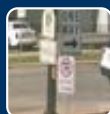
Poles

- 120,340 Assets
- 11 Attributes
- 1,276,407 Data Elements



Sidewalks

- 50,768 Assets
- 15 Attributes
- 701,865 Data Elements



Signs

- 129,385 Assets
- 30 Attributes
- 3,842,820 Data Elements



Signal Intersections

- 958 Assets
- 9 Attributes
- 8,577 Data Elements



Street Lights

- 65,347 Assets
- 33 Attributes
- 2,129,127 Data Elements



Traffic Signals

- 4,814 Assets
- 38 Attributes
- 179,550 Data Elements

Stormwater



Channel Features

- 17,860 Assets
- 10 Attributes
- 178,600 Data Elements



Inlet

- 39,803 Assets
- 41 Attributes
- 1,631,431 Data Elements



Manhole

- 10,295 Assets
- 31 Attributes
- 319,145 Data Elements



Channels

- 15,890 Assets
- 17 Attributes
- 270,521 Data Elements



Pipes

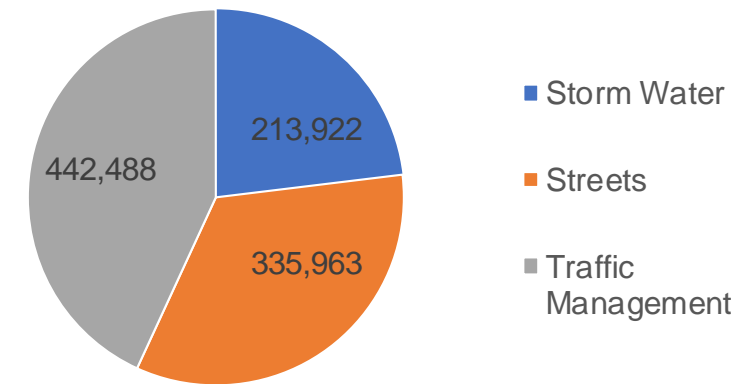
- 70,392 Assets
- 17 Attributes
- 1,196,664 Data Elements



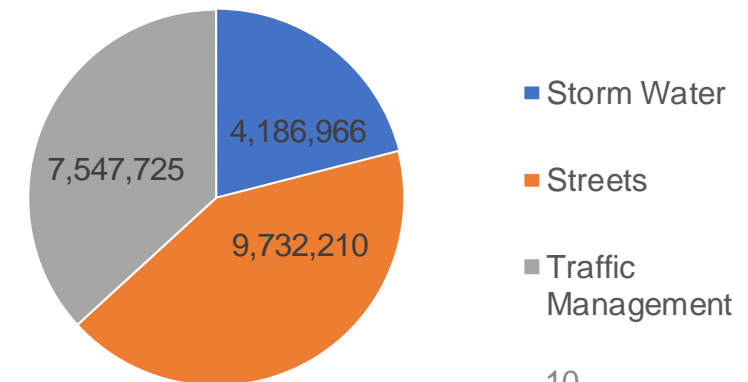
Pipe Features

- 38,784 Assets
- 7 Attributes
- 271,509 Data Elements

Assets in Inventory – 992,373



Data Elements - 20,512,839

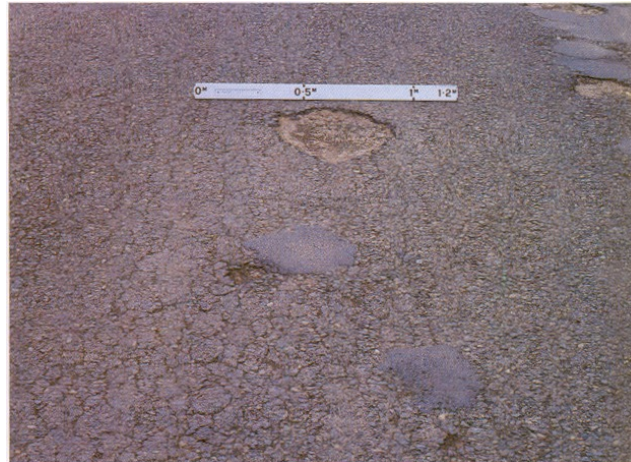


Progress Against Program Elements

			Stormwater	Streets	Traffic
6	Life Cycle Costing	Apply R&R Decisions	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
5	Optimal Maintenance	Plan & Execute PM	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
4	Asset Condition	Rate Assets	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
3	Service Levels	Establish Performance Standards	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2	Asset Criticality	Identify Critical Assets (PoF & CoF)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
1	Asset Inventory	Asset Inventory & Data Management	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Practical Applications

- Pavement Condition Assessment
- SW Storm Drain Rehabilitation Program



Pavement Condition Assessment/Inventory

- 2016 Inventory
- 3200 lane miles
- Additional assets:
 - Streetlight
 - Traffic Signals
 - Sidewalks
 - Pavement Markings



Periodic Condition Assessment

Pavement Condition Index (PCI) is a numerical index between 0 and 100, which is used to indicate the condition of a specific section of road pavement.

Overall Condition Index (OCI) utilizes the PCI but also takes into account other factors such as, curb/gutter condition and missing curb.

Condition Form
Condition Table
Filter
Reports
Calculations

Record
Documents

Asset Class: TPW Streets Layer: Pavement Pavement Condition Index: 57

Asset Type: Hot Mix Asset ID: PST0015345

Form: Hot Mix - Condition

By Inspection
 Assigned
 Override

Record Date: 04/04/2018 7:10 PM

Recorded By: Muongkm

Created: 4/4/2018 7:13 PM By: Mala Muongkhot

Modified: 4/9/2018 10:19 AM By: Mala Muongkhot

Ride Quality: 80

Rutting: 70

Raveling/Flushing: 80

Alligator Cracking: 70

Transverse Cracking: 10

Longitudinal Cracking: 10

Patching: 80

Notes: Testing condition assessment

Notes 2:

Comment(s) for:

Ride Quality		
Defect	Severity	Deduct
Ride Quality	Fair	100%
20		

Alligator Cracking		
Defect	Severity	Deduct
Alligator Cracking	Slight Prevaler	
30		

Rutting		
Defect	Severity	Deduct
Rutting	Slight Prevaler	
30		

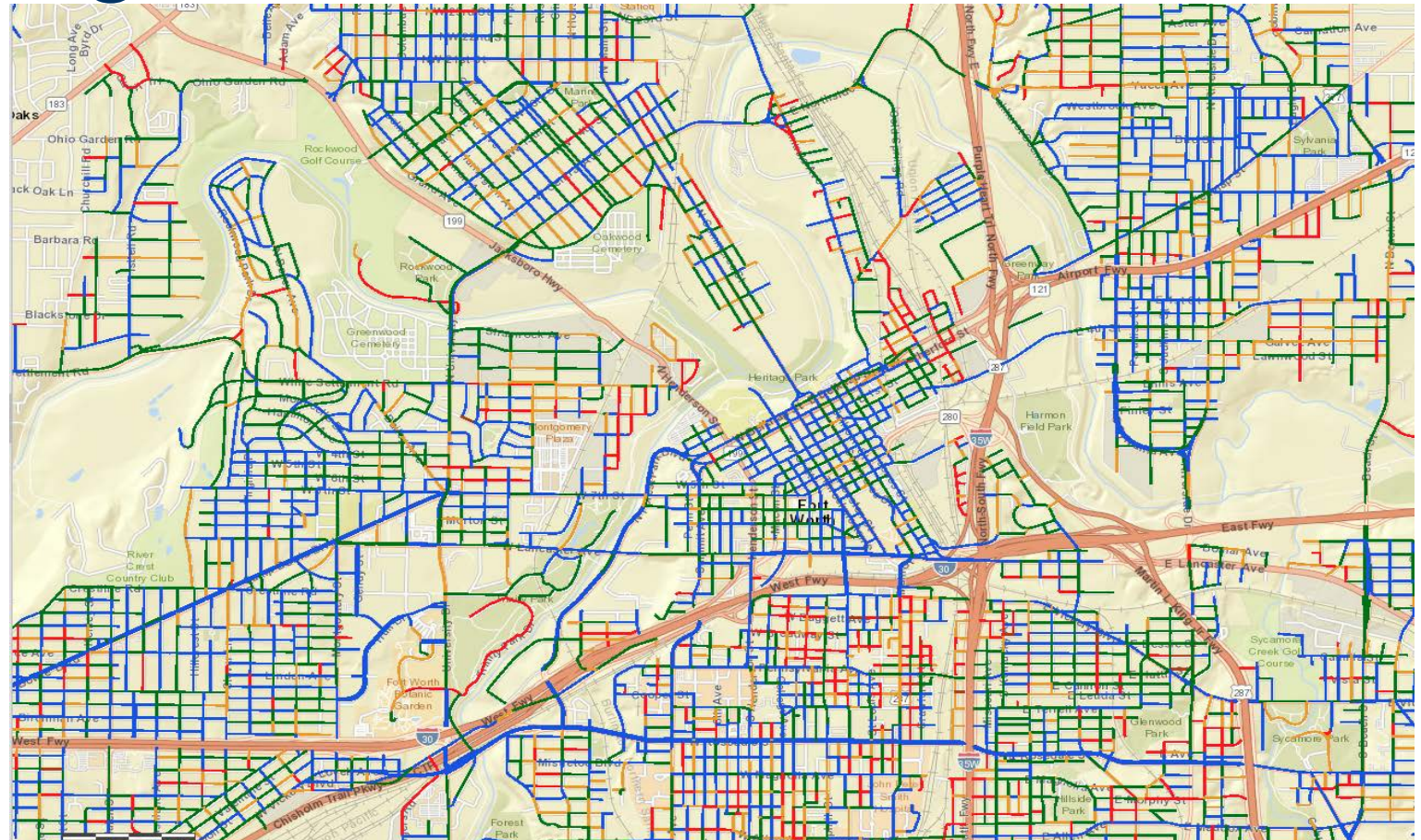
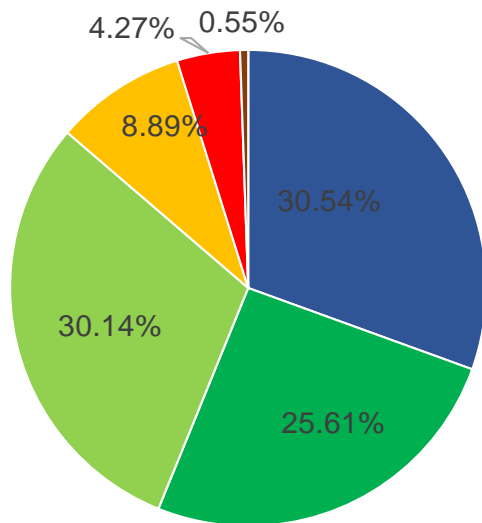
Transverse Cracking		
Defect	Severity	Deduct
Sealed	NR	

Raveling/Flushing	
Defect	Severity
Raveling/Flushing	Slight Intermitt

Longitudinal Cracking	
Defect	Severity
Sealed	NR

Condition Scoring

PCI		Condition
Low	High	
91	100	Excellent
81	90	Very Good
61	80	Good
41	60	Fair
21	40	Poor
0	20	Failed



Risk and Forecasting

Risk Manager

Filter is OFF - Current list contains 4 out of 4 Assets

[Form View](#)
[Table View](#)
[Filter](#)
[Reports](#)
[Calculate](#)

Layer: Pavement
 Location: Cutter St (3300-3399 Foard St - Nolan St)
 Risk Calculation D
 Created: 01/23/2018 By: Wade Goodman

Probability of Failure Ratings

Consequence	Rating	Weight	S
Consequences that contribut			
Risk Factor:	NR		
Consequence Factor:	NR		
Failure Probability:	NR		
Criticality Factor:	NR		

Budget Scenario Wizard

Budget Scenario Wizard: New Scenario 4

[Step 1](#)
[Steps 2 & 3](#)
[Step 4](#)
[Step 5](#)
[Step 6](#)
[Step 7](#)
[Run](#)

Scenario Name:

Scenario Description:

Step 1: Select Analysis Type

- Automated Budget Forecast where VUEWorks picks Assets and Jobs based upon your criteria**
 - A multi-year budget estimate that meets threshold goals using a 'what-if' approach
 - A prioritized list of assets based on information from the Risk and Condition Modules
 - Jobs to be performed based on Risk, Condition, and Deterioration information
- Budget Forecast where Assets and Jobs are specified in Projects**
 - Analyze Projects from the Projects Module for long term costs
 - Selects Assets and Jobs as defined in Projects
- Project Analysis with Life-Cycle cost options to calculate Benefit/Cost ratios**
 - Analyze Projects from the Projects Module for long term costs
 - Selects Assets and Jobs as defined in Projects
 - Calculates Benefit/Cost ratios as a basis for Project comparison

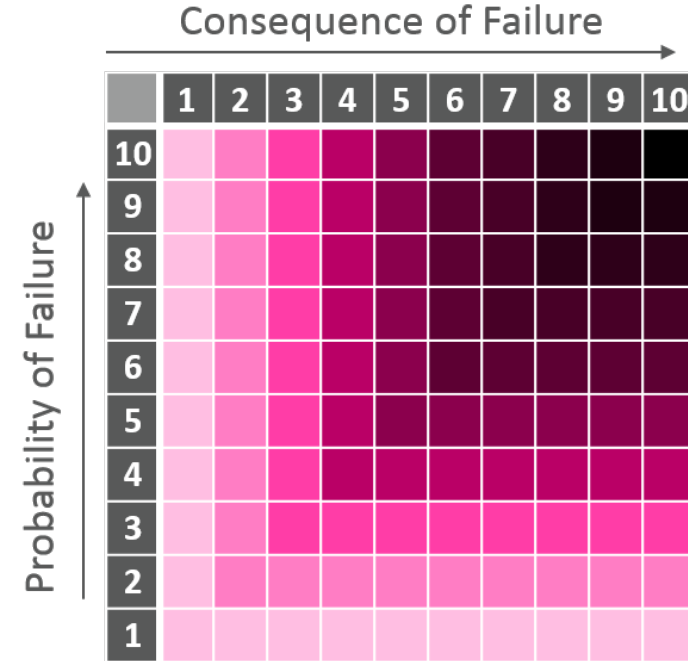
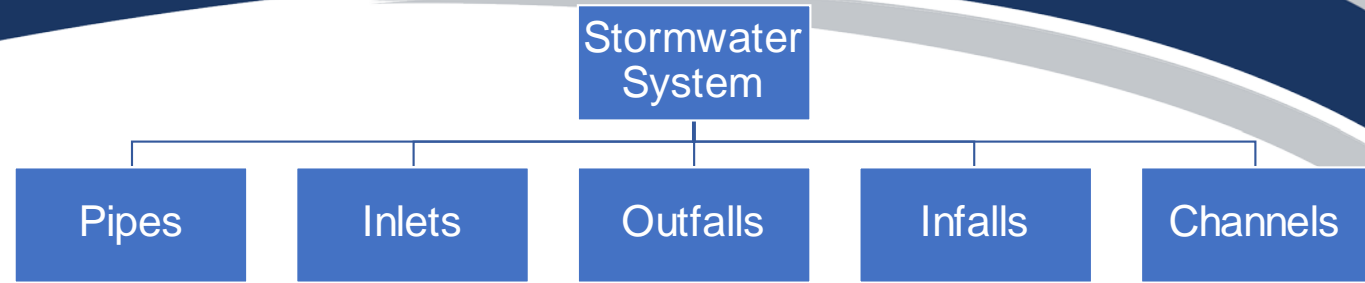
NOTE: The Analysis Type can not be changed after a Scenario is saved

[<< Previous](#)
[Next >>](#)
[Save](#)
[Close](#)

Storm Drain Rehabilitation Program



Criticality of Stormwater Infrastructure



Risk Assessment Matrix

Probability of Failure x Consequence of Failure = Criticality

Storm Drain Rehabilitation – BRE Criteria

- Criteria: Probability of Failure (POF) and Consequence of Failure (COF)

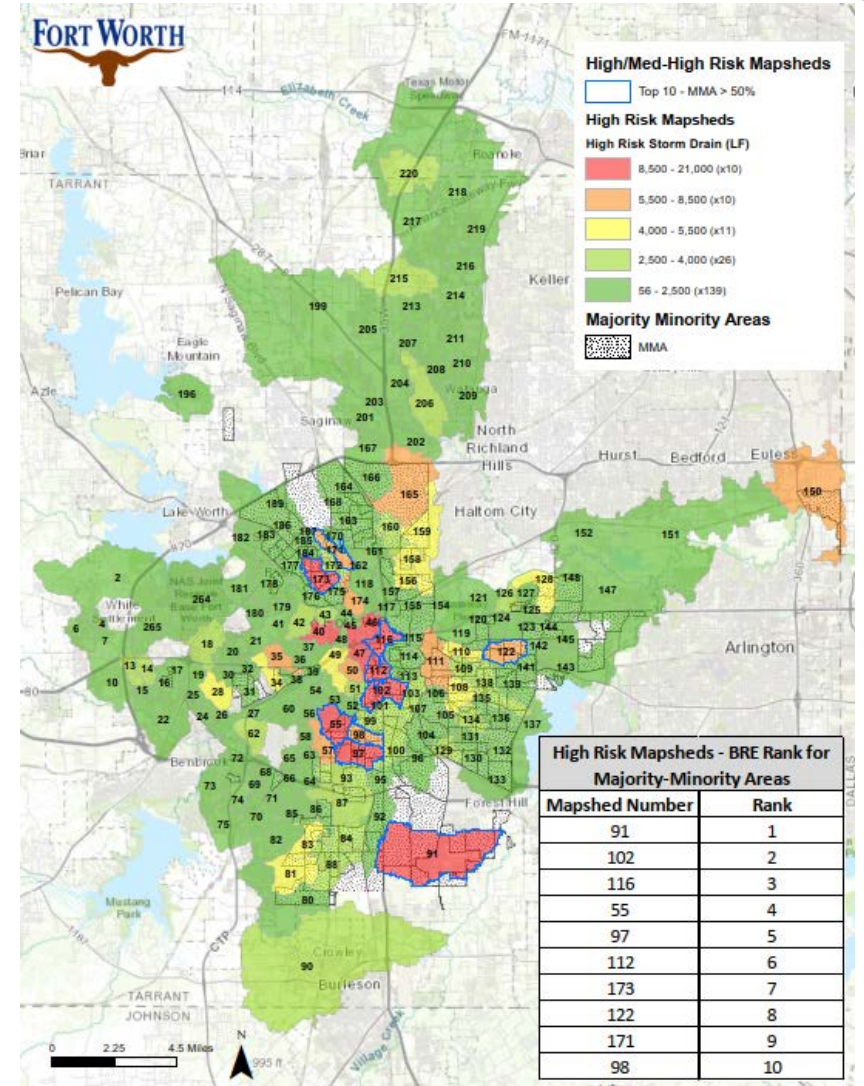
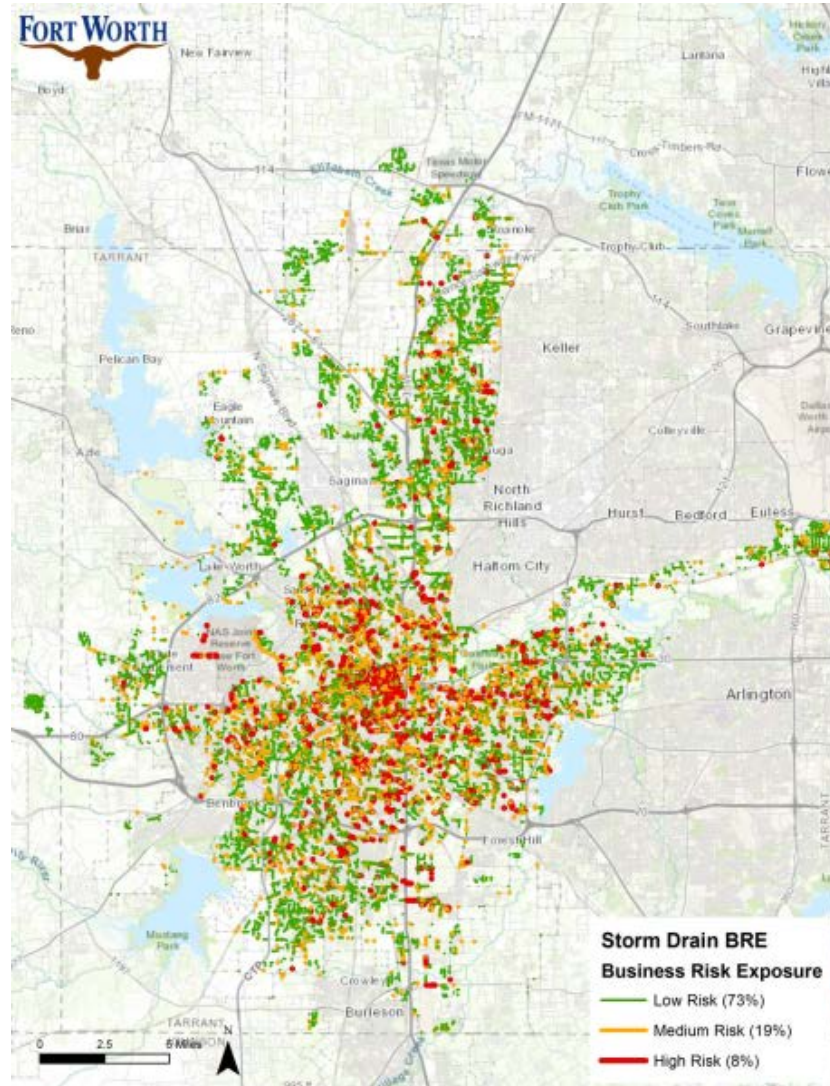
Probability of Failure	Description	Weight (%)
Percent Consumed	remaining useful life	30%
Capacity	pipe capacity vs contributing runoff	10%
Operating Environment	zoning designation	20%
Material	pipe material designation	20%
Soils	expansive soils by geologic formation	20%
TOTAL		100%

Consequence of Failure	Description	Weight (%)
Size	size as indicator of pipe flow and population	40%
Buildings	buildings served by pipes	15%
Roads	roads by class near pipe	15%
Critical Service	critical facilities served by pipes	15%
Sag Inlets	sag inlets connected to pipes	15%
TOTAL		100%

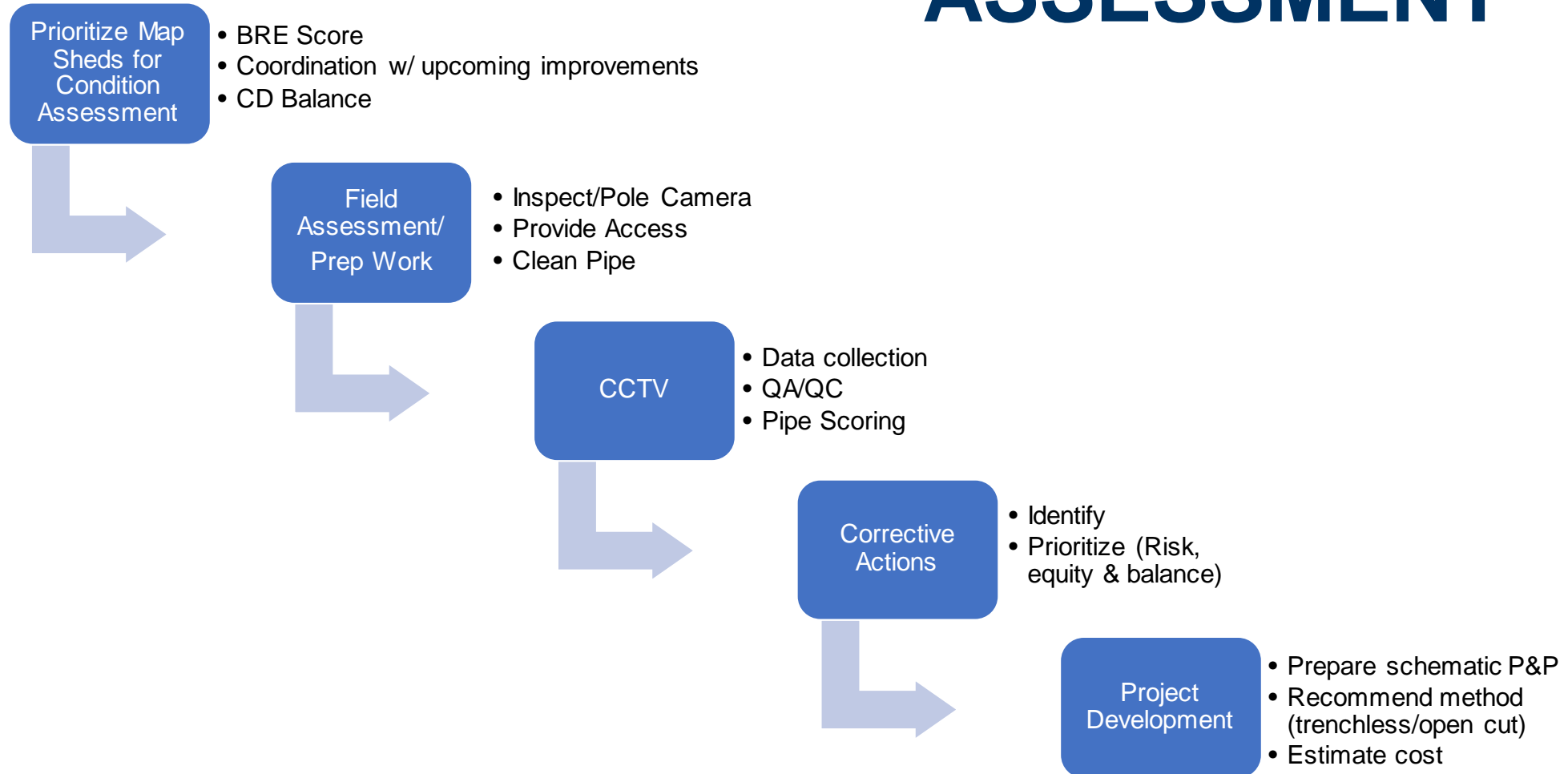
- POF x COF = Business Risk Exposure (BRE)

Storm Drain Rehabilitation – BRE Priority

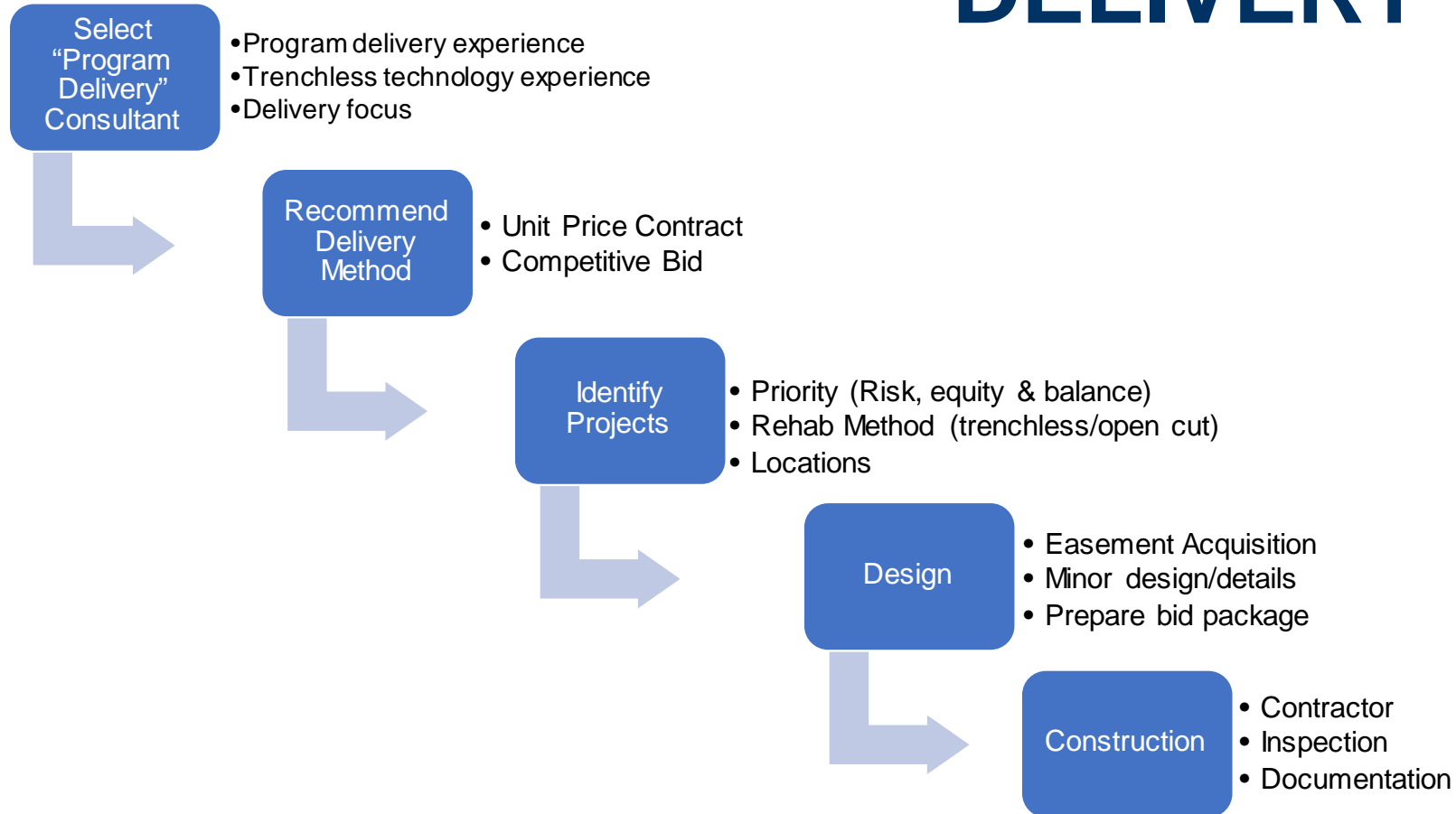
- Low Risk: 73%
- Medium Risk: 19%
- High Risk: 8%



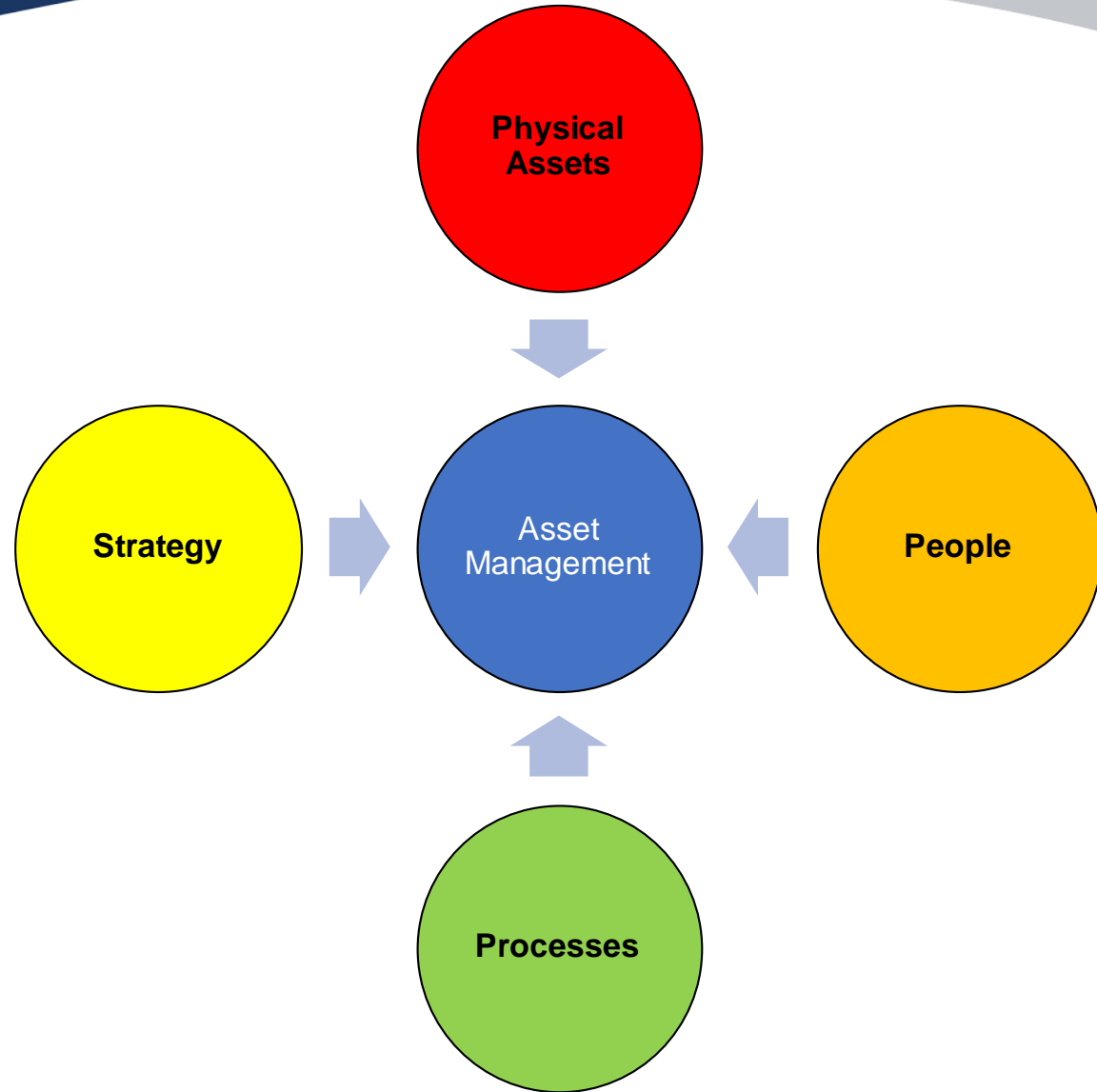
Storm Drain Rehabilitation ASSESSMENT



Storm Drain Rehabilitation DELIVERY



Asset Management Focus Areas



TPW Next Steps

Develop TPW-wide Asset Management “strategy” to guide on-going and future Asset Management efforts

- Continue education/training efforts
- Engage Asset Management experts to assist
- Develop Asset Management Road Map
- Develop TPW Strategic Asset Management Plan
- Formalize Asset Management Plans for Asset Groups

Questions?

Thank you!

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