

Fort Collins Utilities Asset Management Program

Rocky Mountain Chapter NASTT
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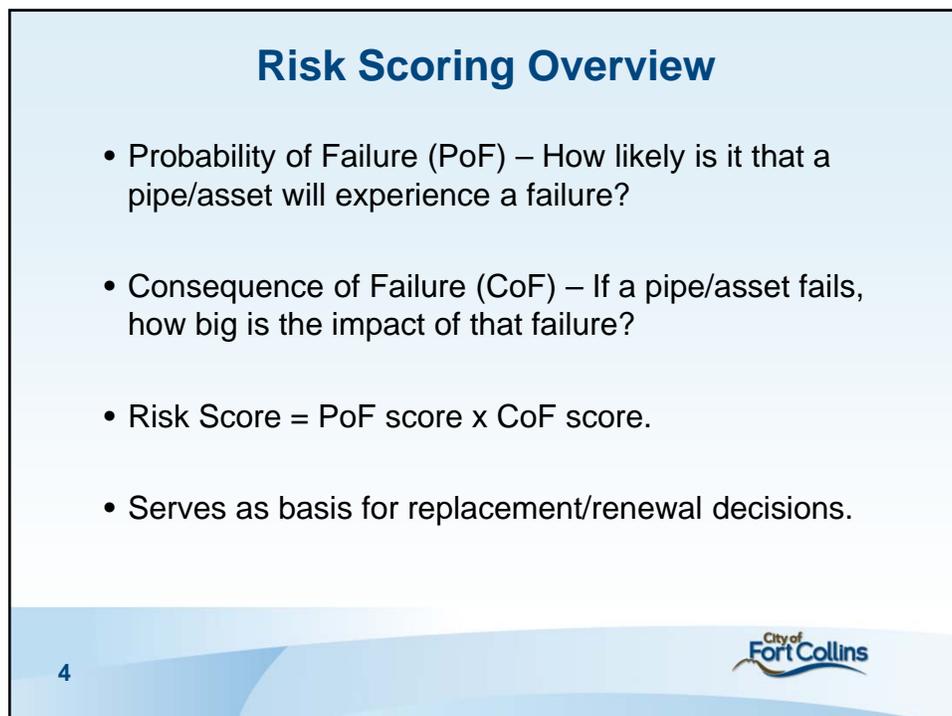
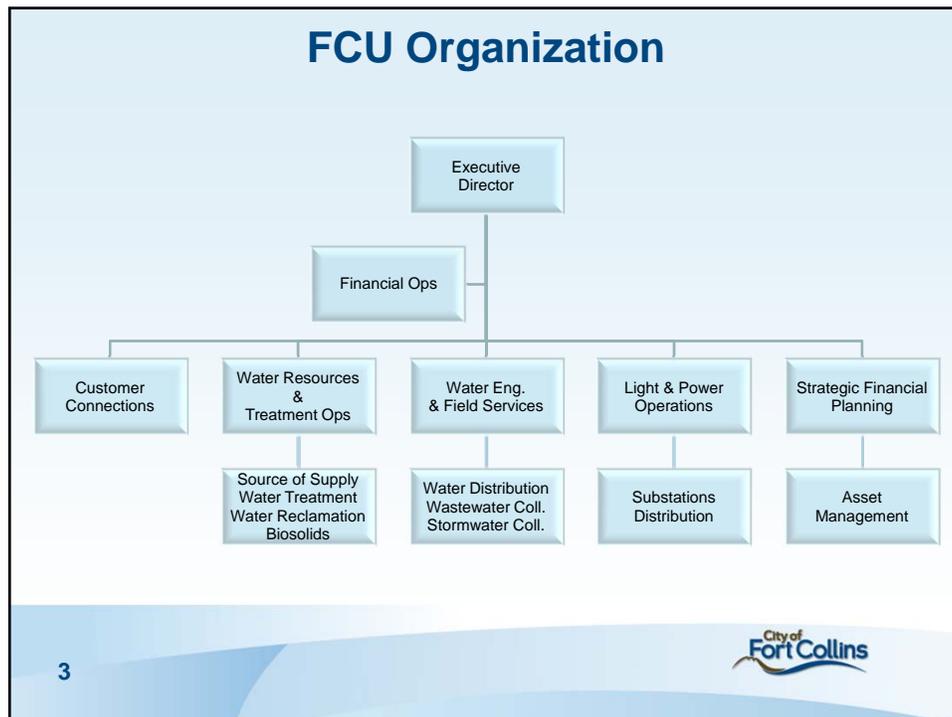


Topics

- Fort Collins Utilities Organization
- Risk Scoring
- Financial Projections
- Capital Prioritization

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Risk Scoring Probability of Failure Assessment

- Readily Available Data
 - Work order history
 - Age
 - Pipe material
 - Soil characteristics

- **Staff knowledge!**
 - Existing Condition
 - Each pipe or piece of equip. gets a PoF score from 1 to 5

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Risk Scoring Condition Assessment

Condition Score	Description
1	Very good. Sound physical condition. Asset likely to perform adequately without major work for 25 years or more for structures and for 10 years or more for electrical and mechanical assets.
2	Good. Acceptable physical condition. Minimal short-term failure risk, but potential for deterioration in medium- to long-term (10-years plus for structures and 5-10 years for electrical and mechanical assets). Only minor work required, if any.
3	Fair. Significant deterioration evident for structures and deterioration beginning to be reflected in performance and higher attendance in mechanical and electrical assets. Failure unlikely within 2 years, but further deterioration likely and major replacement likely within the next 10 years for structures and within 5 to 10 years for mechanical and electrical assets. Minor components or isolated sections of the asset need replacement now, but asset still functions safely at expected level of service. Work required but asset is still serviceable.
4	Poor. Failure likely in short-term. Likely need to replace most, or all, of the asset within 2 years. No immediate risk to health or safety, but work required within 2 years to ensure asset remains safe. Substantial work required in the short term, asset barely serviceable.
5	Very Poor. Failed or near failure. Immediate need to replace most or all of asset. Component effective life exceeded and excessive maintenance costs incurred. A high risk of break down with a serious impact on performance. Health and safety hazards exist which present a possible risk to public safety, or asset cannot be serviced without risk to personnel. Major work or replacement required urgently.

Source: International Infrastructure Management Manual, 2006 ed.

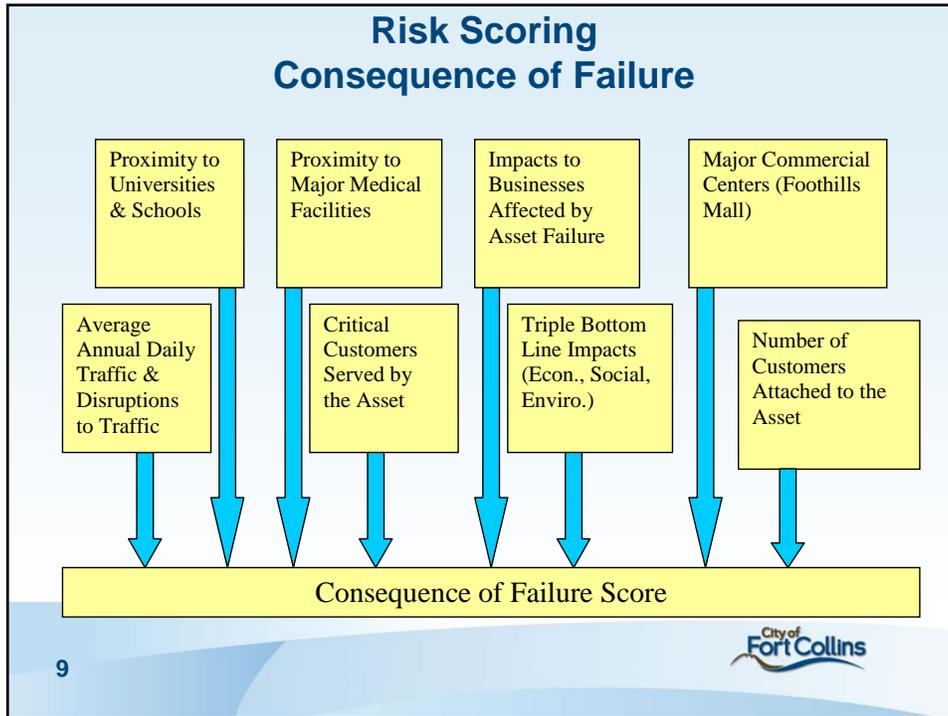
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Risk Scoring Tabletop Exercise



Risk Scoring Consequence of Failure

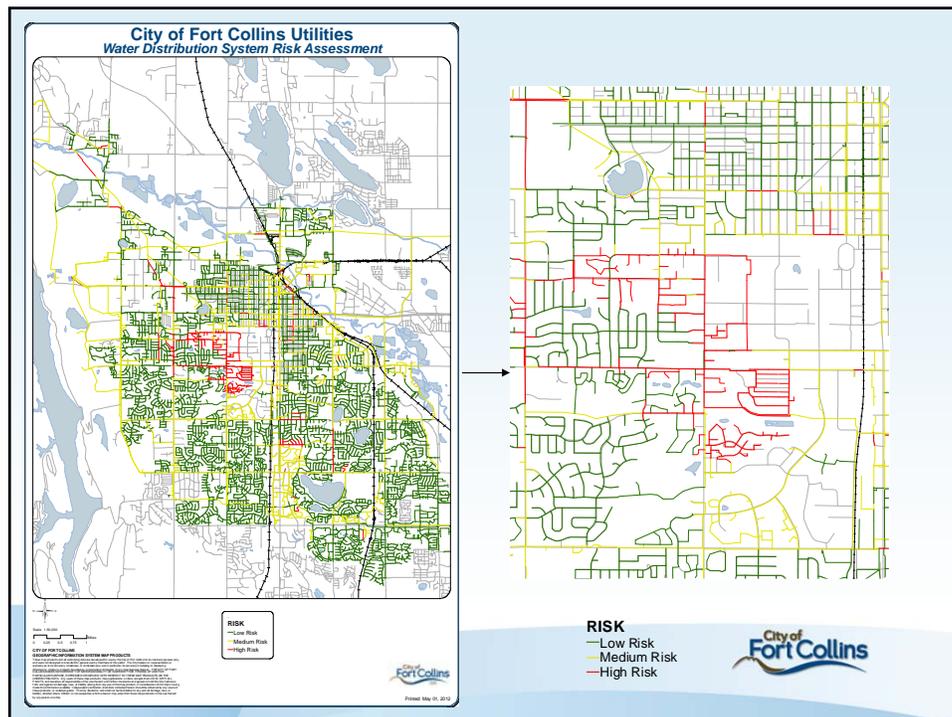
Consequence of Failure Score	Description
1	Low
2	Medium
3	High



Risk Scoring

Risk Score = Condition x Consequence		Condition Score (Probability of Failure)				
		1 Very Good	2 Good	3 Fair	4 Poor	5 Very Poor
Consequence of Failure	1 Low Impact	1	2	3	4	5
	2 Medium Impact	2	4	6	8	10
	3 High Impact	3	6	9	12	15

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Risk Scoring “Enabling” Processes

- Field crews are your eyes in the field.
- Every time they repair or inspect, they see:
 - Condition score
 - Pipe material
 - Pipe size
 - Depth of bury
 - Pavement surface
 - Soil conditions
 - Failure Modes – beam break, electrolysis, etc.

Financial Forecasting

- Provide an estimate of capital needs for the future
- Linear Assets Model Focused On:
 - Pipe Age
 - Pipe Material
 - Condition (Likelihood of Failure Score)
 - Inspection & Replacement Timeframes
 - Budget Scenarios
- Best ROI for Reduction in Risk

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Risk Scoring Infrastructure Schedules

Risk-Based Inspection Schedule						
		Likelihood of Failure				
		1	2	3	4	5
Consequence of Failure		>50	>50	10	5	3
	1	>50	7	4	2	1
	2	5	3	2	1	1
	3					

Risk-Based Asset Replacement Schedule						
		Likelihood of Failure				
		1	2	3	4	5
Consequence of Failure		>50	>50	50	30	12
	1	>50	50	30	10	3
	2	50	25	8	2	1
	3					

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Financial Forecasting Renewal Scenarios

- “Do Nothing”

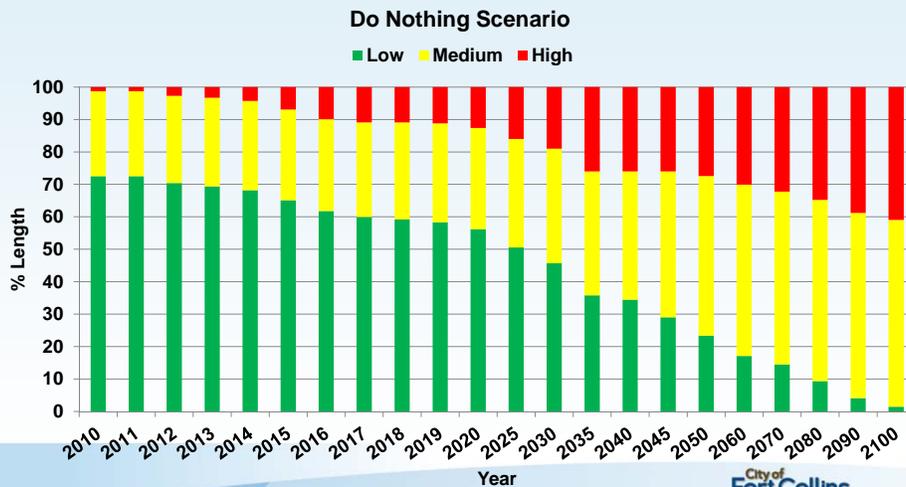
- “Risk-Constrained”
 - Current Level
 - Desired Level
 - Alternative Level

- “Budget-Constrained”
 - Current Budget Amount
 - Current Budget Increased/Decrease by %

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Wastewater Collection “Do Nothing” Scenario



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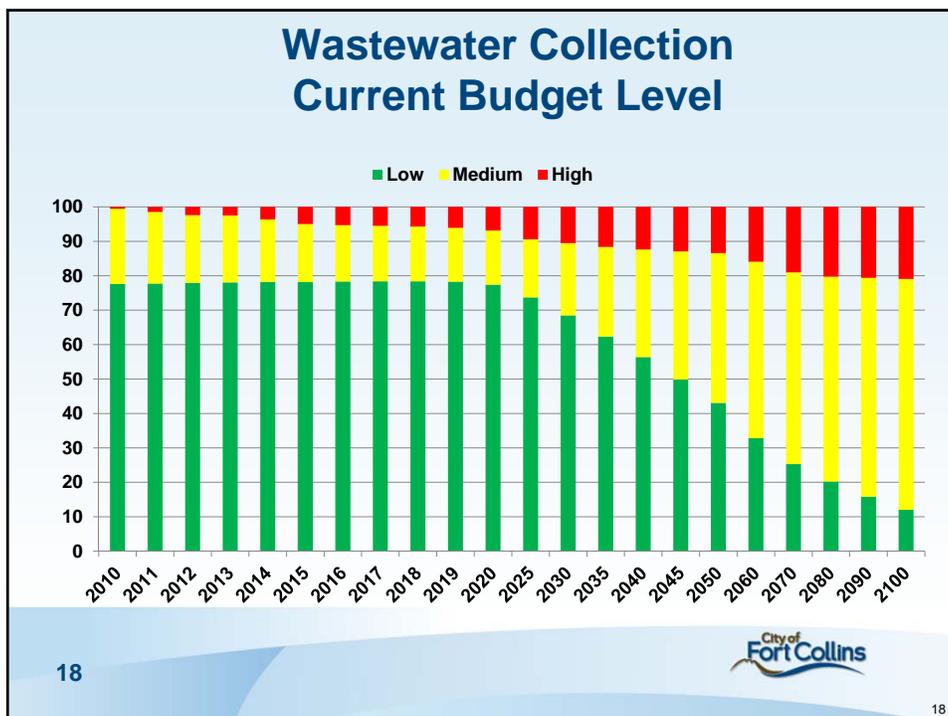


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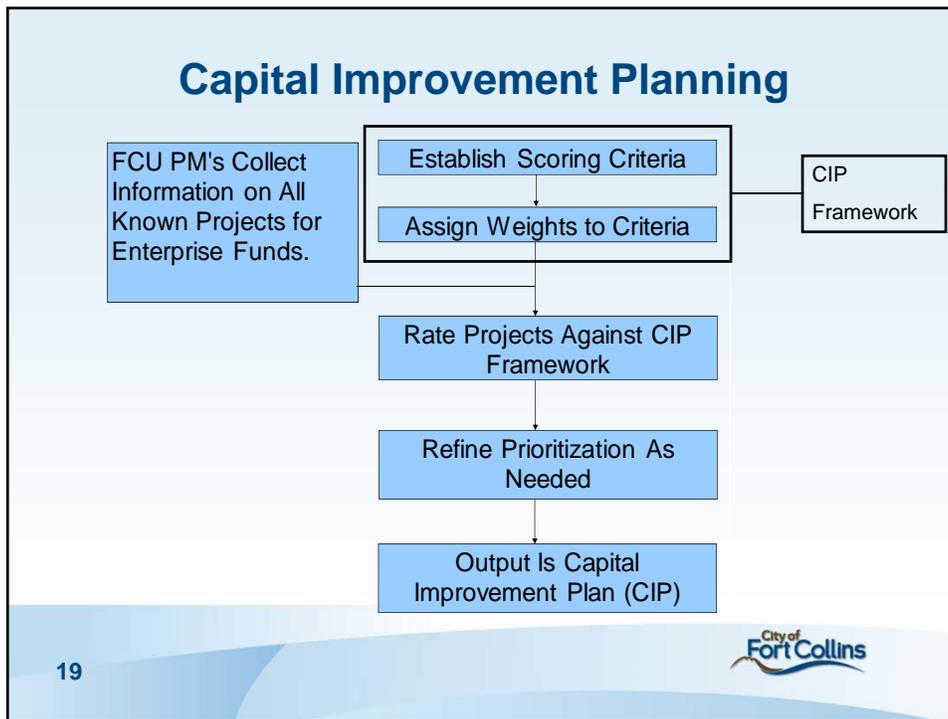
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Capital Improvement Planning

Criterion	Weight (out of 10)
Regulatory Compliance	10
Public Health & Safety	10
System Reliability & Redundancy	10
Risk Score	10
Coincides with Other Projects	9
Employee Health & Safety	8
Sustainability	7
Operational Cost Savings	6
Revenue Generation	5
Process Improvement	5
System Capacity	4
Public Relations	4
Security	2
Other Community Benefit	1

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What did we learn today?

- Risk scoring
 - Likelihood of Failure
 - Consequence of Failure
- Drives Financial Forecasting
- Can incorporate into capital planning process

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THANK YOU!

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Questions?