GIS/Data Management Support to Improve Reaching Asset Management Goals

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Effectively managing pipeline asset data to make wise decisions reduces the risk of asset failures and the cost of maintaining assets

Why Is Information on Pipeline Assets Important?

Scottsdale, AZ Pipeline replacement costs:

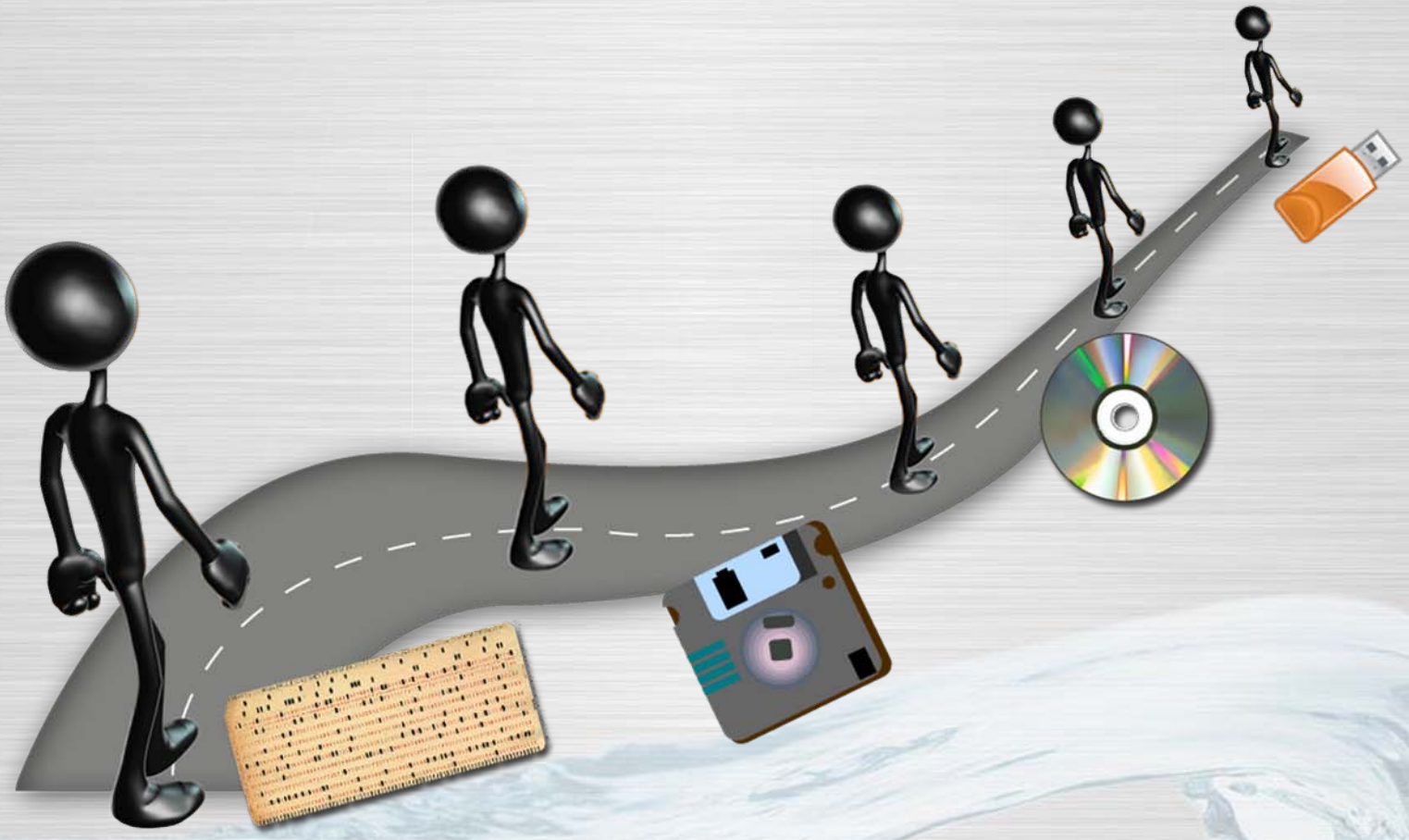
Water Pipelines:	$2,900,000,000
Wastewater pipelines and manholes:	$1,600,000,000
Total:	**$4,500,000,000**

Because these assets are very valuable and provide an essential service

Improved Decisions with Good Data Enables us to Reduce Risk

Risk = Vulnerability X Criticality

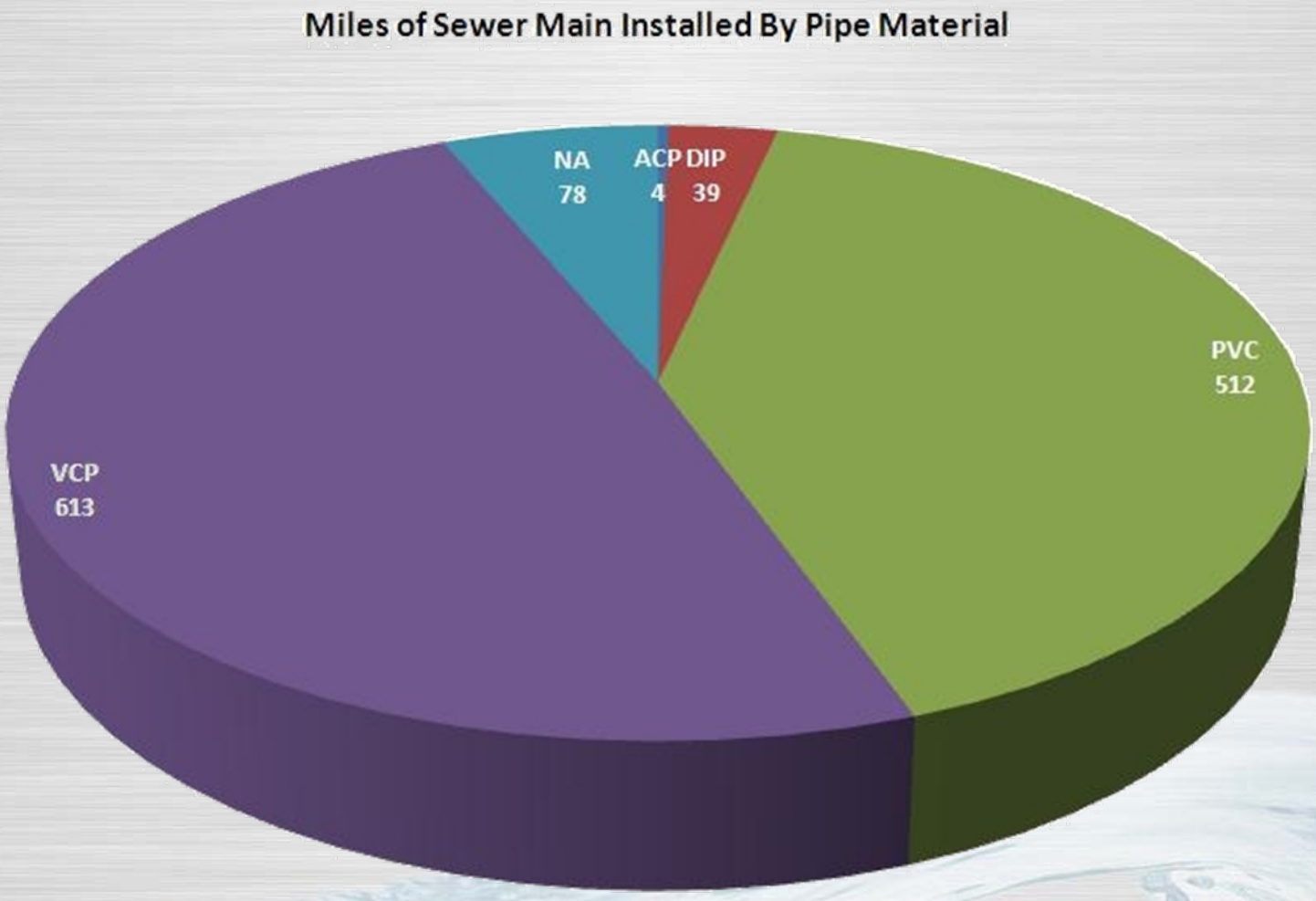
Asset Management is a Journey, not a Destination. Apply the technology that works today; tomorrow's technology will be even better.



What Information is Useful?

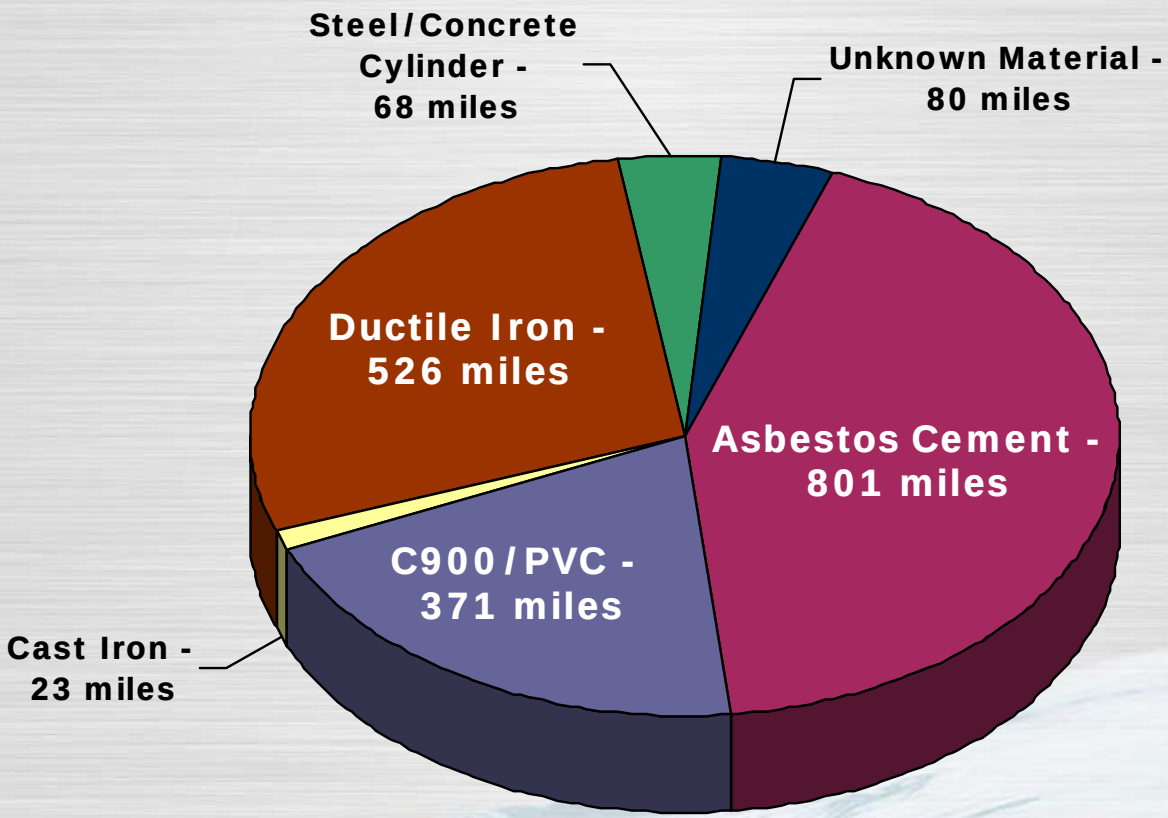
1. Pipe diameter, age, material, linings
2. Soils, loads, vegetation
3. Construction methods
4. Inspection results
5. Failure events
6. Complaints
7. Maintenance activities
8. Nearby construction activity
9. Costs

Step 1 is to Inventory Assets



Improve and Complete Asset Data

Miles of Sewer Main Installed By Pipe Material



Use All Available Sources to Estimate Missing Pipe Diameter, Age, and Material

Record Drawings

Standard Practices

Property Plat Dates

Development Approval Dates

Repair Records

Operation Staff

Inspect to Determine Condition

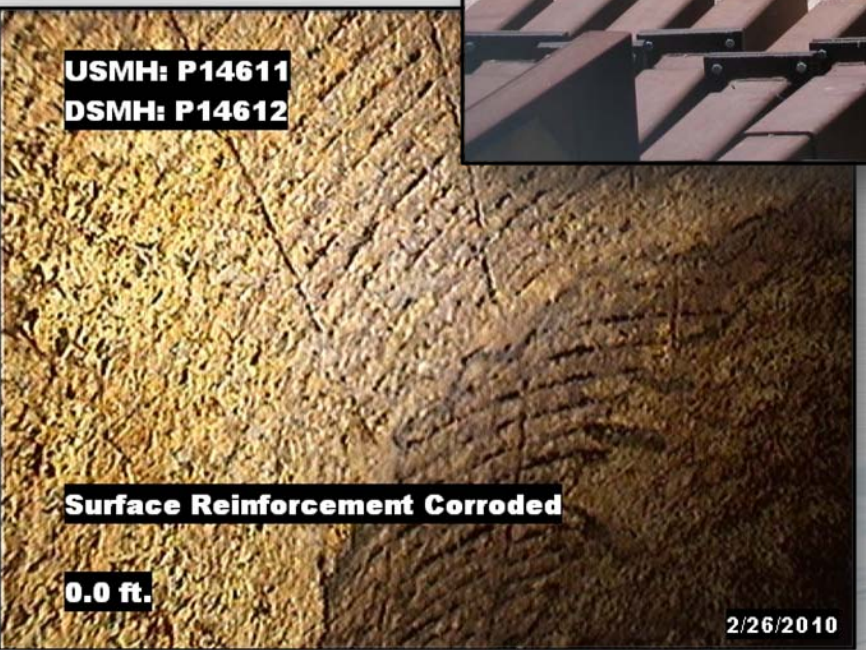
Evaluate Coatings and Linings

Record Locations with High Maintenance

Document Repair Locations and Causes

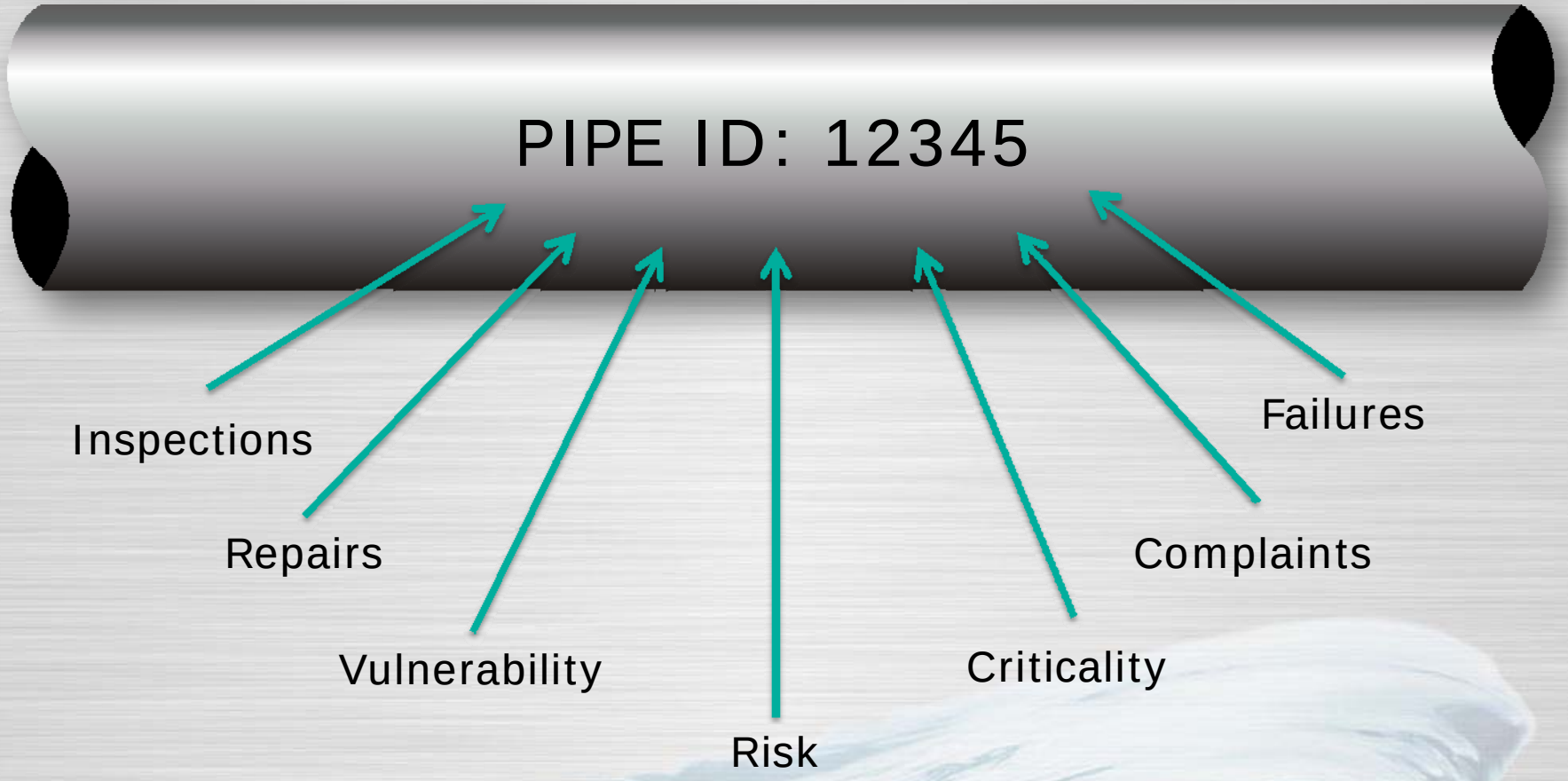
Record Related Parameters such as Hydrogen Sulfide for Wastewater and Leaks for Wastewater

Record Failure Causes



Identify Infrastructure with Insufficient Capacity

Link all Information on an Asset to the Asset ID



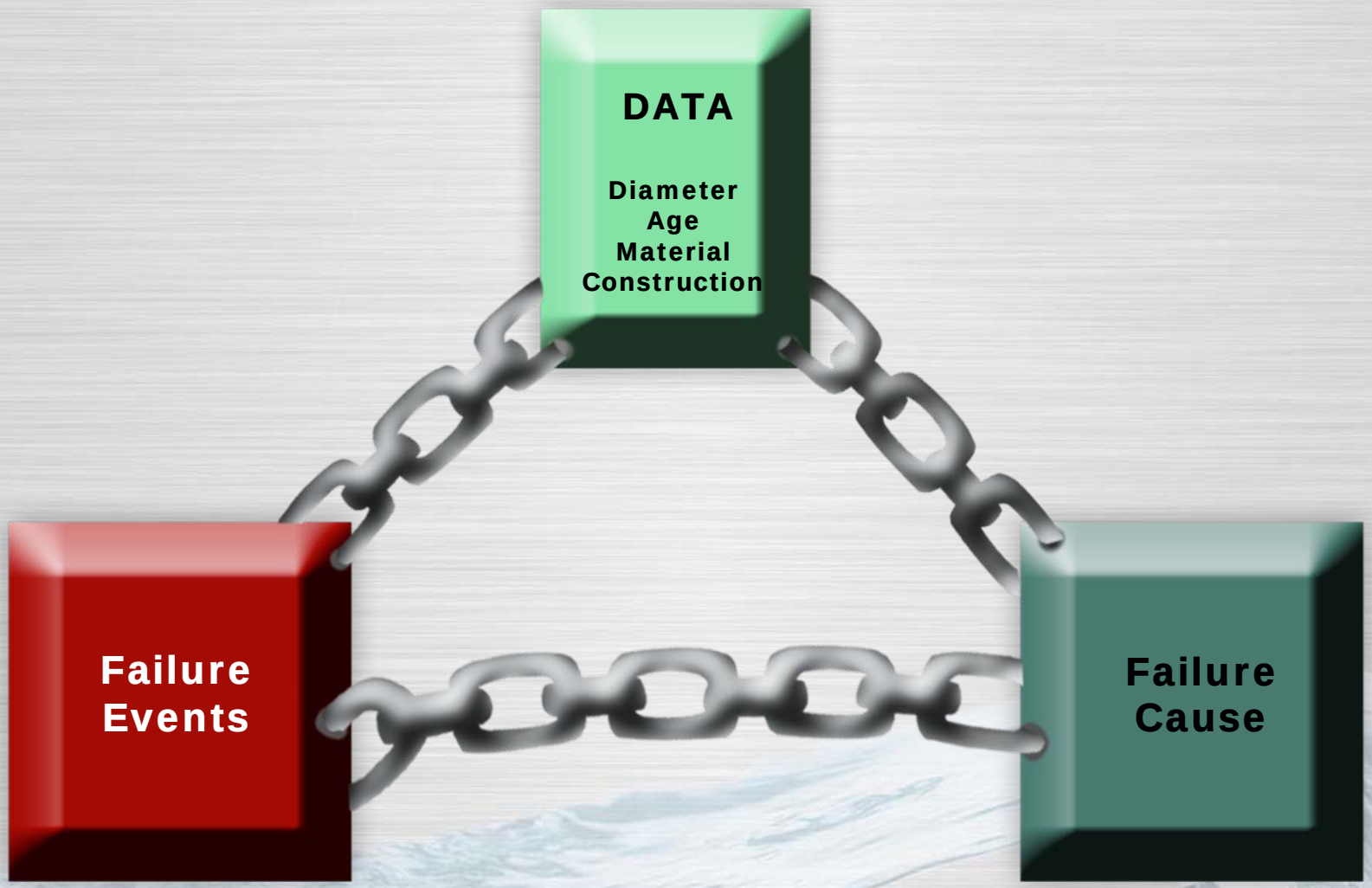
Store Data in Database form to Query and Analyze

Pipe Table

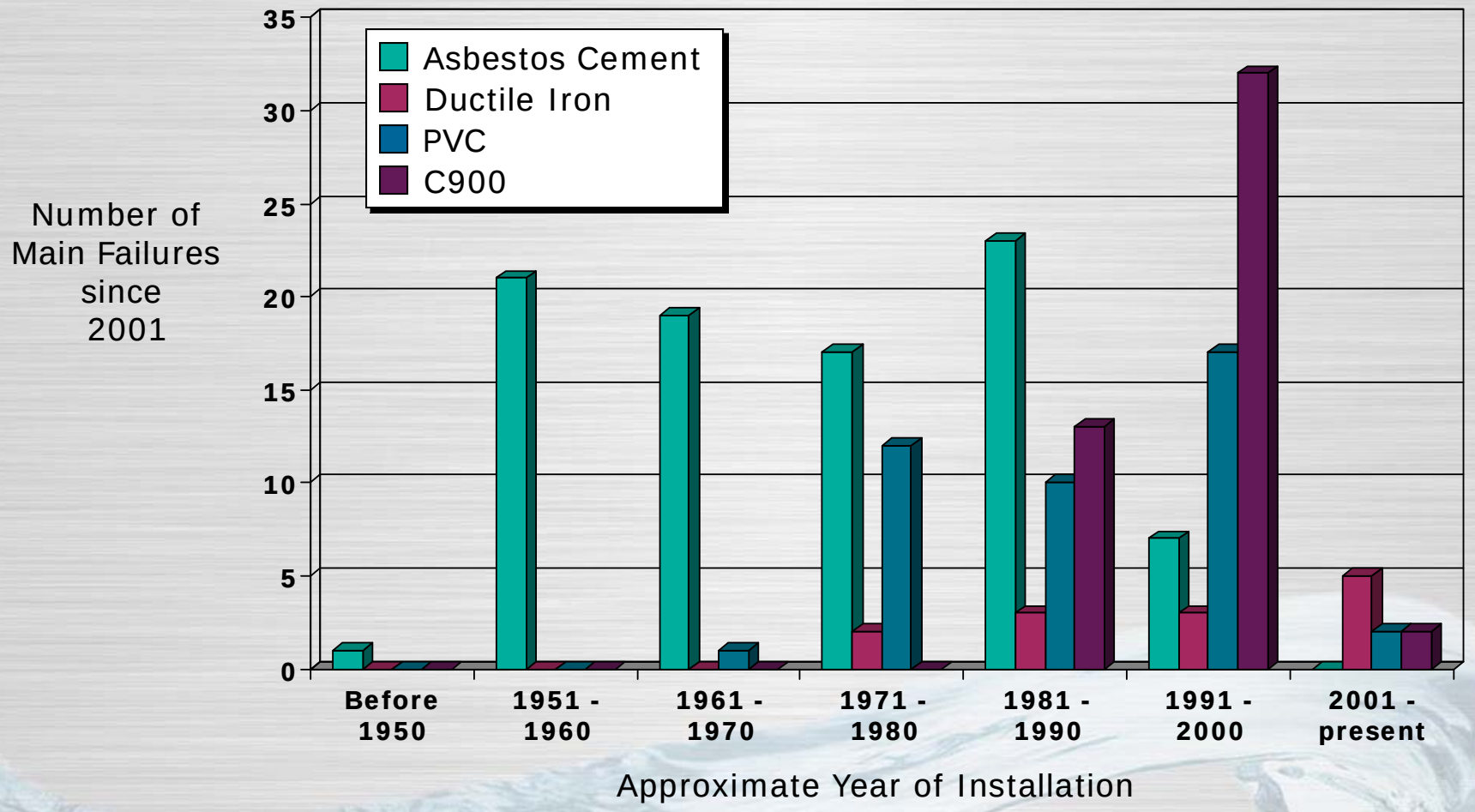
ID	Diameter	Material	Install Date	Failure Code	Repair Code	Vulnerability	Criticality	Risk
12345	12	PVC	1975	A	O	2	4	8
.	.	.	.	.	.	.	.	.
.	.	.	.	.	.	.	.	.

Code	Description
O	None
A	PRV Induced Waterhammer
B	Backhoe Activity
C	Poor Bedding
D	Joint Defect
E	Lining
.	.

Correlate Failure Events with their Cause

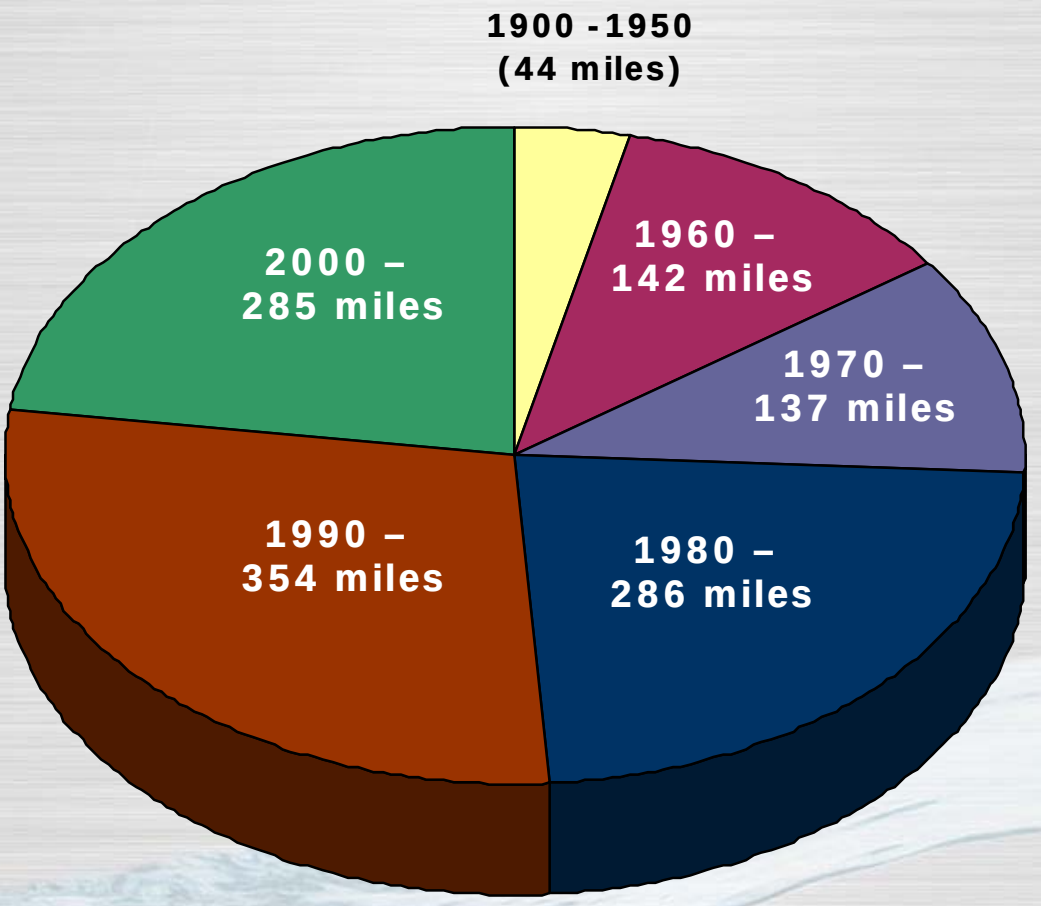


Correlate Failure Events with Pipe Location, Type, Age, Construction, Environment



Pipe Age and Material Can Indicate Useful Life and Vulnerability

Miles of Sewer Main Installed By Pipe Decade



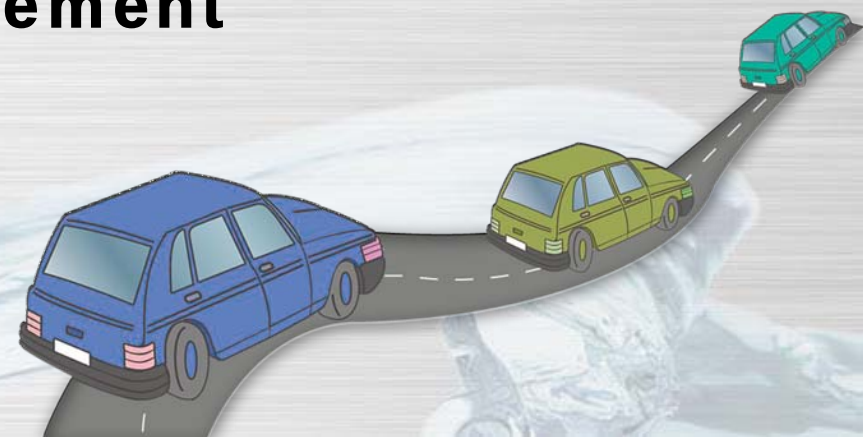
With the right information, the following types of decisions and improvements can be made:

Update Standards to Exclude Under-Performing Materials and Practices

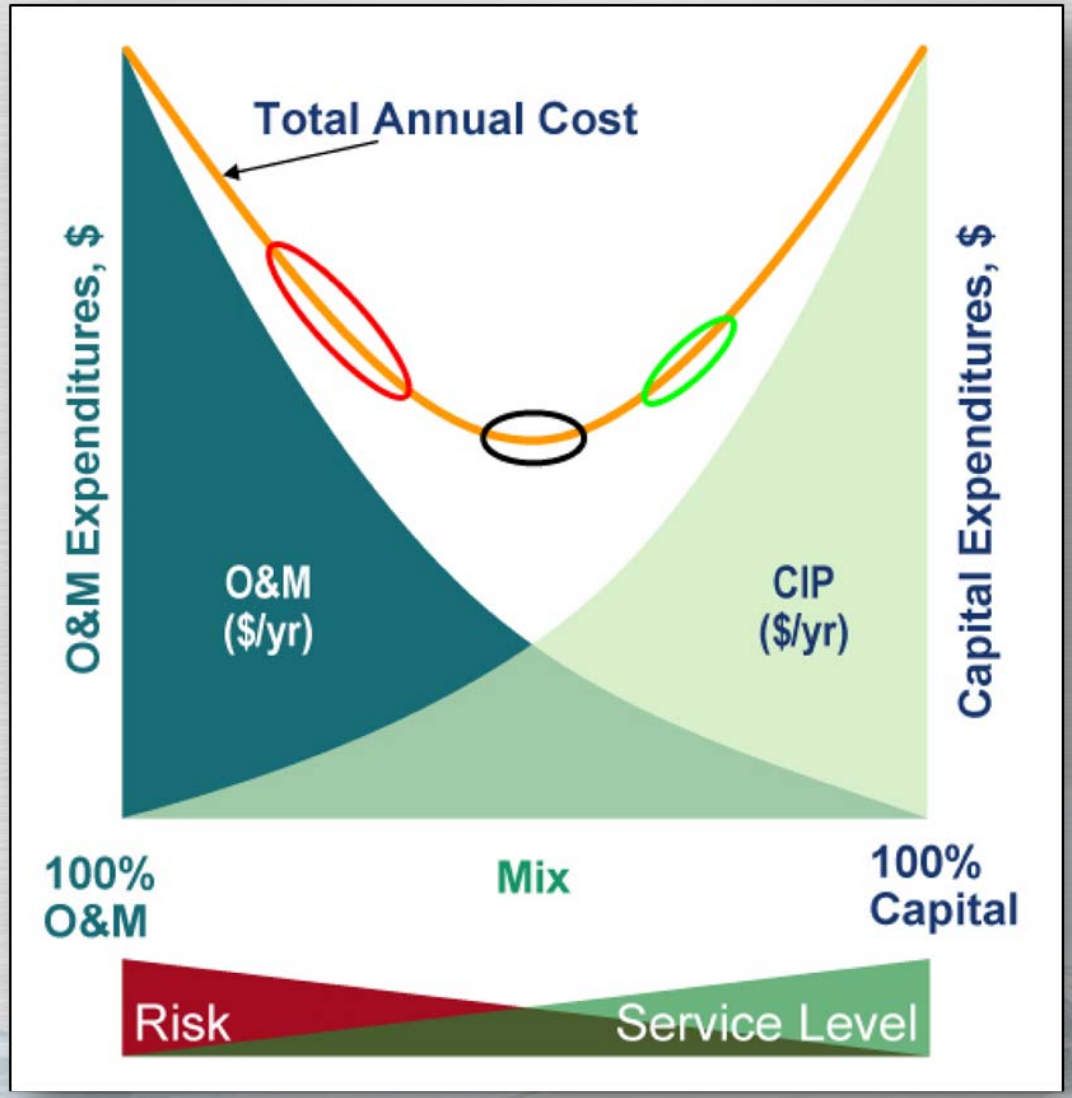
A Successful Asset Management Program Should Provide Benefits Early

Benefits → Investment

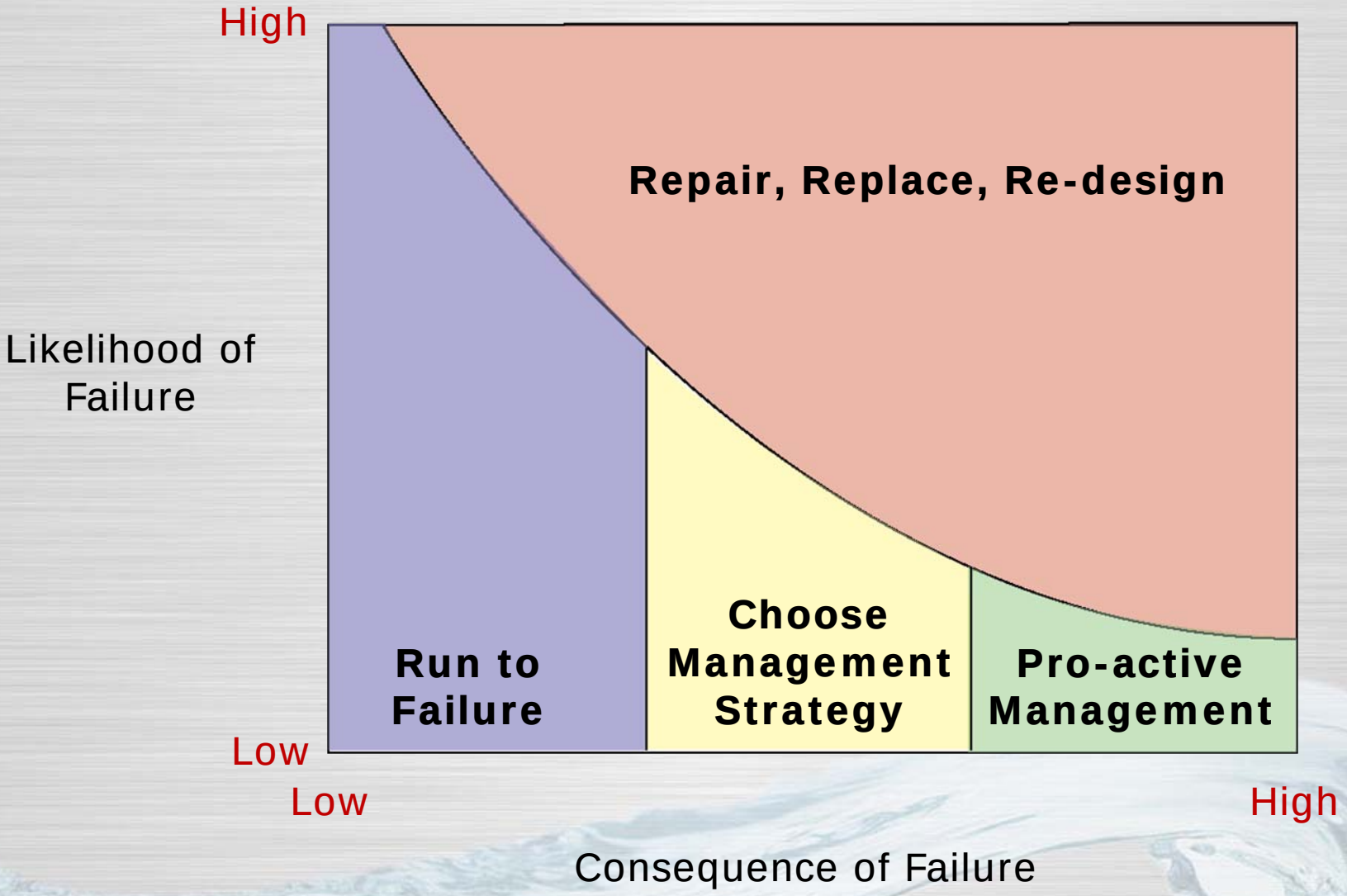
Some Asset Management steps can be implemented quickly, other steps take time to implement



Determine the right mix of Capital and O&M Expenditures to minimize Total Costs



Select Appropriate Maintenance Action



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Questions?

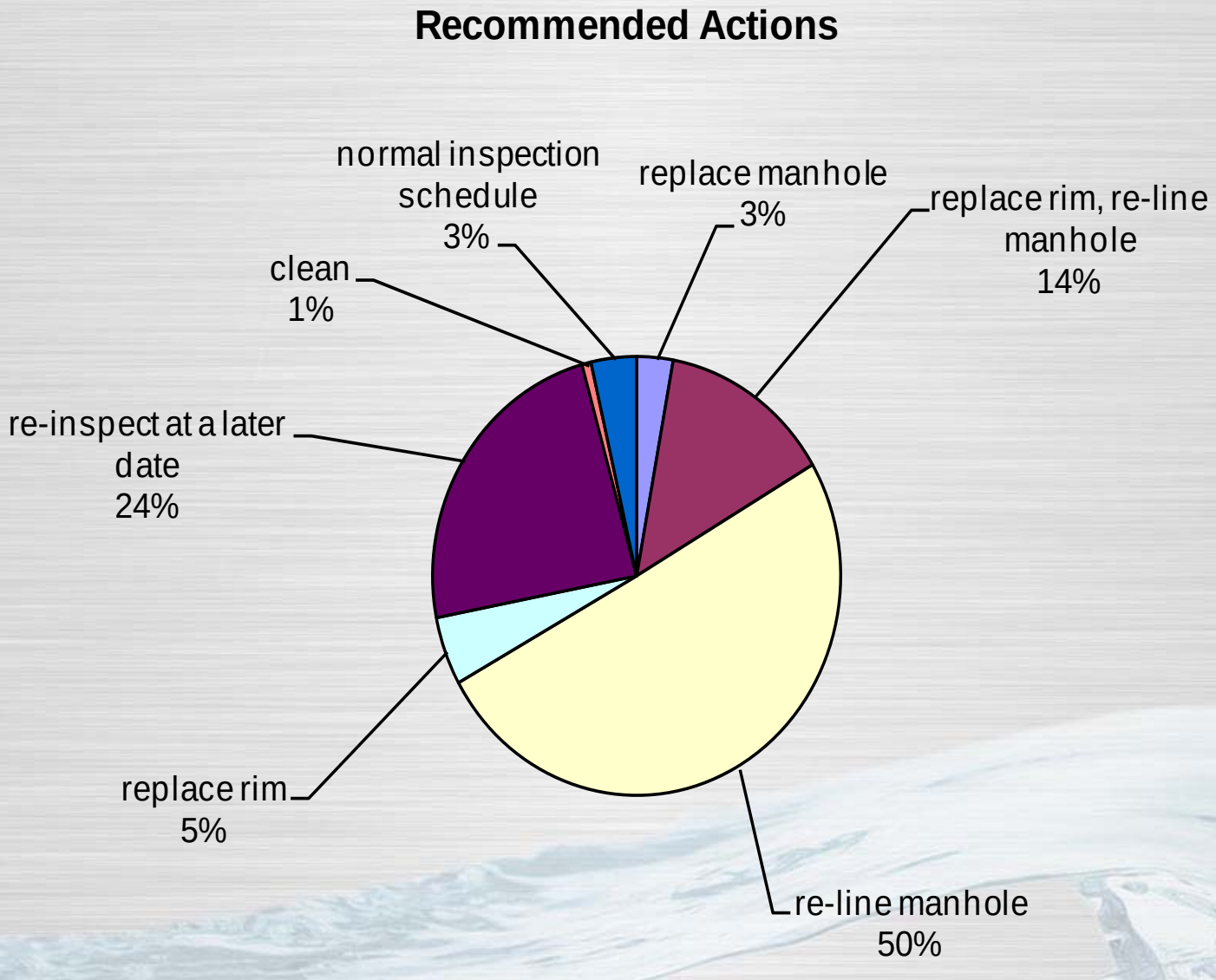
Asset Management Steps Implemented Over Time

1. Improve and complete asset data
2. Correlate failures with causes
3. Refine design and construction standards
4. Improve useful life estimates
5. Select commercial asset management software

Asset Management Steps to Implement Quickly:

1. Develop risk based classification process
2. Continue infrastructure assessment
3. Identify, Justify near term improvements
4. Determine cost of near term improvements
5. Integrate current asset management activities

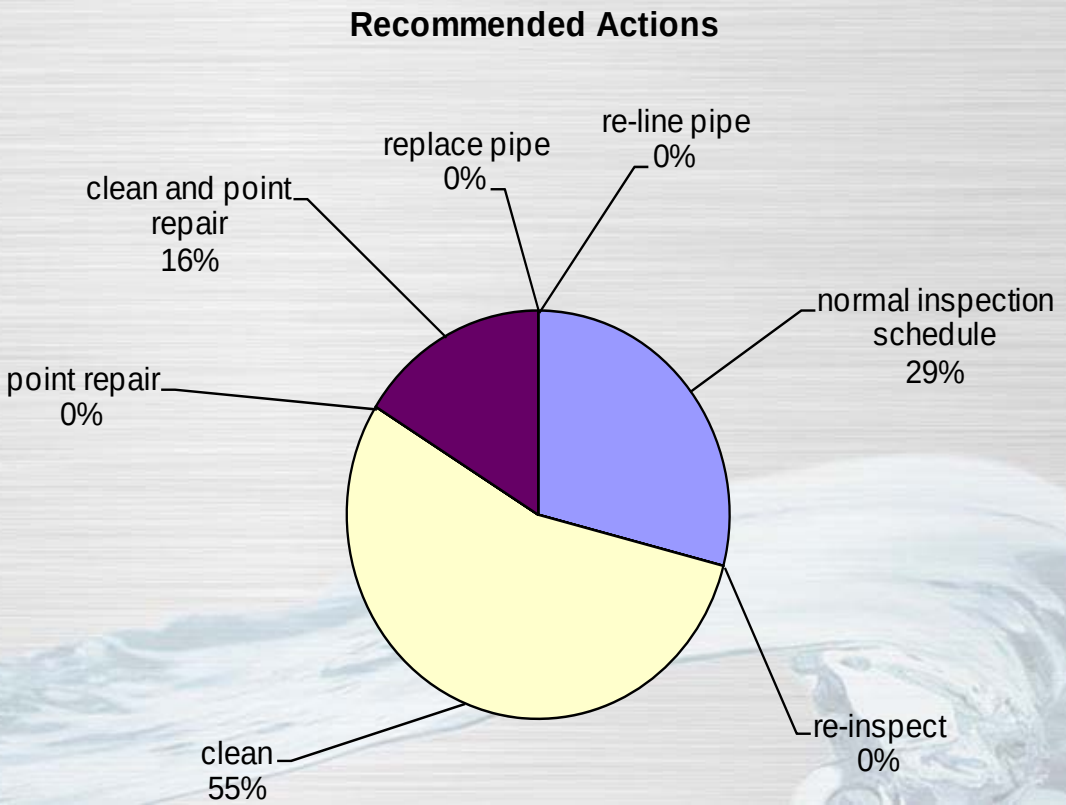
Inspection Results Dictate Maintenance Activities



Presentation Outline

1. Importance of Asset Management
2. Role of data in pipeline asset management
3. Addressing data problems…
   a. Incomplete Asset Information
   b. Poor Correlation to Failure events
4. Improving Asset Decisions

Why Is Data Management Important ?

Good information provides the ability to reduce risk while lowering cost

Most of the City's Pipes Needed Cleaning