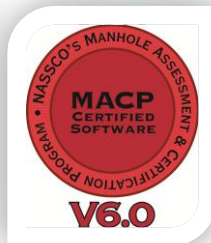
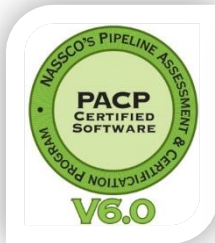


Leveraging Lucity Data for Water and Sewer Asset Management Rehabilitation Planning and Prioritization

InfoMaster[®]



Innovyze[®]

Innovyze at a Glance

49 of the top 50 cities in US

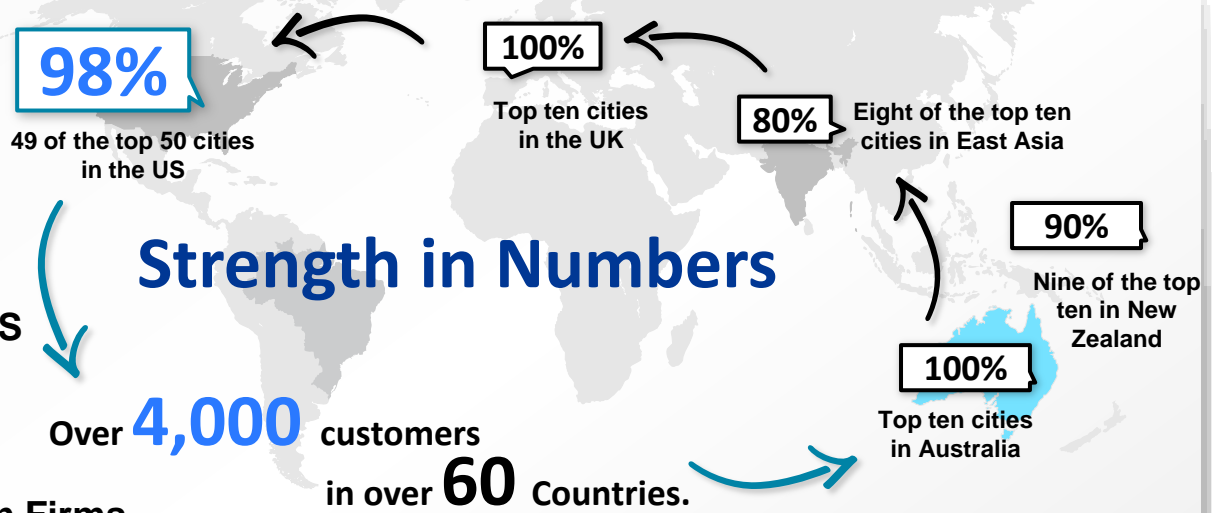
Innovyze is also proud to have...

84 of the top 100 cities in US

Consulting firms also make up the user base including...

9 of the top 10 ENR Design Firms

Broad Coverage in Major Cities Across the Globe



Strength in Numbers

Over **4,000** customers in over **60** Countries.

Leading Technology Platform

Complete Smart Water Network Tool-Set

CapEx



optimally size pipes & water facilities

OpEx



minimize operations costs

Real-Time

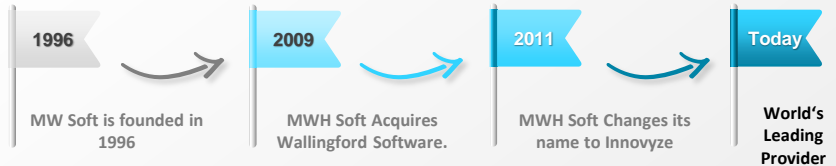


maximize ROI by having facilities "talk to" each other

Asset Management



minimize risk & optimally plan renewal activities



Milestone overview. Innovyze has grown to be a leading global provider of wet infrastructure business analytics software solutions designed to meet the technology needs of the water/wastewater industry.



Esri Gold Business Partner/ Authorized Developer. Includes pre-release of all Esri software and full access to Esri technical development resources guaranteeing the highest level of GIS integration.

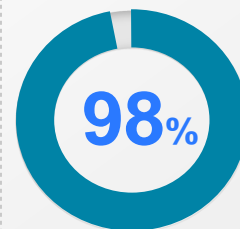


Referrals, in 2013, accounted for 32% of all software orders.

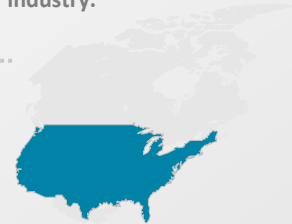


...and Repeat Business accounted for 81% of Innovyze's Revenue.

Unmatched Customer Service



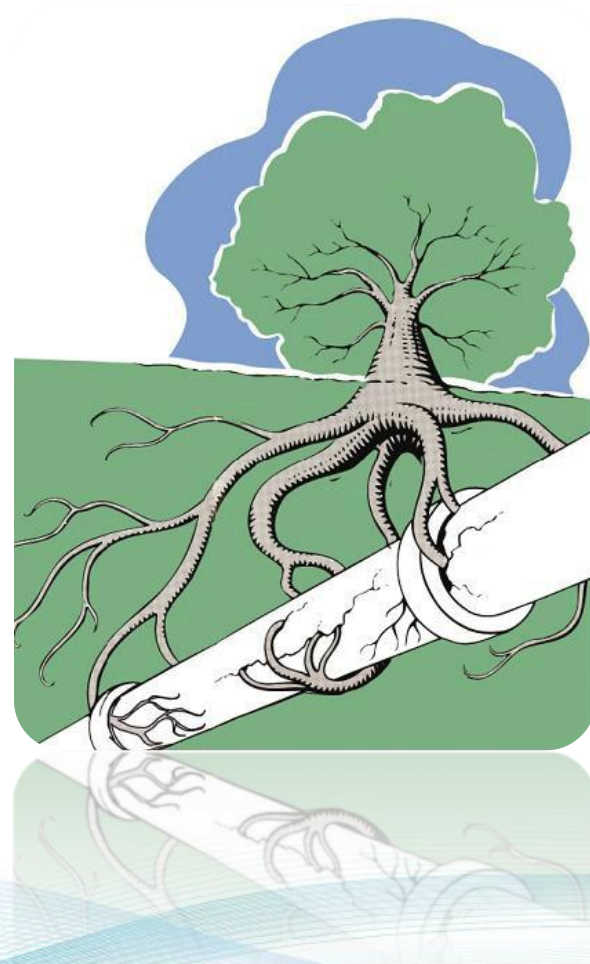
98% of Support issues resolved within **24 hours**, typical resolution is at time of initial contact (phone, web, e-mail)



All U.S. time-zones supported by experienced engineers/modelers.

InfoMaster Overview

- Software for asset management, and capital planning
- Water and wastewater systems
- GIS-centric (Esri ArcGIS based) data collection platform
- Maintenance management (CMMS)
- Independent of hydraulic model
- Framework for risk-based decision making



Innovyze[®]

How does InfoMaster help?

Asset management framework/model

- Risk analysis
- Reliability analysis
- Defensible decision logic
- Prioritize tasks for O&M and CIP budgets

Maintenance management

- CCTV: Review, validate, map, analyze
- Tasks, incidents, complaints, etc.
- Work order management
- Mobile links field crews to office

Maps, graphs, and reports

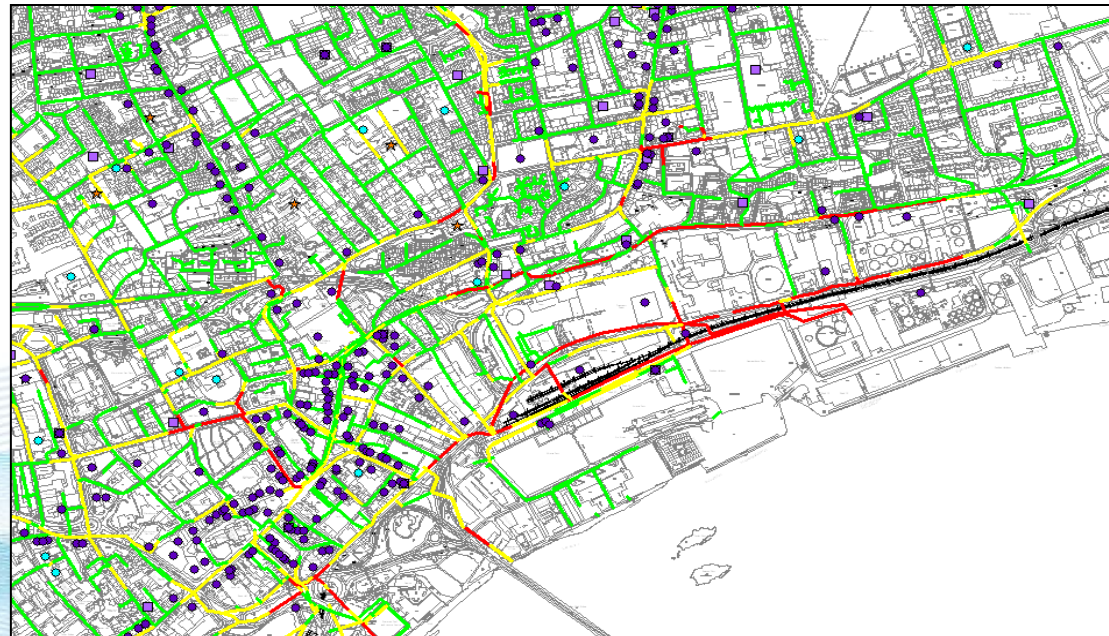
- HTML and PDF reports



Risk Analysis Drives Capital and Operational Actions

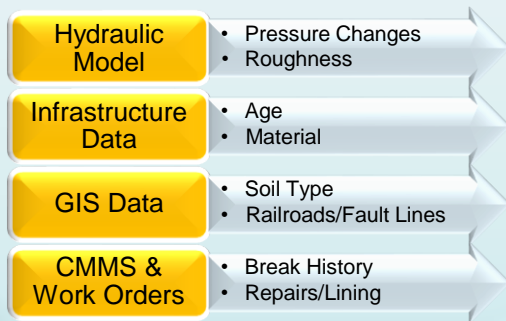
- Integrate programs for enhanced decisions:
 - GIS
 - Asset Data
 - Field Work
 - Hydraulic Model
- Determine timelines
- Estimate budgets
- Use to attain additional funding

Risk Class	Capital Action
Extreme	High Priority in CIP / Yearly Operational Frequency
High	Standard Priority in CIP / Biannual Operational Frequency
Medium	Low Priority in CIP / 1 in 5 Years Operational Frequency
Low	1 in 10 Years Operational Frequency
Negligible	Wait for a problem to arise



Risk Analysis

Likelihood of Failure

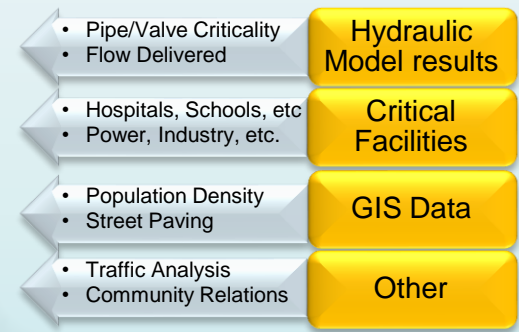


Multiple Calculation Options



Calculation of Risk

Consequence of Failure



Pipe Risk Summary

Graph | Report | Report By Risk Tiles

	LOF - Low	LOF - Medium Low	LOF - Medium	LOF - Medium High	LOF - High
Conseq. - High	16 pipe, 1.36 mile	18 pipe, 1.24 mile	6 pipe, 0.42 mile	4 pipe, 0.57 mile	28 pipe, 2.71 mile
Conseq. - Medium High	22 pipe, 1.60 mile	17 pipe, 1.07 mile	2 pipe, 0.11 mile	2 pipe, 0.05 mile	7 pipe, 0.66 mile
Conseq. - Medium	23 pipe, 1.67 mile	9 pipe, 0.35 mile	1 pipe, 0.12 mile	0 pipe, 0.00 mile	8 pipe, 0.48 mile
Conseq. - Medium Low	91 pipe, 5.36 mile	68 pipe, 4.58 mile	91 pipe, 5.29 mile	40 pipe, 3.12 mile	127 pipe, 8.43 mile
Conseq. - Low	75 pipe, 3.84 mile	23 pipe, 1.66 mile	53 pipe, 3.20 mile	13 pipe, 0.65 mile	127 pipe, 6.61 mile

Risk Class	Capital Action
Extreme	High Priority in CIP / Yearly Operational Frequency
High	Standard Priority in CIP / Biannual Operational Frequency
Medium	Low Priority in CIP / 1 in 5 Years Operational Frequency
Low	1 in 10 Years Operational Frequency
Negligible	Wait for a problem to arise

Defect-by-Defect Analysis

DB Editor

Rehabilitation Methods

Rehab. Method	Description	Full Pipe	Diameter Source	Connection Cost	Import Cost Field	Rehab. Buffer Width (in)	Rehab. Merge Width (in)	Allow Merge
<input type="checkbox"/> CLEANING		No	Existing	No				No
<input type="checkbox"/> FULL LINING		Yes	Existing	Yes				No
<input type="checkbox"/> HEAVY CLEANING		No	Existing	No				No
<input type="checkbox"/> LATERAL REINSTATEMENT		No	Existing	No				No
<input type="checkbox"/> LINING		No	Existing	No				No
<input type="checkbox"/> PIPE BURSTING		No	Existing	No				No
<input checked="" type="checkbox"/> POINT REPAIR		No	Existing	No		48.00	120.00	Yes
<input type="checkbox"/> REPLACEMENT		Yes	Existing	Yes				No
<input type="checkbox"/> SERVICE		No	Existing	No				No
<input type="checkbox"/> UPSIZE		Yes	New	Yes				No
<input type="checkbox"/> CCTV		Yes	Existing	No				No

25 D 2.00 MISCELLANEOUS Defective Connection POINT REPAIR POINT REPAIR 0 0

26 DAE 3.00 SERVICE Defected Defect "XYZ" POINT REPAIR POINT REPAIR 0 0

27 DAGS 5.00 SERVICE Deposits Attached Encrustation CLEANING CLEANING 0 0

28 DAR 5.00 SERVICE Deposits Attached Grease CLEANING CLEANING 0 0

29 DAZ 5.00 SERVICE Deposits Attached Ragging CLEANING CLEANING 0 0

30 DB 2.00 MISCELLANEOUS Deposits Attached Other CLEANING CLEANING 0 0

31 DC 2.00 MISCELLANEOUS Displaced Brick 0 0

32 DE 2.00 MISCELLANEOUS Change in Sewer 0 0

33 DG 2.00 MISCELLANEOUS Debris 0 0

34 DH 2.00 MISCELLANEOUS Debris Grease CLEANING CLEANING 0 0

35 DI 2.00 MISCELLANEOUS Deformed Horizontal Back POINT REPAIR POINT REPAIR 0 0

36 DNF 5.00 SERVICE Dropped Invert POINT REPAIR POINT REPAIR 0 0

37 DNGV 2.00 SERVICE Deposits Ingressed Fine Buffer (48 in) CLEANING CLEANING 0 0

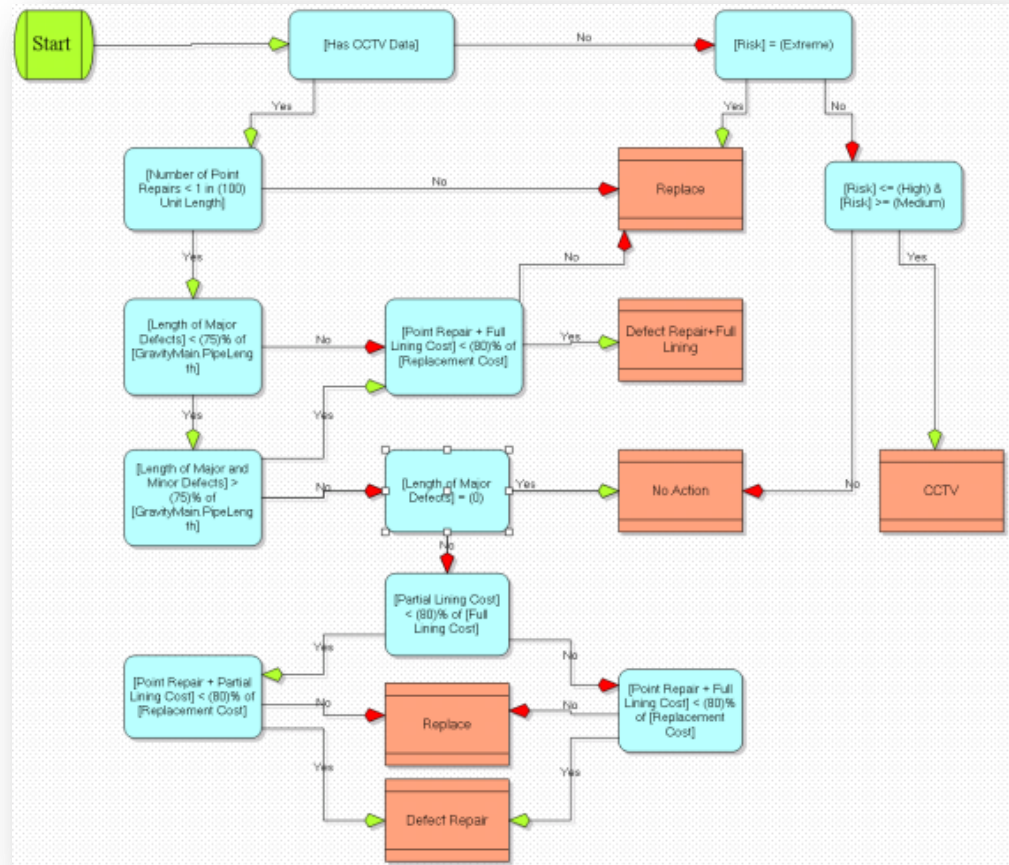
38 DNZ 4.00 SERVICE Deposits Ingressed Gravel Merge Width (120 in) CLEANING CLEANING 0 0

38 DNZ 4.00 SERVICE Deposits Ingressed Other CLEANING CLEANING 0 0

Single Merged Rehab

Pipe by Pipe Analysis

- Employ **ANY** Logic
- Utilize **ANY** Data
- Defensible
- Repeatable
- Fast



Pipe Rehabilitation Plan Summary - RehabPlan1

	Pipe ID	Rehab Actions	Reason	Flowchart Branch	Number of Rehab.	Total Cost
1	I-2.I-1.1	Replace	[Point Repair + Full Lining Cost] < (80)% of [Replacement Cost] is No	Y-Y-Y-N-N-N-N	12	62864.14
2	B-1.1.B-1.1	Replace	[Point Repair + Full Lining Cost] < (80)% of [Replacement Cost] is No	Y-Y-Y-N-N-N-N	15	49487.98
3	B-1.C-97.1	Replace	[Number of Point Repairs < 1 in (100) Unit Length] is No	Y-N	4	46029.68
4	I-6.I-3.1	Replace	[Point Repair + Full Lining Cost] < (80)% of [Replacement Cost] is No	Y-Y-Y-N-N-N-N	5	37307.49

Interactive Review

- InfoMaster users can modify proposed rehab / O&M

The screenshot displays the InfoMaster software interface, which is used for managing utility assets and planning rehabilitation work. The main window shows an aerial map of a residential area with a street grid. Overlaid on the map is a large window titled 'CCTVVideoFrame' showing a live video feed from a camera inside a pipe. The video shows a dark, circular opening with the text 'MULTIPLE CRACK' overlaid. Below the video is a control panel with buttons for 'Play', 'Repeat', and 'Set Video Offset Time (seconds)', along with a 'Set Play Buffer Length (total length)' field.

To the right of the map is a 'Data Explorer' window showing a list of facility details for a specific pipe. The details include:

- FacilityID: 0005C0153.0005C01-
- FacilityNameID: 0005C0153
- Height
- Hydrant
- InstallDate
- Last Edit
- Last Update Date
- LegacyID
- LifecycleStatus
- LiningType
- MaintenanceBy
- Material: Cast Iron Pipe
- OBJECTID: 309
- OwnedBy
- OwnedBy
- PipeClass
- ProjectNumber
- Roughness
- Shape: System_CondObject
- Shape_Length: 260.35631541332971
- Style
- SubtypeCode
- URL: www.mca.ca

At the bottom of the screen, there is a 'Rehab Plan Browser' window showing a detailed diagram of a pipe section. The diagram is a long horizontal cylinder with various colored segments representing different rehabilitation methods. The segments are labeled with 'CLEANING', 'LINING', and 'POINT REPAIR'. The diagram includes a scale from 0 to 200.36 and various numerical markers along the length of the pipe.

Below the diagram is a table with the following data:

Rehab No	Rehab Type	Begin	End	Length	
1	0195	LINING	22.10	23.10	1.00
2	0196	LINING	26.80	27.00	1.00
3	0197	LINING	40.50	41.50	1.00
4	0198	LINING	33.40	34.40	1.00
5	0199	CLEANING	37.10	38.10	1.00
6	0200	CLEANING	195.18	141.90	38.80
7	0201	LINING	125.18	142.00	17.70
8	0202	LINING	125.18	136.10	1.00
9	0203	CLEANING	133.60	134.60	1.00
10	0204	LINING	154.90	155.90	1.00
11	0205	LINING	156.70	157.70	1.00
12	0206	LINING	167.50	200.30	41.30
13	0207	CLEANING	163.50	183.00	13.50
14	0208	POINT REPAIR	216.00	217.00	1.00
15	0209	LINING	220.18	221.10	1.00

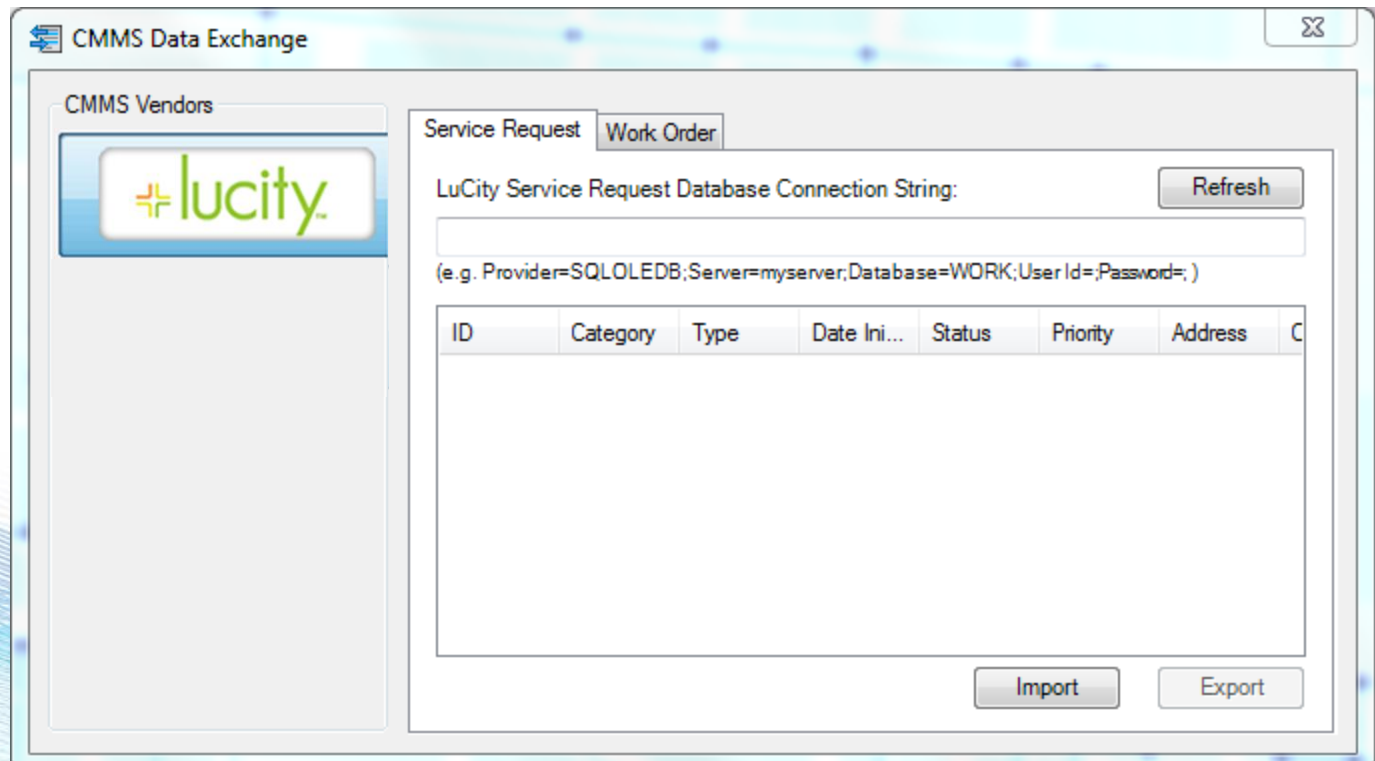
Out-of-the-Box Data & Reporting Hub

The screenshot displays the InfoMaster Reports interface with the following components:

- Browser Tabs:** Tim Hill | Links, Childhood Mot, Expressive lang, Innovize - Inno, InfoMaster Rep, Innovize - Inno.
- Address Bar:** file:///C:/Demo/InfoMaster/Reports/Report14-Risk3/index.html
- Navigation Menu (Left):**
 - Report Cover
 - Risk Summary**
 - Risk Break Down
 - Risk Detail
 - Consequences of Failure
 - CON1 (Diameter)
 - Summary
 - Break Down
 - Details
 - CON2 (Critical Facilities - Hospitals)
 - CON3 (Critical Facilities - Schools)
 - CON4 (Critical Facilities - Highways)
 - CON5 (Critical Facilities - River)
 - Likelihood of Failure
 - LOF1 (Material)
 - Summary
 - Break Down
 - Details
 - LOF2 (Intersection - Railroads)
 - LOF5 (Count of Incidents)
 - LOF4 (InstallDate)
- Summary Data (Top):**
 - COF - Low: 0 Pipe, 0.0 miles; 0 Pipe, 0.0 miles; 0 Pipe, 0.0 miles; 0 Pipe, 0.0 miles; 0 Pipe, 0.0 miles
 - LOF2: 1, 1, Intersection
 - LOF5: 1, 1, Incidents
 - LOF4: 1, 1, Pipe Attribute
 - LOF6: 1, 1, Incidents
- Report Graph Manager (Top Right):**
 - Average Risk by Diameter, Risk1
 - Report: Average Risk by Diameter, Risk1
- Average Risk by Diameter (Bar Chart):** Shows Average Risk (Y-axis, 360-440) vs Diameter (X-axis).
- Defect Count by Installation Year (Bar Chart):** Shows Defect Count (Y-axis, 600-2900) vs Installation Year (X-axis, 1900-2010). Legend: Defect Count @ Defect Count by Installation Year (Green), Average Risk @ Average Risk by Installation Year (Purple).
- Consequence of Failure Distribution - Risk1 (Pie Chart):** Shows distribution of risk by consequence of failure. Legend: COF1 (InstallDate): 9%, COF2 (Critical Facilities): 35%, COF3 (Critical Facilities - Hospitals): 17%, COF4 (Critical Facilities - Schools): 17%, COF5 (Population Density): 17%, COF6 (Slope): 17%.
- Other Pie Charts:**
 - CON1 (Diameter): 15%
 - CON2 (Critical Facilities - Hospitals): 15%
 - CON3 (Critical Facilities - Schools): 22%
 - CON4 (Critical Facilities - Highways): 22%
 - CON5 (Critical Facilities - River): 22%
 - LOF1 (Material): 23%
 - LOF2 (Intersection - Railroads): 23%
 - LOF5 (Count of Incidents): 23%
 - LOF4 (InstallDate): 23%

Exchange Data with Lucity

- Pull in Likelihood of Failure info
 - Breaks, leaks, service calls, customer complaints, etc.
- Push back Prioritized Tasks
 - Inspections, cleaning, lining, pigging, etc.



The screenshot displays the 'CMMS Data Exchange' application window. On the left, under 'CMMS Vendors', the 'lucity.' logo is selected. The main area is split into two tabs: 'Service Request' and 'Work Order'. The 'Service Request' tab is active, showing a text field for the 'LuCity Service Request Database Connection String' with a 'Refresh' button. Below this is a table with columns: ID, Category, Type, Date Ini..., Status, Priority, Address, and C. At the bottom, there are 'Import' and 'Export' buttons.

ID	Category	Type	Date Ini...	Status	Priority	Address	C
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Introducing InfoMaster

- Live demonstrations
 - Wastewater collection system
 - Potable water distribution system



Innovyze®