

# The Operations Management System for **Water Utilities**

PRESENT BY

*Cartègraph*<sup>™</sup>

# Cartegraph™

A little about us...



# Cartegraph™



Trans



Water



Flood



Tree



Parks



Facilities



Fleet



YourGOV

Solutions

Requests

Assets

Work

Resources

Operations Management

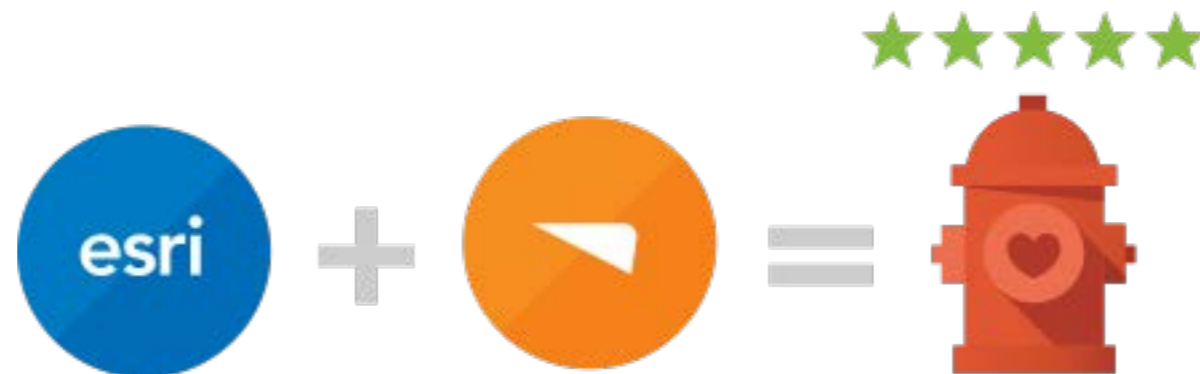


*Cartegraph*<sup>TM</sup> +  **esri**<sup>®</sup>

Connected like never before.

# Cartegraph™

Together with Esri, we provide every Cartegraph user an ArcGIS Identity. One sign in, two powerhouse platforms. It's that simple.



# Cartēgraph™



Distribution



Storm



Waste



Plant

Water Solution

Requests

Assets

Work

Resources

Operations Management



# Cartegraph™

## Water Distribution Network



Water Lateral



Water Pump



Water Main



Water Meter



Water Hydrant



Water Valve



Water Storage Tank



Water Facility



Water Backflow

# Cartegraph™

## Waste Water Network



Sewer Main



Sewer Pump



Sewer Force Main



Sewer Manhole



Sewer Lateral



Sewer Cleanout



Sewer Facility



# Cartegraph™

## Storm Water Network



Storm Outlet



Storm Basin



Storm Facility



Storm Culvert



Storm Pump



Storm Pipe



Storm Manhole



Storm Inlet



Storm Channel

# Cartegraph™

## Water Plant Assets



Pumps



Motors



Generators



Gas Detector



Water Facility



Filters



Tanks



Reservoirs



Monitor



Hvac



Aerators



Chlorinator



Chlorine Analyzer



Valve





# Water Plant Operations Management



The Goal

Be more proactive.

Case Study

# Joint Water Commission

Primary Drinking Water Supplier to Communities in  
Washington County, Oregon

*Cartègraph*

A little about...

# Joint Water Commission

- 400,000 Customers in Washington County, OR
- 17 Person Team
- 2000+ Plant Assets
- 22,000+ Completed Tasks Since 2010
- 8,059 Tasks Last Year
- 423 Work Orders Since 2010

JWC's goal was to become more proactive to improve service and save dollars.



## Real Results

# Strategic Preventative Maintenance

Between 2014 and 2015

Proactive  
Hours



2,697

Reactive  
Hours



81

## Measurable Benefits

Pattern Recognition

Automation

Real-Time Information

Data-Driven Decisions

Happier Teams

So how do you do it?



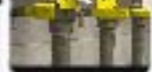
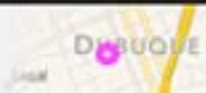

# The Process

What do you have?

# Inventory Your Assets

The image shows a tablet displaying a mobile application interface for asset management. The background is a photograph of industrial pipes with yellow tags. The tablet screen shows the following information:

Verizon LTE 11:56 AM 80%  
Back Asset Detail

|   |                            |   |                         |                        |  |
|---|----------------------------|---|-------------------------|------------------------|--|
|  | ASSET TYPE<br><b>Valve</b> | ID<br>095   | TOTAL COST<br>\$781     | OCI<br>80              | 1 Year and 10 Mont...<br> |
|  | 159 MAIN ST<br>Dubuque     |  | 2013-02-13<br>INSTALLED | 2013-02-13<br>REPLACED | Good<br>                  |

Location Cancel Save

Basic Information

Address Number: 159  
Street: MAIN ST  
City: Dubuque  
Location Description: Located near 7th and Main.

Locator Information

Locator Address Number:   
Locator Street:







How is it all connected?

# Asset Relationships



What condition is it in?

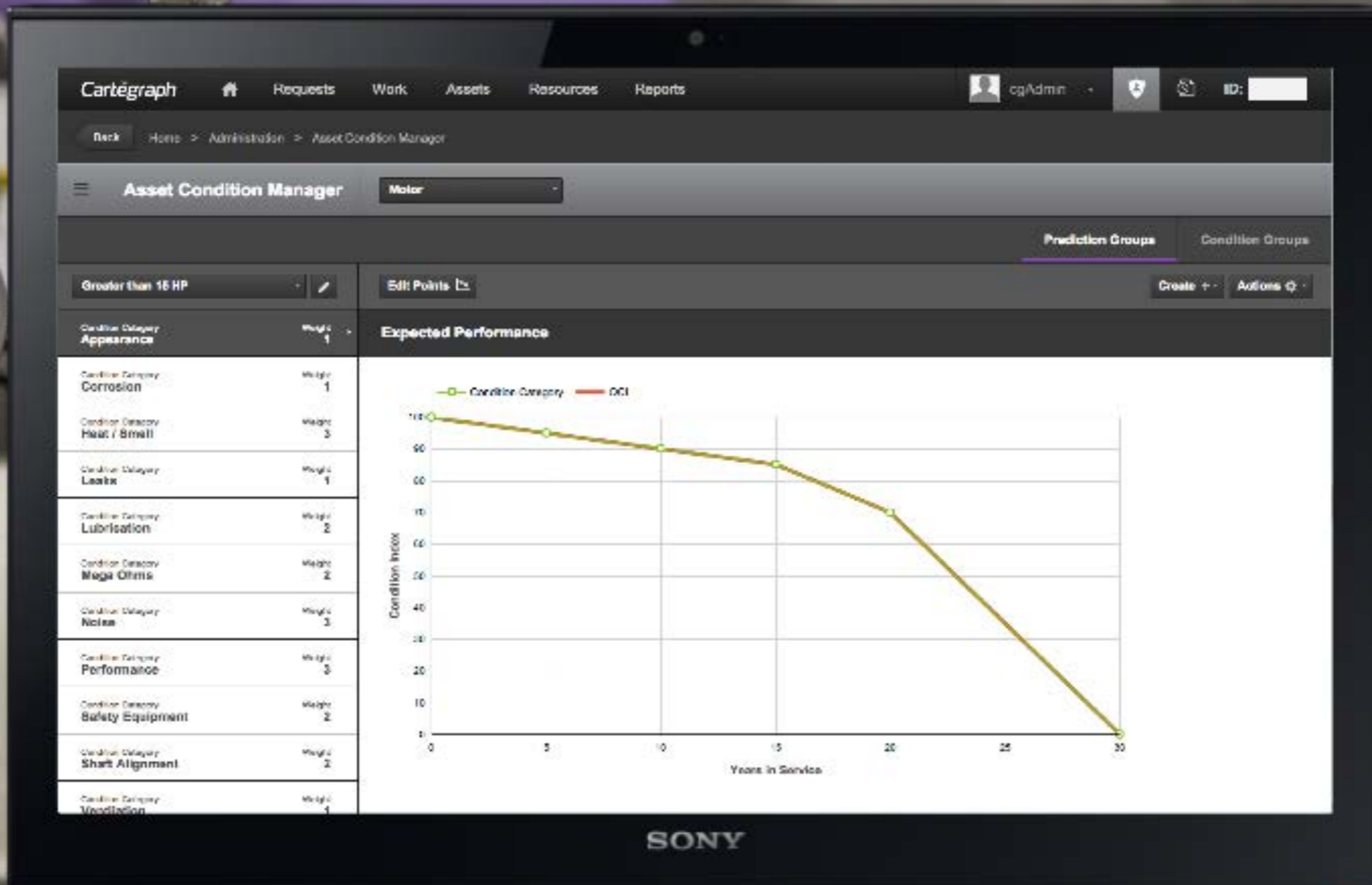
# Perform Inspections

|                 |   |           |     |
|-----------------|---|-----------|-----|
| 1 Appearance    |    | Good      | 80  |
| 2 Corrosion     |   | Good      | 70  |
| 3 Functionality |  | Excellent | 100 |
| 4 Heat / Smell  |  | Average   | 60  |
| 5 Leaks         |  | Good      | 70  |
| 6 Noise         |  | Fair      | 40  |



When will it fail?

# Performance Curves





Get proactive.

# Preventative Maintenance

Task Triggers Based on:



Usage



Time



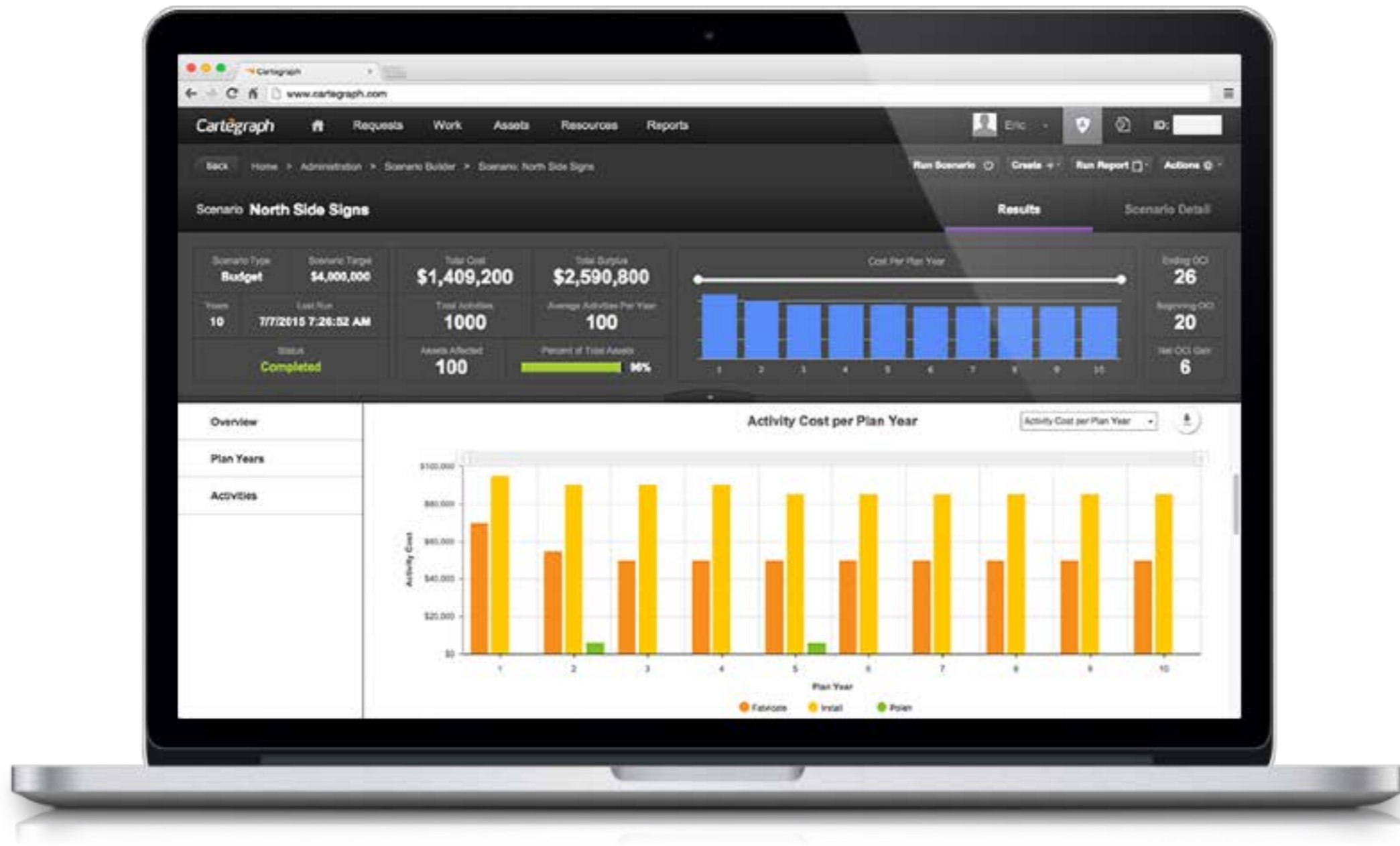
Repeat



Condition

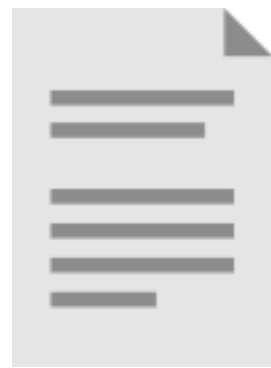
Predict the future

# Proactive Work Planning



Predict the future

# Proactive Work Planning



## Asset Data

Attributes  
Location  
Maintenance History  
Condition  
Criticality  
Protocol/Filter

## Performance

Performance Curves  
Activity Costs  
Activity Impacts  
Activity Triggers  
Condition Categories  
Prediction Groups

## Budget/Goal

Budget Limitation  
OCI Target  
Unlimited Budget

## Timeline

Start Date  
Plan Years

Put it to work

# Work Management

The tablet screen shows a mobile application interface for inspecting an asset. The interface includes a navigation bar at the top with a back arrow and the text 'Inspecting Asset'. Below this, there is a 'Basic Information' section with fields for 'Inspection Date' (4/9/2014), 'Inspected By' (J21), and 'Full Name' (Craig Patterson). A 'Comment Container' section follows, with three rows for 'Aesthetics', 'Structure', and 'Surface'. Each row has a star rating system and a dropdown menu. The 'Aesthetics' row shows 4 stars and 'Average'. The 'Structure' row shows 5 stars and 'Not Inspected'. The 'Surface' row shows 4 stars and 'Good'. At the bottom, there is a 'Notes' section with a text area containing the text 'No maintenance recommended before rewrapping'.

| Category   | Rating  | Condition     |
|------------|---------|---------------|
| Aesthetics | 4 stars | Average       |
| Structure  | 5 stars | Not Inspected |
| Surface    | 4 stars | Good          |

Notes: No maintenance recommended before rewrapping.



# Monitor your progress Real Time Data

The screenshot displays the Cartegraph web application interface. The browser address bar shows the URL <https://cgweb05.cartegrphoms.com>. The navigation menu includes 'Requests', 'Work', 'Assets' (highlighted), 'Resources', and 'Reports'. The user is logged in as 'cgAdmin'. The breadcrumb trail is 'Home > Assets > Facility: 22'. The main content area is titled 'Facility 22' and has tabs for 'Summary', 'Components', and 'Asset Detail'. The 'Summary' tab is active, showing a dashboard with the following data:

- Overview
- Requests: 0
- Tasks: 84
- Assets: 251

Below the dashboard, there are three summary cards:

- Average Asset Cost: \$851
- Total Asset Cost: \$213,639
- Average Estimated OCI: 57

A condition distribution chart shows the following counts:

- Excellent (5 stars): 50
- Good (4 stars): 22
- Average (3 stars): 10
- Fair (2 stars): 4
- Poor (1 star): 34
- Failed (red circle): 8
- Not Rated (circle with slash): 123

At the bottom, a table lists asset details:

| Asset Type  | ID      | Street            | Estimated OCI | Inspected OCI | Criticality |  |
|-------------|---------|-------------------|---------------|---------------|-------------|--|
| Chlorinator | JWC1000 | Chlorinator 5 FM  | 86.78         | 90            | ⚠           |  |
| Chlorinator | JWC1001 | Chlorinator 4 PS1 | 86.78         | 90            | ⚠           |  |