ASSET MANAGEMENT VISUALIZATIONS
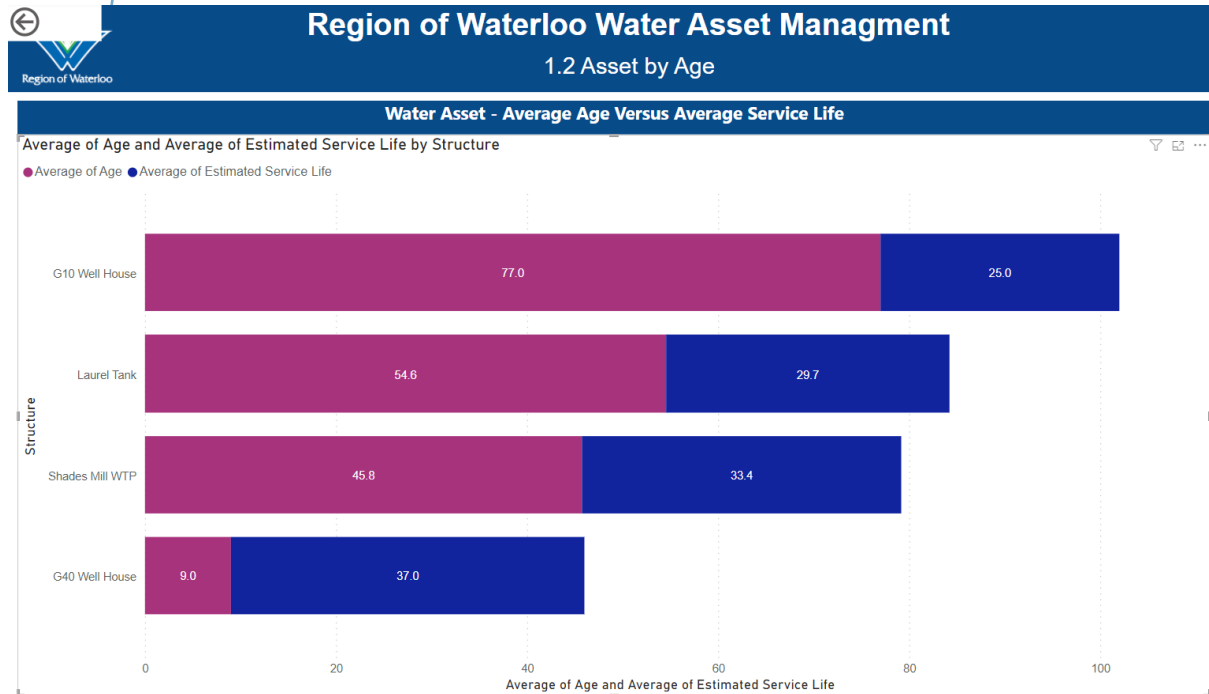
INTRODUCTION:

DIRECT IT

- Niche IT Consulting firm

- Software development, implementation & integration

- Supporting Municipal services for over 30 yrs

- EAM, CMMS & AM implementations & integrations

- George Lykoudis, CEO of Direct IT
    - 30+ years of experience in supporting governments locally & across North America

BluePlan

- Full infrastructure lifecycle consulting

- Employee Owned, 7 offices throughout Ontario, 250+ staff

- Focused Asset Management & Infrastructure Planning Team (60+ staff)
    - Asset Management Strategies/Frameworks
    - Wet Weather
    - Maintenance Management Systems
    - Decision Support Systems
    - Data Analytics/Management & Technology

- Terry Martins, Partner, AM Lead
   - 32 years AM experience

EVOLUTION OF ASSET DATA

Region of Waterloo Water Asset Managment

1.2 Asset by Age

Water Asset – Average Age Versus Average Service Life

Average of Age and Average of Estimated Service Life by Structure

● Average of Age ● Average of Estimated Service Life

| Structure	Average of Age	Average of Estimated Service Life
G10 Well House	77.0	25.0
Laurel Tank	54.6	29.7
Shades Mill WTP	45.8	33.4
G40 Well House	9.0	37.0

- Technology is changing the game, we can do a lot more than we ever could:
    - Ability to manage & integrate data l
    - Ability to analyze data, see trends (AI), etc.
- EAM is integrating O&M (CMMS) with AM (DSS), also seeing Enterprise Implementations
- Asset Registers provide a single source of the truth, trend is to build these in the CMMS/GIS
- New approach to asset visualization (ie. Training O&M staff to manage asset data)
- Sharing of data is improving the ability to make decisions (asset visualization)

BENEFITS OF ASSET MANAGEMENT VISUALIZAT

- Enhanced Data Insights
  - Visualizations offer intuitive representations of asset data
  - Enabling quick identification of trends, patterns & anomalies

- Improved Decision-Making
  - Clear visualizations facilitate informed decision-making, optimizing resource allocation, maintenance plans, and capital investments

- Stakeholder Communication
  - Visualizations provide a visual common language, enabling effective communication with stakeholders, including residents, policymakers, and other departments

- Risk Mitigation
  - Visualizing asset condition &performance helps identify potential risks
  - Enabling proactive maintenance & minimizing service disruptions

- Long-Term Planning
  - Visualizations aid in long-term planning by assessing asset lifecycle, predicting future needs, and aligning with budgeting and funding requirements

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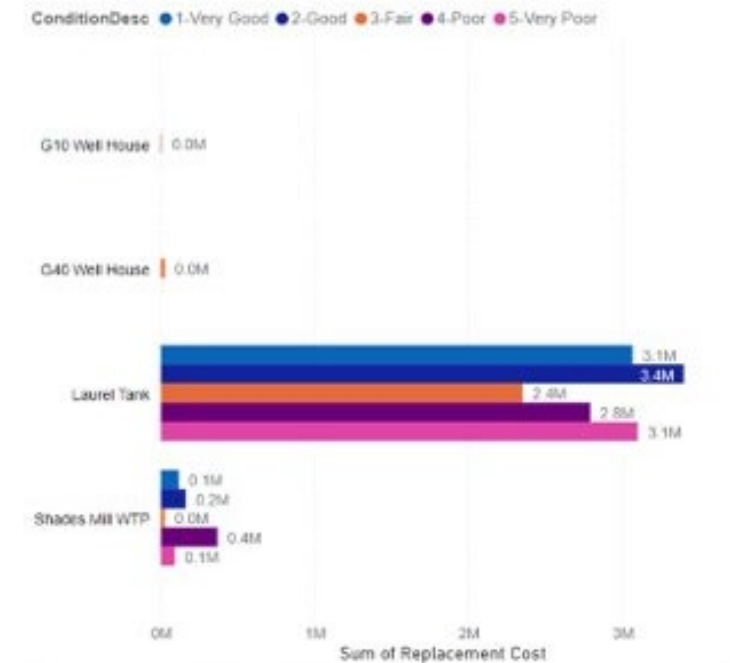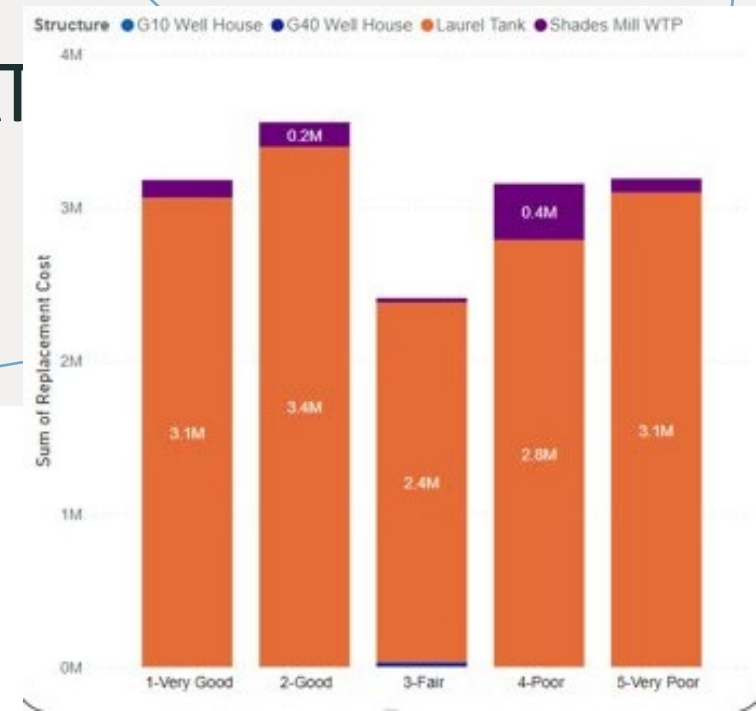
WHO NEEDS TO VISUAL ASSET DATA
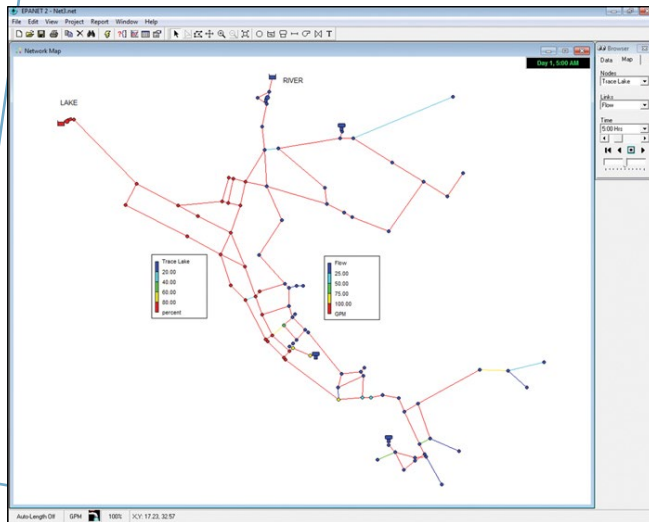
- Operations & Maintenance (front line staff, planners, etc.)

- Engineering (design, planning, etc.)

- Performance (hydraulic models, DWQMS, LIMS, etc.)

- Senior Management, Council (impacts to LOS & customers)

- Asset Management (Capital Plans, AMP, Master Plans, etc.)

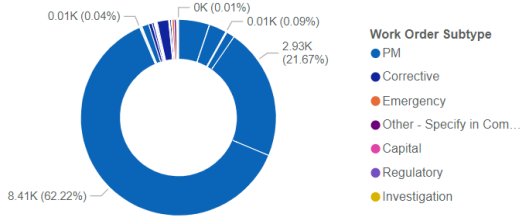- Public & 311 (closures, call centre, etc.)

DIRECT IT

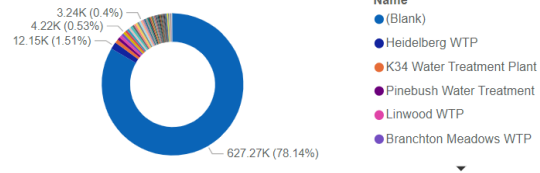**Region of Waterloo Dashboard**
1.2 Water Services Work Order & Facility

Work Order Count by SubType & Water Building

WO Count by Subtype and Category

0.01K (0.04%) 0K (0.01%)
0.01K (0.09%)
2.93K (21.67%)
8.41K (62.22%)

Work Order Subtype
- PM
- Corrective
- Emergency
- Other - Specify in Com...
- Capital
- Regulatory
- Investigation

WOSubtypeType	Admin Time	Booster Pumps	Distribution Pumping Station
PM	1	695	
Regular/Scheduled	87	105	15
Corrective	5	77	4
Emergency		4	
Other - Specify in Comments	38	5	
Capital	8		
Regulatory	3		
Investigation			
Total	**142**	**886**	**2**

Building Cost (Source Assetcost)

3.24K (0.4%)
4.22K (0.53%)
12.15K (1.51%)
627.27K (78.14%)

Name
- (Blank)
- Heidelberg WTP
- K34 Water Treatment Plant
- Pinebush Water Treatment
- Linwood WTP
- Branchton Meadows WTP

Name	Sum of Work Cost
	627,272.33
ASR01 Well House	61.04
ASR02 Well House	66.65
ASR03 Well House	261.56
ASR04 Well House	81.87
Ayr Pumping Station	2,814.54
Ayr Reservoir	3,702.44
Ayr Standpipe	321.30
Ayr Water Treatment Plant	3,484.93
Badan Pumping Station	124.66
Total	**802,741.51**

Ready Backlog
- Internal WO Hours Scheduled
- OCWA Staff = Available Hours / Weeks Backlog (> 2 weeks)
- External Contractors: Hours Contracted

Total Backlog
- Internal WO Hours Identified
- OCWA Staff = Available Hours / Weeks Backlog (< 6 weeks)
- External Contractors: Hours to be Contracted

Available Hours

	Last 4 weeks	Next 8 weeks
Regular	hours	hours
Overtime	hours	hours
Sick	hours	Hours (STD/LTD)
Training	hours	hours
Safety Training	hours	hours
Vacation	hours	hours
Miscellaneous	hours	hours
Available	hours	hours

Preventative Maintenance (Past 4 Weeks)

Critical Asset PMs
Compliance Related PMs
Unplanned Corrective
Planned Corrective
Contractor Labour
Fault Finding
Fault Finding Follow Up
Safety Works
Capital
Corrosion Control
Preventative Maintenance
Locate WOs

Total WOs

- OCWA Staff # WOs
- OCWA Staff WO hours
- OCWA Staff WO Costs
- External Contractor # WOs
- External WO POs/Costs

Reports
- Asset Age
- Replacement Value
- Value Invent. Materials
- # Catch basins
- Standby Power Unit Operating Hours
- SMD or Maintenance SOP or RCMD Refer #
- Remaining Service Life
- Condition Rating
- Value Issued from Invent.
- # Trans. Valve Chambers
- Standby Power Unit Uptime Hours
- Equipment Run Hours

Additional reports as per KPIs

TYPES OF ASSET MANAGEMENT VISUALIZATIONS:

- **Geographic Information System (GIS) Mapping:**
  - Display asset locations, spatial relationships, & attributes on interactive maps
  - Enable geospatial analysis for efficient asset planning, maintenance & emergency response

- **Dashboard & Key Performance Indicators (KPIs):**
  - Present asset performance metrics, such as condition ratings, maintenance costs & service levels, in concise & visually appealing dashboards
  - Track KPIs to measure progress, identify areas for improvement & support data-driven decision-making

- **Predictive Analytics:**
  - Utilize advanced algorithms & machine learning to predict asset condition, failure risks & maintenance requirements
  - Visualize predictive models to support proactive maintenance strategies & optimize asset lifecycle management

IMPLEMENTATION AND INTEGRATION CONSIDERATIONS
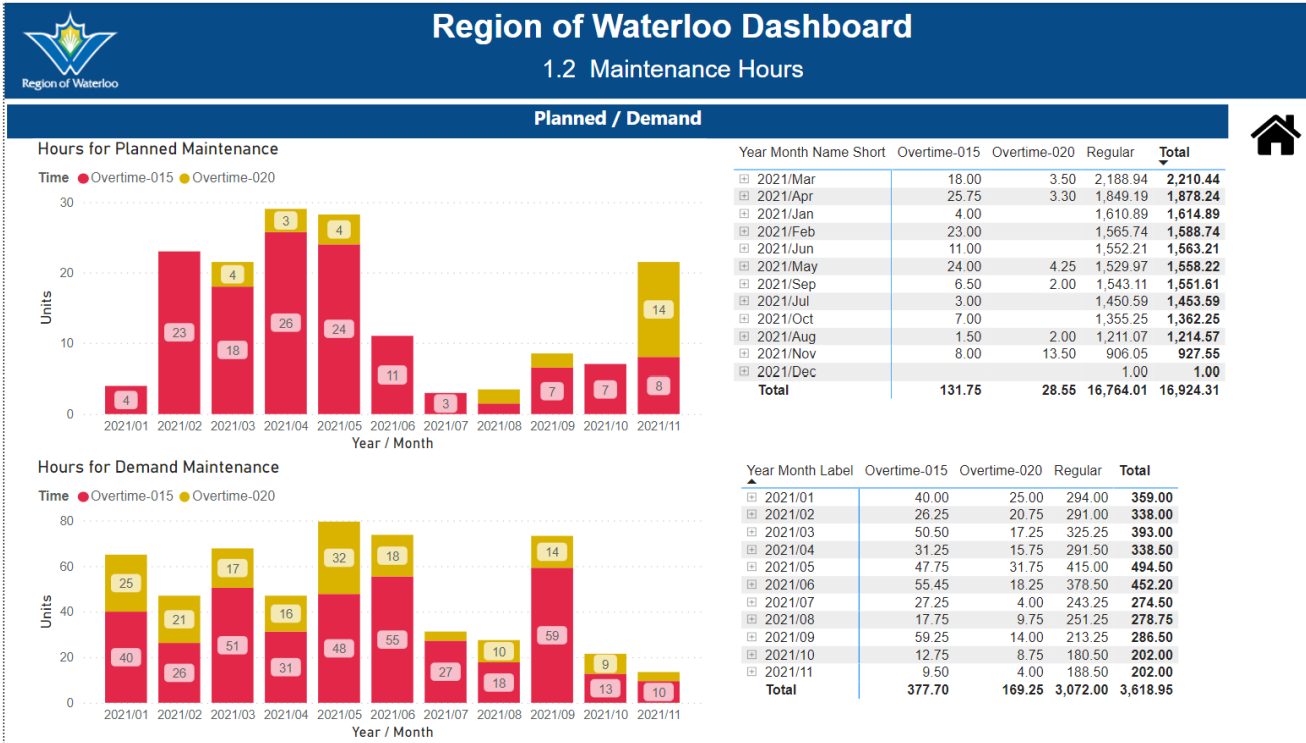
- **Data Management:**
  - Ensure data quality, accuracy, and consistency to provide reliable visualizations.
  - Implement data governance practices and standardized asset data structures.

- **Integration with Existing Systems:**
  - Identify integration points with existing asset management systems, financial systems, and work order systems.
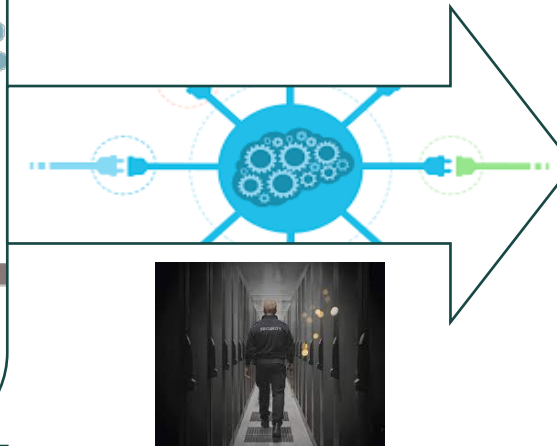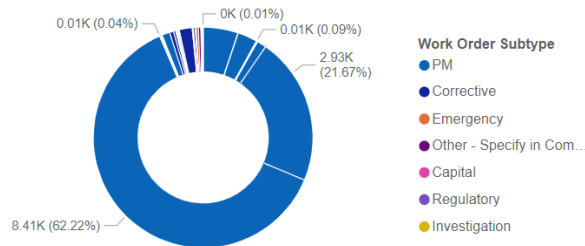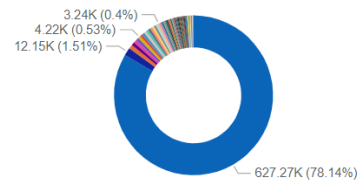 - Facilitate seamless data flow and update visualizations in real-time.

- **User Training and Adoption:**
  - Conduct training programs to educate staff on using asset management visualizations effectively.
  - Foster user adoption through workshops, documentation, and ongoing support.

IT ARCHITECTURE

Asset Register

Secure API gateway

Analytics platform / tools

USER PROFILES

- Maintenance / Ops
  - Field Staff
  - Supervisory Staff / Team Leaders
  - Maintenance Planners
- Asset Management
  - Capital Planning
  - Financial / Budget / PSAB
  - Senior Management
  - Council
- Public

Maintenance
Planner

MAINTENANCE /OPS

ASSET MANAGEMENT

Region of Waterloo Regional Structures
1.1 Bridges

A - Inventory

86	489.35M	49.26
Number of Structures	Estimated Replacement Cost	Average Age

B - Condition

Condition	Count of I
2	5
1	1
3	1
4	
Total	**8**

%GT Count of Id by Condition

%GT Count of Id by Condition
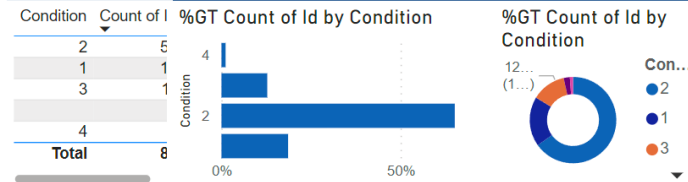
C - Needs

E - Bridges Only

PSAB	#	Deck Area
Truss	4	1,025.70
Arches	4	4,317.60
Rigid Frame	31	7,216.10
Beam/Girder	47	48,618.70
Total	**86**	**61,178.10**
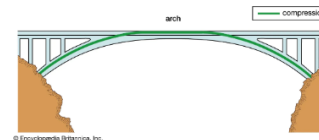
Number of Bridges rated as Good or Very Good

Arches	8	1,861.80
Rigid Frame	60	9,774.40
Total	**68**	**11,636.20**

loo Regional Structures
1.2 Culvert

B - Condition

Condition	Count of Id
2	50
3	16
1	6
4	1
Total	**74**

%GT Count of Id by Condition

%GT Count of Id by Condition
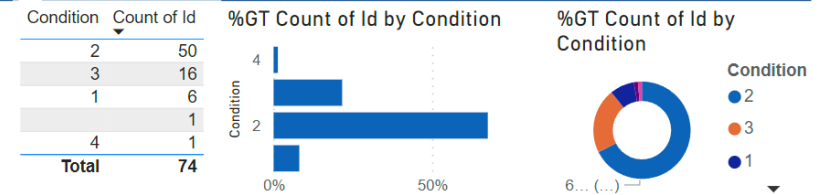
E - Culverts > 3.0 m Only

Condition
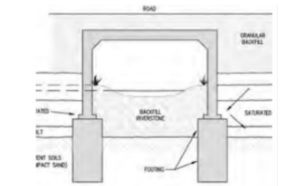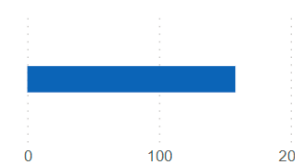
Number of culverts rated as Good or Very Good

COUNCIL / PUBLIC

Asset Replacement Value ($M)

- Water Services — $2,534.3
- Transportation — $2,010.1
- Transit Services — $1,163.4
- Waste Management — $183.9
- Regional Airport — $135.8
- Housing Services — $382.8
- Seniors' Services — $64.2
- Children's Services — $12.6
- Police Services — $132.4
- Paramedic Services — $15.8
- Corporate & Other — $419.9

Very Poor (end of life) ■ Poor ■ Fair ■ Good ■ Very Good

- Water Services — $2,534.3
- Transportation — $2,010.1
- Transit Services — $1,183.8
- Waste Management — $183.9
- Regional Airport — $135.8
- Housing Services — $382.8
- Seniors' Services — $64.2
- Children's Services — $12.6
- Police Services — $132.4
- Paramedic Services — $15.8
- Corporate & Other — $419.9

Asset Replacement Value

Replacement Value ($M)

- Very Good — $2,468
- Good — $2,520
- Fair — $1,426
- Poor — $473
- Very Poor — $189

> 90% in State of Good Repair | < 10% nearing End of Life

CONCLUSION

Recap the benefits of asset management visualizations for Ontario municipalities.

Emphasize the role of technology in bridging the gap between business objectives and successful project outcomes.

Express gratitude for participants' attendance and encourage further exploration of asset management visualization solutions.

DIRECT IT