

Turning Asset Data into Budget Decisions that Last

ACWA Spotlight Session

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Introduction



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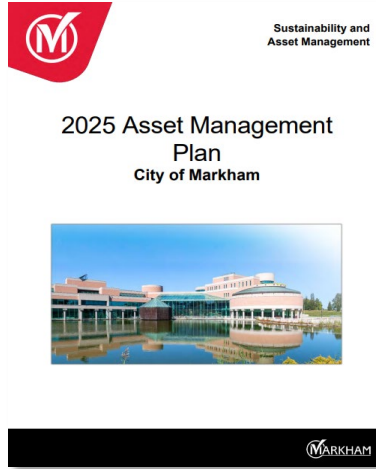
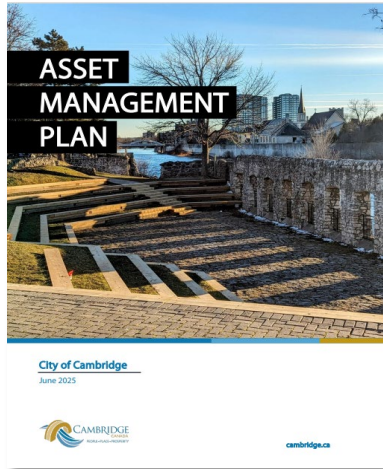


Agenda

- 01** Asset Management & Decision Enablers
- 02** Decision Support Systems and Tools
- 03** Leveraging Data and Systems to Make Decisions
- 04** GEI Overview & Services

Asset Management Plans

\$330 B

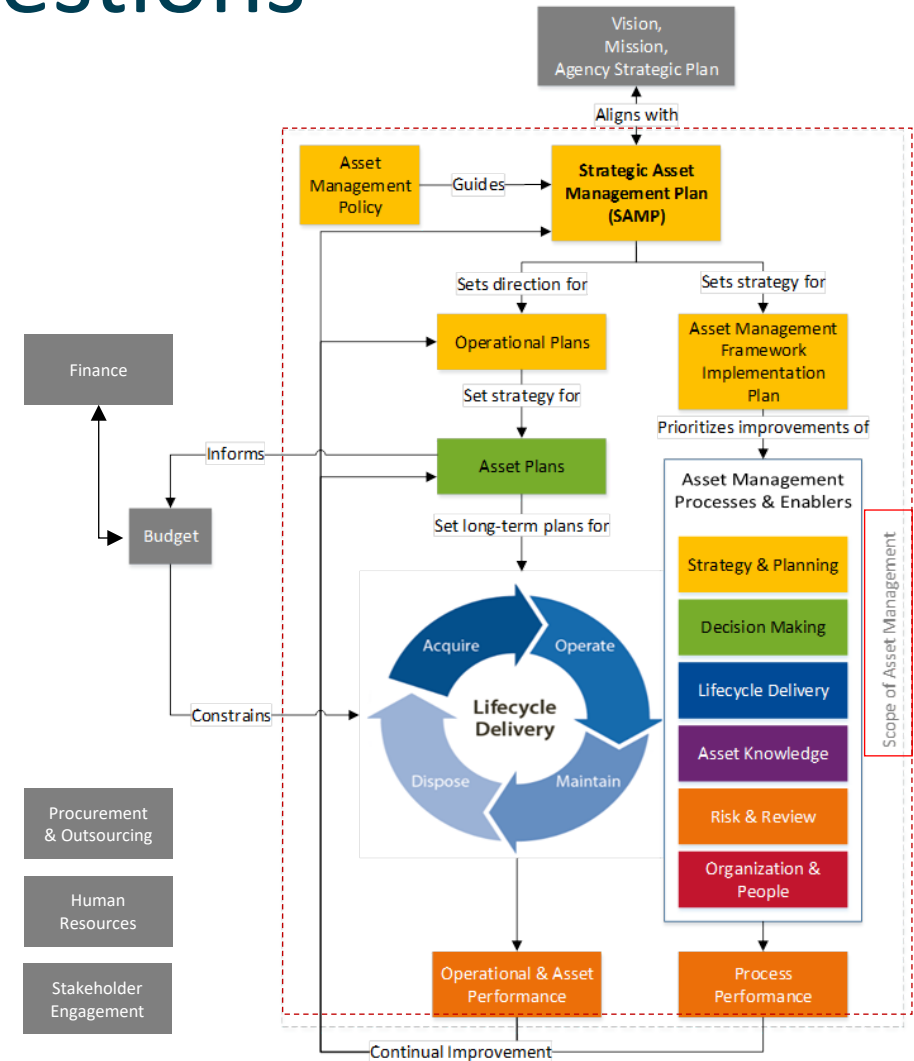
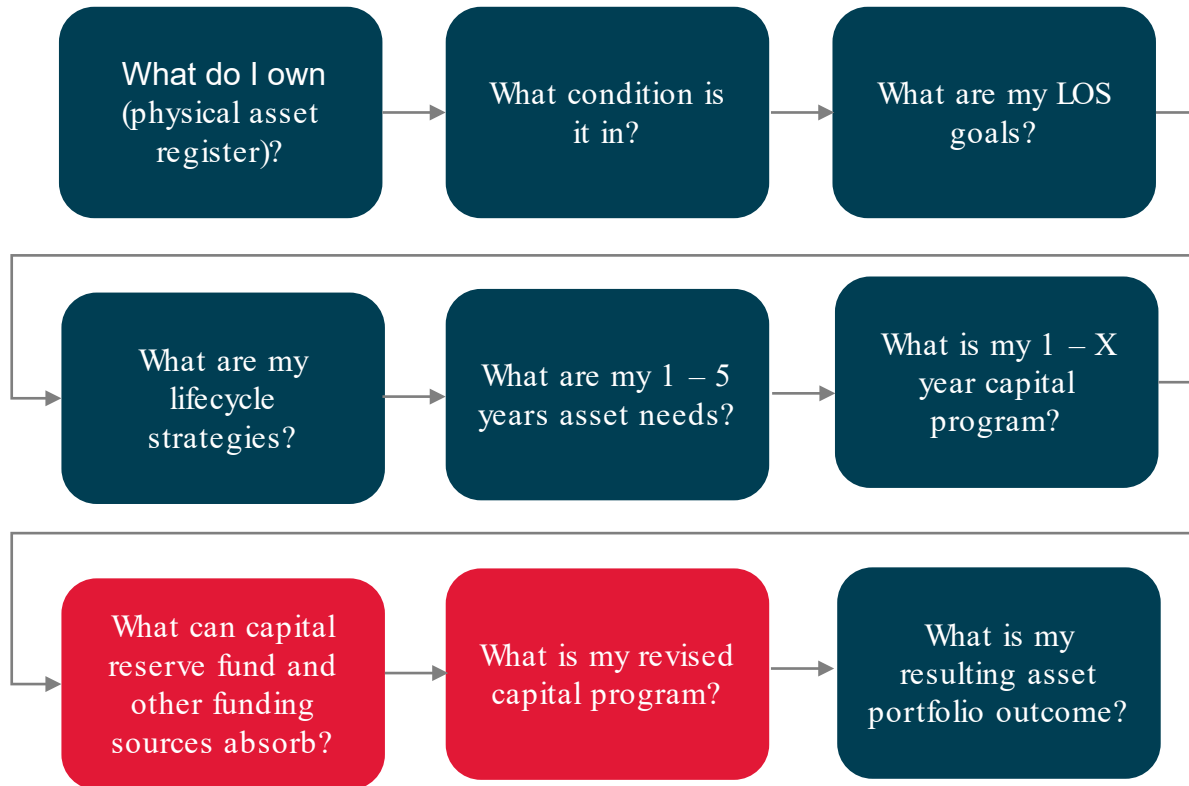




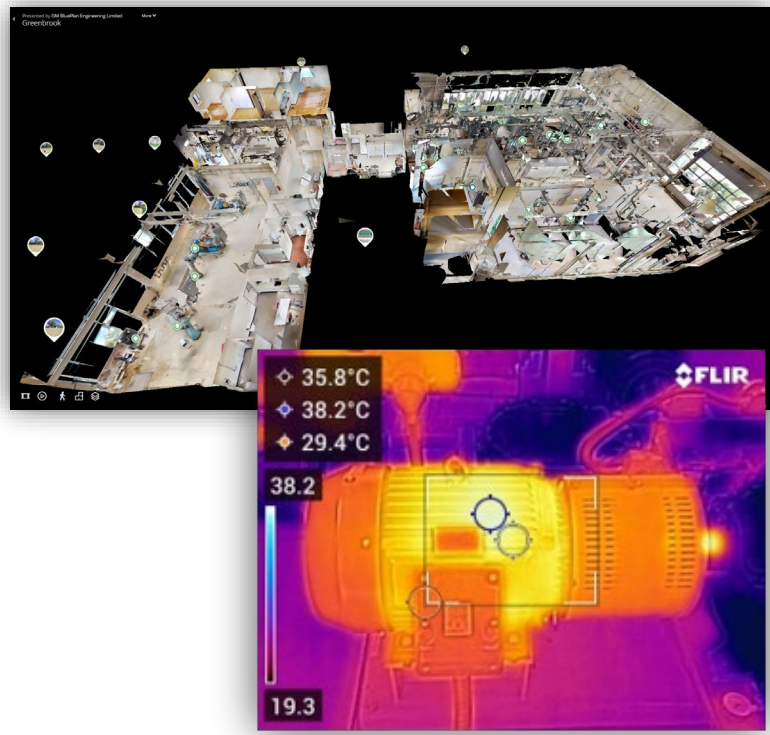
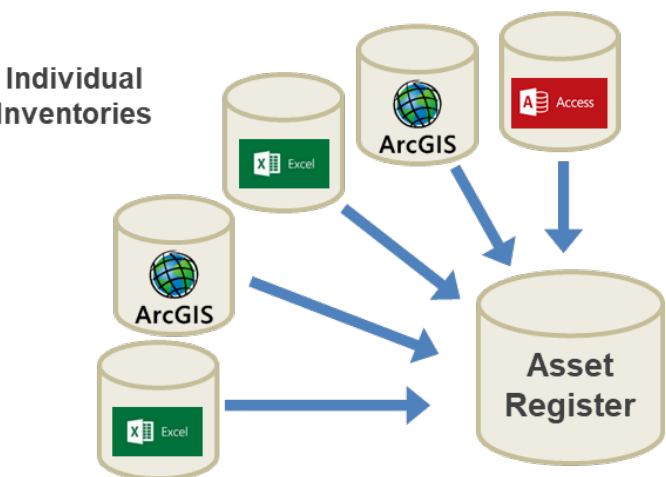
01

Asset Management & Decision Enablers

100



AM Enablers: Data and Information



Data Sources



Data Insights



Data Information



AM Enabler: Enterprise Asset Management System

CMMS

Plan and Manage Work Orders

Work Scheduling

Work Management

Workforce/ Skills
Management

Maintenance Job
Definitions

Preventive Program
Management

Subcontractor
Management

Work Order Data Entry

Work Order Creation +
Close Out

Manage Warehouse

Inventory (Materials)
Management

Equipment
Management

Inventory Accounting / Adjustments

Supply Chain Planning

Inventory
Reconciliation

Material Requisition/ Procurement

Manage Work Requests

Unplanned Job
Reporting /
Requesting

External Work
Requests /
Management

Asset Register

Manage Data Access and Integration

Mobile
Access

GIS
Integration

Document Management
Integration

Project Management
Integration

Automated Asset Condition
Reporting Integration

Reporting

Financial and Staff
Information

Other Integrations

Manage Asset and Component Information

Asset Classes & Configuration Management

Asset Tracking

Component Tracking
and Tracing

Decision Support System

Manage Asset Condition and Level of Service Information

Level of Service
Rating Scales

Inspection History
and Results

Inspection Data Capture

Conduct Advanced Analytics/Decision Support

Deterioration Modelling

Advanced Trends
Analysis and Alerts

Scenario
Analysis/What-if
Analysis

Conduct Asset Planning and Budgeting

Short-Term
Budgeting

Long-Term
Budgeting

Life Cycle Management Activities

Organizational Challenges in Asset Planning



Horizontal Silos



Operations, engineering, finance, linear and facilities—each managed in isolation



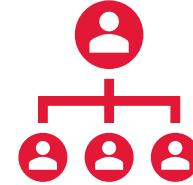
Different condition assessment methods across asset classes



Competing for the same budget



No visibility into trade-offs across asset classes



Vertical Silos



Policy sets strategic direction



Finance controls the budget



Engineering knows condition and needs



Operations maintains and responds to failures



Each speaks a different language

Result: Suboptimal decisions, reactive management, and missed opportunities

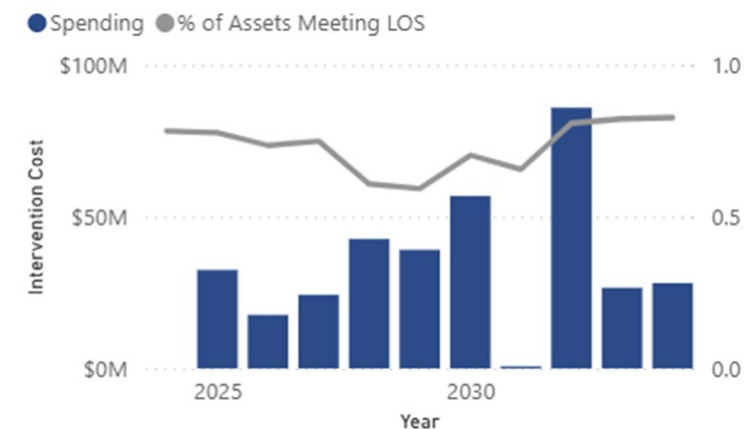
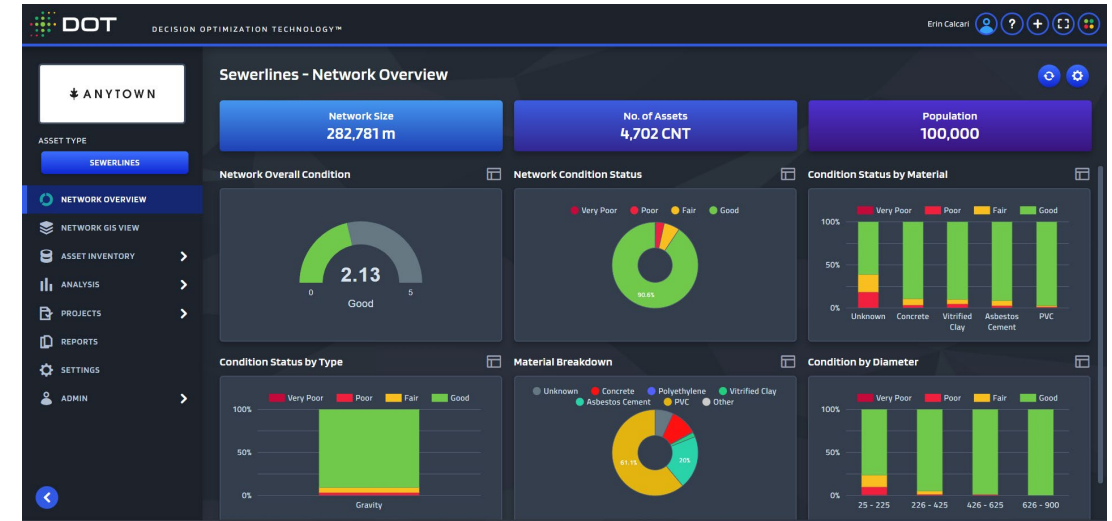


02

Decision Support Systems and Tools

What is a Decision Support System?

- A Decision Support System (DSS) helps quantify and assess current and future infrastructure needs based on defined Levels of Service.
- Serves as the connective tissue between disparate systems, asset classes, and organizational functions
- DSS software can:
 - Perform and compare multiple forecasting scenarios
 - Be displayed via geospatial visualization, dashboards, or reports.

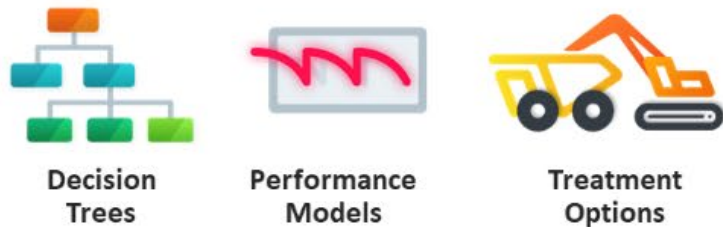


Decision Support System Architecture

Scenario Objectives & Constraints



Engineering Models



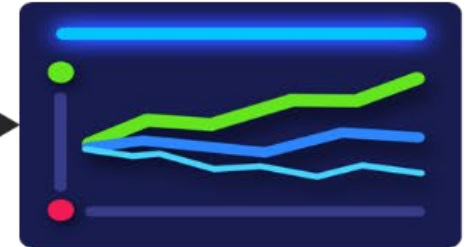
Extremely **high level of flexibility** in scenario settings with the ability to incorporate **community benefit** considerations into the decision-making process.

Optimization Engine



- Perform Mixed-Assets Analysis
- Maximize Long-Term Performance
- Minimize Cost & Risk Impact
- Target Levels of Performance
- Satisfy Multiple Constraints
- Investment Timing & Delays
- Maximize Operational Efficiency

Maximum ROI Investment Plan



Decision Variables

- ✓ Asset Types
- ✓ Asset IDs
- ✓ Treatment Types
- ✓ Treatment Alternatives
- ✓ Budgeted Costs
- ✓ Intervention Timings

Decision Support Tool Methods



SIMPLE RANKING

Sections are ranked and investments are determined based on current asset condition (worst first). Budget is used until it is fully exhausted. This results in the lowest level of investment efficiency.

- x Multi-criteria analysis
- x Guaranteed best performance setting
- x Target level of performance
- x Considering multiple constraints
- x Investment timing and delay analysis



PRIORITIZATION & CBA

Sections are prioritized using multiple criteria such as condition or risk or based on a cost-benefit analysis. The analysis is performed on a year-by-year basis to identify projects.

- ✓ Multi-criteria analysis
- x Guaranteed best performance setting
- x Target level of performance
- x Considering multiple constraints
- x Investment timing and delay analysis



TRUE OPTIMIZATION

A true multi-constraint multi-year analysis that results in a scientifically proven and mathematically guaranteed best possible solutions.

- ✓ Multi-criteria analysis
- ✓ Guaranteed best performance setting
- ✓ Target level of performance
- ✓ Considering multiple constraints
- ✓ Investment timing and delay analysis

Why Decision Support Tools?



Reduce Life
Cycle Costs



Create
Stakeholder
Buy-In



Policy
Objectives



Build Data
Driven Budgets

Cross-Asset Integration

The Horizontal Dimension

Unified Framework

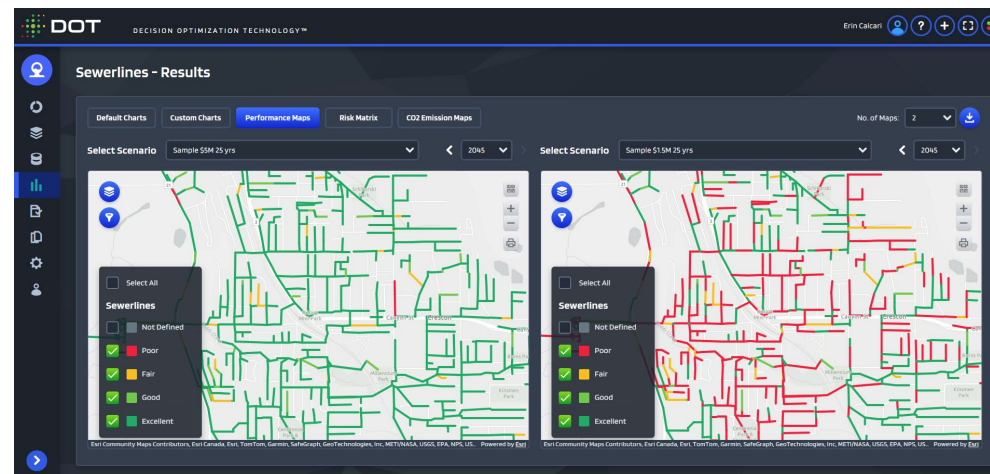
- Common condition metrics
- Standardized risk scoring
- Comparable performance measures
- Shared planning horizon

Portfolio View

- See all assets together
- Compare investment scenarios
- Understand trade-offs
- Optimize across portfolio

Data Integration

- Connect GIS, CMMS, inspection tools
- Automate data flows
- Single source of truth
- Real-time updates

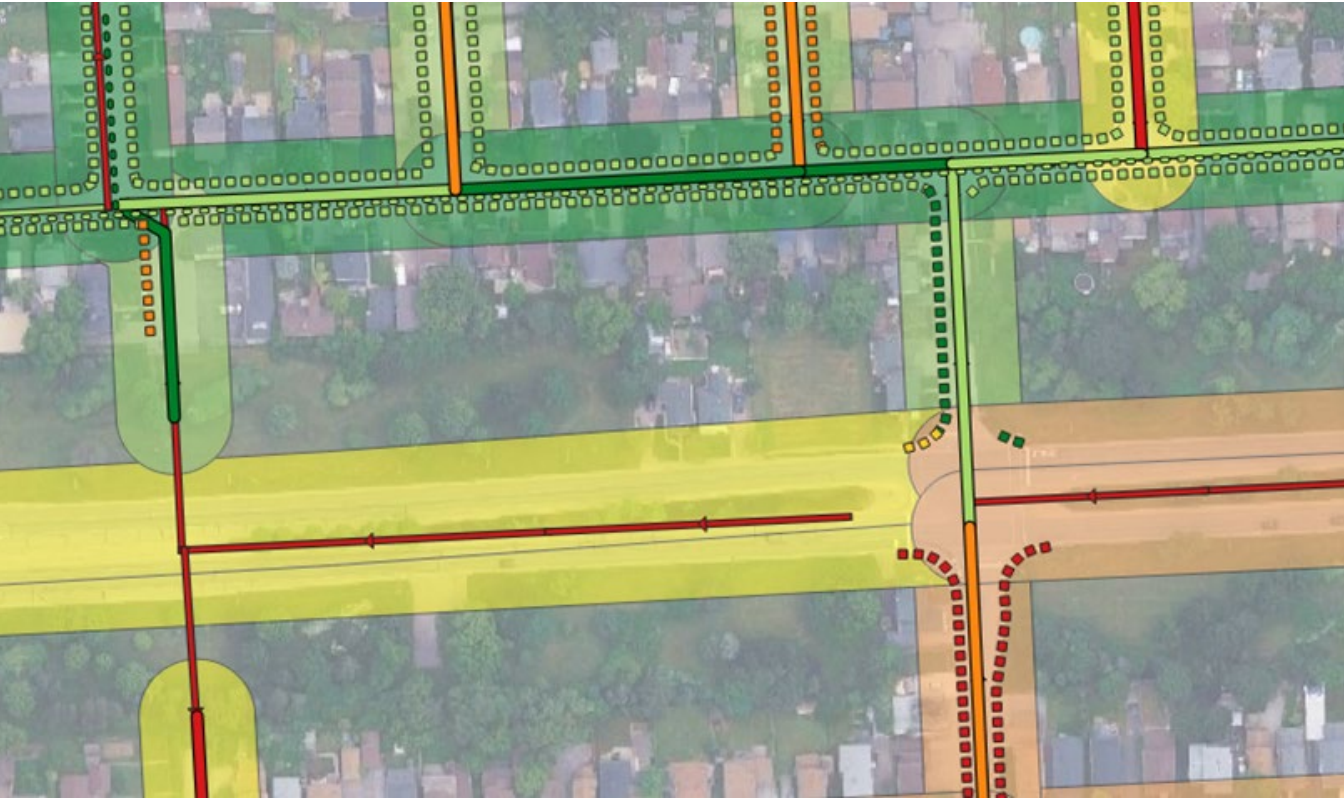


Cross-Department Integration

The Vertical Dimension



Translation to Asset Management Planning and Capital Investment Decisions



- DSS scenario outputs can be grouped together based on years, asset type, or location to aid in the development of capital investment projects.
- Spatial data outputs can be used to coordinate with other service providers or organizations.

Real-World Example

Typical Planning Cycle

Before: Siloed Approach

- Each department collects own data
- Separate Excel spreadsheets/systems per asset class
- Weeks of manual consolidation
- Competing priority lists
- Finance arbitrates without full picture
- Board receives conflicting recommendations
- Final plan created in crisis mode

After: Integrated Approach

- Automated data import from OSIMple, GIS, CMMS
- Single platform with all assets
- Optimization runs multiple scenarios
- Each department sees relevant view
- Collaborative refinement of priorities
- Council receives unified, defensible plan
- Plan generated in days, not months



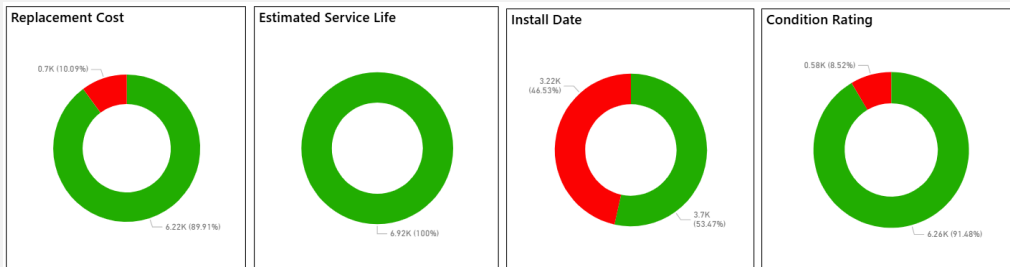
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Leveraging Data and Systems to Make Decisions

What Information Do You Need?

Required

- Asset Inventory
 - Unique IDs
 - Installation Dates/Age
 - Estimated Service Lives
- Degradation Models
 - Linear Age/ESL as default
- Replacement costs
 - Unit rates or full cost

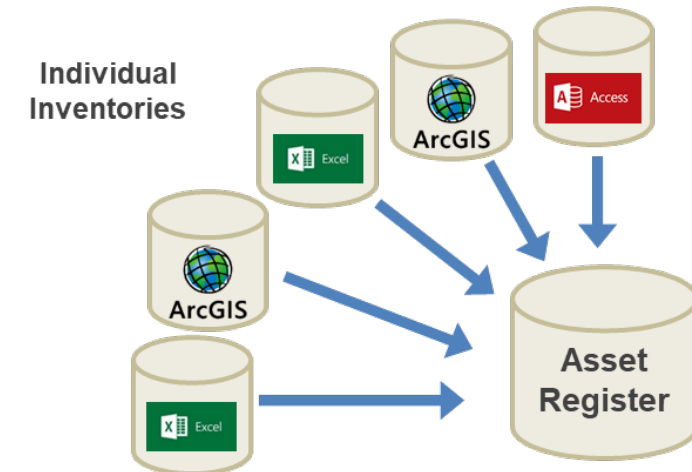
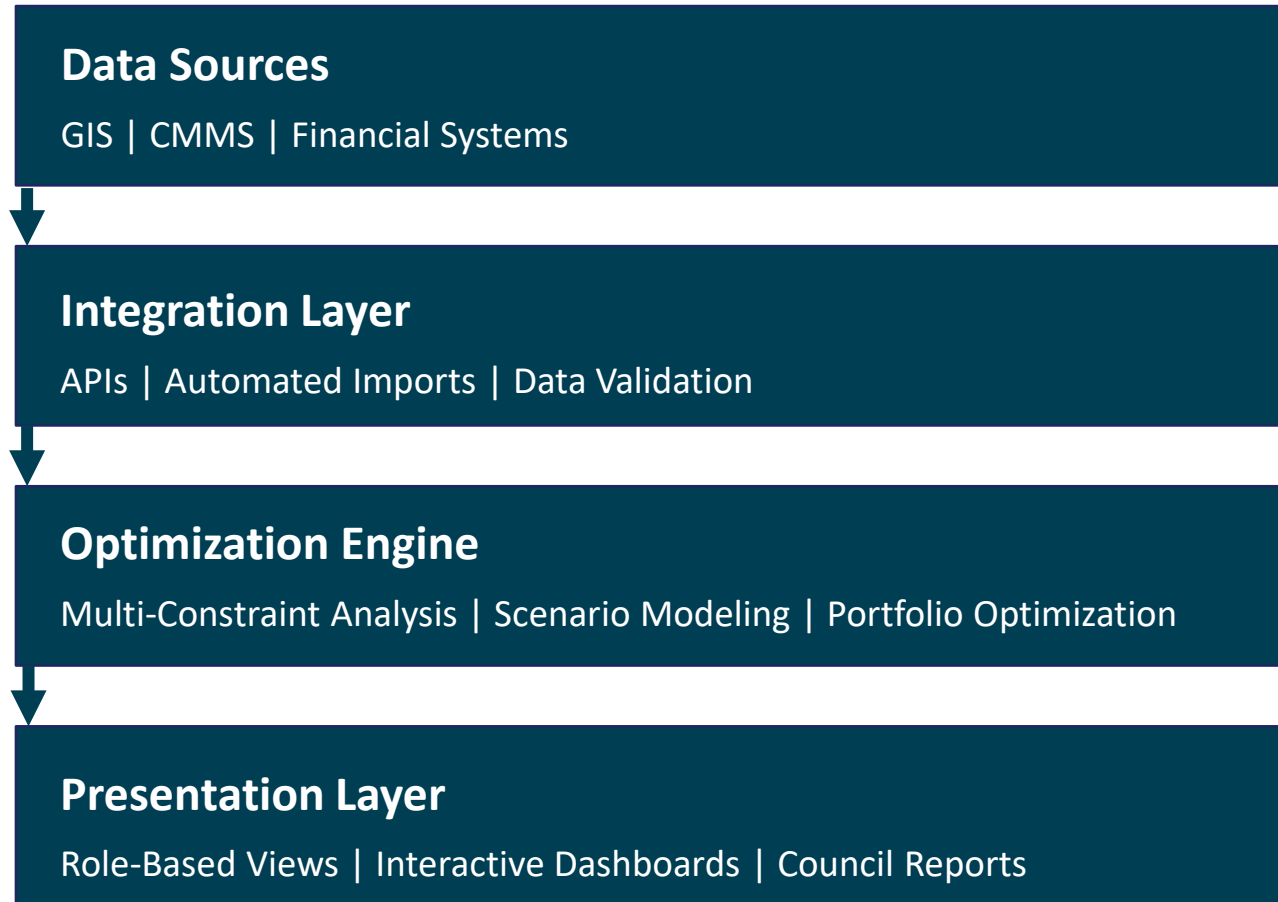


Mature Inputs

- Inspection/Condition Data
 - Including date of inspection
- Budget data
- Degradation Models
 - Non-Linear
- Asset Risk/Criticality Score or Framework
- Spatial Data
- Other important attributes
- Asset Treatments
 - Mid-life interventions, end of life replacements, etc.
- Levels of Service
 - Target/Proposed

Technical Architecture

How DSS Enables Integration



Key Benefits

- No data re-entry
- Real-time synchronization
- Preserved existing systems
- Shared vocabulary
- Audit trail & transparency
- Role-specific interfaces

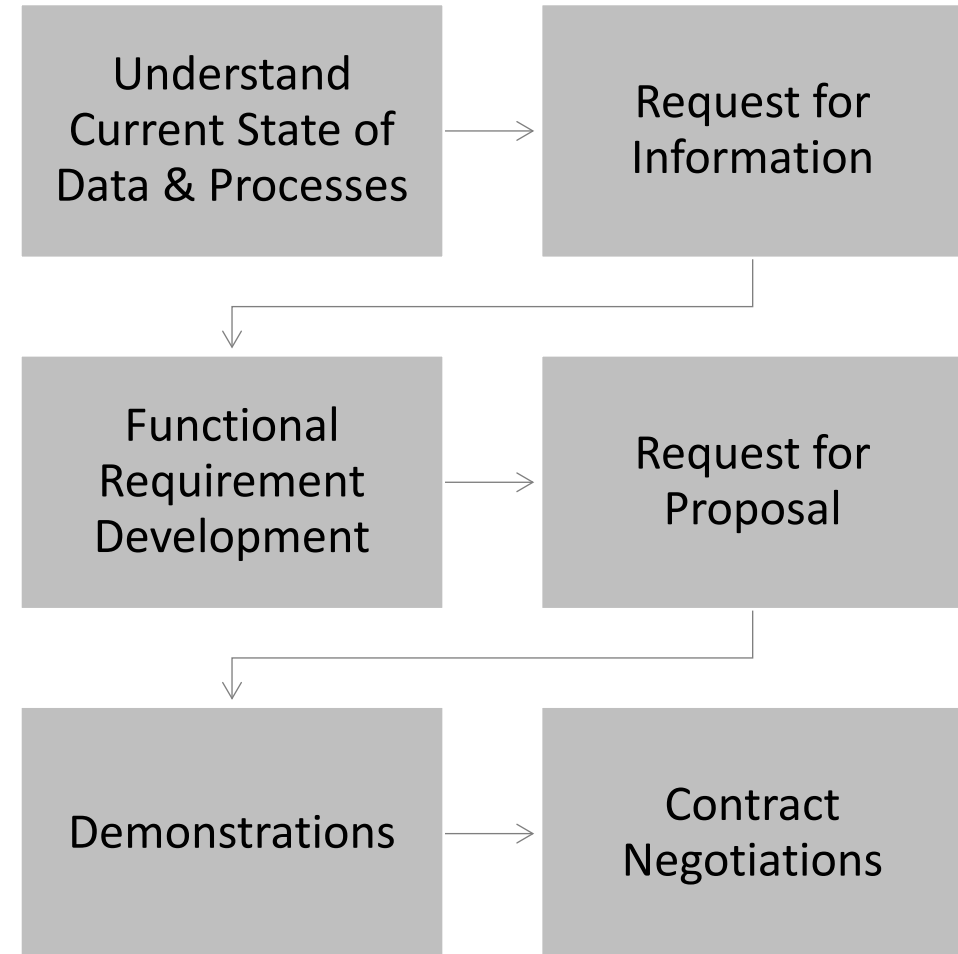
Process for Acquiring Software

DSS Options Available

- Off-the-Shelf DSS software
- Customized solutions

Costs

- Range depending on asset classes, size of organization, users, implementation, license terms, etc.



Path to Integration

Getting Started with Cross-Asset, Cross-Department Planning

1

Assess Current State / 2-4 weeks

Inventory data sources, identify silos, map stakeholder needs

2

Design Integration / 4-6 weeks

Configure of DSS, establish data connections, define workflows

3

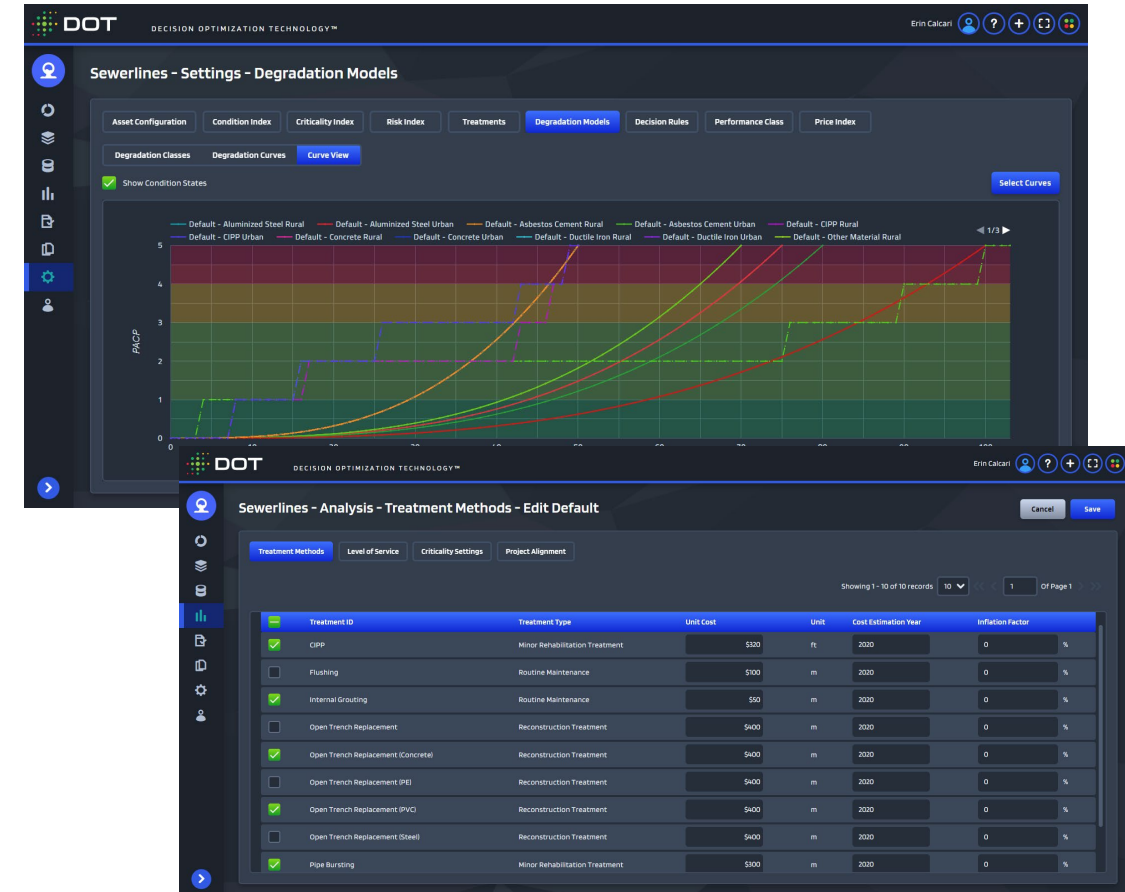
Pilot Program / 8-12 weeks

Run parallel with existing process, validate results, train users

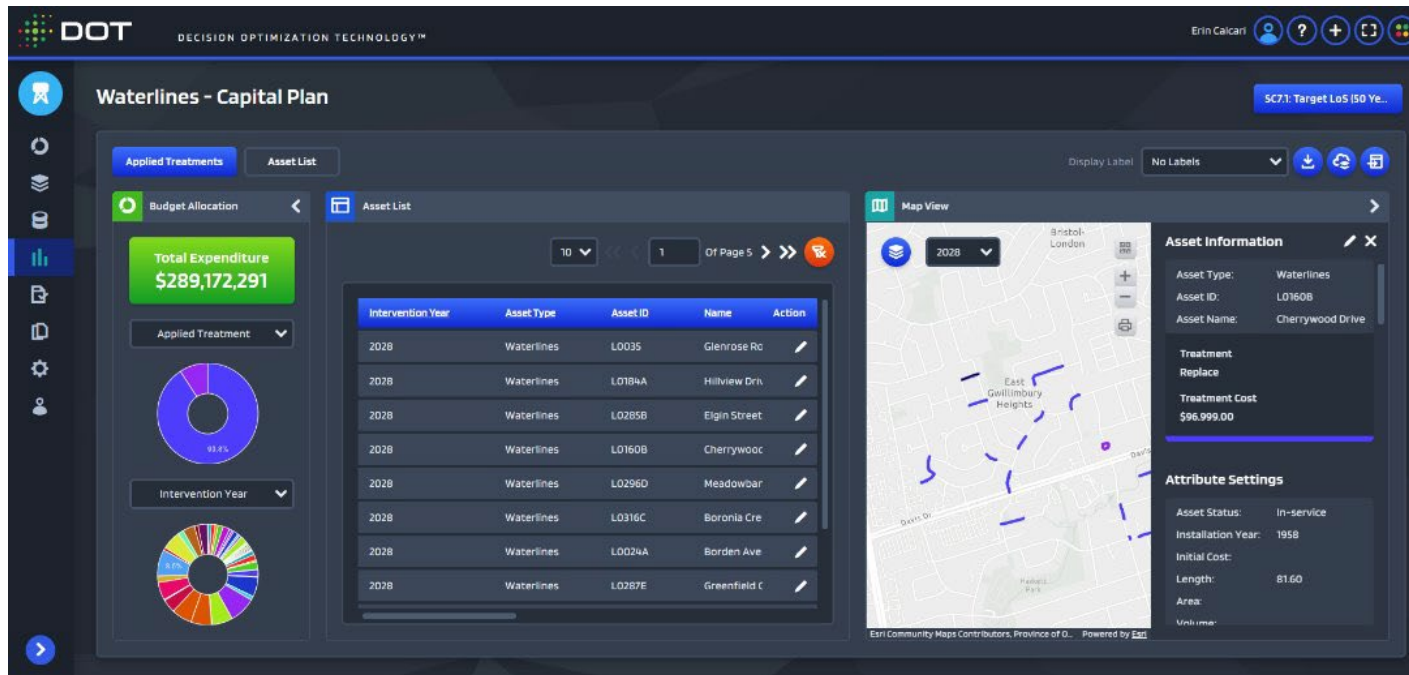
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Full Deployment / Ongoing

Expand to all asset classes, embed in annual cycle, continuous improvement



Common Issues & Misconceptions



- Data quality and processes are misunderstood
- Outputs of a DSS are not analyzed and assessed for alignment with expectations
- One department leverages the system without other stakeholder engagement
- License cost is the only cost

Success Factors

DO

- Encourage stakeholder buy-in through engagement and change management plan
- Be realistic about data quality – understand your gaps and what you need for success
- Understand current state of:
 - Your asset systems
 - Data governance
 - Stakeholder needs vs. wants
 - Organizational and stakeholder goals
- Develop functional requirements for software
- Have several demonstrations of different options
 - with a wide range of users

DON'T

- Assume you need your data to be perfect to get started
- Think a DSS is a big red easy button, and all your problems will be solved
- Make decisions in silos
- Ignore people and processes

Measurable Outcomes

What Integration Delivers



75%

Reduction in planning cycle time



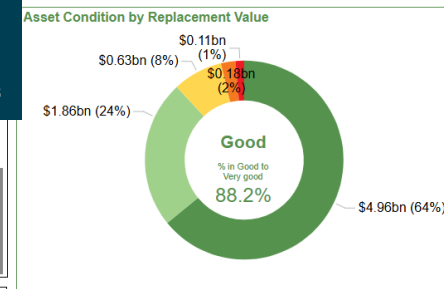
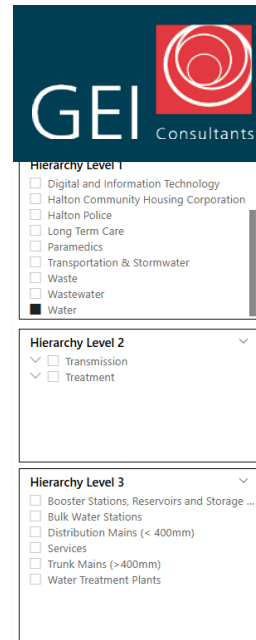
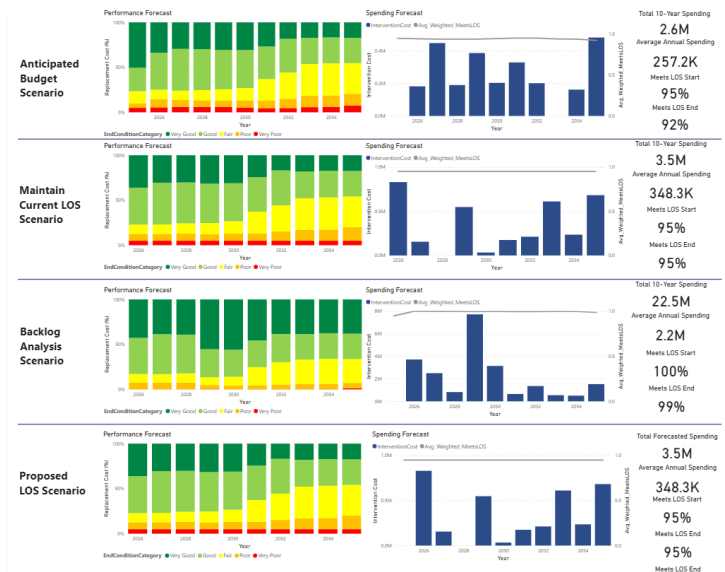
90%

Elimination of data re-entry



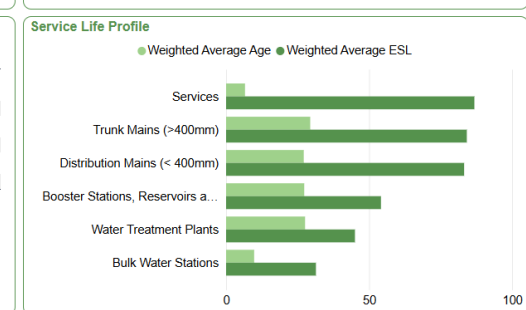
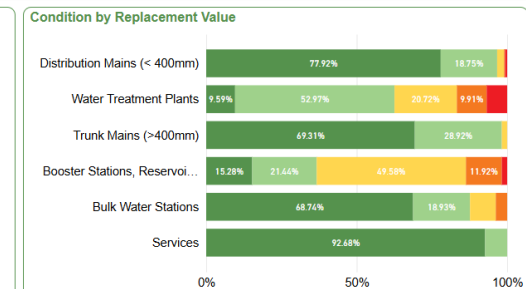
3-5x

More scenarios evaluated



Valuation

Hierarchy Level1	HierarchyLevel2	HierarchyLevel3	Sum of Replacement Cost
Water	Transmission	Booster Stations, Reservoirs and Storage Facilities	\$603,805,704
Water	Transmission	Bulk Water Stations	\$4,188,101
Water	Transmission	Distribution Mains (< 400mm)	\$5,401,265,518
Water	Transmission	Services	\$1,064,929
Water	Transmission	Trunk Mains (>400mm)	\$817,569,818
Water	Treatment	Water Treatment Plants	\$907,455,928
Total			\$7,735,349,998





04

GEI Overview & Services

GEI Office Locations

60+

Offices across the
U.S. and Canada

900

Municipal Clients
Served

1,600+

GEI Staff

300+

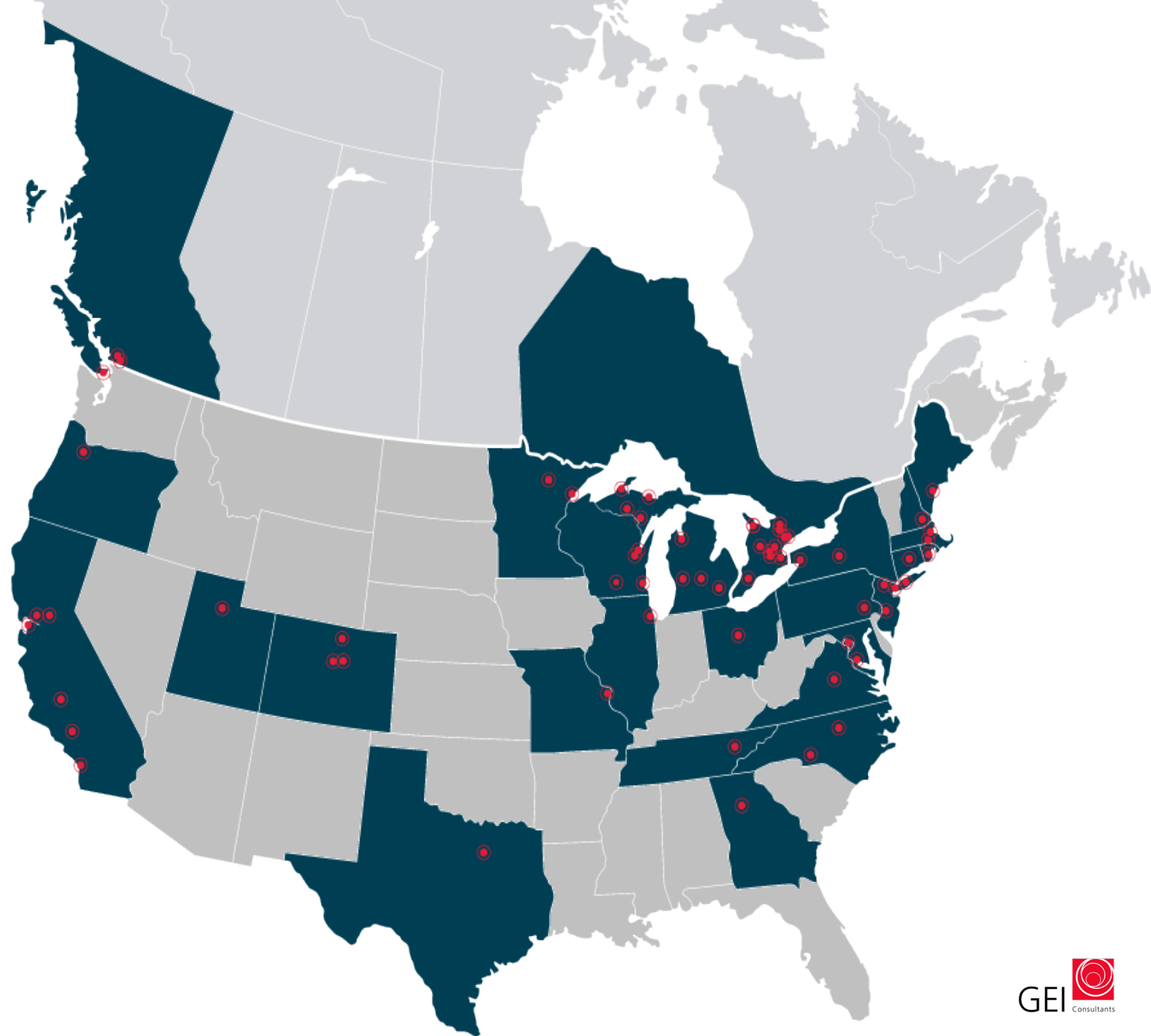
Asset Management
Projects Completed

55

Years in Business

80+

Asset Management
& Infrastructure
Planning Staff



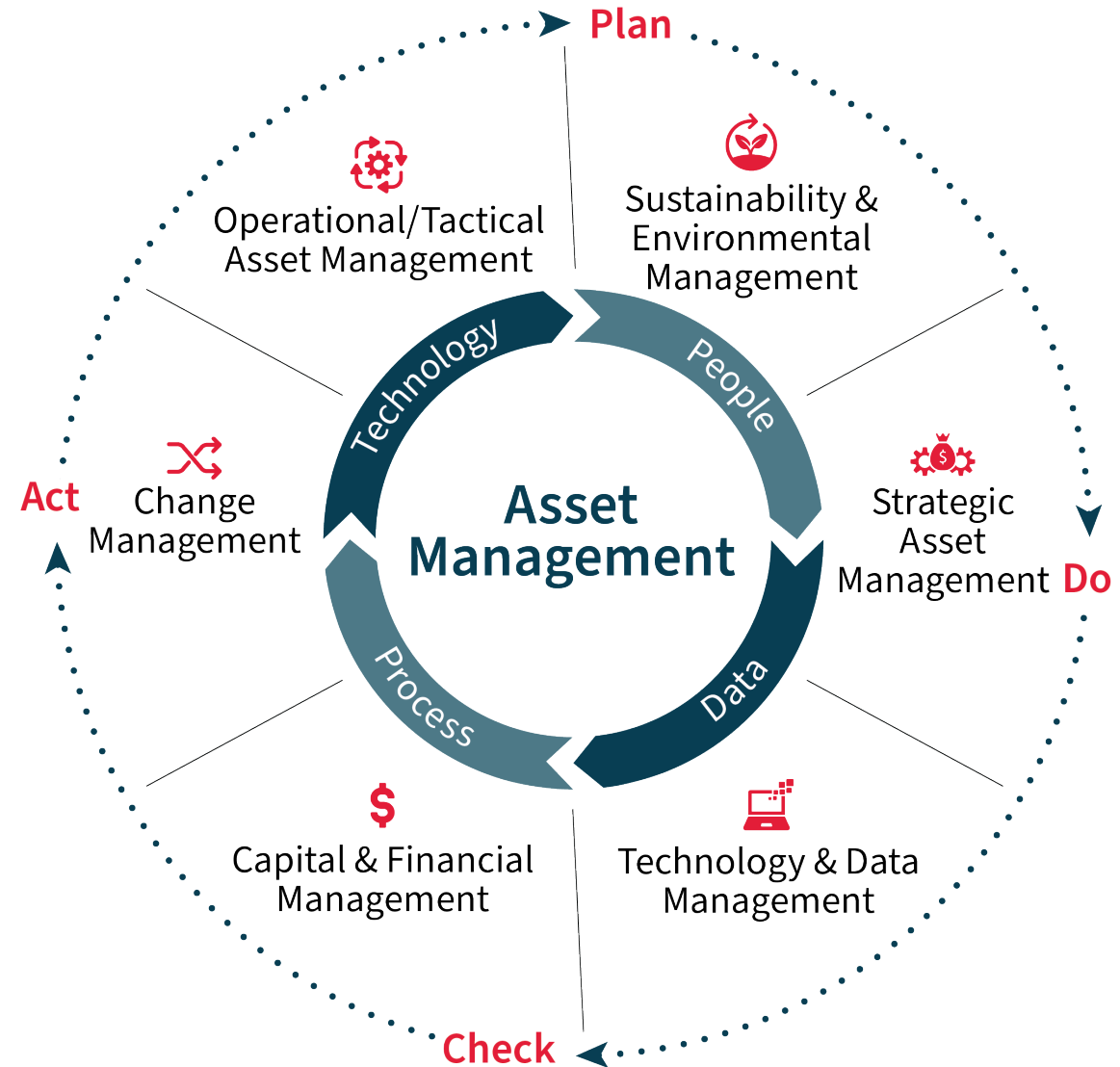
Asset Management Services

Every asset management journey is unique.

We deliver end-to-end asset management support across the entire lifecycle of infrastructure assets through a balanced blend of technical insight, data-driven approaches, and practical field experience.

Our goal is to:

- Maximize asset value over an asset's lifecycle
- Minimize maintenance and operational costs
- Strengthen service delivery
- Support long-term operational sustainability



Questions & Answers

*Come see us at the **GEI Hydrohub** on the second floor!*



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