

COMING THE FEW WATER DATA DILEMMA

Advancements in Data Collection and Analysis

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Agenda

Data Collection and Management Today

How Is Data Collected?

Current Technology

- Mainline Robotics
- Push/Pull Video
- Sonar

Newer Innovations

- Scanners (Manhole/Pipeline)
- Nozzle Mounted Cameras
- 360 Cameras
- Others

How Is Data Managed?

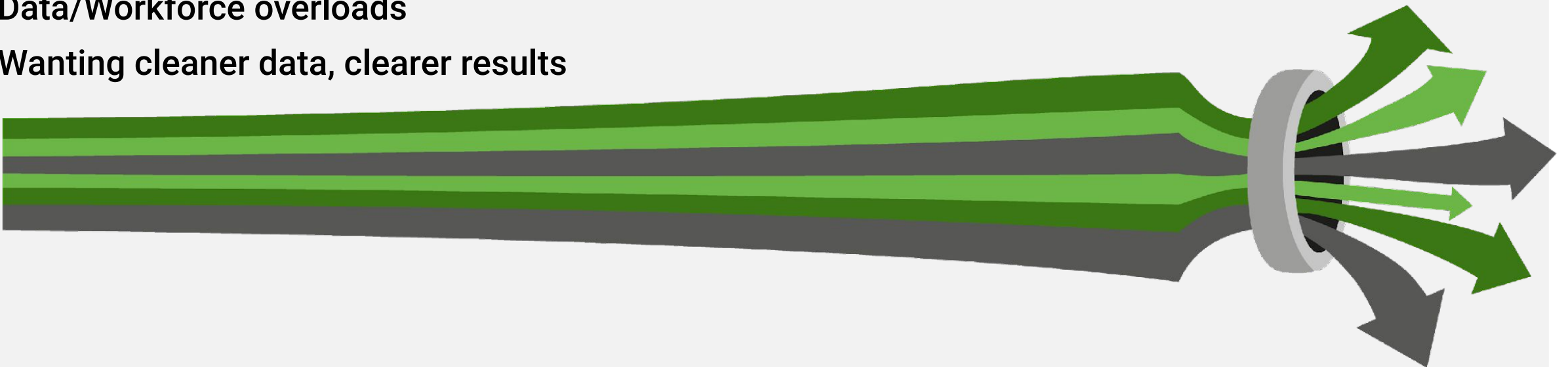
- Synced
- Stored
- Coding and QA/QC
- Visualization
- Risk Assessment/Criticality
- Financial Planning
- Work Management

Today's Challenges

There are more ways than ever to gain intelligent wastewater data.

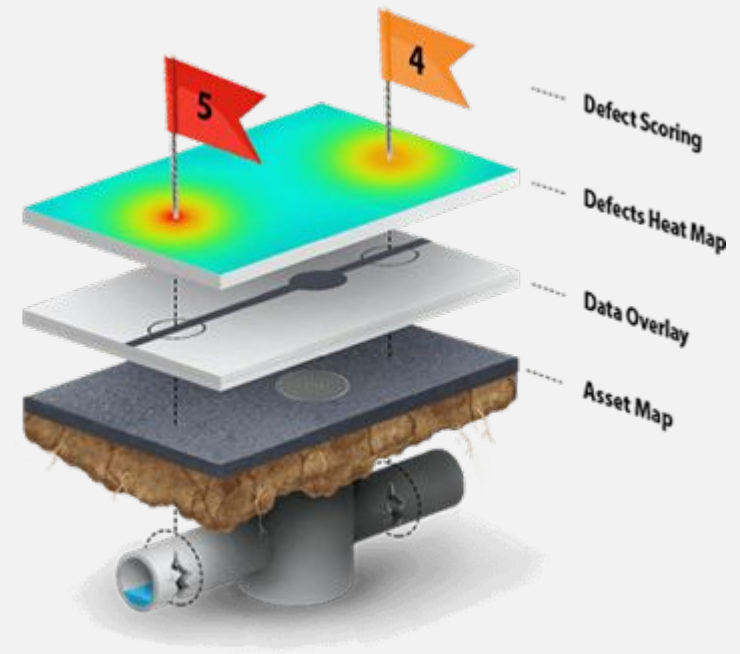
Challenges include:

- Multiple data collection technologies
- Data/Workforce overloads
- Wanting cleaner data, clearer results

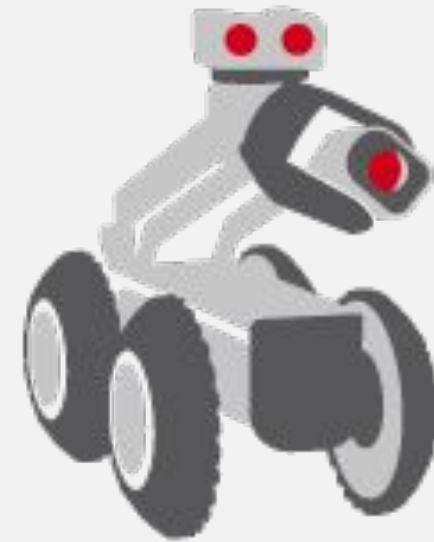
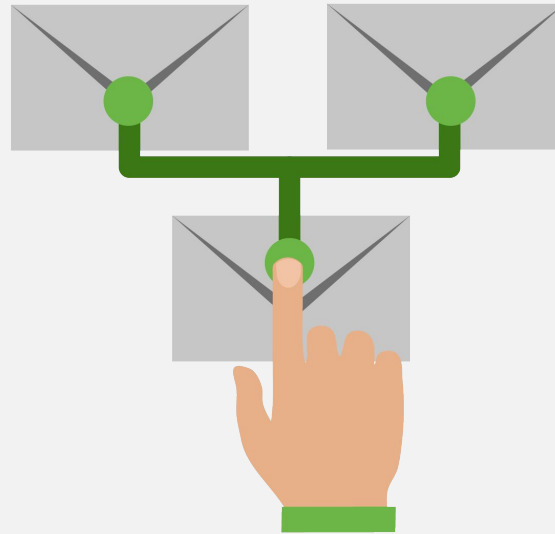


Potential Solutions

- ***Faster:*** Predicting OM and Rehabilitation for engineering and financial decisions
- ***Efficient:*** Quicker collection and rapid movement of data
- ***Innovated:*** AI-infused workflows and software
- ***Practical:*** Utilizing advanced assessment tools

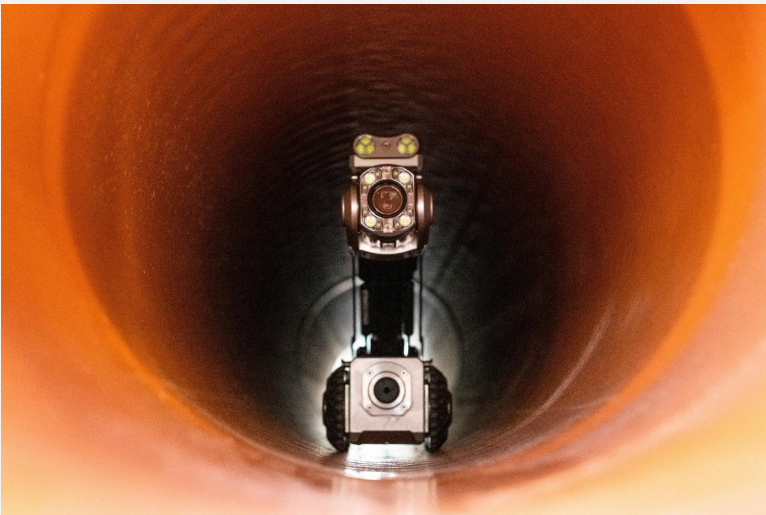


With the right assessment tools, data management practices and automated software you can get the most out of your data.



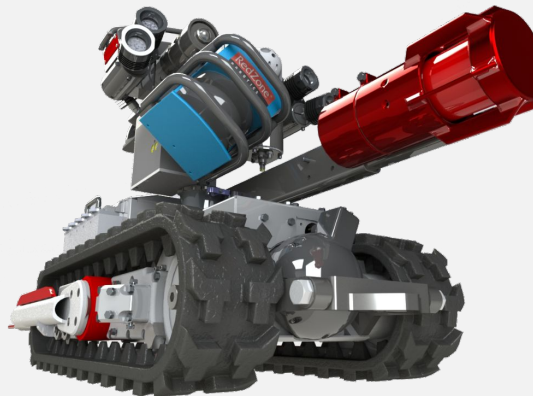
Traditional Methods

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- Mainline and lateral robotic cameras
 - SD
 - HD
 - Push/pull camera options



Emerging Methods

- 360° pipeline and manhole scanning
- MSI (Multi Sensor Inspection)
- Laser profiling
- Acoustic assessment (including sonar)
- LIDAR
- Ground-penetrating radar
- Nozzle-mounted camera inspection
- Drone inspection



Data Management Cycle



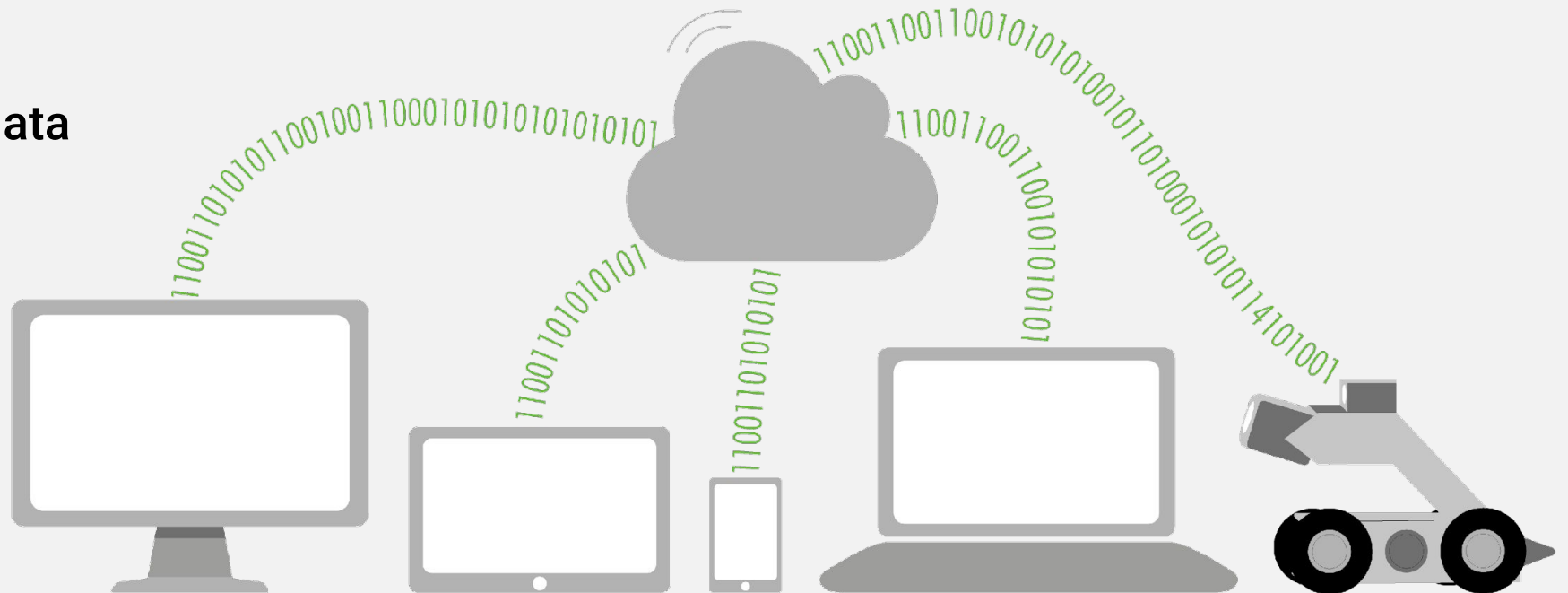
Solutions: Collection

- Current Collection Methods
- Innovated Collection Methods
- Desktop or App Driven
- Continued 5G integration
- Evolution of 4K video/image
- Quicker, more accurate data collection



Data Management: Data Synchronization

- Cellular connected systems
- Embedded software
- App-driven data collection
- Rapid synchronization of data



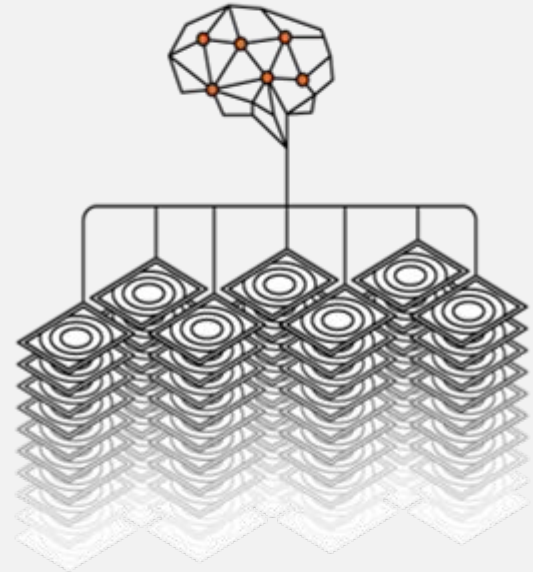
Data Management: Storage

Onsite servers

- Data hosted on premises
- Done via physical servers supported internally
- Can be costly

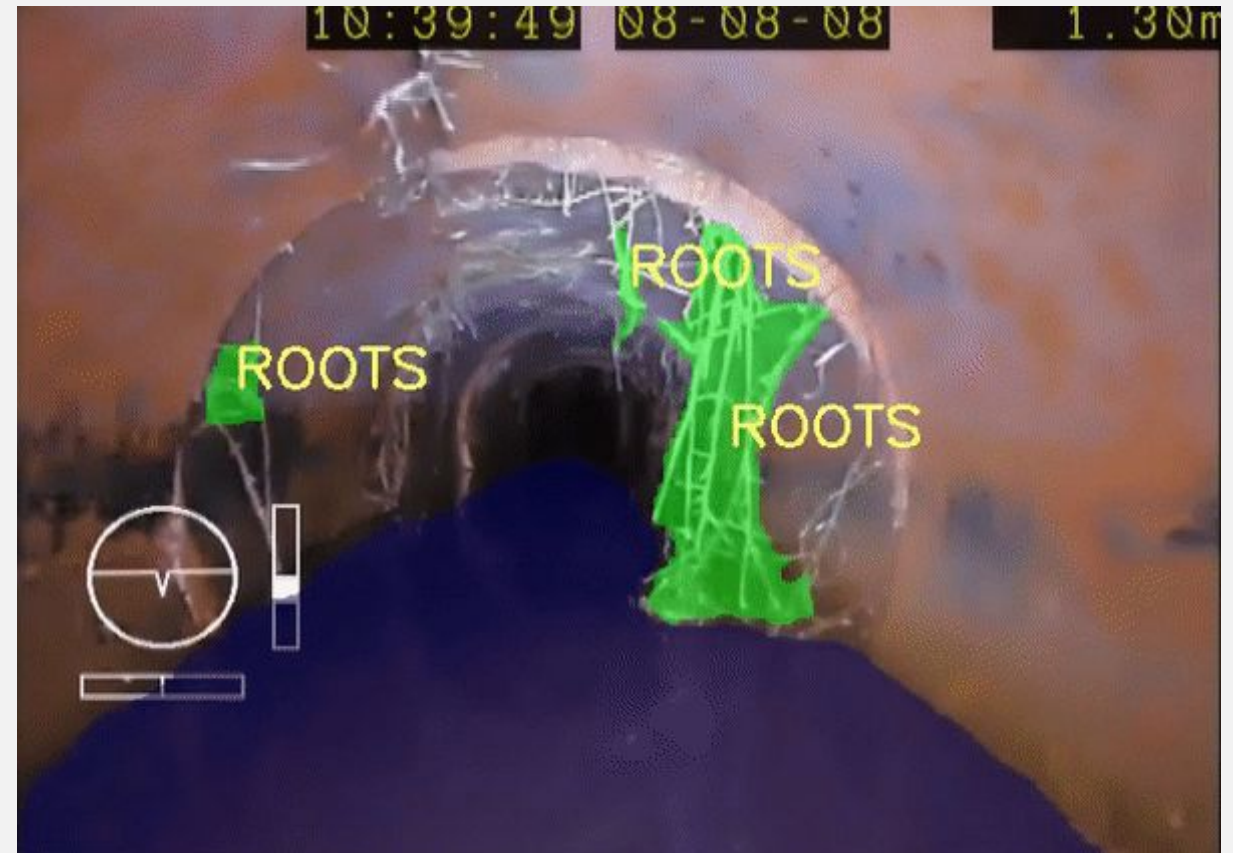
Cloud-based applications (SaaS)

- Data can be quickly shared
- View on any device or web browser
- Extremely secure (AWS, Google, MS Azure, etc.)
- Lower cost than physical hardware or external devices



Data Management: Coding and QA/QC

- Regulatory validation (NASSCO)
 - Standardized observations
 - Cloud-based
 - Standardized severity rating
- Performed during or after the inspection
- Emergence of AI-supported coding and QA/QC
- Improved Data Quality for analysis
 - *"Clear Data, Clear Decisions"*



Data Management: Visualization

- ESRI GIS map (local or web-hosted)
 - 2D or 3D (digital twin)
- Custom symbology
- Heat maps
- Intuitive dashboards and summaries



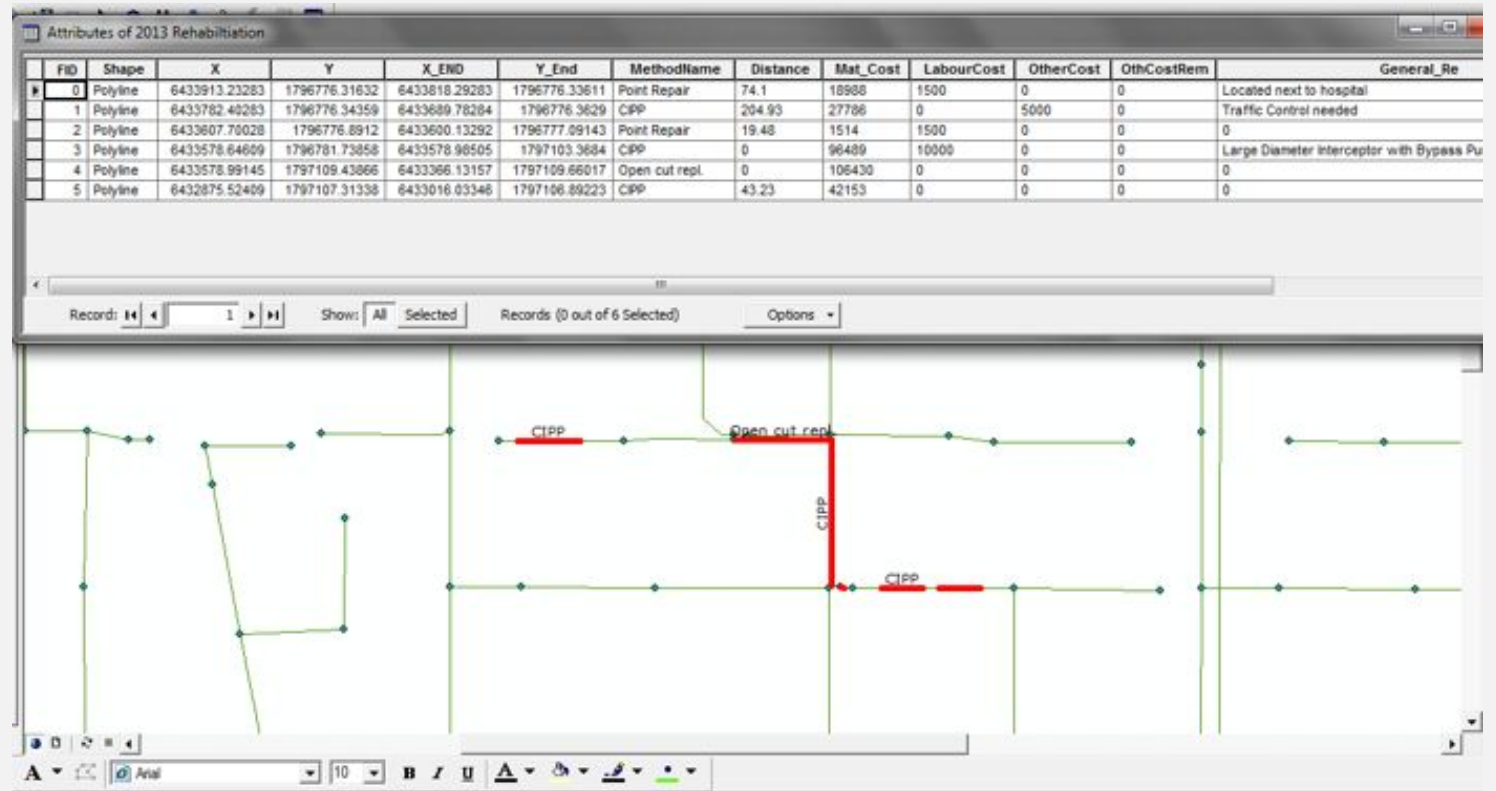
Data Management: Assessing Risk/Criticality

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- Where is the most risk?
 - Multiple factors to consider:
 - Pipe condition
 - Surrounding utilities and other infrastructure
 - Hydraulic modeling
 - Consequence of failure
 - Most at-risk pipes at the top of the list



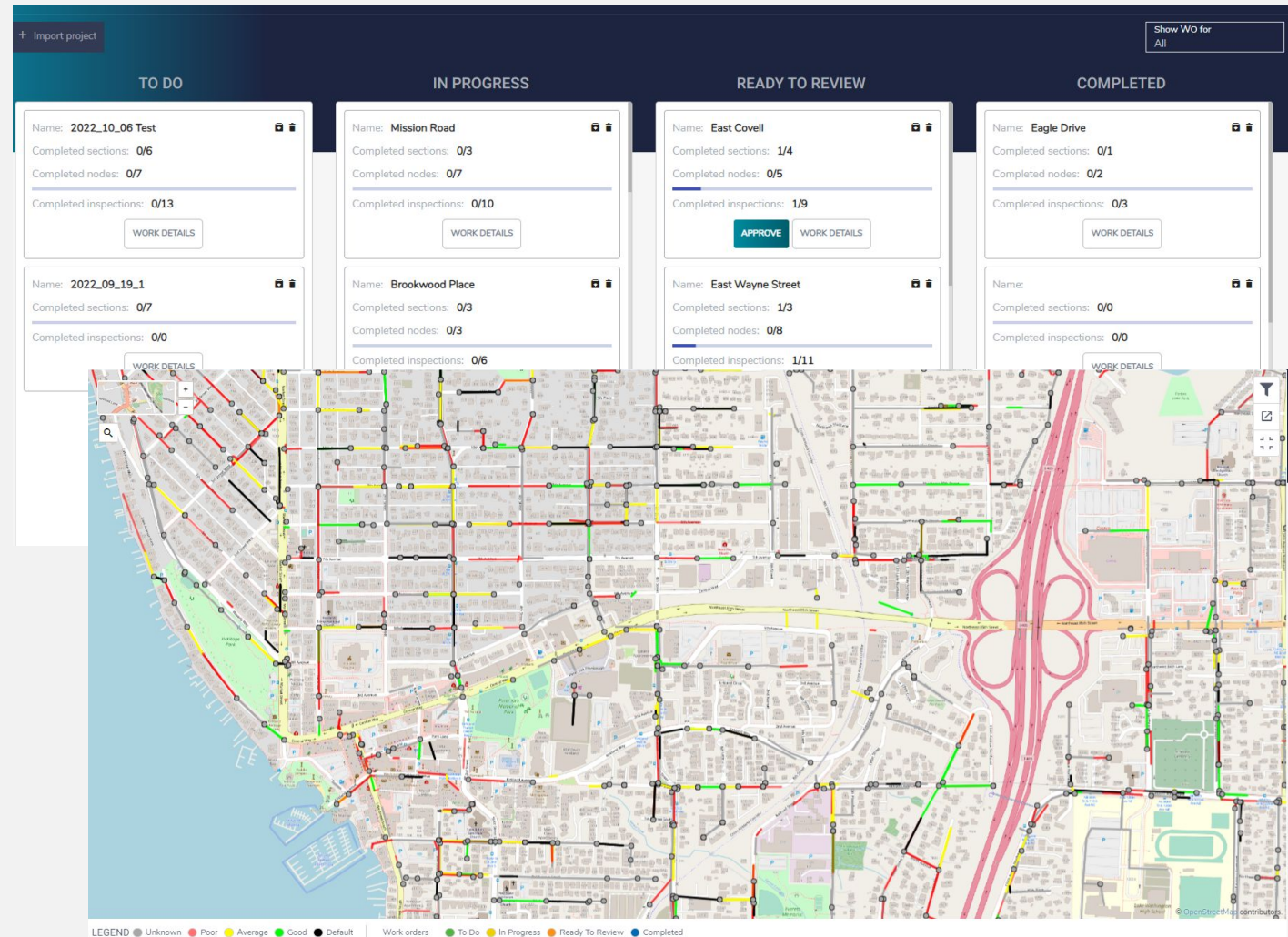
Data Management: Financial Planning

- Cost associated with OM and rehabilitation
- Accurate + Efficient= Better ROI
- AI can be applied for rapid, real-time financial tracking



Data Management: Work Management

- Work order tracking for trucks/fleets
- Organization of work orders
- Real-time work progress tracking
- Statistical dashboards showing:
 - Work completed
 - Defects found
 - Current job progress
- All can be GIS web service-powered



Solutions: Future of Collection

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- Huge potential, think the evolution of AI in automobiles
 - Fully assist- 100% supervised
 - Semi Assisted- 50% supervised
 - No Assistance- 0% Supervised
 - Continued 5G integration
 - Evolution of 4K video/image
 - Quicker, more accurate data collection



Solutions: Future of Data Management

Enterprise System Solution:

- Data Management
- Fleet Management
- Engineering Management
- Financial Management



Questions?

Thank You!

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