Combating Climate Change with Smart Watershed Network Management

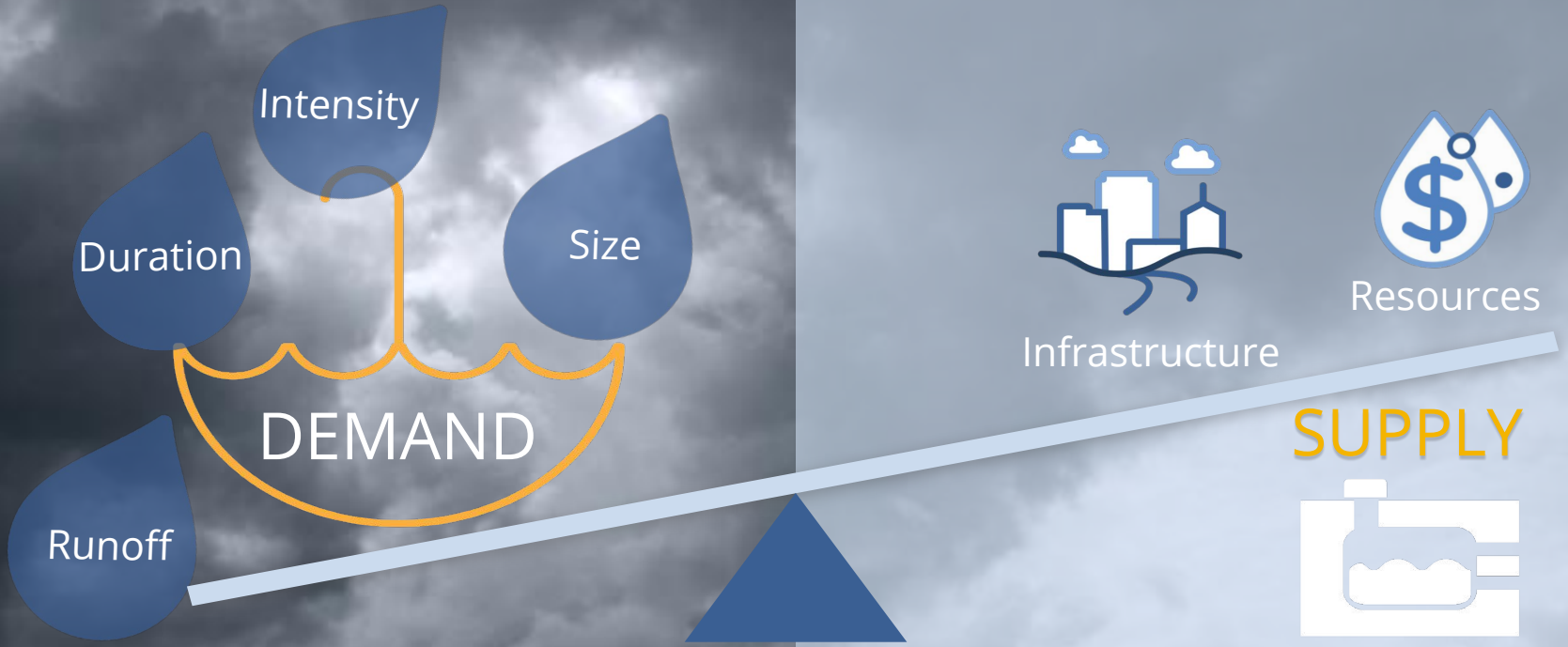
NEWEA CSO Conference 2021

Economic
60%-90% savings and accelerated outcomes

Resilient
5-10X performance improvement and adaptive management

Peace of Mind
Improved safety and compliance

Realities of Stormwater Management



Timing and Predictability is Everything!

Traffic at 7:30

Traffic at 7:31

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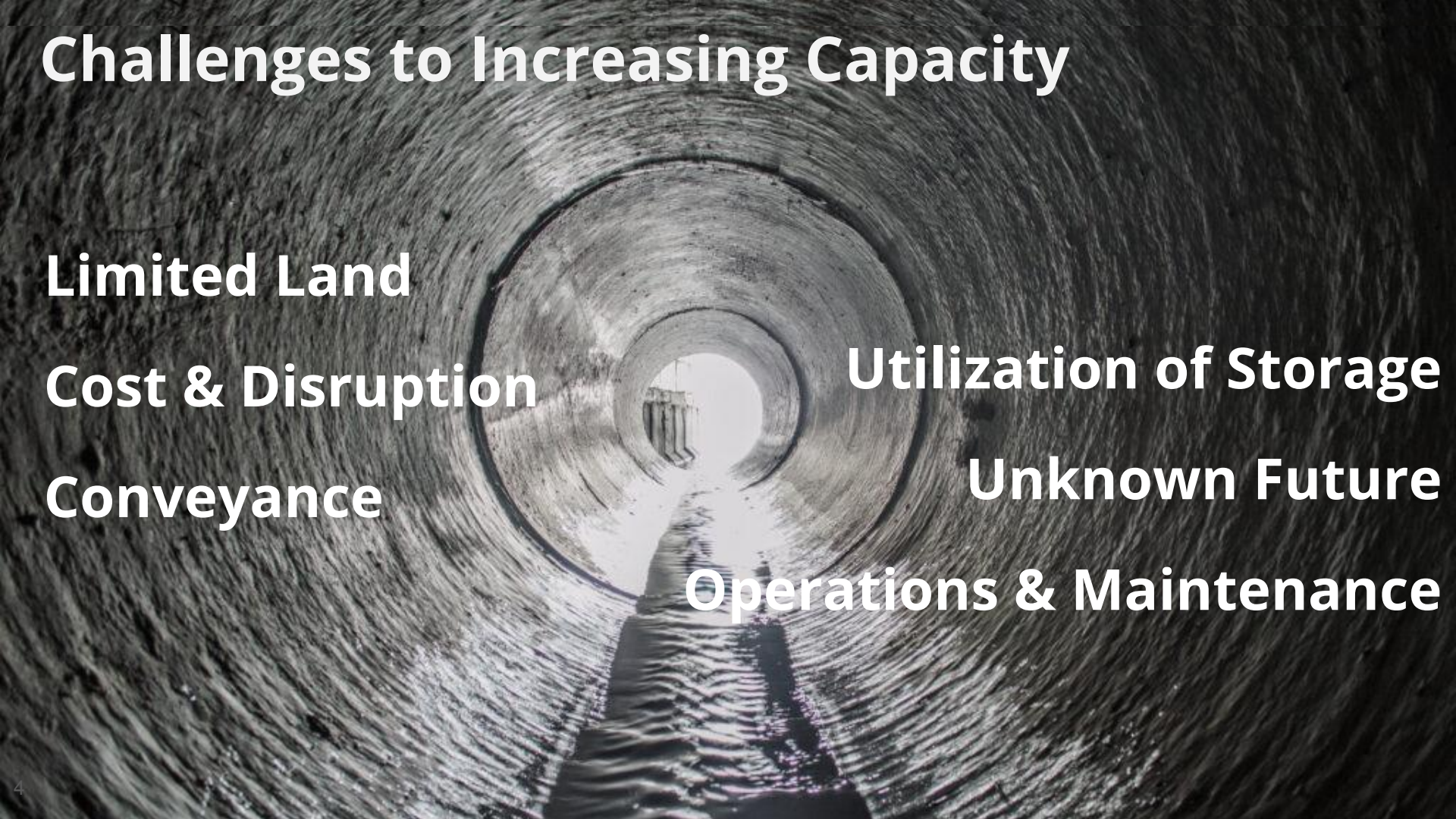
Challenges to Increasing Capacity



Limited Land

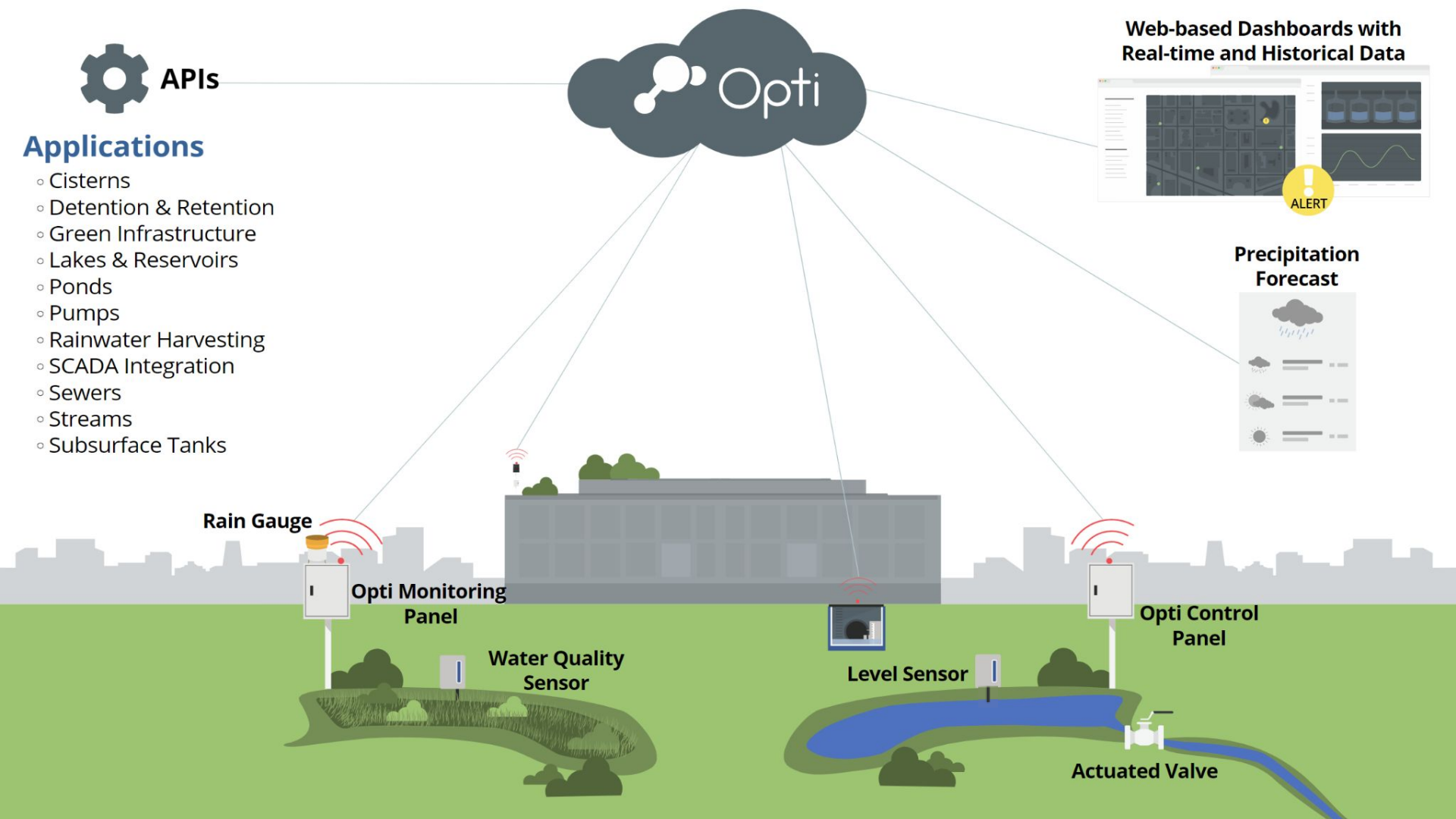
Cost & Disruption

Conveyance

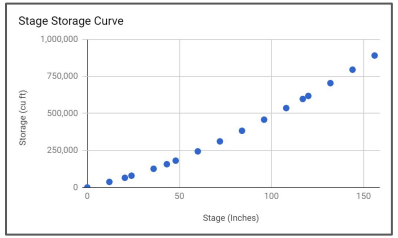
Utilization of Storage

Unknown Future

Operations & Maintenance


APIs
Applications
Cisterns
Detention & Retention
Green Infrastructure
Lakes & Reservoirs
Ponds
Pumps
Rainwater Harvesting
SCADA Integration
Sewers
Streams
Subsurface Tanks
Opti
Web-based Dashboards with Real-time and Historical Data
ALERT
Precipitation Forecast
Rain Gauge
Opti Monitoring Panel
Water Quality Sensor
Level Sensor
Opti Control Panel
Actuated Valve

Continuous Monitoring and Adaptive Control



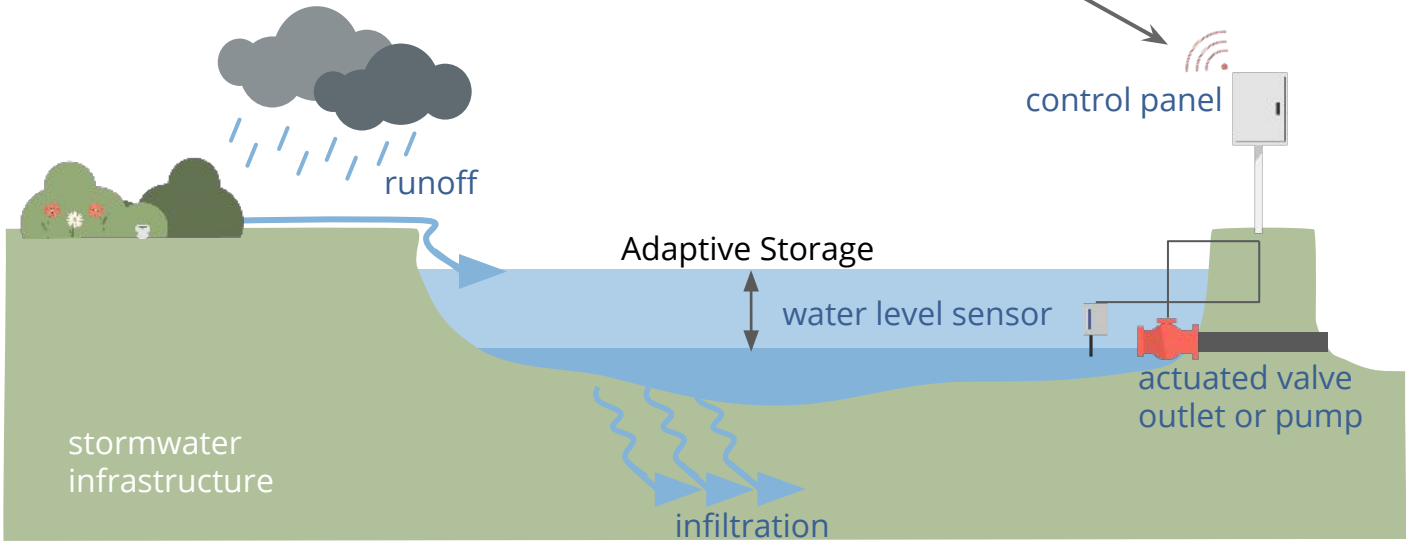
web-based dashboard

Opti Platform

Product Configuration

Example Parameters

- Watershed Area
- Impervious Area
- Valve Diameter
- Overflow Invert
- Peak Discharge
- Retention Period
- PoP Threshold



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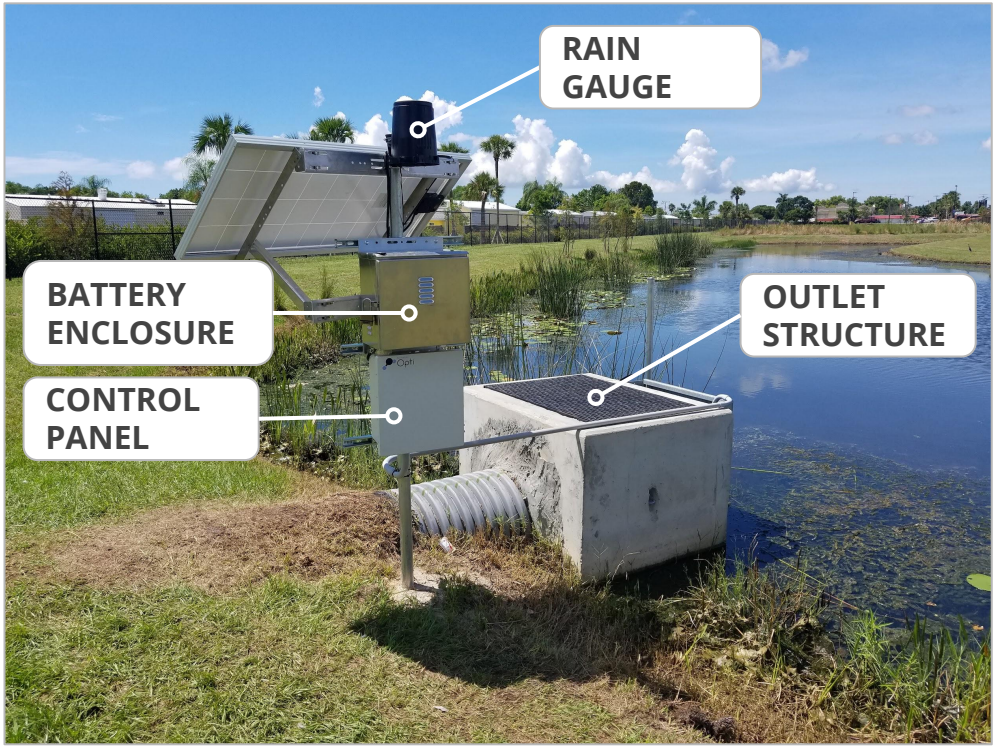
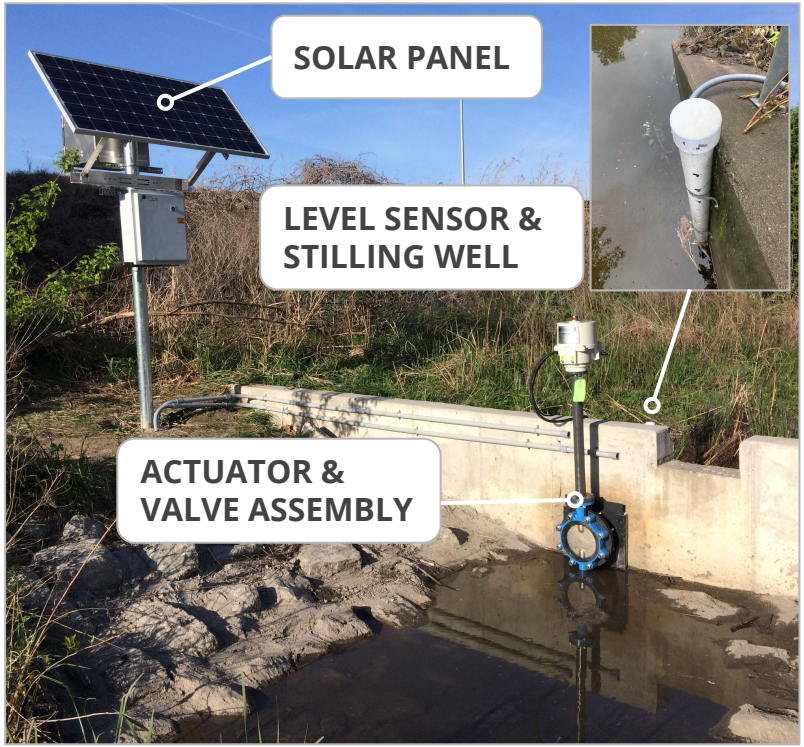
Equipment: Typical Opti Devices





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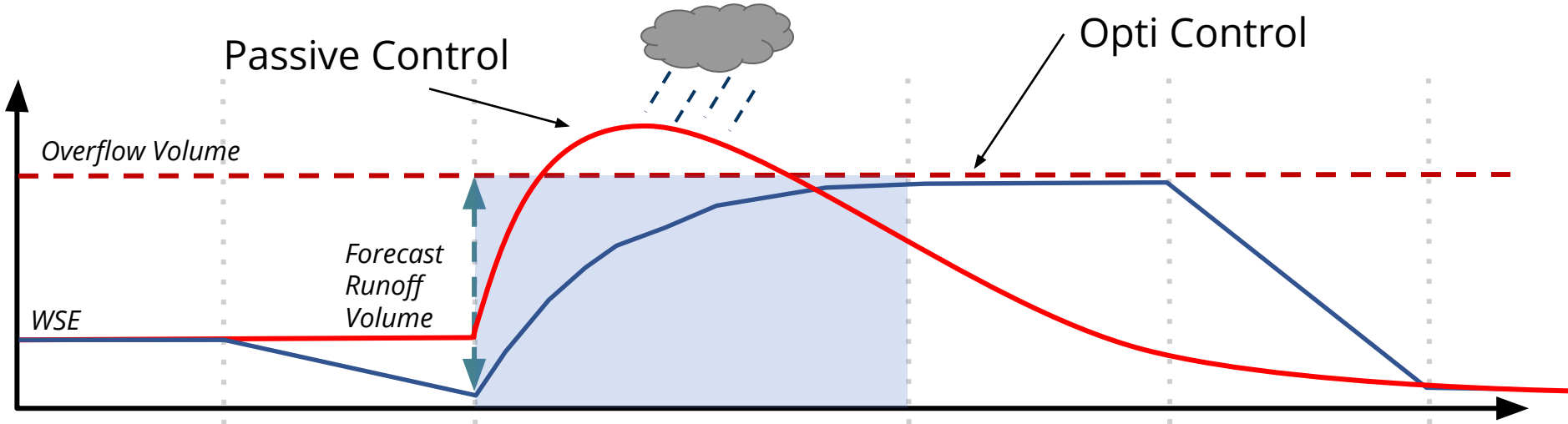
Optimized Control



Dry Weather
Volume at Pre-Storm State

Forecast Period
Pre-Event Drawdown if Necessary to Fully Capture Storm

Wet Weather
Minimum Discharge During Storm Events

Post-Event Retention
Hold Water to Settle Nutrients and Reduce Outflow

Post-Retention Drawdown
Controlled Release

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Opti Dashboard- Site View

MANUAL OVERRIDE

CURRENT CONDITIONS

FORECAST VIEW

ONLINE STATUS

MANAGED STORAGE

CUMULATIVE RAIN GAUGE

VALVE POSITION

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Opti + SCADA: A Natural Integration

Opti

Stormwater Management Automation Platform

- *Predictive controls for stormwater management*
- *Common stormwater asset model*
- *Stormwater analysis*

SCADA

General Purpose Automation Platform

- *Treatment plant operations*
- *All purpose monitoring*
- *CMMS & ERP integrations*

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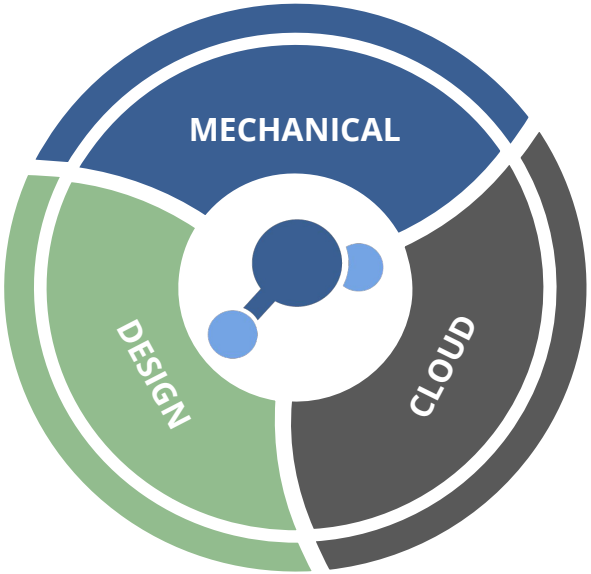
Safety and Security



Cloud-Based:

- Alarms
- Remote Manual Control
- Internationally Certified Data Centers
- Product Release Cycles
- 3rd Party Security Audit

Mechanical:

- Battery Backups
- Local Fail-Safe Logic
- Onsite Manual Control

Civil Design:

- Passive Overflow
- Downstream Condition Assessment

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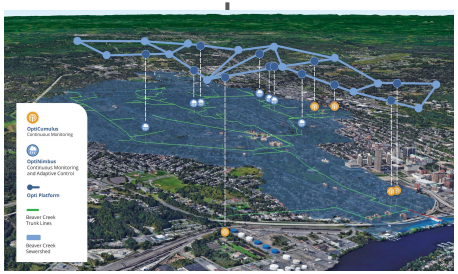
Stormwater Management From Site to Watershed

Applications

Drivers

Existing Asset Optimization	Land Development	Smart City
		
Flooding & Water Quality	Cost and Land Availability	Public Safety Environmental Protection Compliance

Operations & Maintenance

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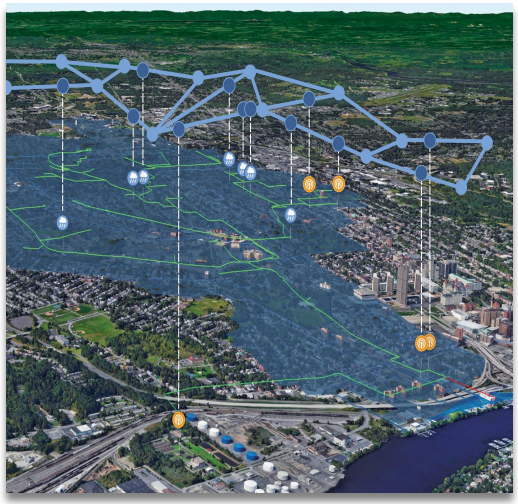
Journey to a Smart Watershed

Monitoring and Analytics → **Enhance Existing Infrastructure** → **Optimize New Infrastructure** → **Smart Watershed Network Management (SWNM)**



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Case Study

Albany, NY

Economic

+90% Savings

Compared to passive construction

Resilient

89% Flow Capture

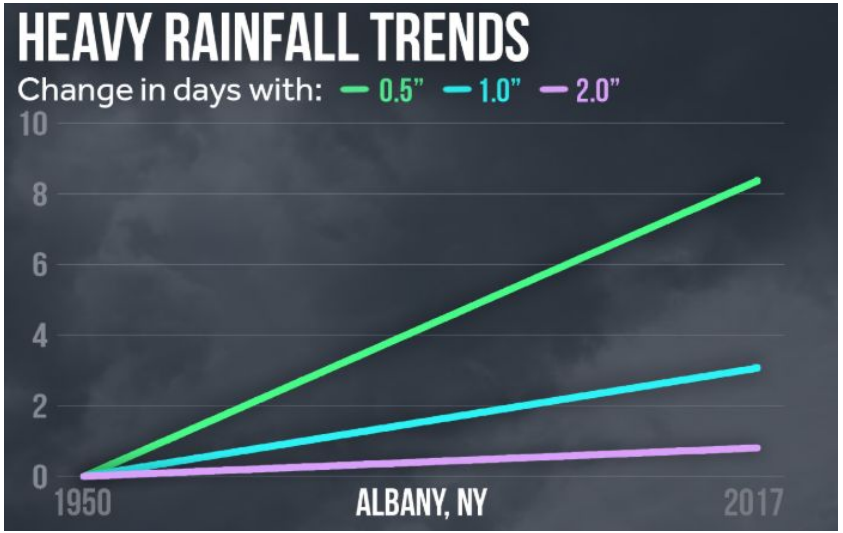
Average annual wet weather performance

Peace of Mind

Improved Customer Service

Public safety and real-time reporting

Background - Flooding and CSOs



August 2014: Flash flood event in Beaver Creek

- *3 inches of precipitation in one hour*
- *Catalyzing new approaches to stormwater management*

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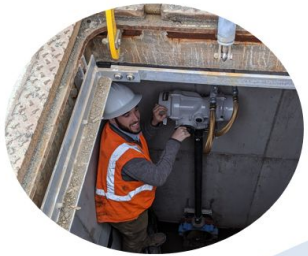
Customer Journey to A Smart Watershed



2015
Introduction

2016-2018
Product Delivery

2019
Enterprise
Subscription

2020
Smart Watershed Network
Management

IDC Smart City
NORTH AMERICA AWARDS

ACEC New York
American Council of Engineering Companies of New York

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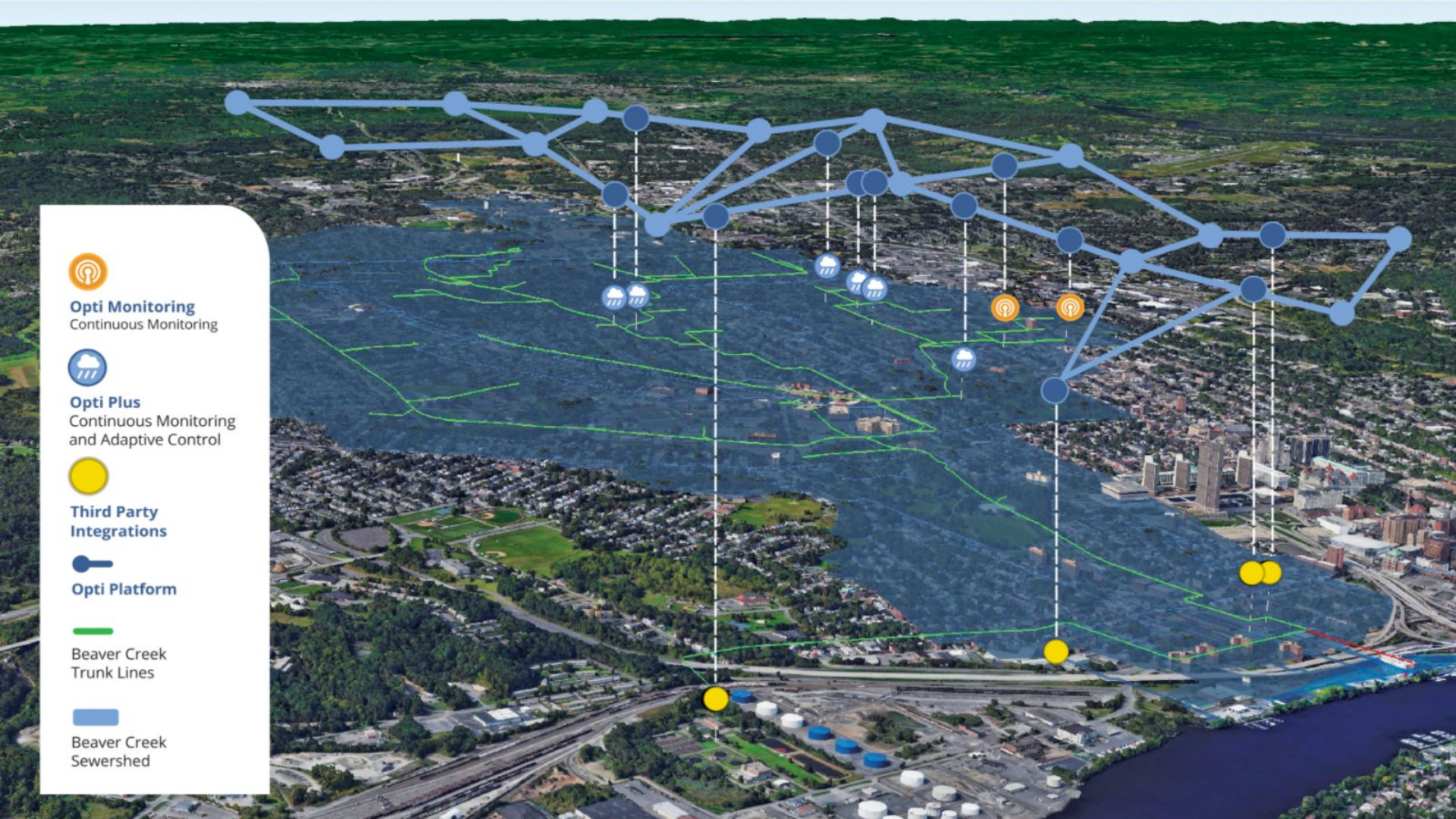
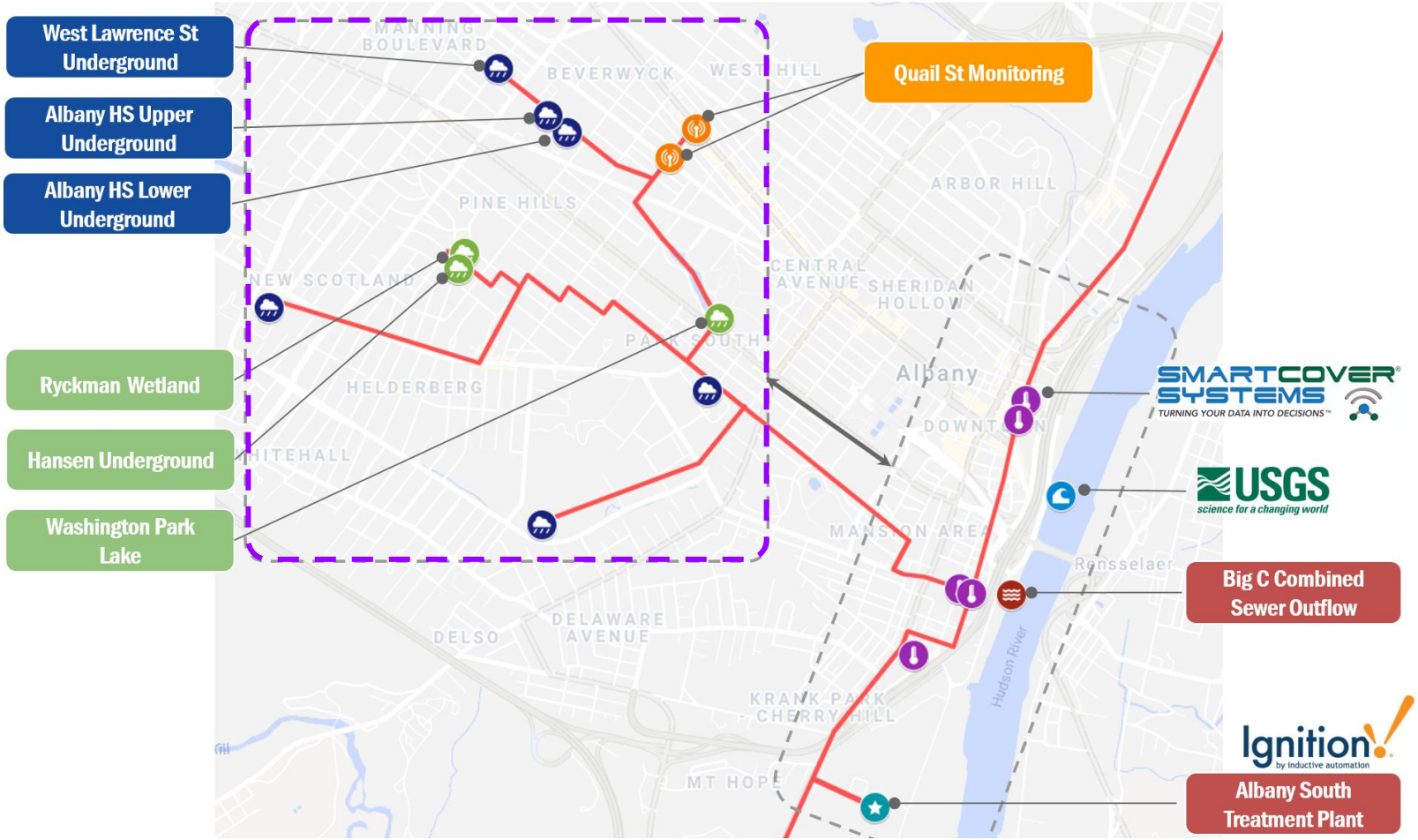

Opti Monitoring
Continuous Monitoring
Opti Plus
Continuous Monitoring
and Adaptive Control
Third Party
Integrations
Opti Platform
Beaver Creek
Trunk Lines
Beaver Creek
Sewershed



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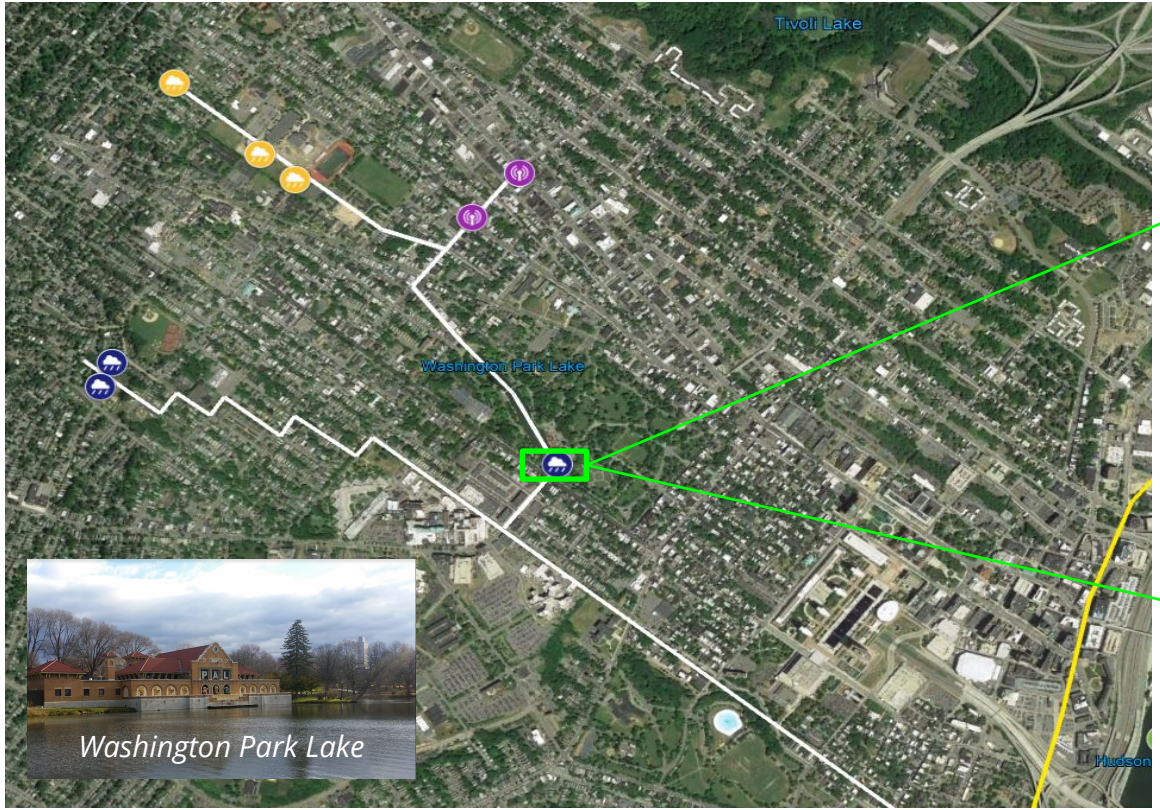
Washington Park Lake: Enhance Existing Storage



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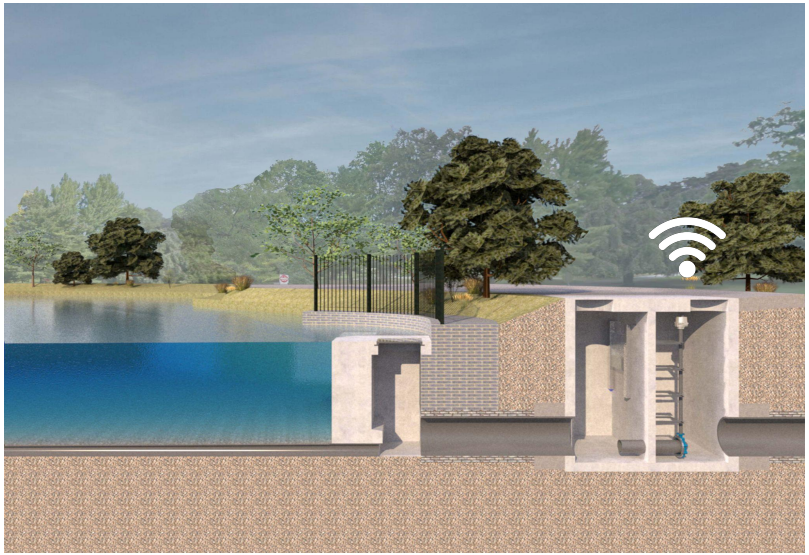
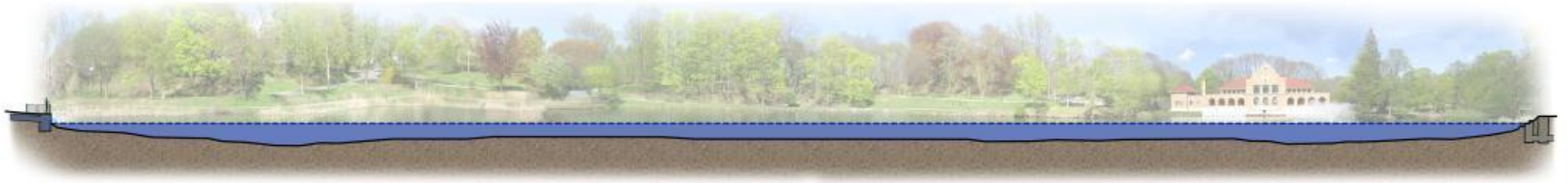
Washington Park Lake



Quick Stats

- Online since 2017
- 102.6 Acres of drainage
- 9,000,0000 Gallons of active storage
- **89% Annual wet weather capture**



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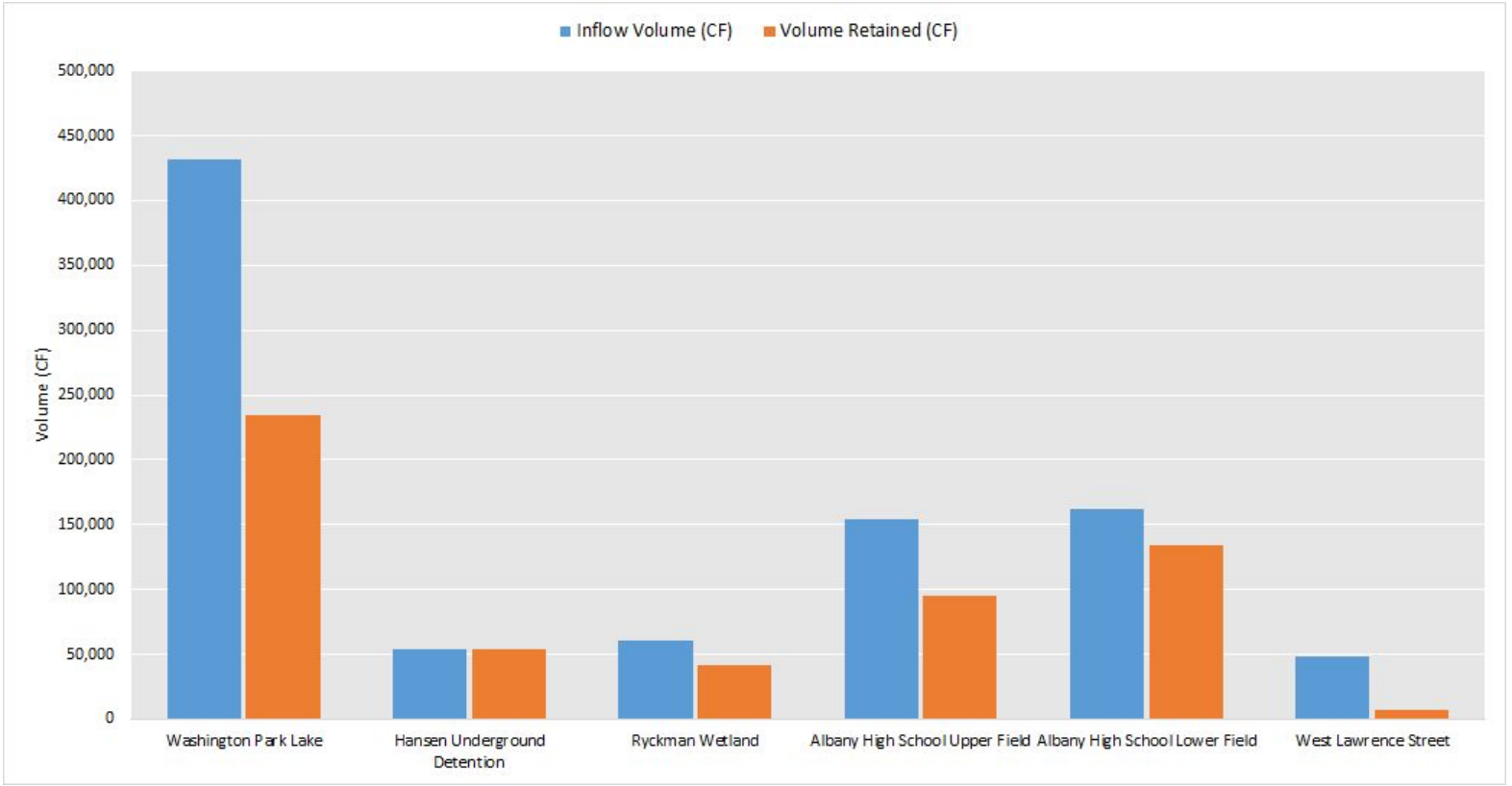
3.8 inch Storm Story - 62% Wet Weather Capture



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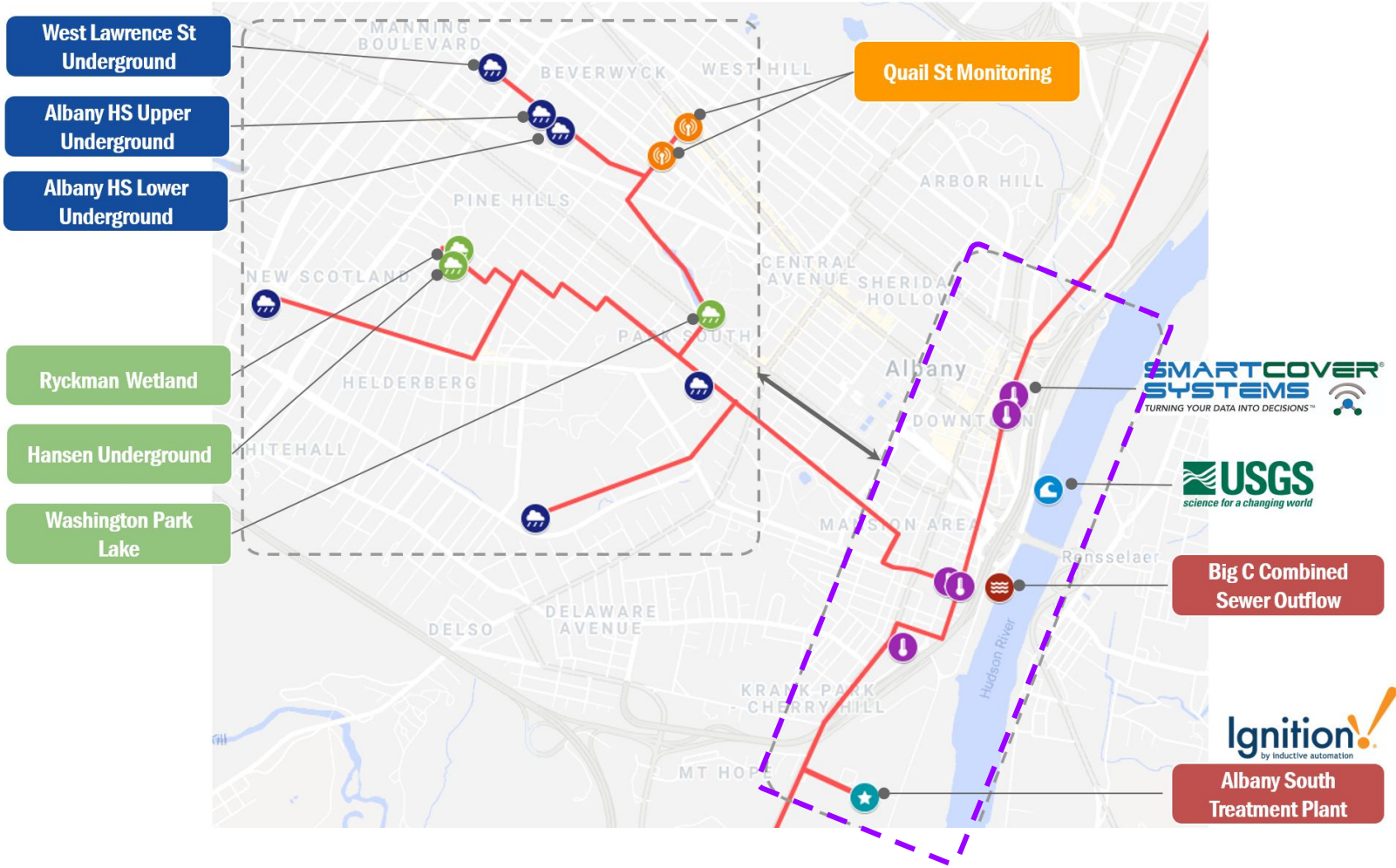

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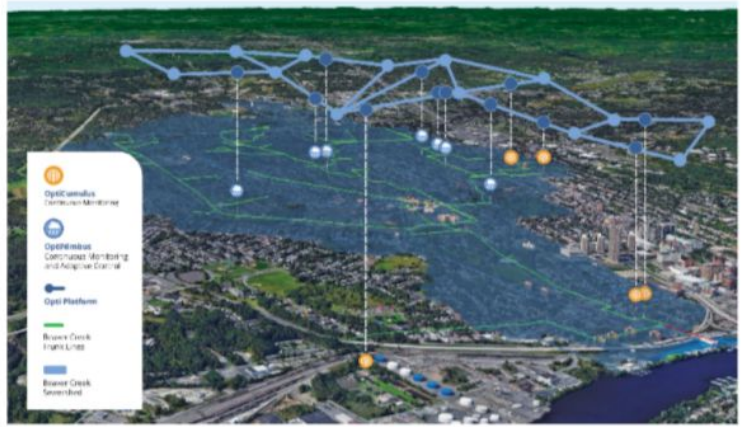
Albany Watershed Network Management

Total Rainfall:
10.31 in

Storms Controlled:
31

Time in Auto:
3 Months



FAST FACTS

Total Events in Which CSO Level > 46 in:
19

Total Hours in Which CSO Level > 46 in:
167

Hours Where CSO Level > 46" and Opti Withheld Volume:
156 (93% of total)

Volume Withheld by Opti from Sewer During CSO Events:
62 Million Gallons

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Customer Benefits

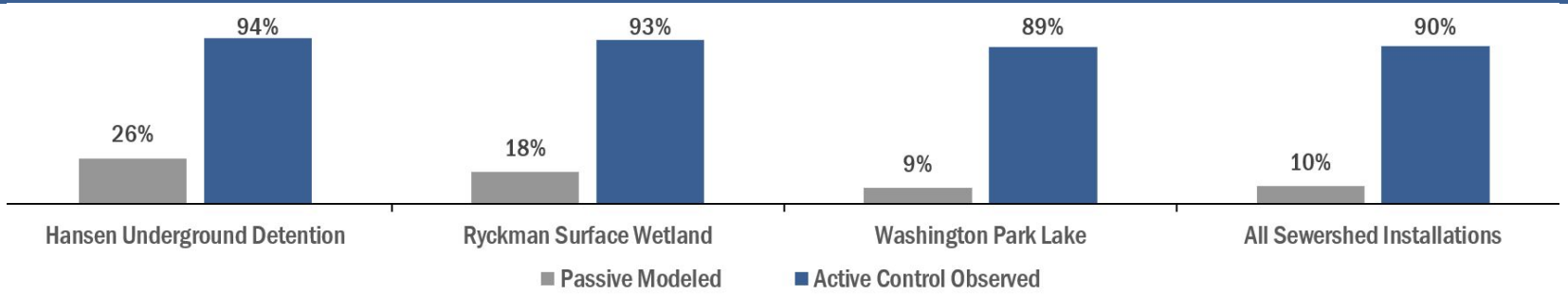
Cost Savings of $6.4 million
($0.001 / gallon)

8x Performance Improvement

Public Safety for 100,000+ Citizens

Enhanced and Streamlined Operations

Wet Weather Flow Volume Reduction



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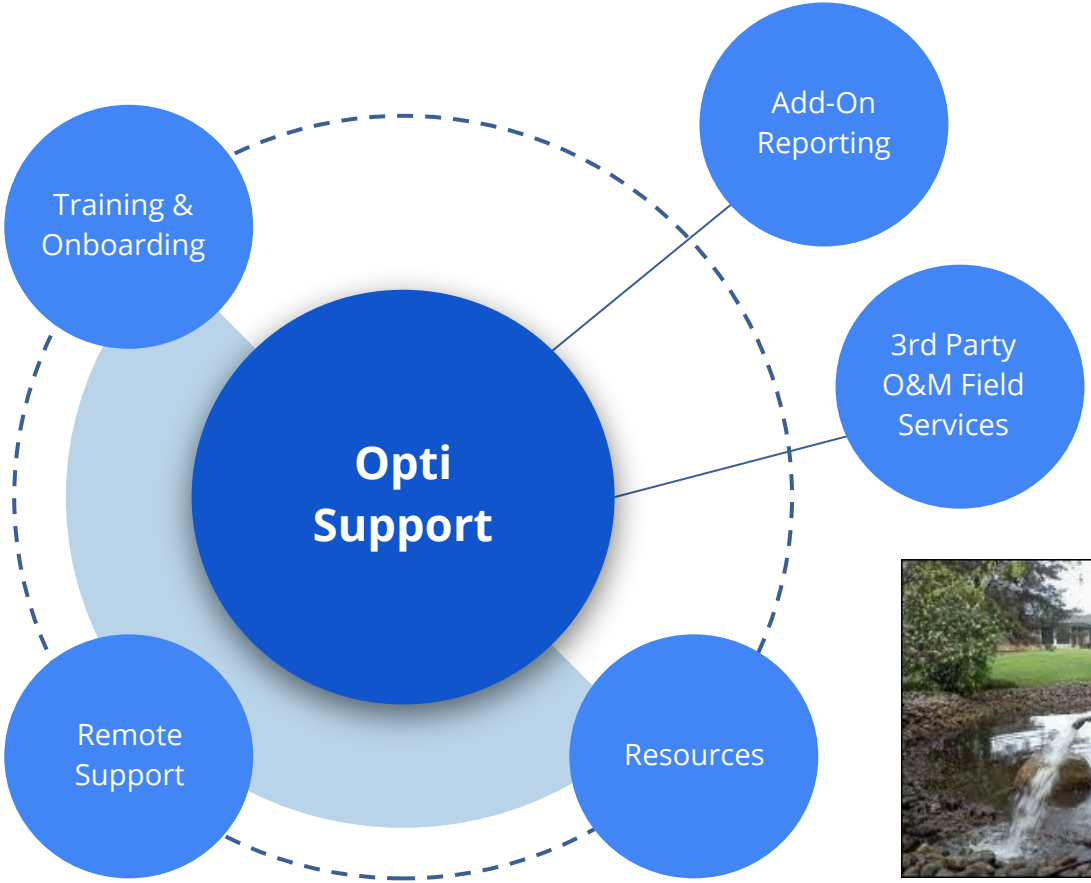
Actuator

Butterfly Valve

Level Sensor



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Recognizing Our Community

Select Awards & Testimonials

2017 Award of Excellence
Green/Sustainability/Environmental Award category from the Maryland Quality Initiative

*Recipient of **2018 National Environmental Achievement Award** from the National Association of Clean Water Agencies (NACWA)*

*Recipient of **2021 Achievement Award** from the National Association of Counties (NACo), County Resiliency: Infrastructure, Energy & Sustainability Category*

***2018 Project of the Year Award** from the Minnesota Association of Watershed Districts*

**2019 Platinum Award*
American Council of Engineering Companies (ACEC) of New York

***Winner: 2019 IDC Smart Cities North America Awards**, Smart Water Category*

*"Opti allows us to deal with an acre of stormwater runoff for **less than $40,000**. The traditional approach… cost us $150,000 an acre. So this is going to save Marylanders as taxpayers tens of millions of dollars."*

*"It's a completely different and **better way to look at solving stormwater problems**. It allows you to work with the existing infrastructure you've got … It's like taking a vehicle and putting a much better, more efficient engine in it. I can **make my existing infrastructure more efficient** by just adding this technology."*

*"Continuous monitoring and automated controls of surface water management facilities are **valuable tools for protecting our community's water resources.**"*

Notable Press Mentions

CNBC — *Tech and Real Estate Turn to the Cloud to Protect Cities from Floods*

Microsoft — *"The Opti-Azure system helps us make our sewers (and water systems) smart and helps make the lives of Kansas Citians better."*

QWI WATER IS OUR CONCERN — *Opti takes US by storm to combat CSOs and flooding*

SWS STORM WATER SOLUTIONS — *Investing in Intelligent Infrastructure*

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