



Smart Sewers: Using Technology to Improve Wet Weather Operations

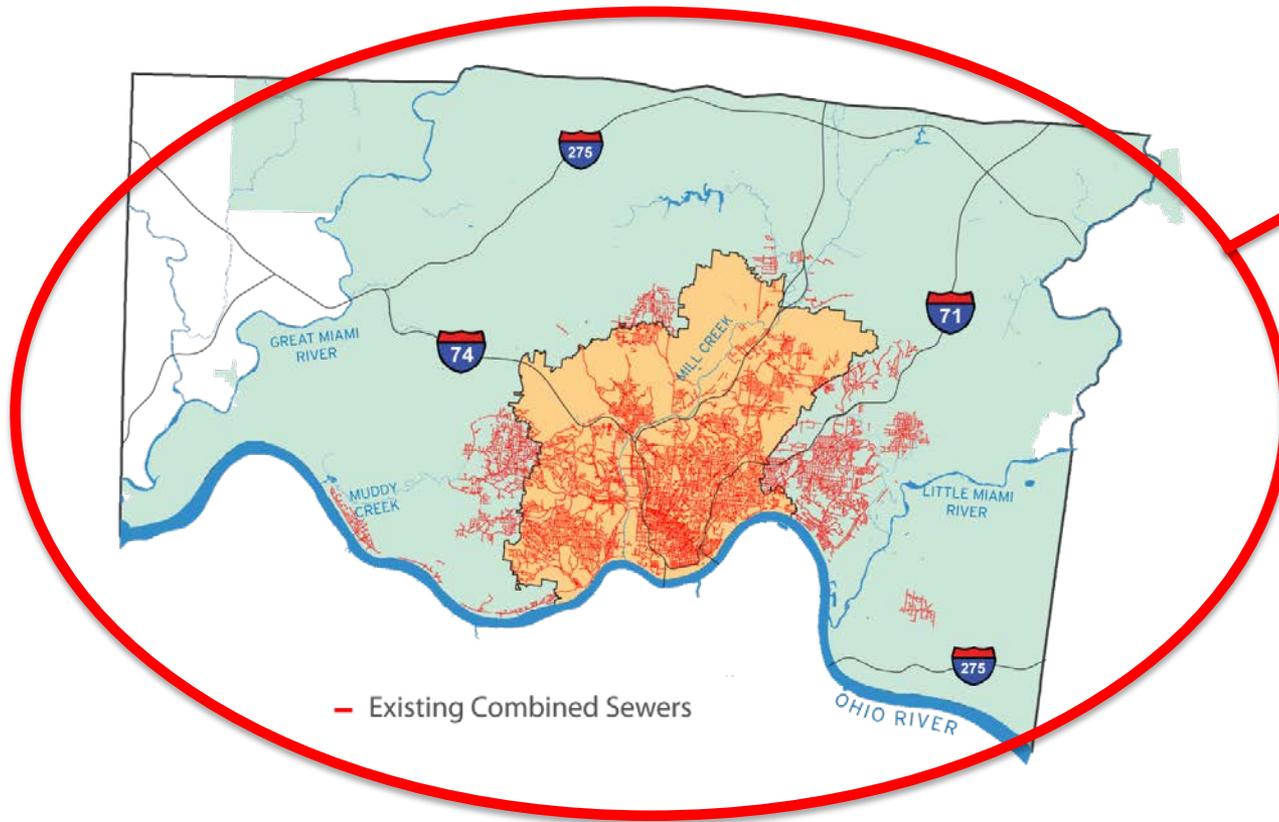
Reese Johnson, PE, PMP

Metropolitan Sewer District of
Greater Cincinnati

METROPOLITAN
SEWER DISTRICT
of greater
CINCINNATI



Metropolitan Sewer District (MSD) of Greater Cincinnati, Ohio



- 800,000+ Residents of Cincinnati and Hamilton County
- 290 Square Miles
- 7 Treatment Plants
- 100+ Pump Stations
- 3,000 Miles of Sewers, Both Sanitary and Combined
- 184 MGD on Dry Days

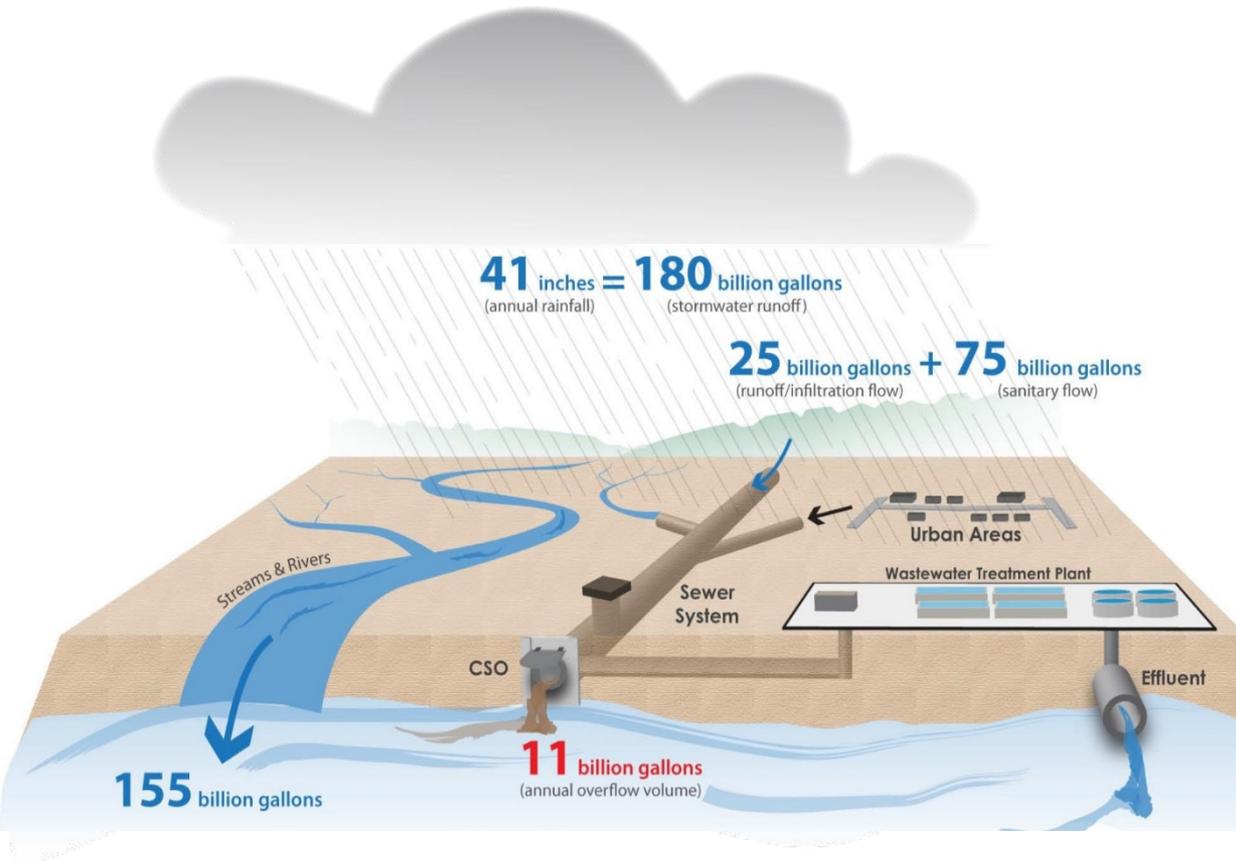
The Challenge of Wet Weather

Southwest Ohio receives **41 inches of rain** per year...

Results in approximately **11 billion gallons of overflow** in a typical year

Led to a **\$3.2B Consent Decree** to address the 200+ overflow points through:

- Pipe Upsizing, Storage
- Strategic Separation
- Green Infrastructure
- Dedicated WW Facilities



What if...

... we could use *all* the conveyance capacity in our pipes before we had a combined sewer overflow?

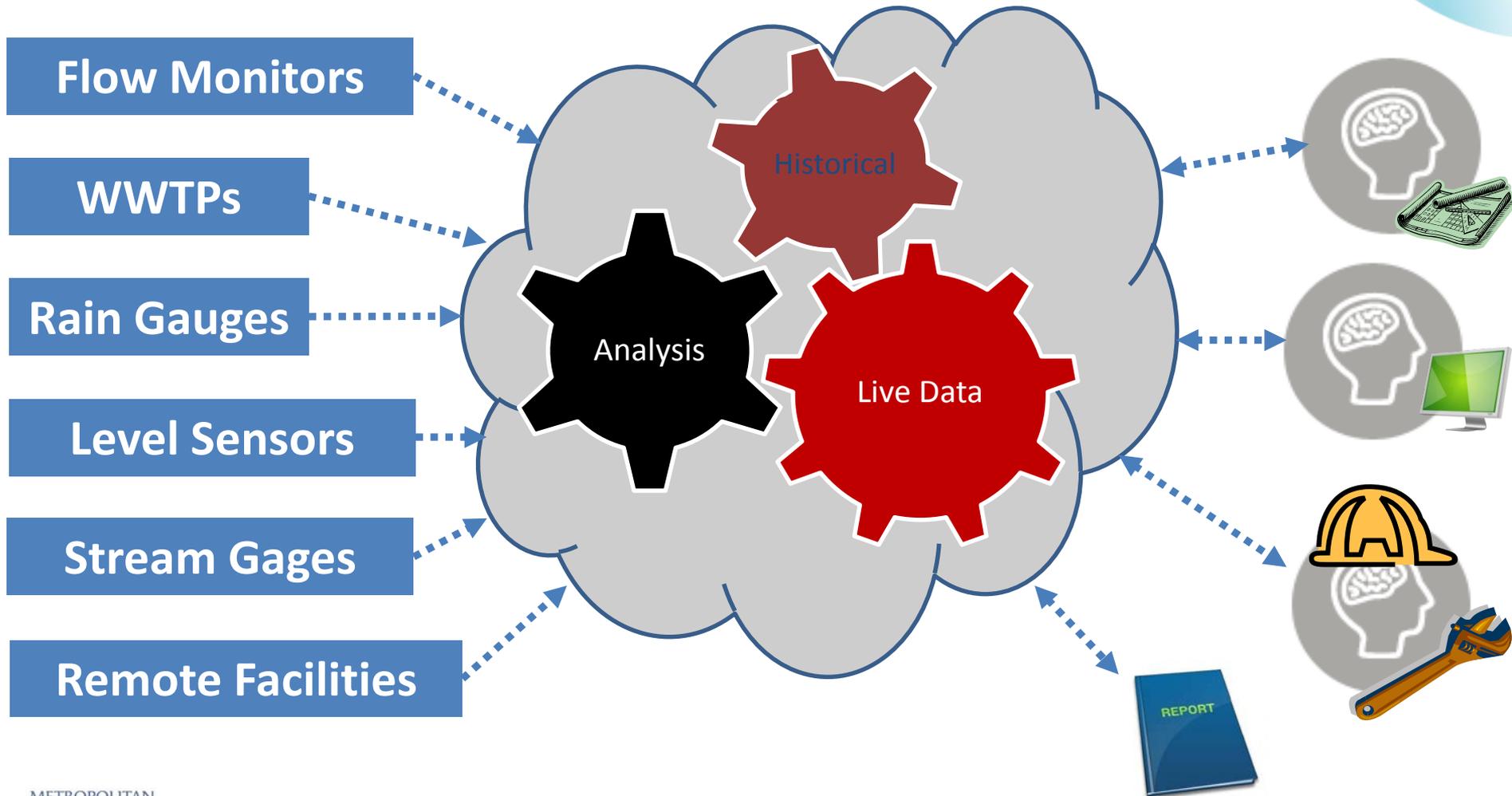
....we could use a remote storage tank to reduce overflows many miles away?

....we could use real-time information to prioritize treatment?

Could we achieve the same, or better, environmental benefit and build less new infrastructure?



Cloud-based SCADA Enables a Smart(er) Sewer

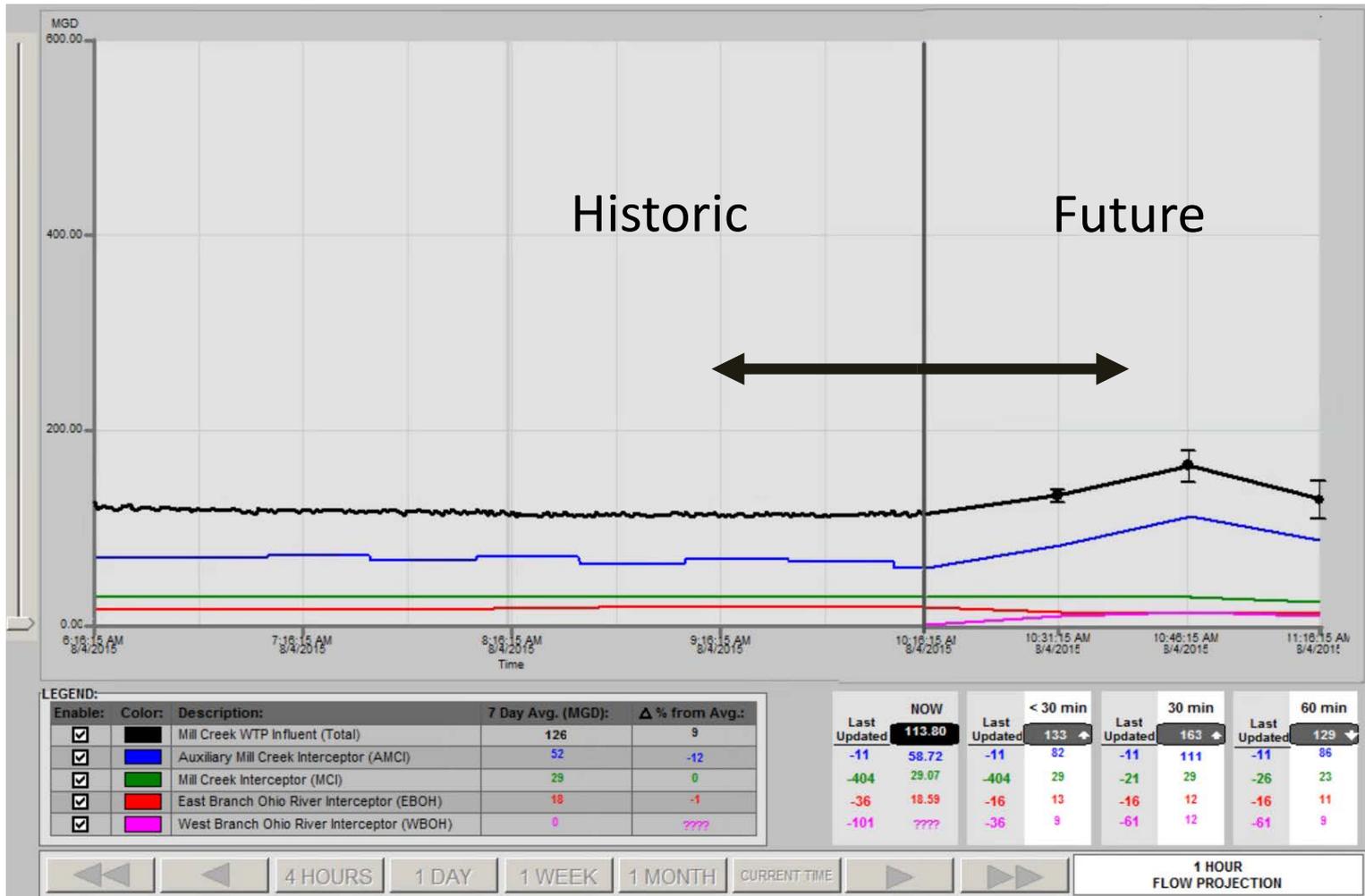


“Smart Sewer” Achieves Results Without Additional Construction

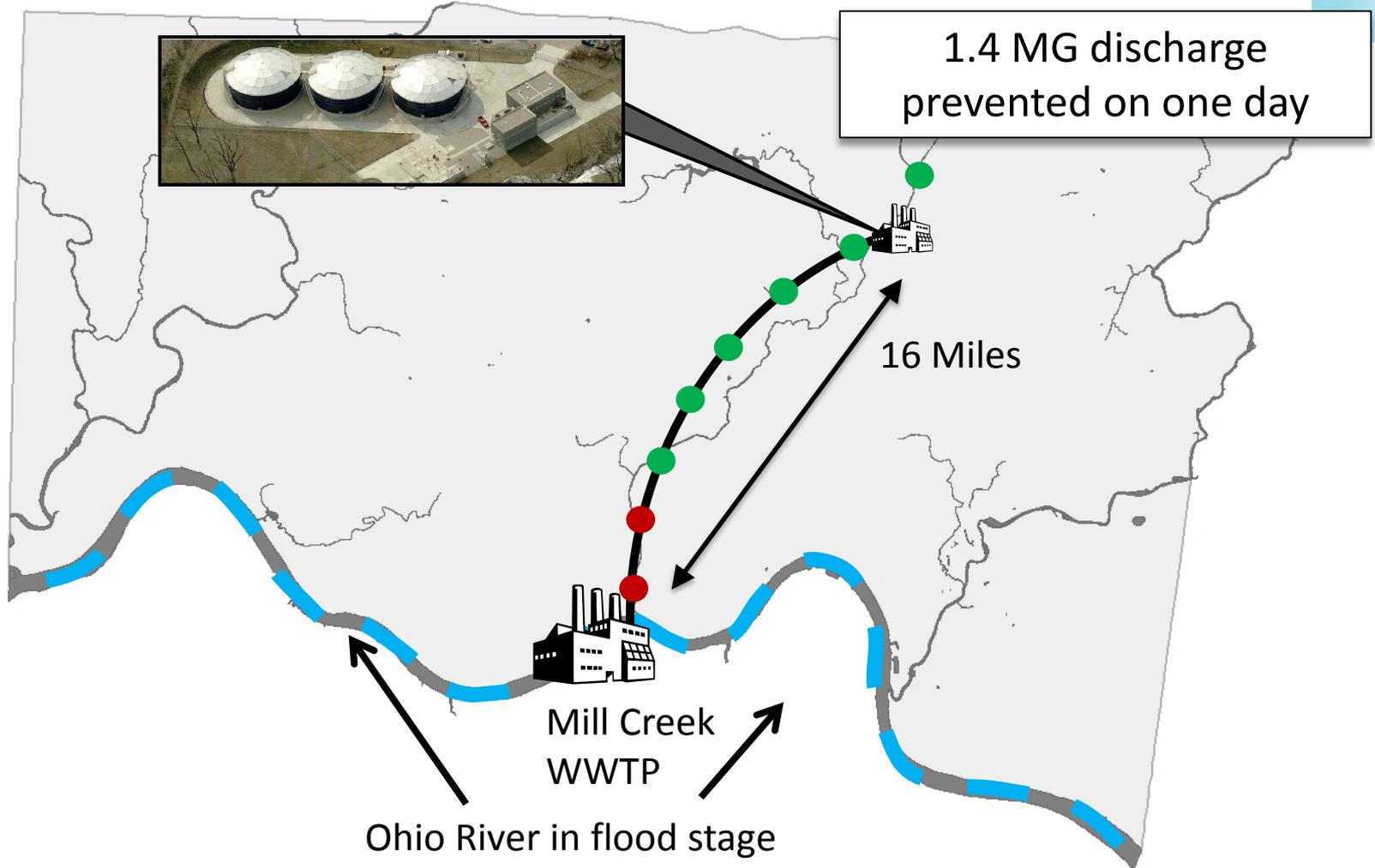
- Improves Treatment Plant Operations
- Reduces Overflows from the Collection System
- Improved Watershed Protection



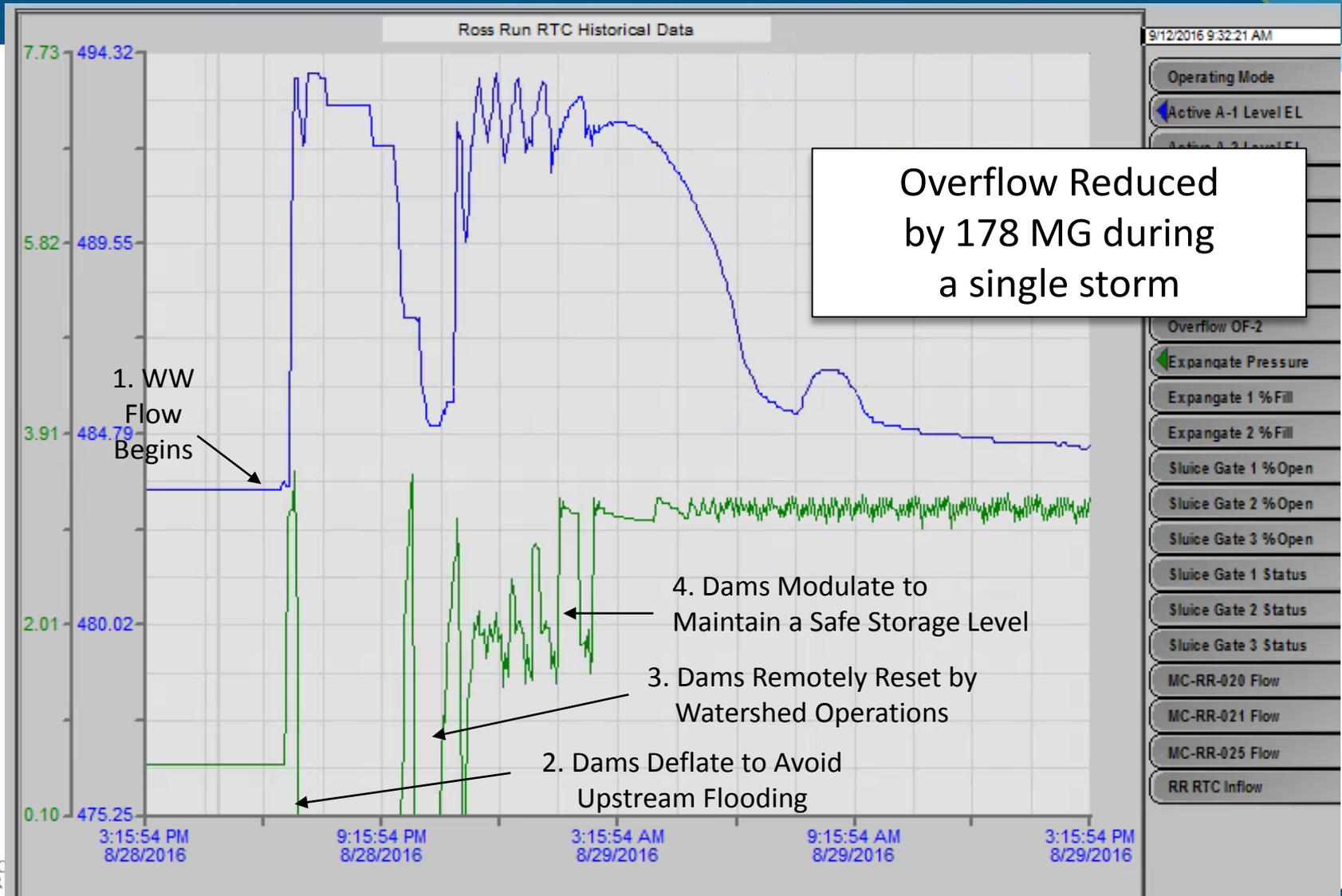
Improved Operations by Projecting Future Flows to WWTP



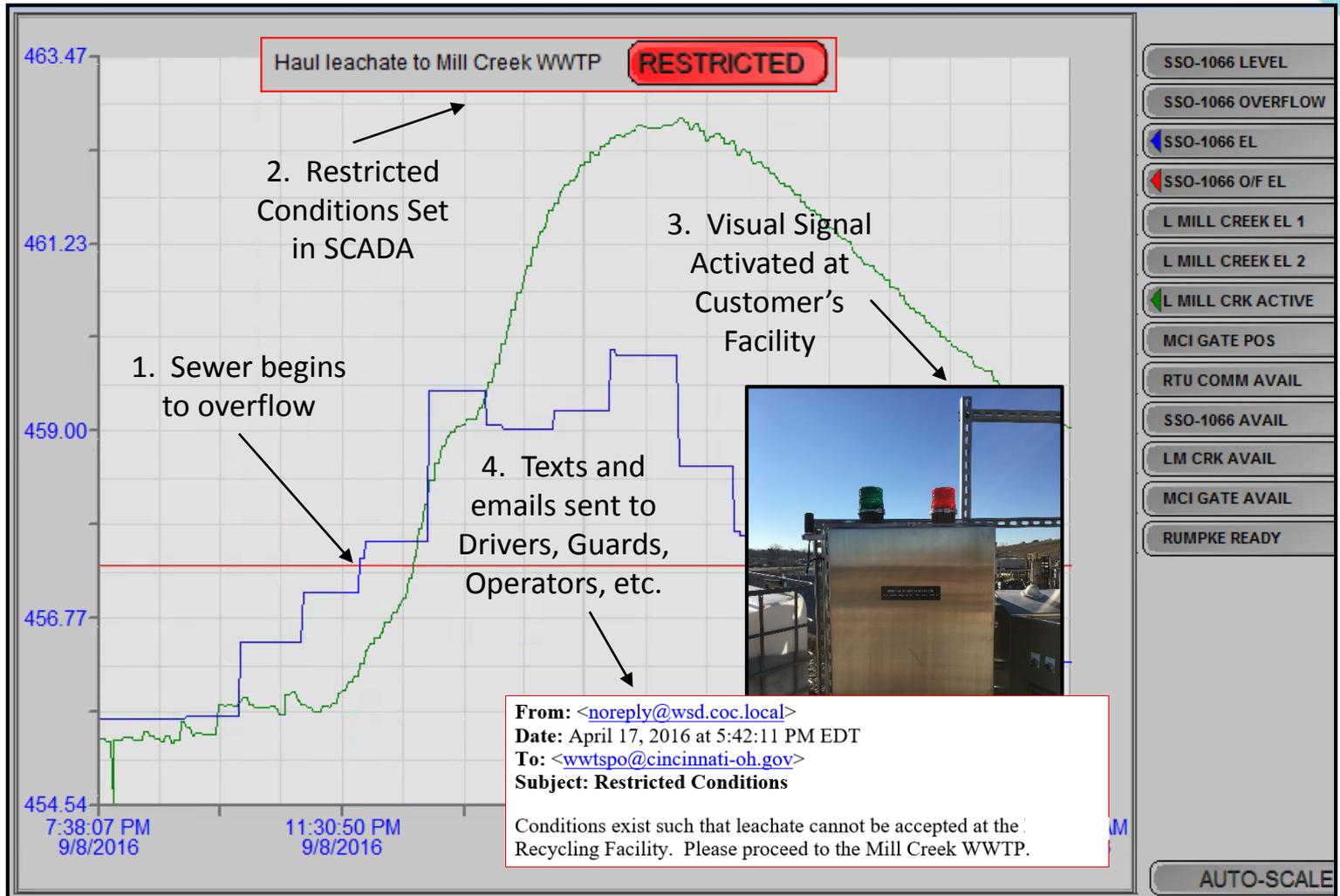
Reduced Overflows by Leveraging Distant Storage/Treatment Facility



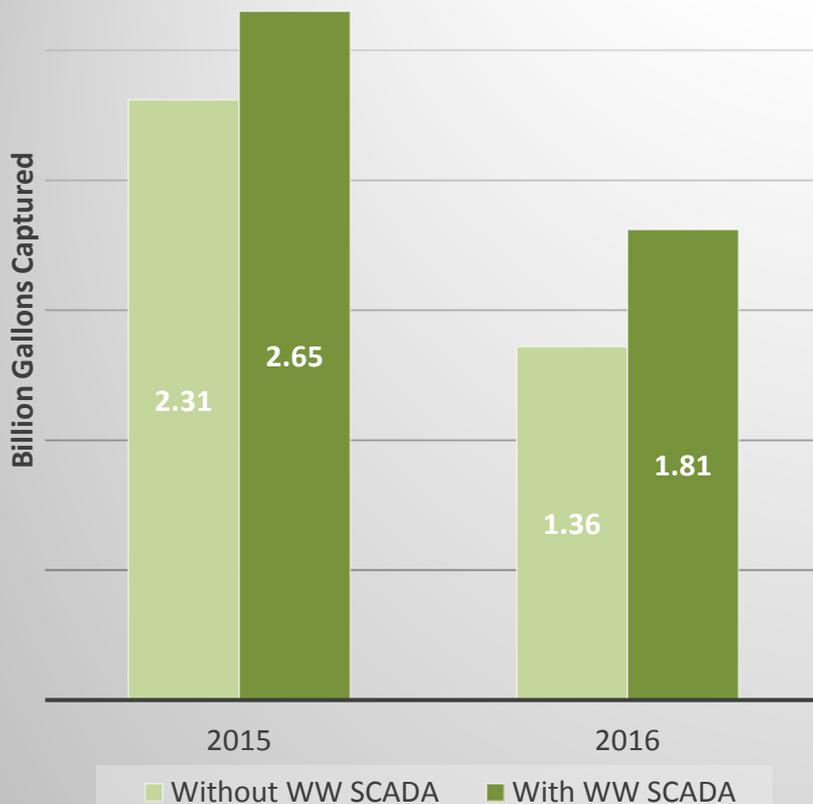
Reduced Overflows by Remotely Resetting an Un-staffed Facility



Reduced Impact by Prohibiting High Strength Discharge Upstream



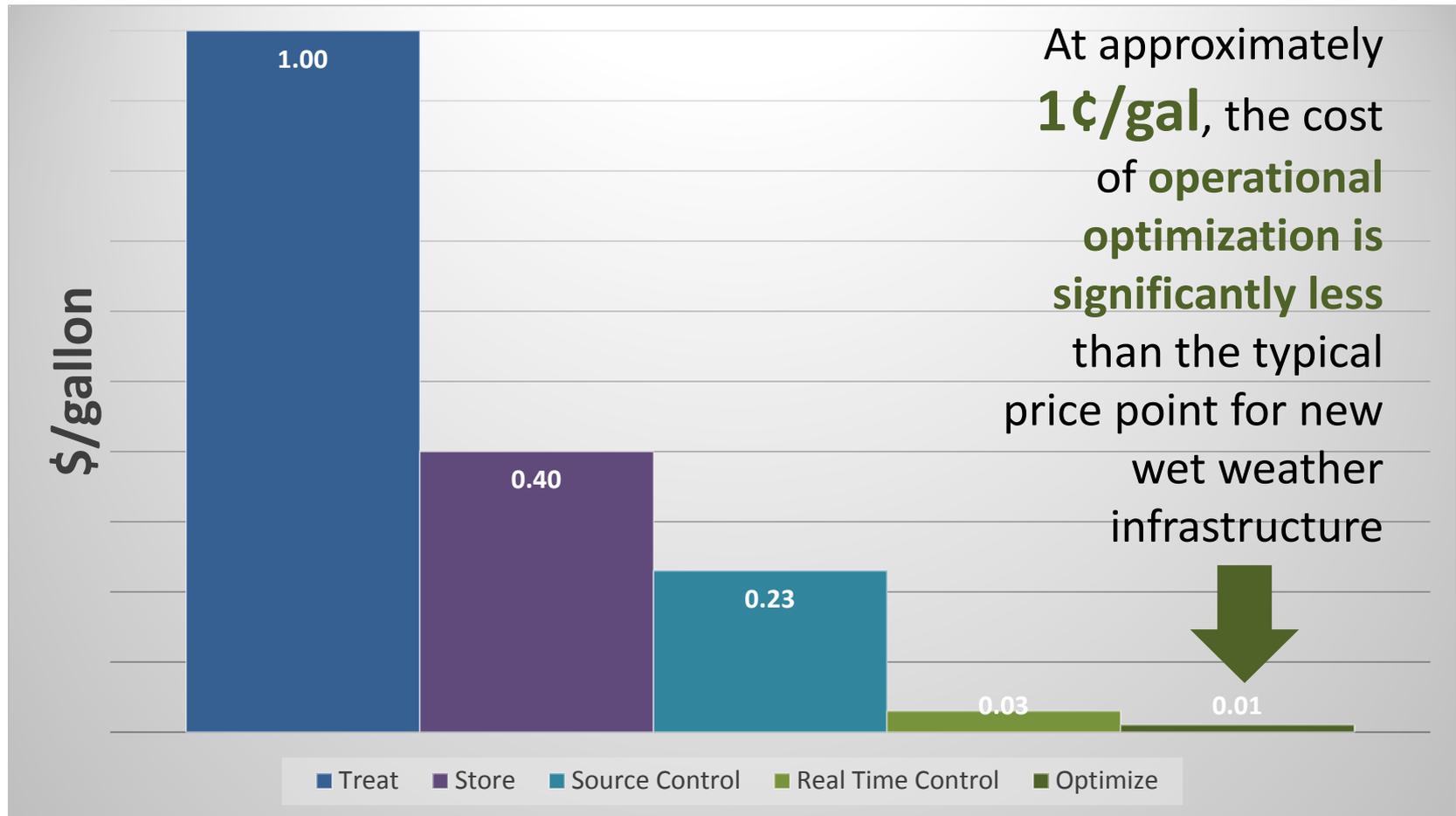
Quantified Early Benefits of the Wet Weather SCADA System

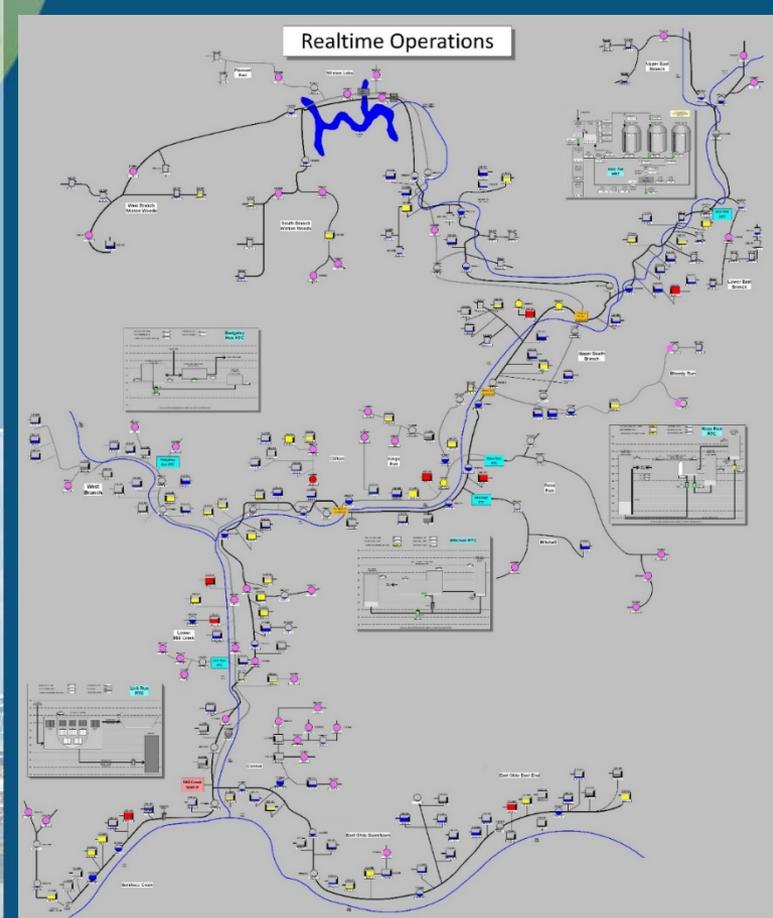


2-year study of 4 Wet Weather Facilities:

15% improvement with addition of real-time monitoring capabilities
33% improvement with real-time monitoring *and* real-time control

Smart Sewers Make Dollars and Sense





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