WET WEATHER STAKEHOLDER TEAM

Agenda

Wet Weather Team
Stakeholder Group Agenda
November 20, 2018
5:30 p.m. – 8:00 p.m.

5:15	Dinner served
5:40 – 5:55	Welcome & Intro, Special Recognition *Clay Kelly, Strand Associates*
5:55 – 6:15	IOAP Update – Tunnel (vs Southwestern) *John Loechle, MSD Engineering Technical Services Director*
6:00 – 6:20	MSD Update *Tony Parrott, MSD Executive Director*
6:45 - 6:50	Stormwater Discussion Introduction *Angela Akridge, MSD Chief Engineer*
6:50 – 7:40	Critical Drivers for Louisville's Stormwater Program *Clay Kelly*
7:40 – 7:45	Observer Comments, Wrap-up and Adjourn *Clay Kelly*

Meeting Summary

Meeting Summary
Wet Weather Team Stakeholder Group Meeting
November 20, 2018
MSD Main Office, Louisville

The Wet Weather Team (WWT) Stakeholders, chartered by the Louisville and Jefferson County Metropolitan Sewer District (MSD), met on November 20, 2018, at MSD's main office. The objectives of the meeting were to:

- Provide a Consent Decree Integrated Overflow Abatement Plan (IOAP) and general MSD update,
- Review the discussions related to stormwater from the June 2018 meeting, and
- Introduce and/or refresh stakeholders on the Value-Based Evaluation Framework.

Welcome

Clay Kelly of Strand Associates opened the meeting by welcoming returning members, introducing new members, and reviewing the meeting objectives, agenda, and basic ground rules. Clay shared with the WWT that this was the last WWT meeting for David Tollerud, Bruce Scott, and Tom Herman and thanked each of them for their service to the group and the community.

Clay noted that there were several new members in attendance: Eric Friedlander, Tim Fulton, Corinne Greenberg, Jody Meiman, Ward Wilson, and Nicole Yates. In addition, Andrew Condia and Mary Ellen Wiederwohl are new members that could not attend the meeting.

In reviewing the WWT Charter, Clay reminded the group that all stakeholders are expected to:

1. Participate fully and honestly in meetings, act in good faith, and strive for consensus;
2. Reach out to constituencies whose interests they reflect and, as appropriate, to other stakeholders to communicate about the project status and gather input and ideas for the project; and
3. Participate in the identification, review, and analysis of options.

IOAP Update

Greg Powell, MSD Engineering Manager - Collection System and Construction, provided an update on the IOAP with a focus on the Waterway Protection Tunnel. Greg shared the details on the size, location, and configuration of the tunnel that is replacing the four storage basins that had been previously planned. He highlighted the safety initiatives, the public outreach, the progress that has been made to date, and the overall construction schedule and cost.

A stakeholder asked whether there would have been cost savings if MSD had proceeded with the tunnel from the beginning instead of basins. Tony Parrott, MSD Executive Director, explained that tunnels were evaluated as part of the IOAP development, but at the time basins were determined to be a better path forward. In the approximately 15 years since then, tunneling technology and construction expertise has advanced considerably and the Waterway Protection Tunnel is now the preferred choice. The stakeholder followed up by asking whether the tunnel could be used for other things. Greg responded that right now the plan is to only use the tunnel for CSO mitigation.

Two stakeholders asked whether the tunnel was lined and, if so, why the existing bedrock was not sufficient, and how it is lined. Greg said that the tunnel has a formed concrete liner. After the boring is completed the concrete is mixed on the surface and pumped into a moveable form system in the tunnel. Greg added that the liner is installed to ensure no infiltration or exfiltration. The liner provides a very robust system to protect from both risks.

Several stakeholders expressed a desire to visit the tunnel. Tony and Greg said that could be feasible and they will attempt to arrange a visit. Greg noted that it might have to wait until construction has progressed further due to safety and other logistics associated with bringing a larger group in for a tour.

MSD Update

Tony began his portion of the meeting with a reminder of how critical MSD's infrastructure is to Louisville's prosperity. Unfortunately, growth and resiliency is being challenged by aging infrastructure as seen by the increase in cave-ins and collapses that have been shared previously. Tony noted that MSD is now in the third month of the current fiscal year but has already spent the entire budget for emergency repairs. This means that once again planned projects will have to be postponed in order to provide funds to make emergency repairs.

Tony reviewed the details of MSD's request to Metro Council to allow a 9.9 percent rate increase each year for a 4-year period. This would allow MSD to fund infrastructure replacement and renewal and to begin more aggressively addressing the aging infrastructure issues. MSD's rates would still be competitive compared to other cities and there is an assistance program to help low income customers.

Additionally, MSD is actively looking for other revenue sources and has been successful with getting state and federal grants and loans. Lastly, Tony explained that HB513 (passed in April 2018) makes it easier for neighboring utilities to regionalize beyond jurisdictional borders through inter-local agreements.

Values-Based Framework for Louisville's Stormwater Program

Clay opened the next topic of discussion with a summary of the history of Louisville's stormwater program and the "ripple-effect" that challenges us today that was presented at the last meeting by Tom Owen and Angela Akridge. Clay explained to the stakeholders that were not at the June 2018 meeting that the WWT completed a brainstorming exercise (the "Blue Board") to identify critical drivers related to stormwater. As MSD and the rest of the technical team was organizing the results of the Blue Board, they noticed that there were striking similarities to the Value-Based Evaluation Framework.

Stephanie Laughlin, MSD Infrastructure Planning Program Manager, provided background on the Value-Based Evaluation Framework. She explained that MSD used this system in developing the IOAP in 2008 and the Critical Repair and Reinvestment Plan in 2016. Stephanie walked through the structure of the Framework and the importance of being consistent in the terminology used when working with it, specifically Values, Aspects, and Threats. Stephanie then highlighted several examples in which the results from the Blue Board fit into the Framework.

Paul Maron of Strand Associates then walked through a fictitious example to show how the Framework can be used to evaluate different solutions to solve the same problem. Paul ended the example by showing where the WWT provides input in the process and how that input affects the evaluation process and results.

Clay wrapped up the topic by asking the Stakeholders to consider what some of the Values should be for evaluating stormwater projects and to identify Values, Aspects, and Threats from the Blue Board exercise. He asked the stakeholders to also consider if any Values, Aspects, or Threats were missing and to think on what some potential measurements might be.

Observer Comments, Wrap-Up, and Adjournment

There were no comments from the observers.

Clay went around the table asking each stakeholder to comment on what they learned and to ask any questions they may have.

Several stakeholders asked whether MSD staff would share its priorities. Brian Bingham, MSD Chief of Operations, said that MSD will weigh in later but for now does not want to bias the WWT.

One stakeholder reminded the WWT and MSD to be careful that the solutions selected do not hinder growth or make Louisville a less attractive or more expensive city to live in. This stakeholder also encouraged everyone to think big whenever possible and take in ideas from wherever they may come. Several stakeholders echoed these sentiments and expressed support for using new and/or emerging technology.

One stakeholder asked what the WWT would tackle after stormwater. Angela Akridge, MSD Chief Engineer, said that stormwater would continue to be the focus for the WWT for some time. Stormwater is unique amongst MSD's service areas because it impacts people at a very personal level. MSD can address the stormwater issues in the community over time. The question the WWT will help answer is what comes first? Many stakeholders would voice their agreement with the personal nature of stormwater and why it can be challenging.

Several stakeholders noted that stormwater management is a moving target as the physical landscape is always changing and climate change is making long-term planning more difficult.

A stakeholder noted that the Blue Board seemed more focused on downstream problems rather than upstream mitigation.

A stakeholder asked whether probability has a role in the Values-Based Evaluation Framework. Clay and Brian both confirmed that probability has a significant part of the Framework and that it will be introduced later.

Numerous stakeholders expressed concern over the amount of effort it would take to develop and evaluate solutions. Clay and many other stakeholders (who had been through this process with the Values-Based Evaluation Framework) reassured them that MSD and its technical team makes the process very easy for the stakeholders and are organized to complete the work in an efficient manner.

Stakeholders that were familiar with the Framework stressed to new members the importance of making their voice heard. They acknowledged that MSD takes the WWT's feedback seriously and that the WWT will be able to see the results of its input from one meeting to the next.

Meeting Materials

- Agenda for the November 20, 2018 WWT Stakeholder Group Meeting
- Copy of the presentation slides – IOAP Update; MSD Update; Values Based Framework for Louisville's Stormwater Program;

Meeting Participants

Wet Weather Team Stakeholders (Present)

Steve Barger, Labor (retired)
Susan Barto, Mayor of Lyndon
Stuart Benson, Louisville Metro Council, District 20
Deborah Bilitski, Waterfront Development Corporation
Billy Doelker, Key Homes
Mark French, University of Louisville Speed School of Engineering
Eric Friedlander, Louisville Metro Government, Chief Resilience Office
Tim Fulton, Louisville Metro Government, Superintendent of Parks and Recreation
Arnita Gadson, West Jefferson County Community Task Force
Corinne Greenberg, Carbide Industries
Tom Herman, Zeon Chemicals (retired)
David James, Louisville Metro Council, District 6
Rick Johnstone, Deputy Mayor, Louisville Metro Mayor's Office (retired)
Maria Koetter, Louisville Metro Government, Director of Sustainability
Kurt Mason, USDA Natural Resources Conservation Service
Jody Meiman, Louisville Metro Government, Director of EMA/MetroSafe
Rocky Pusateri, Elite Built Homes
Lisa Santos, Irish Hill Neighborhood Association
Bruce Scott, Kentucky Waterways Alliance (retired)
Ward Wilson, Kentucky Waterways Alliance
Nicole Yates, Representative John Yarmuth's Office

Wet Weather Team Stakeholders (Not Present)

Andrew Condia, Senator Mitch McConnell's Office
Jeff O'Brian, Louisville Metro Government, Director of Louisville Forward
David Tollerud, University of Louisville, School of Public Health and Information Sciences (retired)
Tina Ward-Pugh, Louisville Metro Government, Resilience and Community Services
David Wicks, Get Outdoors Kentucky; Jefferson County Public Schools (retired)
Mary Ellen Wiederwohl, Louisville Metro Government, Chief of Louisville Forward

Wet Weather Team MSD Personnel (Present)

Tony Parrott, MSD Executive Director
Angela Akridge, MSD Chief Engineer
Brian Bingham, MSD Chief of Operations
John Loechle, MSD Engineering Technical Services Director

Technical Support

Clay Kelly, Strand Associates
Paul Maron, Strand Associates

Meeting Observers

David Johnson, MSD
Stephanie Laughlin, MSD
Steve McKinley, SCM Engineers

Greg Powell, MSD
Lori Rafferty, MSD
Bill Sanders, Heritage Engineering
Wes Sydnor, MSD

Handouts

No Meeting Handouts

Presentations

2018 MSD WET WEATHER STAKEHOLDER MEETING

Louisville MSD

November 20, 2018

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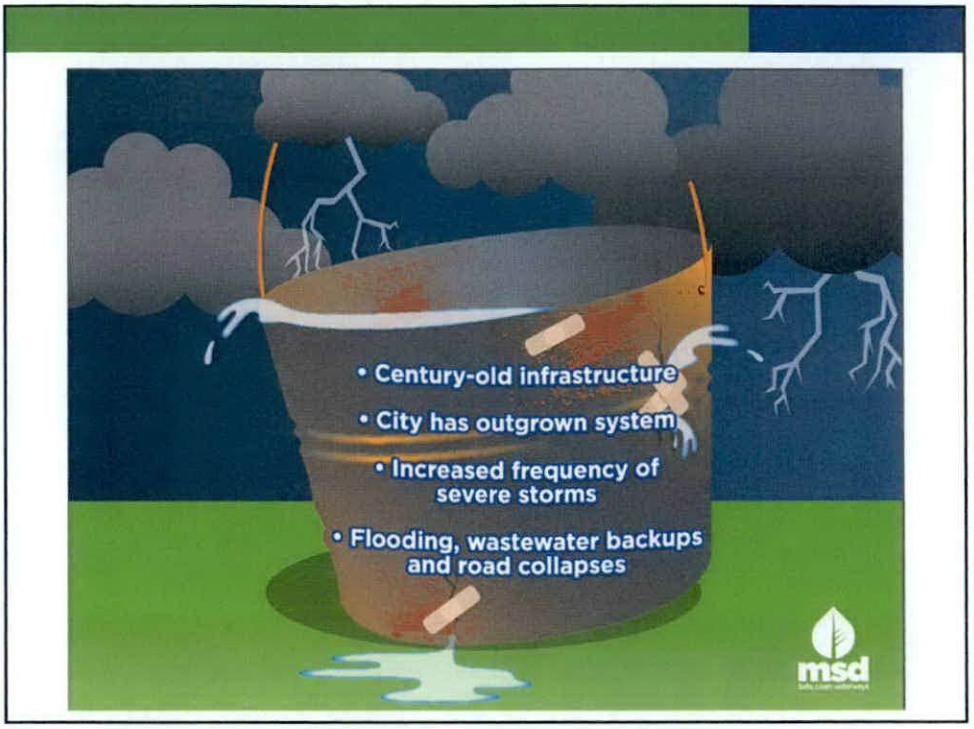
Louisville's prosperity depends on vital sewer, drainage and flood protection infrastructure

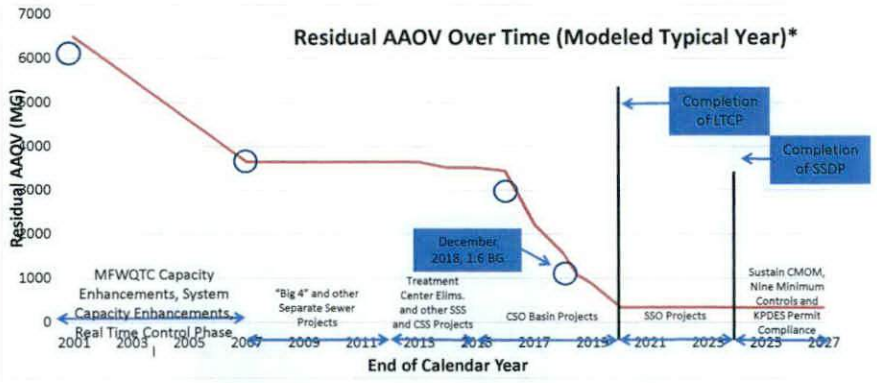
Utility Infrastructure is foundational to Louisville's transformation

$1.2 billion investment downtown with 2018 projected completion

Louisville Metro development estimated to exceed **$13 billion**



Combined Sewer System Residual AAOV*



Residual AAOV modeling includes the baseline assumption that upstream SSDP projects are complete. After 2020, the only SSDP project that will have CSO impacts is Upper Middle Fork PS Improvements and Diversion

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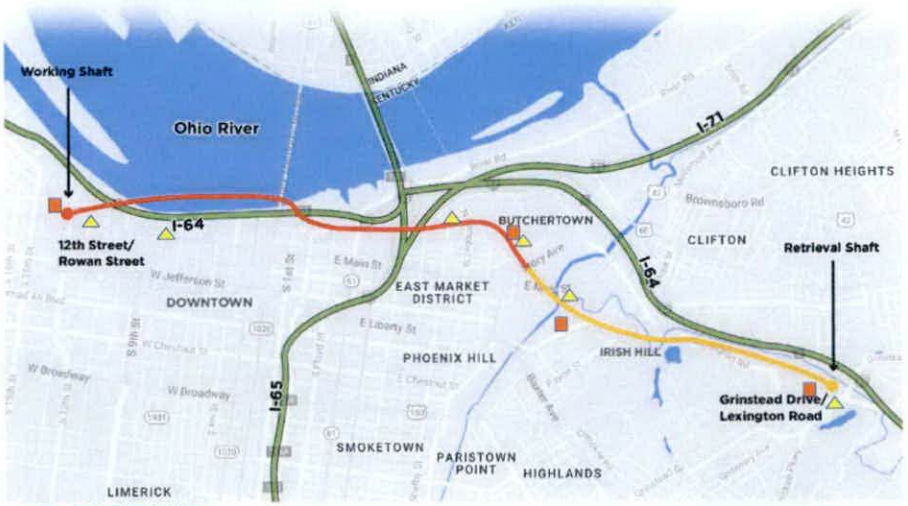
Tunnel Overview



WATERWAY PROTECTION TUNNEL

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Main Street Repair

Ohio River Interceptor Rehabilitation and Pump-Around

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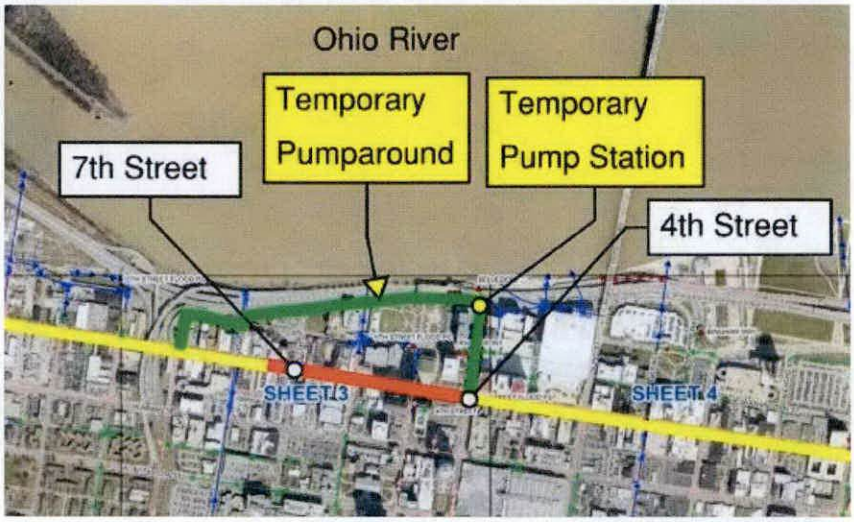
Infrastructure Challenges - Main Street Sewer Collapse

Sewer collapse closes streets in downtown Louisville

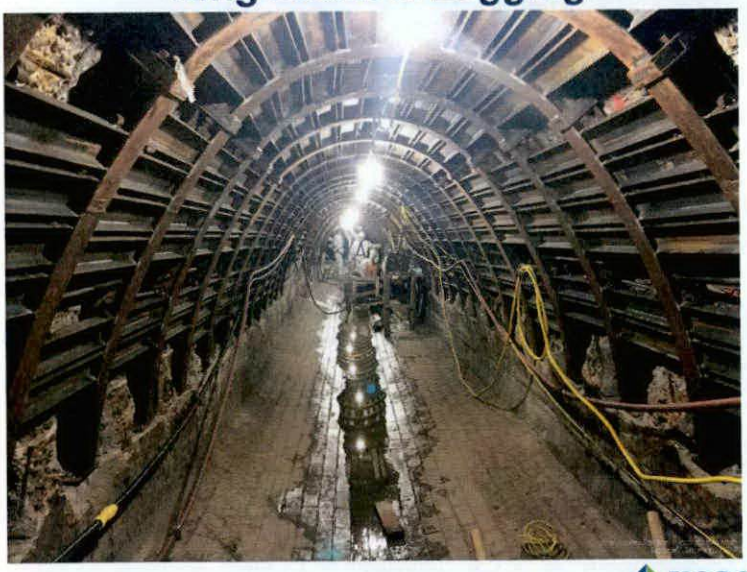
LOUISVILLE, Ky. — A sewer collapse in downtown Louisville has closed several streets.

Project Overview



Video and laser inspection show concrete worn away and exposed rebar due to corrosion from sewer gases, particularly between 4th and 7th streets along West Main St.

Ring Beam & Lagging



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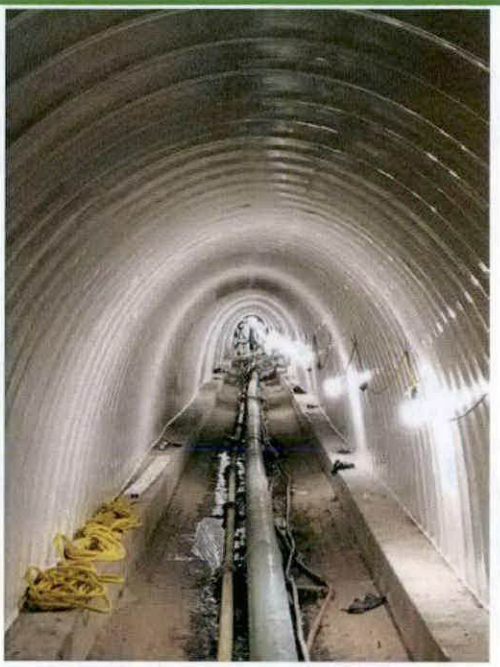

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Broadway and Preston Cave-In

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Broadway at Preston
Ruptured section in 96" triple ring brick sewer

Showing 44" x 36" brick sewer tie in from south

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THE 2018 OHIO RIVER FLOOD
MSD's Role in Protecting Louisville

- MSD maintains the area's **29-mile** flood protection system
- Louisville's wettest February in **135 years**
- **6 floodwall closures** installed by Sunday evening
- **All hands on deck.** Even non-flood pump station MSD employees help staff flood pump stations.
- More than **1,500 customer calls** for assistance in three days, mostly for drainage and sewer backups
- Crews working **24/7** to clear drainage concerns
- **16 flood pumping stations** working nonstop together, pumping **8 million gallons** of water per minute into the Ohio River

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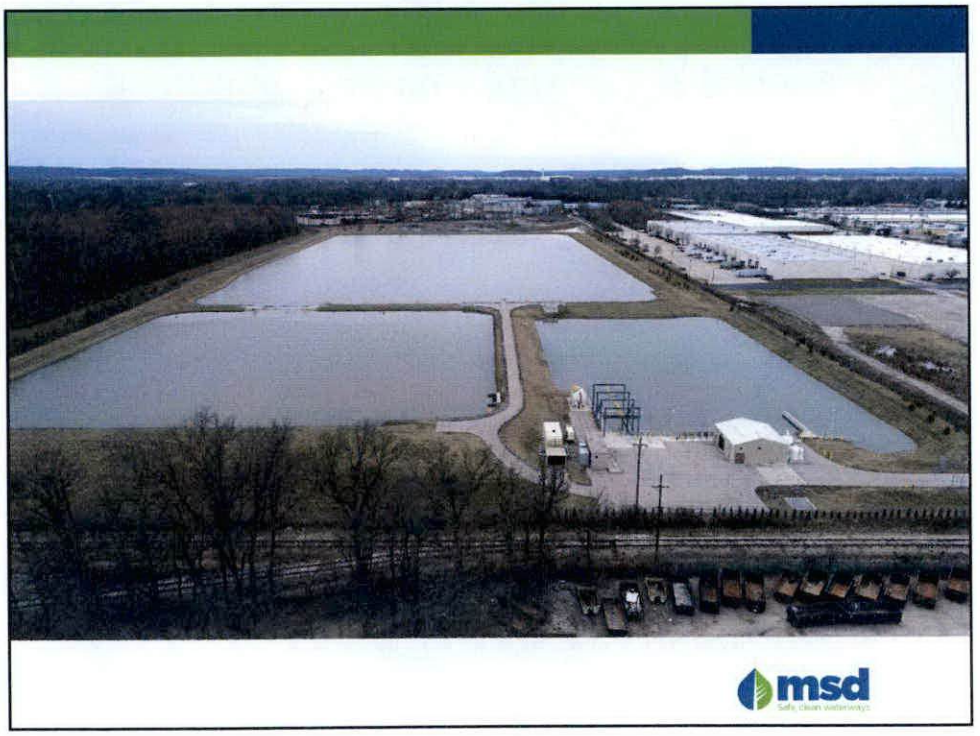
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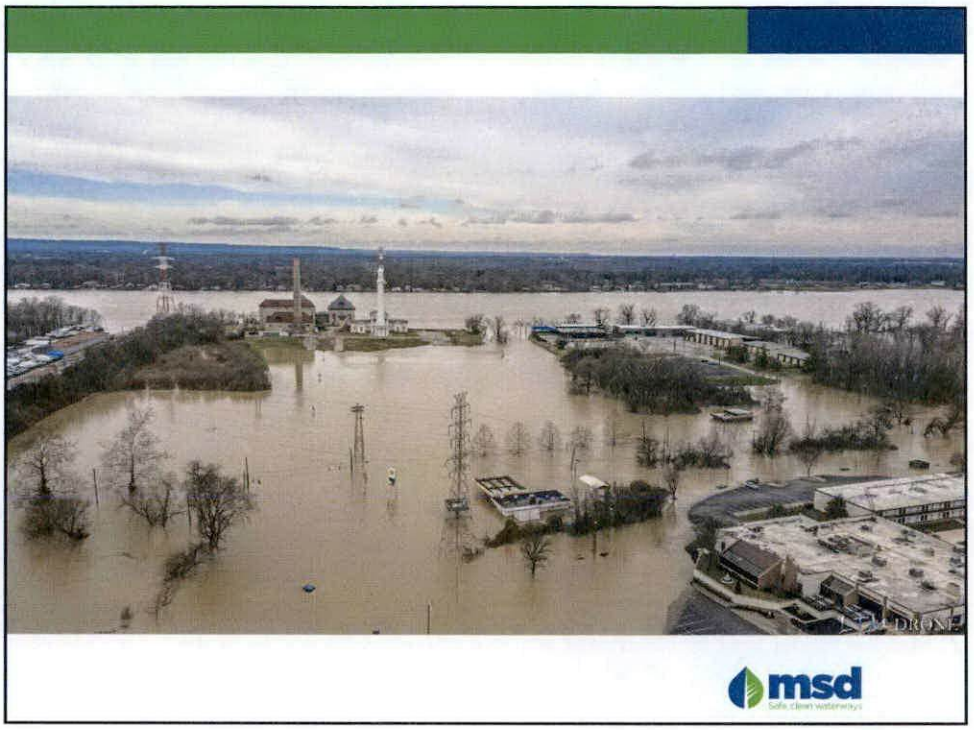

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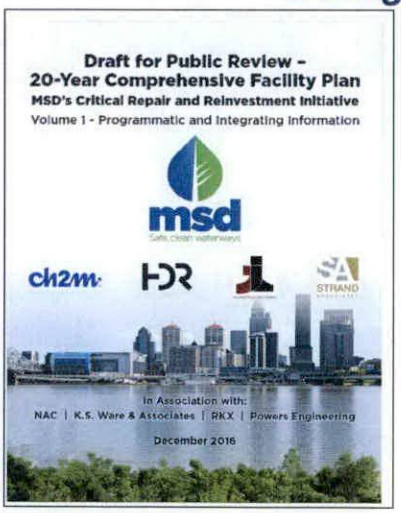
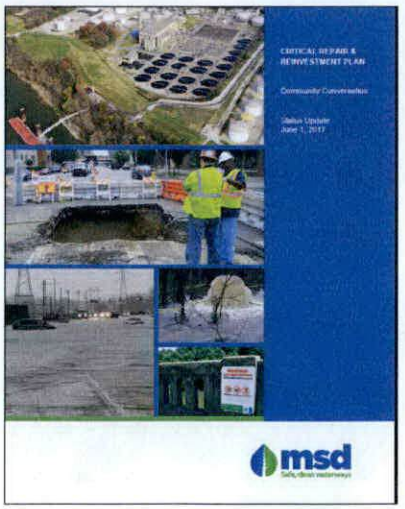
Critical Repair and Reinvestment Plan Background





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2020 – 2024 Rate Increase Alternatives

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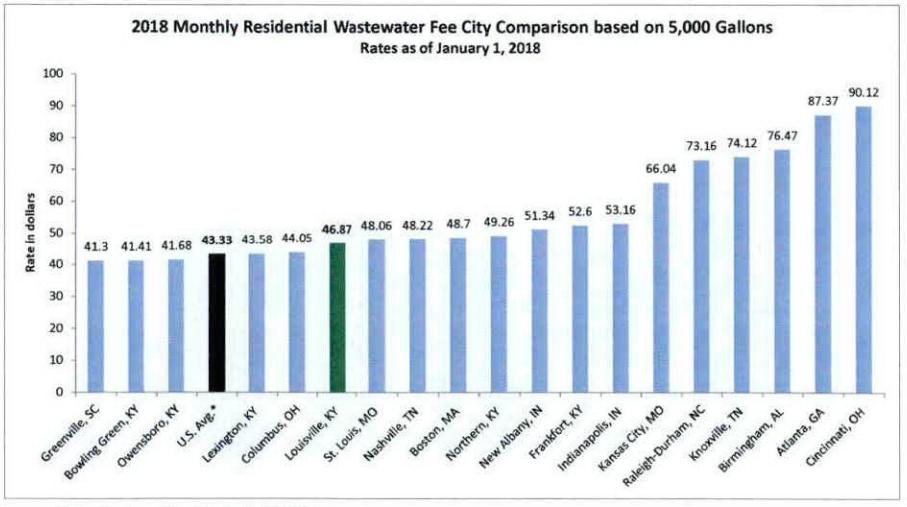
How Does Louisville Compare?



*National Association of Clean Water Agencies (NACWA)

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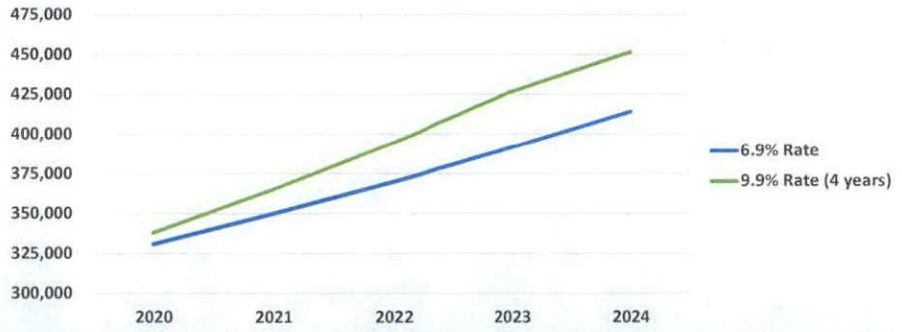
Revenue Per Rate Change



	2020	2021	2022	2023	2024	Total
6.9% Rate	330,722	349,741	369,924	391,345	414,079	1,855,811
9.9% Rate (4 years)	337,818	364,982	394,477	426,710	451,626	1,975,613

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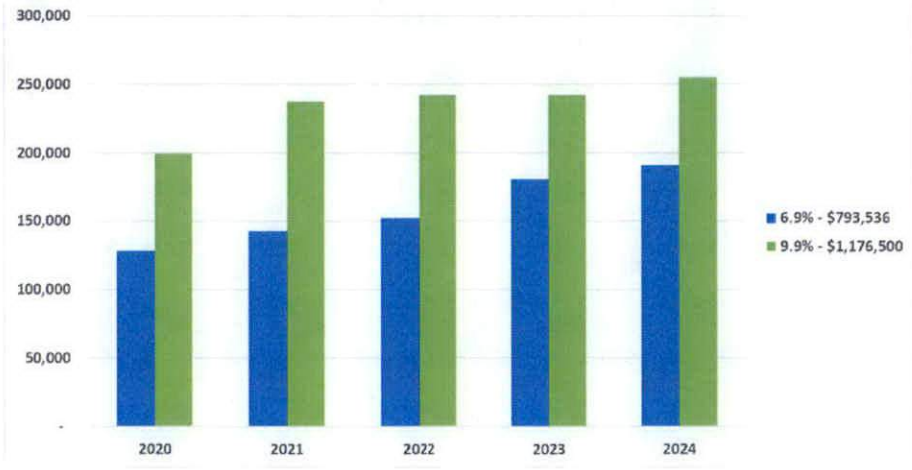
Capital Spend Per Rate Change



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(WRAP)
Wastewater Rate Assistance Program

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WRAP Discount

MSD would introduce a new discount program if given the authority to raise rates by 9.9% from 2020 – 2024. This program would provide relief for households at 130% of the poverty level and phase out the current Senior Citizen discount.

Year	Rate	Amount
2020	8%	$ 638
2021	16%	1,384
2022	24%	2,250
2023	30%	3,050
2024	30%	3,229
Total		$ 10,551

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Federal Affordability Bill

- The newly-introduced legislation led by Sens. Cardin and Wicker is the first bipartisan effort, an important development for likelihood of success of any program over the long-term. In drafting the legislation, Congressional staff took significant efforts to seek input and buy-in from diverse water sector, environmental NGOs, and low-income advocate communities. NACWA aided in developing broad stakeholder engagement and provided input and feedback during the drafting process over the past year.
- Under the proposal, at least 64 pilot communities would be selected for a 5-year grant which would direct federal funding to assist low-income households in paying their water and sewer bills. Priority in choosing the 64 pilots would be given to communities and utilities that have a history of significant rate increases, obligation under a federal clean water consent decree, and the ability to provide local or State matching funds.
- The legislation also would require a balance among the geographic location and size of communities selected. Small/rural communities selected for a pilot program would work with their States on grant implementation. The proposal would require a report to Congress on the outcomes of the pilot grant program. It would also require EPA to conduct a needs assessment to address water and sewer rate issues across the United States.

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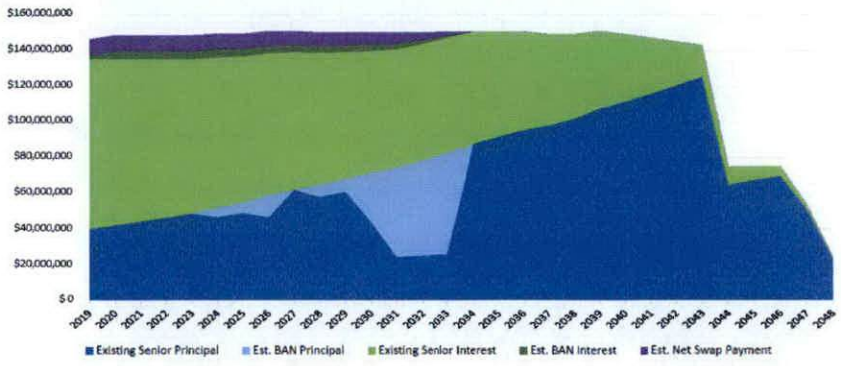
Existing Debt Service



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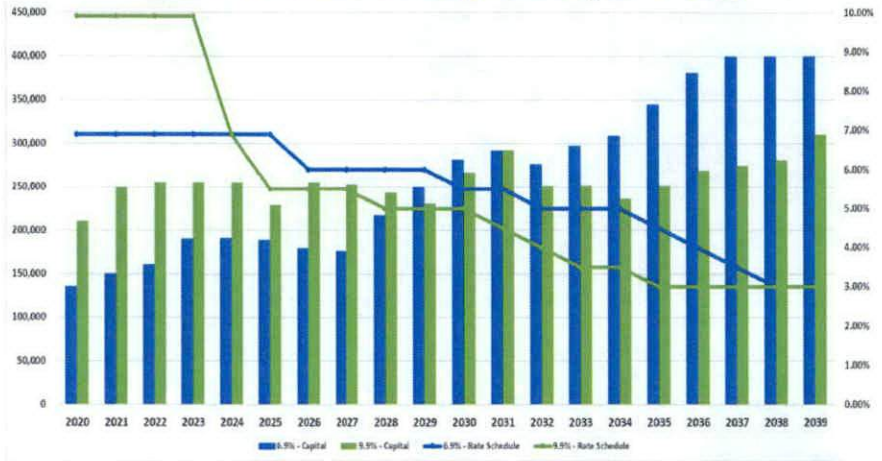
20 Year Projections
Rate Increase/Capital Spending



Benefits of a Commercial Paper Program

- Eliminates Cost of Carry from 1st Year of a new Revenue Bond
- Provides Source of Funds for Emergency Repairs
- Eliminates "Market Access Risk" on BAN
- Improves Rating Agency Key Ratios
  - Debt Service Coverage Ratio
  - Debt to Revenue Ratio

Federal Funding Sources

Executive Director Parrott and Senator McConnell in the U.S. Capitol April, 2018

McConnell Announces Federal Funding for Louisville Flood Disaster Recovery & Prevention
July 12, 2018

WASHINGTON, D.C. – U.S. Senate Majority Leader Mitch McConnell announced today the U.S. Army Corps of Engineers (USACE) has approved $3 million in funding for the Louisville Metropolitan Sewer District (MSD). The funding, which will be used for a feasibility study to determine what repairs will need to be made to Louisville's aging flood protection system, is a result of the *Bipartisan Budget Act of 2018*, which Senator McConnell negotiated and shepherded to enactment. That legislation provided disaster recovery money to states that suffered more than one flood related disaster in the past few years – Kentucky was one of the states eligible.

"This funding is welcome news for the City of Louisville," **Senator McConnell said.** "Earlier this year, severe weather hit the city and caused flooding and extensive damage to the region. This announcement will bring much-needed resources to help improve Louisville's flood control infrastructure and to prevent future damage."

"The $3 million in funding for a study of the flood protection system in Louisville, as outlined in the USACE's recently published Long Term Disaster Recovery Investment Plan list, is the first critical step in providing an overhaul to 65 year old facilities. This system protects thousands of homes and businesses in Louisville when the Ohio River rises, but still depends on 1950's era technology," **said Tony Parrott, Executive Director of Louisville Metropolitan Sewer District.** "We are thankful for Leader McConnell's support to secure the funding to help keep the Louisville Community safe. Louisville MSD looks forward to working with the Leader's office and the Corps on this study, and implementing the projects that will provide a safe and healthy Louisville for future generations."

In April, Senator McConnell met with MSD employees, including Executive Director Tony Parrott, to discuss MSD's work on this issue regarding the severe weather.

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Benefits of a Federal Grant Program

A federal grant program in support of water utility workforce development offers a high return on investment by leveraging local funds and partnerships to maintain critical utility services and infrastructure.

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Enabling Legislation for Regionalization

- In 2016, high profile failures of "package" treatment plants led to the passage of Kentucky House Joint Resolution 56, to initiate a study of regionalization opportunities to limit the risk of future failures.
- The study that was performed in 2017, as a result of this Joint Resolution, provided an inventory of small "package" facilities and emergency risk mitigation.
- Legislative jurisdictional boundaries created a limitation on efforts to regionalize.
- For example, Louisville MSD was created by state statute to own assets in Jefferson County, KY, ONLY.

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Enabling Legislation for Regionalization

- During the 2018 Legislative Session in Kentucky, Senate Bill 151 (SB151) was filed to enable utility ownership of sewer assets outside of jurisdictional boundaries through inter-local agreements.
- House Bill 513 (HB513) was filed to require additional insurance, as well as regulatory and financial accountability for small "package" treatment facility operators/builders.
- Late in the session, these two bills were combined and passed under HB513, and signed by the Governor on April 25, 2018.

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Questions?

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Values-Based Framework For Louisville's Stormwater Program

Wet Weather Team Stakeholder Meeting

November 20, 2018

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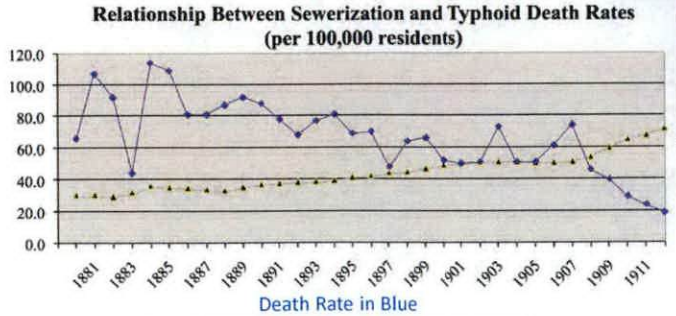
Historical Problems that Needed Solutions

- Survival – typhoid, yellow fever
- Sustainment – need for farmland
- Expansion – need for developable land



Death Rate in Blue
Sewer Miles per 100,000 Residents in Green

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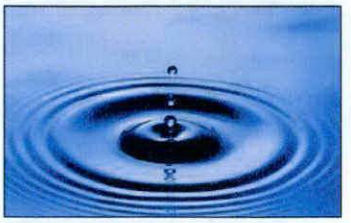
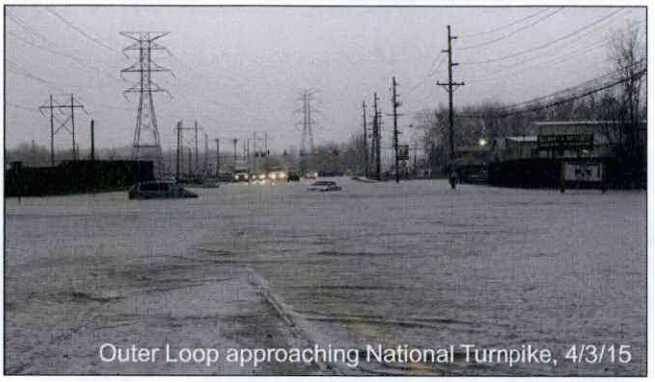
The Ripple Effect





Outer Loop approaching National Turnpike, 4/3/15

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"Blue Board" Exercise Identified Critical Drivers

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"Blue Board" Exercise Identified Community Concerns and Issues

Business Supply Chain	Emergency Services	Public Safety	Economic Development	Property Damage	Flood Insurance	Nuisance Flooding	Resident Stressors	Environment
Business Income	Emergency Vehicle Access	Increases Personal Safety Risk to Citizenry	Tourism	Infrastructure and Facilities	Customer Choice	Standing Water	ACEs (Adverse Childhood Experiences)	Rubbertown Flooding (Chemicals and Water)
Transport of Goods	Stresses of Services	Erosion	Structural Damages	Personal Property	Customer Knowledge	Positive Drainage for Yard/Driveway	Inequitable Impacts on Communities	Water Quality (chemicals, pathogens, etc.)
Work (Employee Income)	Access to Hospitals and Schools	Risk Awareness	Replacement Costs/Value	Roadways	Insurance May Not be Required	Conveyance	Losses of Employment	Worsens Damage to Needed Stream and Wetland Areas
Access to Work	Puts First Responders In Harm's Way	Human Health Threats	Reputation of City	Repetitive Loss	Increasing Costs	Daily Life Interruptions	Flooded Residences on Multiple Occasions	Impact on Environment and Community Health
Goods/Inventory Damage	Isolation of Disadvantaged Populations	Infrastructure Failure	Ability to Attract Business and Industry	Buy-Out Challenges	Insurance May Not be Required	Accessibility	Citizen Impacts	Causes Systematic Problems
		Drowning	Residential Development Trends	Property Values	Impact on Insurance	Mobility	Introduces Additional Financial Challenges to Already at Risk Citizens	
		Life Safety	Hinders Future Economic Growth	Damage to Property			Loses (Quality of Life/Property/ Economics)	
		Public Safety	Development Infrastructure	Loss of Valuable Capital				
		Health and Safety Factors		Stormwater Problems Linger Longer than the Water				
		Flooded Underpasses						
		Infrastructure Failure						
		Resident Safety						

Results of "Blue Board" Looked Familiar

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Values-Based Framework Background

2008 – Integrated Overflow Abatement Plan (IOAP)

2016 – Critical Repair and Reinvestment Plan

IOAP PROJECT-SPECIFIC VALUES
- Asset Protection
- Eco-friendly Solutions
- Environmental Enhancement
- Public Health Enhancement
- Regulatory Performance

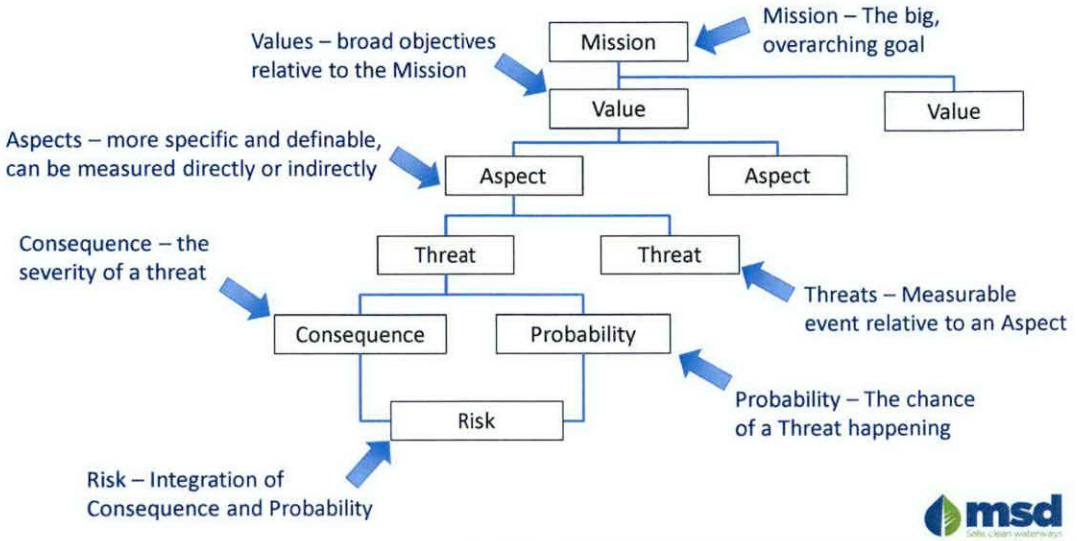
CRRP PROJECT-SPECIFIC VALUES
- Environmental Impacts
- Regulatory Compliance
- Public Health Protection
- Property Protection
- Sustainability
- Economic Vitality

The WWT also helped develop Programmatic Values

Industry-Standard Approach for Values-Based Evaluation Framework

Decision model uses community values to objectively:
- Evaluate Dissimilar Problems
- Quantify the Benefits Consistently
- Calculate Risk
- Integrate Cost

Value-Based Evaluation Framework
Importance of Consistency for Risk Terminology



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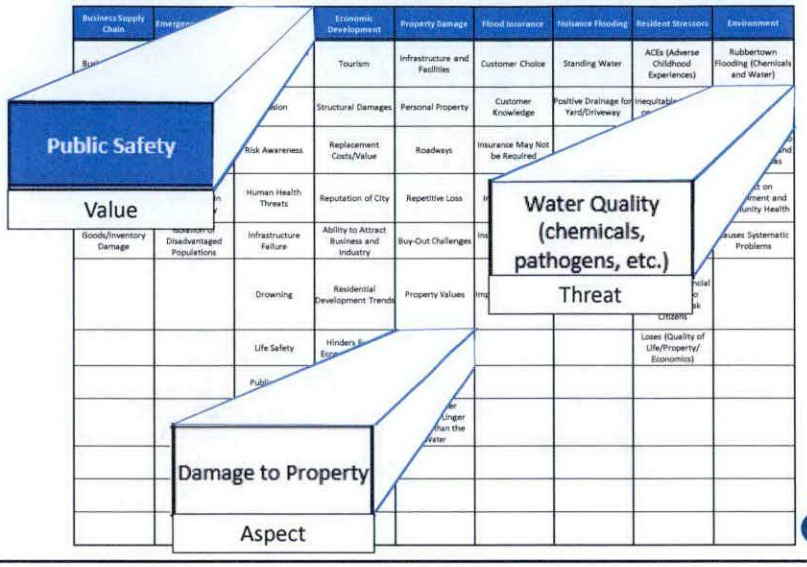
Project Evaluation Approach Built on Community Values

Value:	Environmental Impacts		Consequence Scoring				
Aspect	Rationale	Threat (Measurement Method)	-5	-2	0	2	5
Terrestrial Habitat	Projects can affect habitat positively or negatively	Acres of habitat disrupted or eliminated; enhanced or created	Substantial decrease (>5) in acreage	Slight decease in acreage	No acres of habit affected, neither positively or negatively	Slight increase in acreage created	Substantial increase (>5) in acreage created
Aquatic Habitat	Projects can affect habitat positively or negatively	Feet of stream habitat disrupted or eliminated; enhanced or created	Substantial amount of stream impacted >500LF	Minimal amount of stream impacted	No feet of stream habitat affected, neither positively or negatively	Minimal amount of stream enhanced	Substantial amount of stream enhanced >500LF
Tree Canopy	Projects can reduce or increase tree cover, temporarily or permanently	A healthy forest has approximately 90 trees per acre, measure acres cleared or net increase in number of trees	Substantial Amount (>1 acre) of Canopy Removed	Minimal amount of canopy removed	No square feet of tree canopy affected, neither positively or negatively	Minimal amount of canopy added	Substantial Amount (>50 trees) of canopy added
Visual Aesthetics	Trash and visual appearance	People affected by aesthetic impairment	Create substantial visual disturbance affecting large number of customers	Create slight visual disturbance affecting large number of customers or create substantial visual disturbance to small number of customers	No impact on visual aesthetics	Eliminate slight visual disturbance affecting large number of customers or eliminate substantial visual disturbance to small number of customers	Eliminate substantial visual disturbance affecting large number of customers
Odor Aesthetics	Odor can affect quality of life	Customers or businesses affected by odors	Create frequent annoying odor for 20 or more homes or businesses	Create frequent detectable odor or occasional identifiable odor	No impact on odors	Eliminate frequent detectable odor or occasional identifiable	Eliminate frequent annoying odor for 20 or more homes or businesses
Stream Base Flow	Changes in base flow (up or dow n) can be positive or negative	Amount of flow changed, can increase or decrease	25%+ decrease in flow during critical conditions.	Frequent decrease in flow during critical conditions	No impact on average or base stream flow	Intermittent increase in stream flow - often improves critical conditions	25%+ permanent increase in stream flow during critical conditions.
Stream Peak Flow	Changes in peak flow (up or dow n) can be positive or negative	Amount of flow changed, can increase or decrease	Substantial increase (>25%) in peak flow	Slight increase in flow s - no significant peak increases	No impacts on scouring and erosion due to peak flow events, neither positive or negative	Slight reduction in flow s - no significant peak reduction	Substantial reduction (>25%) in peak flow s
Nutrient Loadings	Even if not in permits nutrient loadings have impacts	Changes in loading of nutrients per WAT model	Substantial increase (>25%) in nutrient loadings	Slight increase in nutrient loadings	No change in nutrient loading, neither positive or negative	Slight decrease in nutrient loadings	Substantial decrease (>25%) in nutrient loadings
Impaired Use Impacts	For impaired stream segments, changes to pollutant of concern can have impacts	For impaired streams, changes in POC per WAT model	Substantial increase (>25%) in pollutants of concern	Slight increase in pollutants of concern	No ecological impacts, neither positive or negative	Slight decrease in pollutants of concern	Substantial decrease (>25%) in pollutants of concern

Opportunity to Identify "Blue Board" Exercise Feedback In terms of Values, Aspects, and Threats



Values-Based Framework Example

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Everyday We Make Decisions Intuitively Based on Our Values

Values-Based Evaluation Framework is a Structured Approach to Decision-Making

Example application:

A neighborhood experiences moderate flooding about once a year.

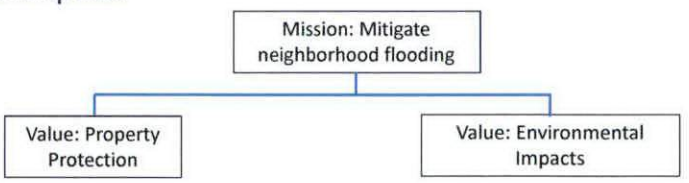
What approach provides the most overall benefit to the community for the investment?

General Stormwater Example

Stakeholders Provide Input on Values
Abstract Representations of Community's Mission

Example values that can be used to evaluate these projects:

1. Property Protection
2. Environmental Impacts

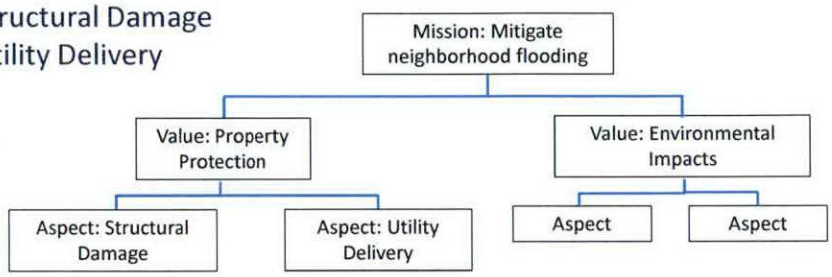


Abstract Values Can be Defined Through Aspects

Value 1 – Property Protection:

Aspects:

1. Structural Damage
2. Utility Delivery



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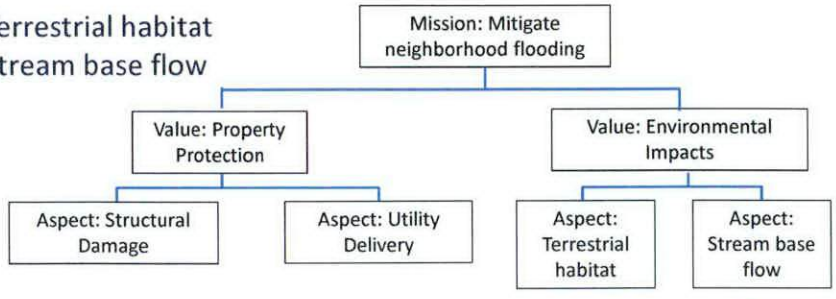
Abstract Values Can be Defined Through Aspects

Value 2 – Environmental Impacts:

Aspects:

1. Terrestrial habitat
2. Stream base flow



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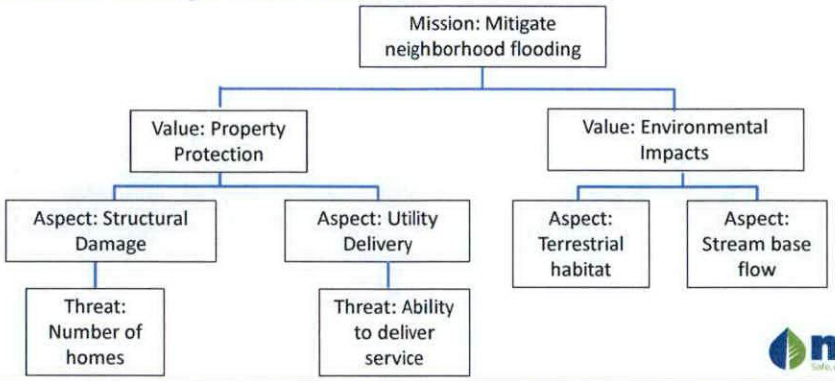
Measurable Items (Threats) are Developed for Each Aspect

Property Protection

Structural Damage – Number of homes protected from flooding

Utility Delivery – Impact on ability of utilities to continue to function during a flood event



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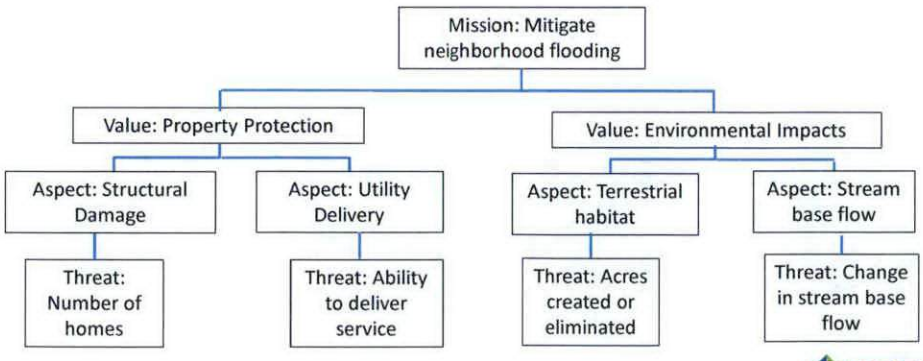
Measurable Items (Threats) are Developed for Each Aspect

Environmental Impacts

Terrestrial habitat – Acres of habitat created or eliminated

Stream base flow – Increase or decrease in stream base flow



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Scores Can be Assigned to Each Aspect to Evaluate their Positive or Negative Impact

Value

Aspects

Threats

Property Protection		-5	-2	0	2	5
Structural Damage	Number of [illegible] Protected	Increase in the structural damage to 20 or more structures	Possibility of an increase in the likelihood of structural damage	No change in likelihood of structural damage, neither positively or negatively	Possibility of an decrease in the likelihood of structural damage	Decrease in the likelihood of structural damage to 20 or more structures
Utility Delivery	Impact on Ability of Utilities to Function during a Flood	Completely prevents other agencies from delivering services	Possibly prevents other agencies from delivering services	No change in ability of other agencies to deliver services	Possibly improves other agencies in delivering services	Guaranteed to improve other agencies in delivering services
Environmental Impact		**-5**	**-2**	**0**	**2**	**5**
Terrestrial Habitat	Acres Created or Eliminated	[illegible]ial decrease (>5) in a[illegible]	Slight decease in [illegible]reage	No acres of habit affected, neither positively or negatively	Slight Increase in acreage created	Substantial Increase (>5) in acreage created
Stream Base Flow	Increase or Decrease in Stream Base Flow	25%+ decrease in flow during critical conditions.	Frequent decrease in flow during critical conditions	No impact on average or base stream flow	Intermittent increase in stream flow - often improves critical conditions	25%+ permanent increase in stream flow during critical conditions.

Scoring Each Project Determines Benefits

Floodplain buy-out: 5

Property Protection		-5	-2	0	2	5
Structural Damage	Number of Homes Protected	Increase in the structural damage to 20 or more structures	Possibility of an increase in the likelihood of structural damage	No change in likelihood of structural damage, neither positively or negatively	Possibility of an decrease in the likelihood of structural damage	Decrease in the likelihood of structural damage to 20 or more structures
Utility Delivery	Impact on Ability of Utilities to Function during a Flood	Completely prevents other agencies from delivering services	Possibly prevents other agencies from delivering services	No change in ability of other agencies to deliver services	Possibly improves other agencies in delivering services	Guaranteed to improve other agencies in delivering services
Environmental Impact		**-5**	**-2**	**0**	**2**	**5**
Terrestrial Habitat	Acres Created or Eliminated	Substantial decrease (>5) in acreage	Slight decease in acreage	No acres of habit affected, neither positively or negatively	Slight Increase in acreage created	Substantial Increase (>5) in acreage created
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Scoring Each Project Determines Benefits

Neighborhood Detention Basin: 7

Property Protection		-5	-2	0	2	5
Structural Damage	Number of Homes Protected	Increase in the structural damage to 20 or more structures	Possibility of an increase in the likelihood of structural damage	No change in likelihood of structural damage, neither positively or negatively	Possibility of an decrease in the likelihood of structural damage	Decrease in the likelihood of structural damage to 20 or more structures
Utility Delivery	Impact on Ability of Utilities to Function during a Flood	Completely prevents other agencies from delivering services	Possibly prevents other agencies from delivering services	No change in ability of other agencies to deliver services	Possibly improves other agencies in delivering services	Guaranteed to improve other agencies in delivering services
Environmental Impact		**-5**	**-2**	**0**	**2**	**5**
Terrestrial Habitat	Acres Created or Eliminated	Substantial decrease (>5) in acreage	Slight decease in acreage	No acres of habit affected, neither positively or negatively	Slight Increase in acreage created	Substantial Increase (>5) in acreage created
Stream Base Flow	Increase or Decrease in Stream Base Flow	25%+ decrease in flow during critical conditions.	Frequent decrease in flow during critical conditions	No impact on average or base stream flow	Intermittent increase in stream flow - often improves critical conditions	25%+ permanent increase in stream flow during critical conditions.

Scoring Each Project Determines Benefits

Levee: 5

Property Protection		-5	-2	0	2	5
Structural Damage	Number of Homes Protected	Increase in the structural damage to 20 or more structures	Possibility of an increase in the likelihood of structural damage	No change in likelihood of structural damage, neither positively or negatively	Possibility of an decrease in the likelihood of structural damage	Decrease in the likelihood of structural damage to 20 or more structures
Utility Delivery	Impact on Ability of Utilities to Function during a Flood	Completely prevents other agencies from delivering services	Possibly prevents other agencies from delivering services	No change in ability of other agencies to deliver services	Possibly improves other agencies in delivering services	Guaranteed to improve other agencies in delivering services
Environmental Impact		**-5**	**-2**	**0**	**2**	**5**
Terrestrial Habitat	Acres Created or Eliminated	Substantial decrease (>5) in acreage	Slight decease in acreage	No acres of habit affected, neither positively or negatively	Slight Increase in acreage created	Substantial Increase (>5) in acreage created
Stream Base Flow	Increase or Decrease in Stream Base Flow	25%+ decrease in flow during critical conditions.	Frequent decrease in flow during critical conditions	No impact on average or base stream flow	Intermittent increase in stream flow - often improves critical conditions	25%+ permanent increase in stream flow during critical conditions.

Dividing Benefits by Costs Determines the Project that Provides the Most Benefits per Dollar

Floodplain Buyouts
Benefit Score – 5
Cost – $10,000,000
Benefit/Cost Ratio – 0.5

Neighborhood Detention Basin
Benefit Score – 7
Cost – $4,000,000
Benefit/Cost Ratio – 1.75

Levee
Benefit Score – 5
Cost – $22,000,000
Benefit/Cost Ratio – 0.063

*Note that Benefit/Cost Ratio is multiplied by 1,000,000

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Moving Forward

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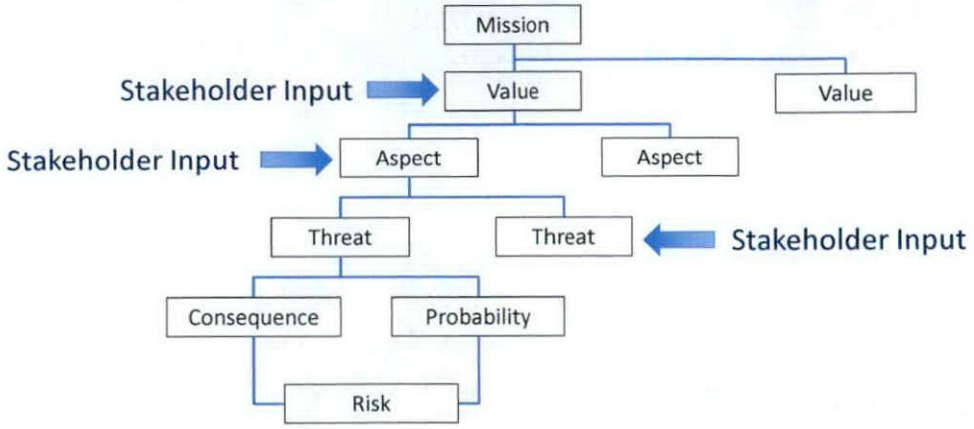
Stakeholder Input is Critical to Integrate Community Input in Project Development and Evaluation



Modification of Values to be Expected as Mission Changes

Integrated Overflow Abatement Plan → Overflow Mitigation
Critical Repair and Reinvestment Plan → Update and Integrate Planning

IOAP PROJECT-SPECIFIC VALUES
- Asset Protection
- Eco-friendly Solutions
- Environmental Enhancement
- Public Health Enhancement
- Regulatory Performance

→

CRRP PROJECT-SPECIFIC VALUES
- Environmental Impacts
- Regulatory Compliance
- Public Health Protection
- Property Protection
- Sustainability
- Economic Vitality

Community values specific to inland flooding and drainage will be needed for our Stormwater Master Planning effort

Discussion of Values, Aspects and Threats

Review the "Blue Board" input provided:

1. Identify Values, Aspects, and/or Threats on the Blue Board.
2. Is there anything missing? What would you add?
3. What are appropriate measurements?

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Thank You!

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VBEF Uses a Community's Specific Values to Evaluate and Prioritize Projects

"It's easier to do it than to explain it."

- Paul Maron (many, many times)

Programmatic Values are Used to Set Boundary Conditions

IOAP PROGRAMMATIC VALUES

- Customer Satisfaction
- Economic Vitality
- Education
- Environmental Justice and Equality
- Financial Equity
- Financial Stewardship

WATERWAY PROTECTION TUNNEL

An Innovative Alternative to Four Combined Sewer Overflow Basins

November 20, 2018

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Agenda

- Overview
- Tunnel Safety Initiatives
- Public Outreach
- Construction Progress
- Schedule & Cost
- Near Term Look-Ahead

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Overview

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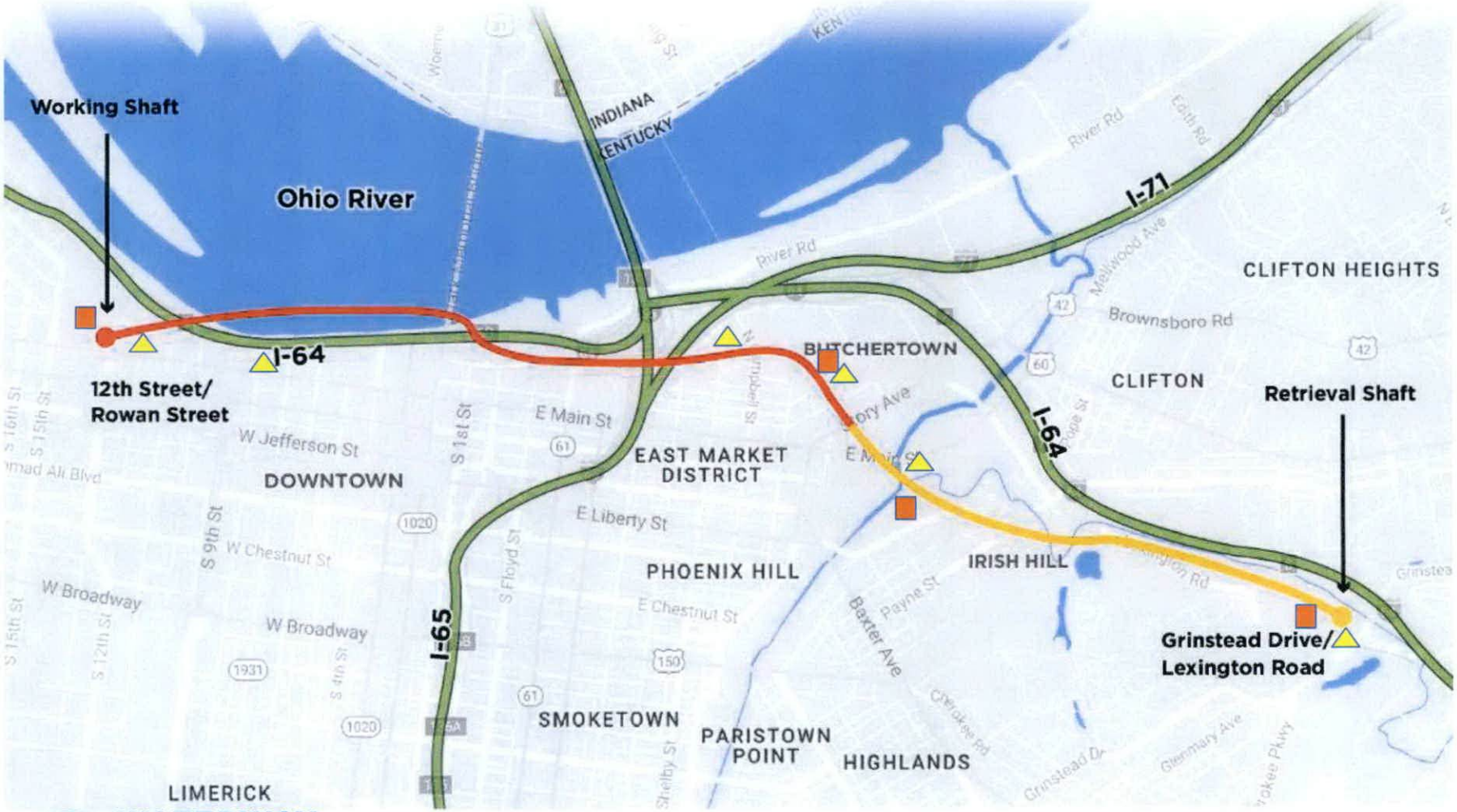
Tunnel Overview



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Tunnel Safety Initiatives

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Tunnel Safety Initiatives

- Daily Safety Moments (all three shifts)
- Sign In/Out Board
- Atmospheric Monitoring (inside tunnel)
- Ventilation System
- Rock Bolts in Tunnel Crown
- Standard Body Harness and Safety Lanyard

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Public Outreach

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Tunnel Public Outreach

- Metro Council Member Meetings
- Louisville Downtown Partnership Coordination Meetings
- Waterfront Development Corporation Coordination Meetings
- Kentucky Science Center Collaboration
- Neighborhood Meetings
- Business Meetings
- Press Releases
- Media Interviews
- Social Media

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Construction Progress

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Shaft Construction

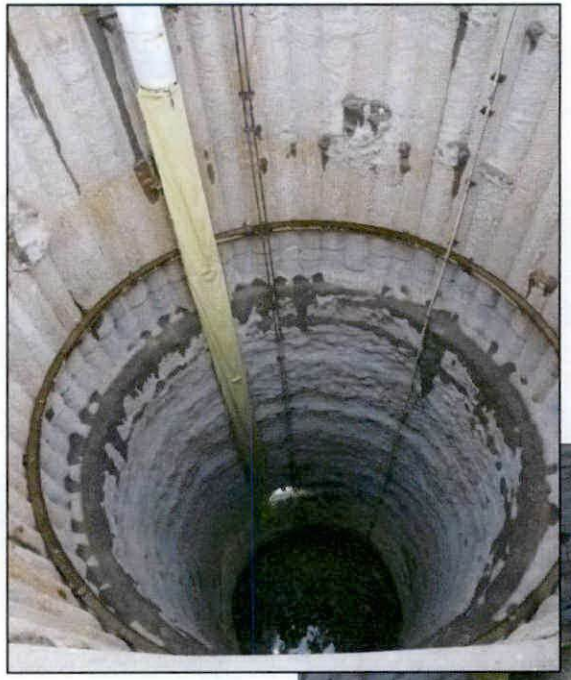
<u>Pump Station Shaft</u>
- Fully excavated
- Concrete liner being installed

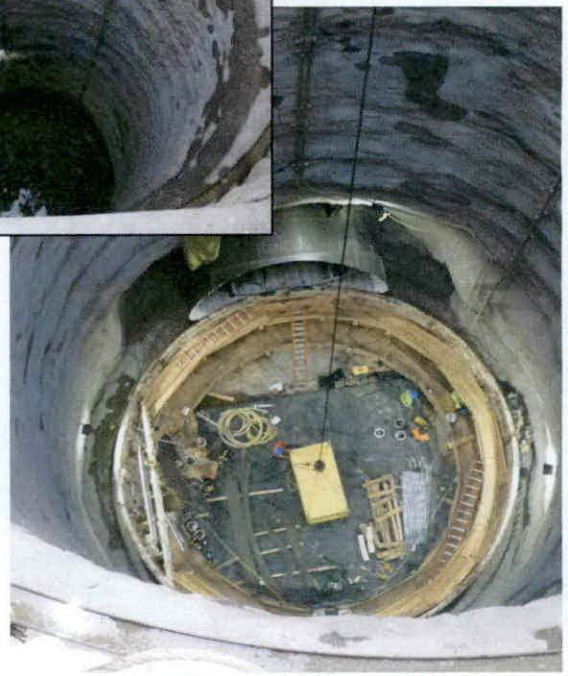
<u>Working Shaft</u>
- Fully excavated
- Will be used to insert TBM into ground

<u>Drop Shaft DS01, DS02, DS03, DS05</u>
- No work completed

<u>Drop Shaft DS04</u>
- Secant pile support of excavation complete

<u>Drop Shaft DS06</u>
- Backfilling operations underway





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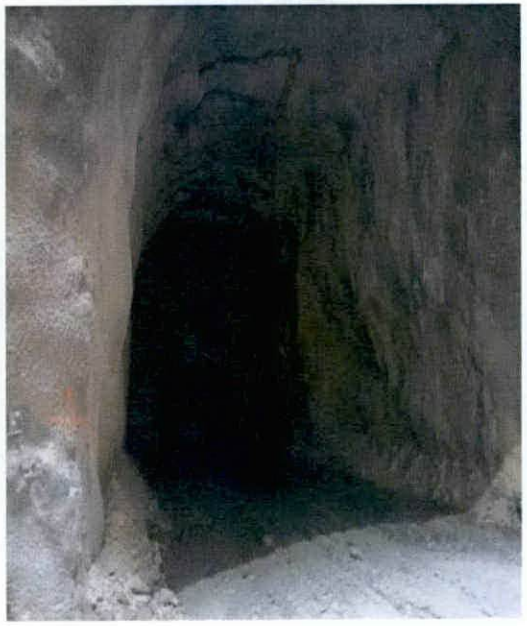
Drilling & Blasting for TBM Assembly

- Horseshoe shaped excavation
- Approximately 24-feet wide and tall
- Approximately 460-feet long



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Drilling & Blasting for TBM Assembly

Example: Indianapolis DigIndy project

- Ventilation System
- Vertical Conveyor System
- Employee Ingress/Egress
- Material Handling

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Tunnel Boring Machine – Fun Facts

Originally fabricated in 1977

415 foot length

885,000 pounds

Project History

1. British Columbia, Canada
2. Dallas, Texas
3. Chicago, Illinois
4. Milwaukee, Wisconsin
5. Louisville, Kentucky

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Tunnel Boring Machine - Cutter Head

22'– 4" diameter

38 – 19" cutters

6 – 350 HP Motors

8 rotations per minute

- Fabricated by The Robbins Company in Italy
- Shipped across Atlantic Ocean via ocean liner to Port of New York
- Shipped to Louisville via tractor trailer

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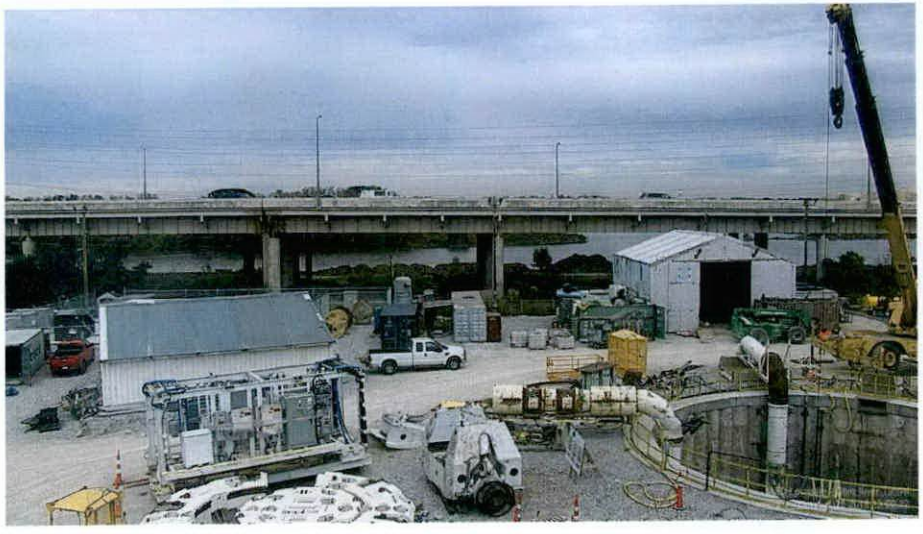
Tunnel Site Features

- Contractor Office Trailer
  - Project Manager, Project Engineer, Safety Manager, Administration
- Owner Office Trailer
  - MSD Project Manager, Construction Management Team
- Inspector Office Trailer
  - MSD Consultant Inspection



- Dry House Trailer
  - Men's & Women's Locker Room and Showers
- Maintenance Shop
  - 2 to 5 Employees
  - Perform routine maintenance and repairs to construction equipment
- Electrical Shop
  - 2 to 5 Employees
  - Perform routine maintenance and repairs to electrical equipment and gear

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Schedule & Cost

WATERWAY PROTECTION TUNNEL

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Schedule & Cost

Milestone	Waterway Protection Tunnel	Lexington & Payne CSO Interceptor	Rowan Pump Station & Downtown CSO Interceptor	I-64 & Grinstead CSO Interceptor
Notice to Proceed	Nov. 8, 2017	Nov. 27, 2017	July 9, 2018	TBD
Substantial Completion	Dec. 31, 2020	Feb. 18, 2020	Sept. 16, 2020	TBD
Consent Decree Deadline	Dec. 31, 2020	Dec. 31, 2020	Dec. 31, 2020	Dec. 31, 2020
Contract Cost (* Estimated)	$139,733,250	$23,123,295	$25,899,973	$11,000,000*
Total Cost	$199,756,518			

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Waterway Protection Tunnel Contract

- Contractor – Shea Traylor JV
- Total Contract Amount – $139,359,150.00
- Local Labor Commitment: 50%
- The MBE/WBE Goals are 15% MBE and 6% WBE
- MBE Participation – 15.0% or $21,600,850.00
  (Platt Construction, TEM Group, Tony Levy, Ward-Edison, L. Watson, Harmon Construction, CTL Engineering, Pioneer Logistics)
- WBE Participation – 6.0% or $8,813,705.00
  (Steppo Supply & Construction)

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Lexington & Payne CSO Interceptor Contract

- Contractor – Garney Companies, Inc
- Total Contract Amount – $23,123,295.02
- Local Labor Commitment: 90%
- The MBE/WBE Goals are 15% MBE and 6% WBE
- MBE Participation – 15.2% or $3,514,740.84
  (TEM Group, American Ready Mix, Seven Seas Construction, L Watson Trucking)
- WBE Participation – 6.0% or $1,387,397.70
  (Jacobi Oil Services, Advance Ready Mix, Matthew's Clearing, Metro Fence, S&M Precast)

WATERWAY PROTECTION TUNNEL

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Rowan Pump Station & Downtown CSO Interceptor Contract

- Contractor – Pace Contracting, LLC
- Total Contract Amount – $25,899,973.00
- Local Labor Commitment: 95%
- The MBE/WBE Goals are 15% MBE and 6% WBE
- MBE Participation – 22.6% or $5,858,070.00
  (TEM Group, Cherokee Construction)
- WBE Participation – 6.8% or $1,762,565.00
  (Advance Ready Mix, McKinney Painting, S&M Precast, Earth Images, Terry Gollar, Professional Fence, Mills Supply, Engineered Solutions)

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Near Term Look-Ahead

WATERWAY PROTECTION TUNNEL

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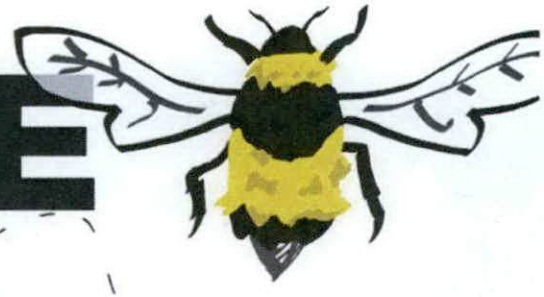
Near Term Look Ahead

- TBM Assembly
- Tunneling Commencement (December 2018)

BUMBLEBEE



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BLACK & VEATCH

J.F. SHEA Construction

TRAYLOR BROS., INC.

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