WET WEATHER STAKEHOLDER TEAM

Agenda

Wet Weather Team
Stakeholder Group Agenda
August 23, 2017
5:30 p.m. – 8:00 p.m.

5:15	Dinner served
5:30 – 5:45	Welcome & Intro *Clay Kelly, Strand Associates*
5:45 – 6:05	MSD *Tony Parrott, MSD Executive Director*
6:05 – 6:25	IOAP Update *John Loechle, MSD Engineering Director*
6:25 – 6:45	Critical Repair & Reinvestment Plan (aka Facility Plan) – Implementation Opportunities *Stephanie Laughlin, MSD Infrastructure Planning Program Manager*
6:45 – 7:10	Rate Increase Defined, Resulting MSD 5-Year Capital Improvements *Angela Akridge, MSD Chief Engineer*
7:10 – 7:30	Responding to the Path Forward - Feedback & Discussion *Clay Kelly*
7:30 – 7:40	Observer Comments, Wrap-up and Adjourn *Clay Kelly*

Meeting Summary
Wet Weather Team Stakeholder Group Meeting
August 23, 2017
MSD Main Office, Louisville

The Wet Weather Team (WWT) Stakeholders, chartered by the Louisville and Jefferson County Metropolitan Sewer District (MSD), met on August 23, 2017, at MSD's main office. The objectives of the meeting were to:

- Provide a Consent Decree Integrated Overflow Abatement Plan (IOAP) update.
- Review the Critical Repair and Reinvestment Plan (CRRP) implementation opportunities.
- Discuss the current status of the proposed rate increase and the issues that confront MSD under the existing revenue scenario.

Welcome

Clay Kelly of Strand Associates opened the meeting by welcoming the members and reviewing the meeting objectives, agenda, and basic ground rules.

Clay recognized stakeholder Allan Dittmer and thanked him for his nearly 12 years of service to the WWT. Allan will be stepping off the WWT to devote his time to other pursuits. Allan commended the leadership and professionalism of MSD, the value the WWT has brought to the community, and Clay for his stewardship of the WWT in recent years.

IOAP Update

Angela Akridge, MSD Chief Engineer, opened the presentation by explaining that in lieu of a detailed status update on each of the major projects, she would provide an overview of the program as a whole. Detailed updates for specific projects were provided in the handouts.

Angela began by reviewing the IOAP implementation schedule and discussing that it was made up of two efforts, one to address combined sewer overflows (CSOs) and one to address sanitary sewer overflows (SSOs). The implementation can be generally broken down into four phases:

1. "Big 4" plus other separate sewer system projects.
2. Treatment center elimination plus other CSO and SSO projects.
3. CSO basin projects.
4. Separate sewer system projects.

MSD is currently in the third phase, which is the largest and most expensive. Overall, the program is approximately 62 percent complete and 6 percent over the original cost opinions.

A stakeholder asked whether MSD had observed any improvements in water quality as a result of its efforts to date. Angela responded by saying that there has not been any noticeable improvements in the Ohio River, mostly due to the upstream impacts. However, the water quality in the creeks and streams within the county have improved, especially Beargrass Creek. A different stakeholder shared that he canoes on Beargrass Creek regularly and has seen a tremendous improvement in the creek since the IOAP began. He said that he has seen lots of wildlife returning and flourishing in the creek and a remarked improvement in the smell of the creek.

Angela continued with the presentation by updating the group on the status on MSD's green infrastructure. To date, MSD has invested over $32 million of the $47 million it committed to spending on green infrastructure. This figure does not include the leveraged amounts invested by private entities as a result of MSD's incentive program. It is believed that this value represents a huge investment by the community as a result of MSD's program.

MSD committed to planting 10,000 trees and so far has exceeded 8,000. Also, nearly 3,000 downspouts have been disconnected from the sewer system between MSD's green infrastructure program and other capital projects.

A stakeholder wondered what became of the acreage that was removed from contributing to the combined sewer system by disconnecting its drainage. John Loechle, MSD Engineering Director, replied that most sewer separation and downspout disconnection projects drain to grassy-areas or infiltrate into green infrastructure practices. However, most of the IOAP projects store combined sewer flows before release back into the system for treatment.

Clay reminded the WWT that they were instrumental in getting green infrastructure included as a part of the IOAP. The original plan did not include green elements but the WWT insisted and MSD worked with EPA to include green infrastructure. The program has since been a huge asset to the community.

One stakeholder inquired whether MSD's incentives program was included in capital budget. Angela answered that it was through 2020, but at a lower amount, and also said that Tony would discuss the budget situation later in the meeting. Another stakeholder asked whether MSD had projects already identified for the $15 million remaining for the Green Infrastructure Program. Angela responded that yes, the remaining budget was committed.

John then led a high-level overview of MSD's real time control (RTC) system. He explained that MSD saved more than $200 million by maximizing the use of existing assets, particularly the very large diameter sewer tunnels that were built by previous generations.

John highlighted one key component that is currently out to bid right now, the Ohio River Tunnel and its associated projects. John narrated a video animation of the layout, construction, and operation of the system and how it would help reduce overflows.

A stakeholder asked how much the tunnel costs to dig per foot and asked if it would be worth the expense to extend the tunnel further. John explained that the dynamics of tunnel construction is resulting in the tunnel having a storage volume that is already larger than what would have been stored by the CSO basins it replaces. There is also additional storage in the drop shafts that is available, but not counted in MSD's published information. Angela and John shared that there are only a handful of tunnel boring machines of this size in the world and the contractors that own them are motivated to keep them in use. So while MSD's plans call for a 20-foot-diameter tunnel, a contractor with a 24-foot-diameter machine would rather use it on MSD's project than have it sit idle. They are hopeful they will get lucky and the selected contractor will use a larger-diameter machine, which results in more storage at no additional costs. John went into further detail describing how the tunnel starts to lose cost-effectiveness at a certain length and that the current design maximizes the effective volume.

John reviewed the four components of the Ohio River Tunnel and pointed out that each element is scheduled for completion ahead of the project's Consent Decree deadline. He then showed the cost estimate for each part and explained that the $200 million value included a 10 percent contingency budget fee.

John ended the presentation by reminding the WWT that information on individual projects is included in the handouts and that he and Angela are available to answer any questions.

Critical Repair and Reinvestment Plan (CRRP) – Implementation Opportunities

Stephanie Laughlin, MSD Infrastructure Planning Program Manager, began her presentation by saying that one of the most consistent questions MSD received during the CRRP Community Conversations was about other sources of funding than rates. The public wanted to know whether MSD was looking at government grant and loan programs, private funding, and other sources. MSD does try to leverage as many funding opportunities as possible, but many of limited and/or have requirements that are not in the community's best interest. Stephanie then reviewed the following six programs that MSD is either using or has evaluated as well as the pros and cons of each:

1. The 100 Resilient Cities program.
2. United States Army Corps of Engineers flood protection funding programs.
3. Federal Emergency Management Agency flood mitigation grants.
4. Kentucky Infrastructure Authority's State Revolving Loan Fund.
5. Water Infrastructure Finance and Innovation Act (WIFIA).
6. White House infrastructure investment.

There were no questions or comments from stakeholders.

MSD Update, Rate Increase Update, and Touch Choices Ahead

Tony Parrott, MSD Executive Director, began his portion of the meeting by sharing that he serves on a committee of water business leaders and they had a conference call recently. The topic of the call was the recent flooding in New Orleans. The sobering reality is that the flooding was not caused by a hurricane, but by a combination of extreme storms and aging infrastructure–the same risks that the CRRP highlighted. A tremendous amount of rain fell on New Orleans, so much that the existing systems would have been overwhelmed regardless. However, the consequences were worsened by the fact that numerous pump stations, sewers lines, and other infrastructure were out of service for maintenance, were nonfunctioning, or had simply failed. This kind of event could happen in Louisville and the destroyed neighborhoods, political fallout, health risks, and economic losses could be devastating. New Orleans is an example of why MSD takes its mission and the findings of the CRRP so seriously.

Tony affirmed that there are risks and costs with delaying, deferring, or not fully funding the implementation of the CRRP. The public understood that and expressed its support for a rate increase through the Community Conversations. The CRRP recommended a 23 percent rate increase which MSD staff reduced to 20 percent before submitting a recommendation to the Board. MSD's Board approved the 20 percent rate increase in May 2017, and asked Metro Council for the approval MSD needed to enact the rate increase (Metro Council approval is required for any MSD rate increase above 6.9 percent). Through the Council's legislative process, an alternative scenario was put forward that would temporarily raise the MSD Board's autonomous authority to increase rates from the current 6.9 percent maximum to 9.9 percent for four years. Neither option was acted on, however, so MSD's Board was only able to implement a 6.9 percent rate increase in July.

Although neither of the Metro Council options were approved, the conversations continue with MSD, Metro Council, and the Mayor's office. In the meantime though, MSD must move forward with significantly less revenue than expected. Tony described the upcoming capital budgets as very lean as MSD pushes through the largest, most costly phase of the IOAP. The Ohio River Tunnel is the largest single project MSD has ever undertaken and if the bids opened in September are not favorable, there will be even more cuts to programs and budgets, or increased borrowing could jeopardize MSD's current AA bond rating.

To illustrate this point, Tony showed the budget that MSD's Board recommended in May for addressing stormwater issues (including Ohio River flood protection) and aging wastewater infrastructure. These areas were two of the biggest risks identified in the CRRP and (with the 20 percent rate increase) the Board approved $692 million over the next 5 years to address them. However, based on what was approved in July, there will only be $356 million budgeted. Most of the difference between the two is taken from stormwater, which was the single biggest risk in the CRRP. Essentially, most of the funding is required to address Consent Decree requirements.

Tony elaborated that there are other long-term negative consequences to reduced revenue. Currently MSD is able to borrow money at lower interest rates because of its strong bond rating. However, the two factors with the largest impact on that rating are the Debt Service Coverage Ratio (the ratio of revenues available for paying debts to the actual, required debt payments) and the Debt to Revenue ratio. Both of these are significantly impacted by reduced revenues in the face of rising costs. The result is that if MSD must borrow more money to pay for the Consent Decree projects, it may result in a downgrade in bond rating and thus be required to pay more in interest charges.

All told, the combined additional costs of implementing the CRRP using 6.9 percent annual rate increases versus four, 9.9 percent rate increases, totals $600 million.

Tony concluded the presentation by reiterating that the Consent Decree must be funded, and even doing only that may require additional borrowing, which risks downgrades in credit ratings as well as the risks associated with not implementing the CRRP.

A stakeholder asked whether the costs to reinvest in our infrastructure to prevent a disaster were less than the costs to recover from one, especially if one considered repetitive disasters. Tony responded that the cost to reduce risk and avoid a failure would be significantly less than the cost to recover from one. He elaborated by adding that there is a delay between a disaster and when recovery funding arrives and can be put to use. During that time, there are more losses and hardships. Tony said that when MSD first began the Community Conversations, they included information on averted losses and the financial losses associated with a catastrophe. MSD received feedback that they were using "scare tactics" though and were encouraged to stop framing the discussion in this way.

One stakeholder asked if there were other river cities struggling with the dilemma of aging infrastructure and a need for substantially more revenue. Tony responded that yes, almost every city is dealing with these, especially the large cities. He added that even with the proposed rate increases, MSD's rates would still be competitive with our peer cities.

Disappointment in the lack of political courage was expressed by a stakeholder. Tony responded by saying that the Community Conversations are still ongoing and will not stop. He asked the WWT to continue to support MSD as members and advocates in the community.

A stakeholder asked why everything seen in the media talked about the rate increase in terms of percentage as opposed to dollars per month, as the WWT suggested. Tony explained that all of their materials and messaging was in dollars per month but that the media did the math and published in percentages.

A stakeholder added to the previous comments by encouraging everyone to talk to their Council member directly–not to an aide or assistant–and tell them to support the rate increase. Everyone was encouraged to express to their Council member why they want them to support the increase. Members were also encouraged to contact the Mayor with a similar message.

As part of continued discussion of the previous a comments, one stakeholder stated that the Mayor chooses MSD's Board and MSD's Board is recommending a rate increase so the Mayor should show his support for his

appointees by supporting the CRRP and leading Metro Council to approve the recommended rate increase. The stakeholder noted that, politically, it will become increasing more difficult to pass a rate increase due to upcoming elections.

One stakeholder asked whether MSD knew how much of the $4.3 billion was needed for each component of the system (flood protection, drainage, and wastewater). Tony answered that MSD knew the budgets for each component and had them further broken down as well. Brian Bingham, MSD Chief of Operations, let the stakeholder know that the Community Conversation presentations had this information and were available online.

A stakeholder inquired whether Louisville was the only Kentucky community with a Consent Decree. Angela said that every community with a combined sewer system had a Consent Decree and that there were others that did not have a combined system that had them as well.

A stakeholder asked Tony what were the next steps to bring the rate increase back up with Metro government. Tony answered that there is interest in reintroducing the ordinance sooner rather than later. The feedback he was receiving was that the next best time frame was roughly between Labor Day and the end of October. If the rate increase were to pass, MSD would wait until May 2018 to begin implementing it because MSD cannot raise rates more than once in a 12-month period. Waiting until then also allows MSD to maintain its current fiscal year schedule. Another stakeholder recommended that MSD should implement the rate increase as soon as it is approved and not wait until May 2018. The reasoning being that the sooner an increase is implemented, the sooner people will become accustomed to it; waiting until May will bring the implementation closer to election season and may cause elected officials to avoid voting for it for fear of it being brought up during campaigns. Tony thanked the stakeholders and said that he was sure attorneys could craft the ordinance in such a way that it could be implemented as soon as it was approved and that MSD would make whatever adjustments were needed to schedule and fiscal cycles.

Clay asked the WWT if they were surprised by the consequences of the rate increase not passing. One stakeholder expressed that it was a lot of information to digest and suggested being more specific with what will not get done as a result of the rate increase not passing (specific projects, maintenance, and/or other activities) and continued by saying that focusing on the numbers obscures the personal impacts that are actually more forceful to the general public. Several stakeholders added that they felt the same way. Tony agreed with the comment and added that the presentations given to the public as part of the Community Conversations had focused on these things.

Observer Comments, Wrap-Up, and Adjourn

There were no comments from the observers.

Meeting Materials

- Agenda for the August 23, 2017 WWT Stakeholder Group Meeting
- Copy of the presentation slides–IOAP Update; Critical Repair and Reinvestment Plan - Implementation Opportunities; MSD Updates, Rate Increase Update, and Tough Choices Ahead

Meeting Summary
Wet Weather Team Stakeholder Group Meeting
August 23, 2017
MSD Main Office, Louisville

Meeting Participants

Wet Weather Team Stakeholders (Present)

Stuart Benson, Louisville Metro Council, District 20
Deborah Bilitski, Louisville Metro Government, Direct of Develop Louisville
Allan Dittmer, University of Louisville Provost Office
Billy Doelker, Key Homes
Mark French, University of Louisville Speed School of Engineering
Arnita Gadson, West Jefferson County community Task Force
Tom Herman, retired from Zeon Chemicals
David James, Louisville Metro Council, District 6
Maria Koetter, Louisville Metro Government, Director of Sustainability
Kurt Mason, USDA Natural Resources Conservation Service
Rocky Pusateri, Elite Built Homes
Lisa Santos, Irish Hill Neighborhood Association
David Wicks, Get Outdoors KY; Jefferson County Public Schools (retired)

Wet Weather Team Stakeholders (Not Present)

Steve Barger, Labor (retired)
Susan Barto, Mayor of Lyndon
Rick Johnstone, Deputy Mayor, Louisville Metro Mayor's Office (retired)
Gina O'Brien, Brightside Executive Director
Bruce Scott, Kentucky Waterways Alliance (retired)
Marty Storch, Louisville Metro Parks
David Tollerud, University of Louisville, School of Public Health and Information Sciences (retired)
Tina Ward-Pugh, citizen representative, former Metro Council member

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 Director

Technical Support

Gary Swanson, CH2M-Hill
Clay Kelly, Strand Associates
Paul Maron, Strand Associates

Meeting Observers

Chuck Anderson, Strand Associates
Mike Harris, JTL
Stephanie Laughlin, MSD

Handouts

No Meeting Handouts

Presentations

Wet Weather Team Meeting
IOAP Update

August 23, 2017

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Agenda

- IOAP Progress Overview
- Green Infrastructure
- Projects in Design
  - Ohio River Tunnel
- Construction Projects (Handout only)
  - Logan CSO Basin
  - Portland CSO Basin
  - Southwestern Parkway CSO Basin
  - Clifton Heights CSO Basin
  - I-64 & Grinstead CSO Basin

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IOAP System Status Overview

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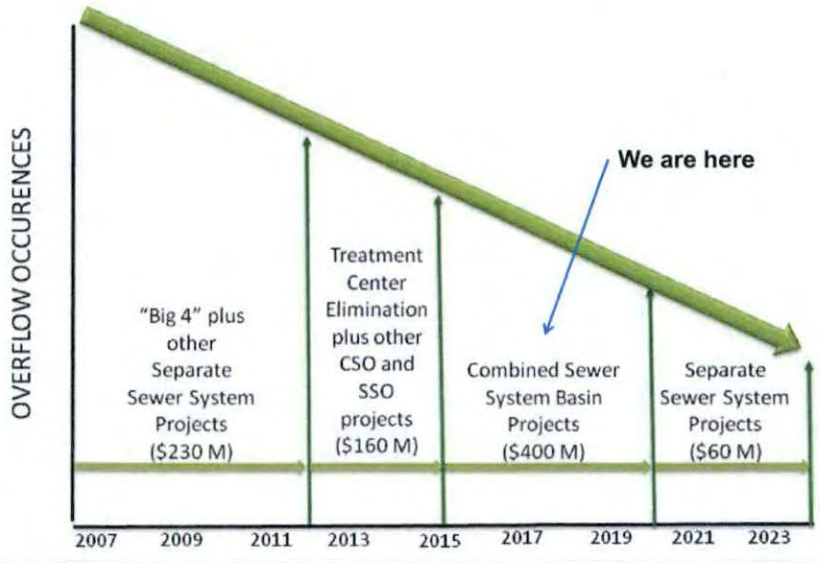
IOAP Implementation Schedule



Implementation Progress
2007 thru July 2017

LTCP Projects (28)

- 14 completed
- 14 in design/construction

SSDP Projects (78)

- 59 projects completed
- 2 projects construction
- 17 projects in planning

Overall Program Completion

- 62% complete
- 6% over estimate, compared to original estimates

CSO Reduction Schedule

SSO Reduction Schedule

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Innovative Stormwater Management – Green Infrastructure

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MSD's Investment in Green Infrastructure

- MSD has spent over $32 Million in green infrastructure, to date
- Since 2009 more than 11,200,000 square feet of impervious surface has been removed from the combined sewer system
- 8000 trees planted
- 1500 downspouts removed

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Green Infrastructure Benefits

- 275,000,000 gallons of stormwater removed from the combined sewer system annually.
- Outside of the CSS, the MS4 permit requires capture and treatment of stormwater on projects that disturb more than 1 acre.
- More than 150 additional green/water quality projects have been built in the MS4 area.

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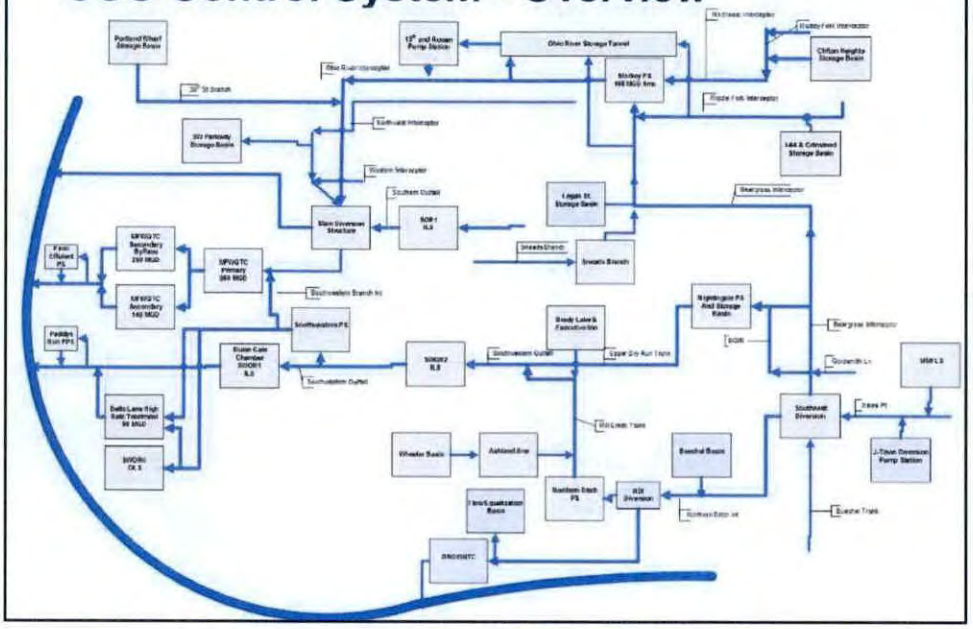
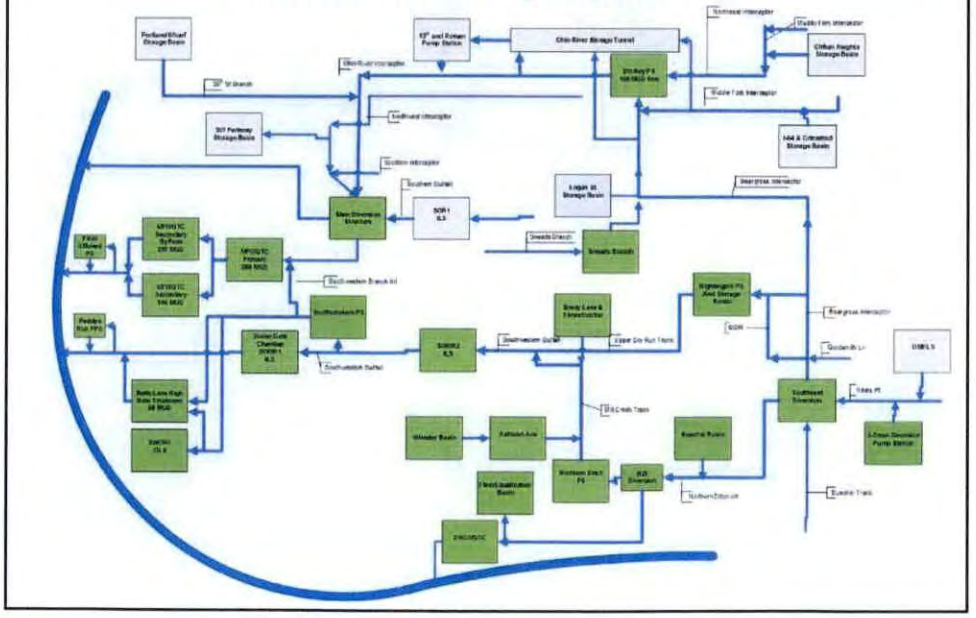
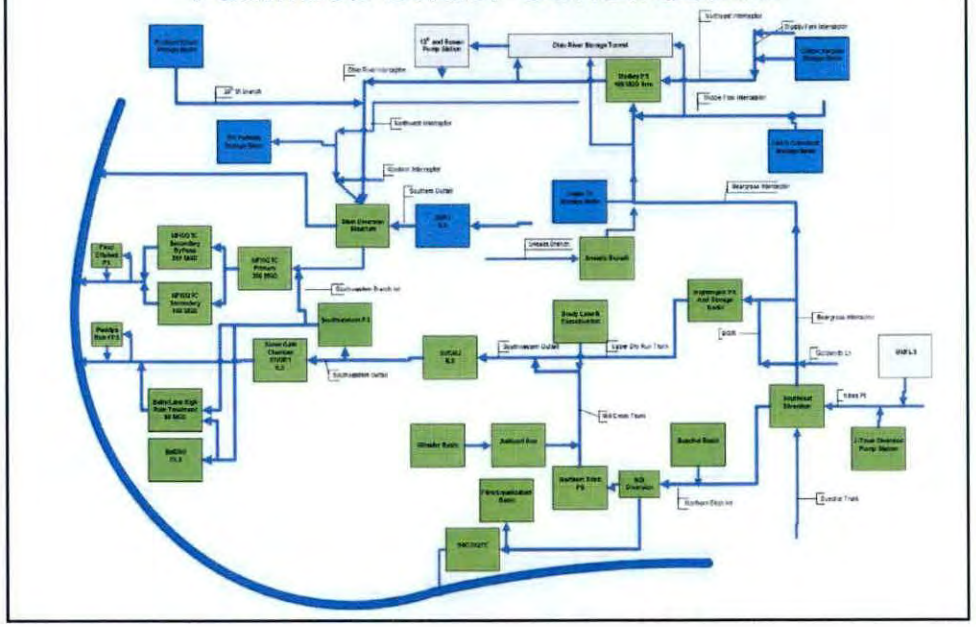
CSO Control System - Overview



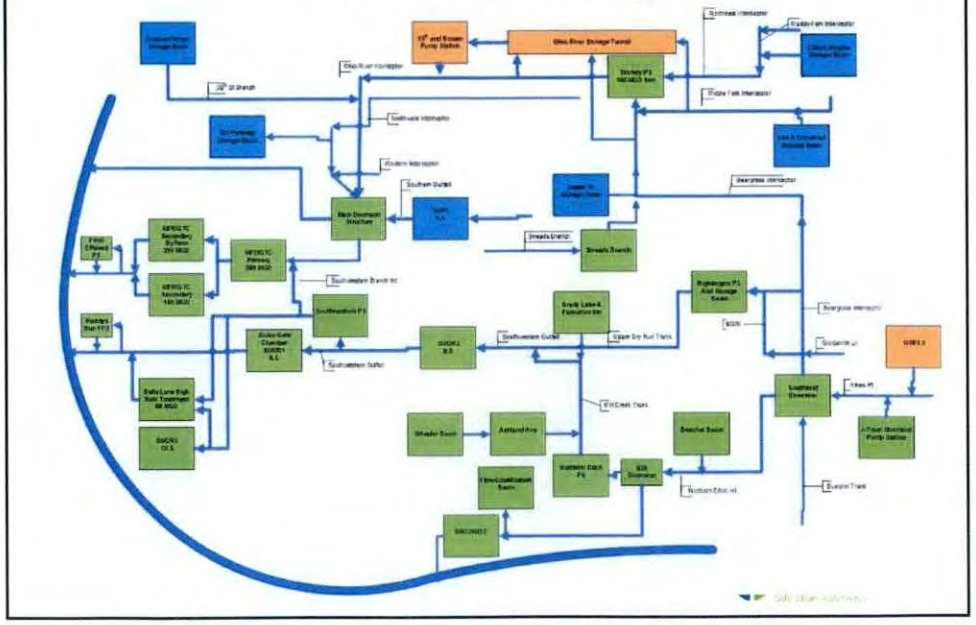
Facilities In Operation



Facilities Under Construction



Facilities In Design



Ohio River Tunnel System

The Last Big CSO Control Project

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- video

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Project Schedule

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Ohio River Tunnel – Schedule

Milestone	Ohio River Tunnel	Lexington & Payne CSO Interceptor	Downtown CSO Interceptor	Rowan Pump Station
Final Design	May 2017	Feb. 2017	Sept. 2017	Nov. 2017
Advertisement	July 11, 2017	July 24, 2017	Sept. 2017	Dec. 2017
Bid Opening	Sept. 14, 2017	Sept. 5, 2017	Nov. 2017	Jan. 2018
MSD Board	Sept. 25, 2017	Sept. 25, 2017	Nov. 27, 2017	Jan. 22, 2018
Construction Start	Oct. 2017	Oct. 2017	Dec. 2017	Feb. 2018
Substantial Completion	June 2020	June 2019	Oct. 2019	Aug. 2020
Consent Decree Deadline	Dec. 31, 2020	Dec. 31, 2020	Dec. 31, 2020	Dec. 31, 2020

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Cost Estimate

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Ohio River Tunnel – Construction Costs

Project	Construction Cost Estimate
Ohio River Tunnel	$ 135,000,000
Lexington & Payne CSO Interceptor	$ 25,000,000
Downtown CSO Interceptor	$ 15,000,000
Rowan Pump Station	$ 25,000,000
Total	$ 200,000,000

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Questions?

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Additional Information (handouts)

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Ohio River Tunnel Overview

A project to combine the volume of 3 individual Combined Sewer Overflow (CSO) basins into a single deep rock tunnel

September 30, 2016 approval by MSD's Board to move forward with design

Three basins will be eliminated by the consolidated tunnel solution

Meetings to Date: Community

Project Phase	Butchertown	Irish Hills
Orientation	June 16, 2015	January 19, 2016
Conceptual Design	February 10, 2016	April 26, 2016
Update	October 11, 2016	October 18, 2016
Update	July 11, 2017	

Meetings to Date: Stakeholder

Location	Date
Lou. Downtown Partnership	February 10, 2017
Lou. Downtown Partnership	February 24, 2017
Lou. Downtown Partnership	March 1, 2017
KY. Science Center & Ali Center	April 26, 2017
MSD Main Office	July 19, 2017

Project Background

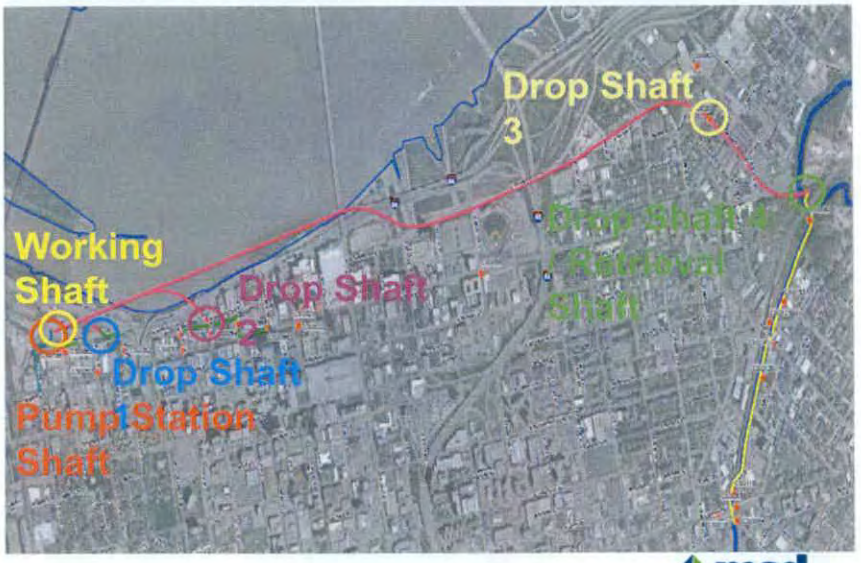
- Divided into four (4) separate projects
  - Ohio River Tunnel
  - Rowan Pump Station
  - Lexington & Payne CSO Interceptor
  - Downtown CSO Interceptor
- Consent Decree Deadline of December 31, 2020

Ohio River Tunnel – Project Alignment

Ohio River Tunnel – Project Facts

- Parameters
  - 13,400 linear feet in length (main tunnel)
  - 1,200 linear feet in length (bifurcation)
  - 200 feet below ground to invert
  - 20 feet minimum internal diameter
- Volume
  - Required - 33.7 million gallons
  - Provided - 37.0 million gallons
  - Rock Removal – 300,000 CY or 30,000 trucks

Ohio River Tunnel – Shaft Locations



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Rowan Pump Station

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Rowan Pump Station – Project Alignment

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Rowan Pump Station – Project Alignment

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Rowan Pump Station – Project Facts

- Pump Station Building
  - 120 foot x 72 foot
  - Pump Station Shaft
  - Loading/Maintenance Area
  - Elevated Electrical/Control Room
- Wet Well
  - 10 submersible pumps (3,500 gpm each)
  - 2 grit pumps (1,000 gpm each)
  - 60 inch gravity sewer to Ohio River Interceptor (ORI)

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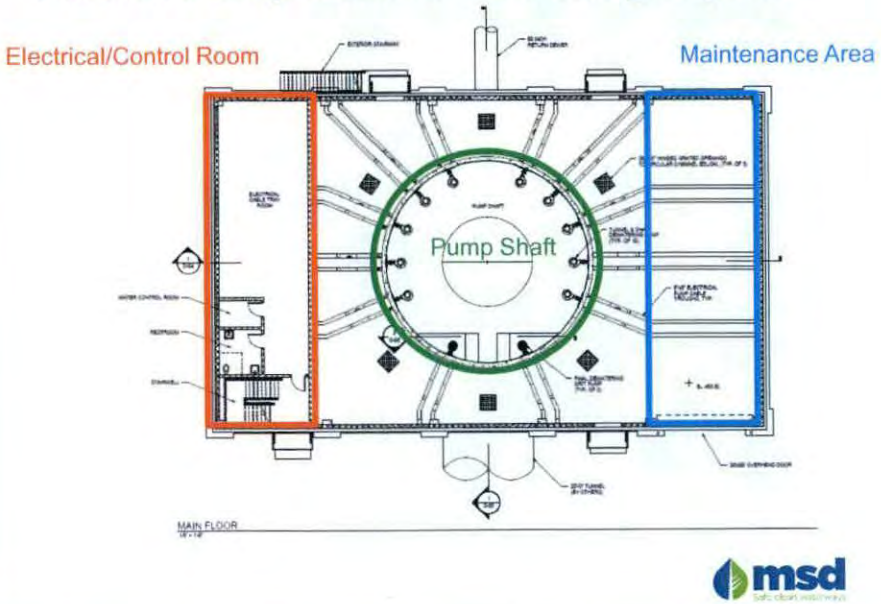
Rowan Pump Station – Building Layout



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Rowan Pump Station – Draft Rendering

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Rowan Pump Station – Draft Rendering

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Lexington & Payne CSO Interceptor

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Lexington and Payne CSO Interceptor – Project Alignment

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Lexington and Payne CSO Interceptor – Project Alignment

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Lexington and Payne CSO Interceptor - Project Facts

- Sewer line to capture overflows from nine (9) existing CSOs and convey that flow to the tunnel
- Interceptor will be below the concrete channel of South Fork Beargrass Creek
- Approximately 5,000 linear feet in length
  - From E Broadway to E Main Street
  - Pipe size ranging from 36-inch to 102-inch diameter

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Downtown CSO Interceptor

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Downtown CSO Interceptor – Project Alignment

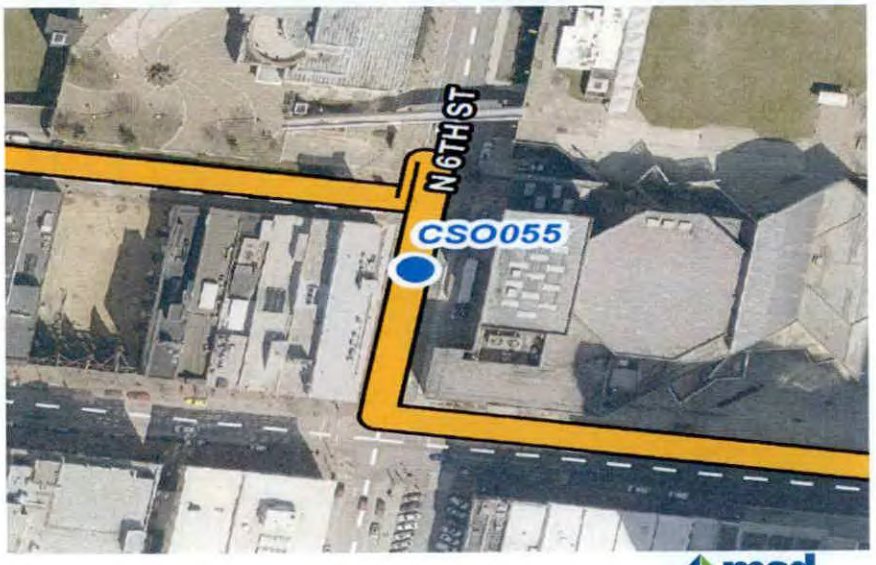
Downtown CSO Interceptor - Project Facts

- Sewer lines to capture overflows from twelve (12) existing CSOs and convey that flow to the tunnel
- Approximately 2,000 linear feet total in multiple segments
- 12-inch to 60-inch diameters
- Street Impacts
  - Rowan Street between 10th & 13th Streets
  - Washington Street between 6th & 8th Streets
  - 6th Street between Main & Washington Streets
  - Main Street between 5th & 6th Streets

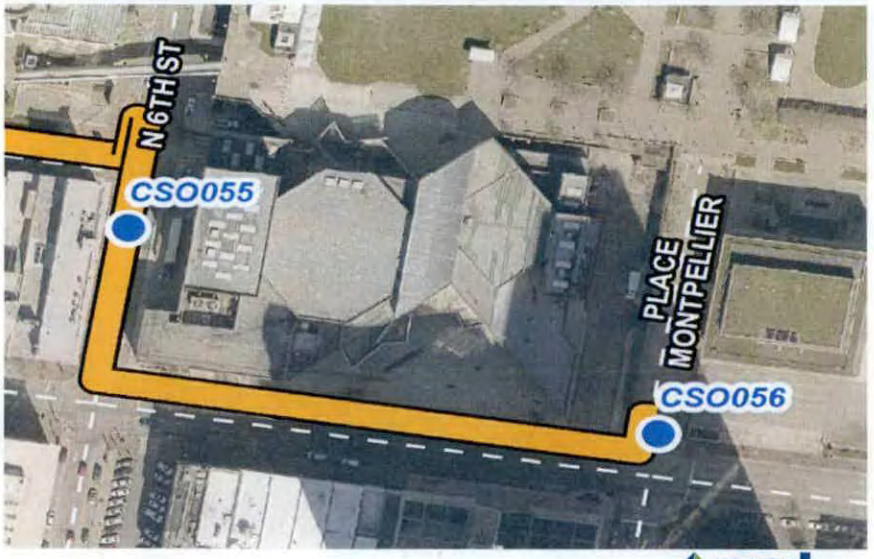
Downtown CSO Interceptor – Rowan Street

Downtown CSO Interceptor – Washington St

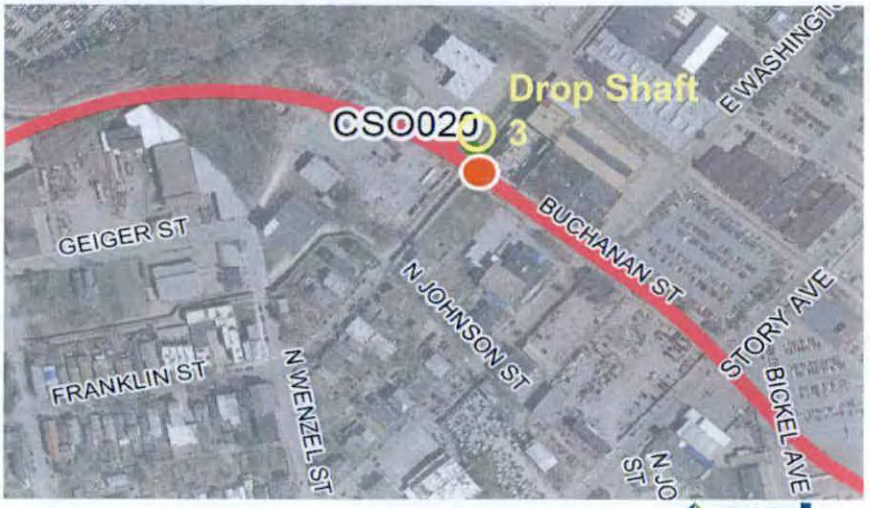
Downtown CSO Interceptor – 6th Street



Downtown CSO Interceptor – Main Street



Story and Main Connector – Project Alignment



Story and Main Connector - Project Facts

- Sewer line to capture overflows from two (2) existing CSOs and convey that flow to the tunnel
- Approximately 200 linear feet in length
  - Near the intersection of Franklin Street and Buchanan Street
  - Pipe size: 48-inch diameter

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Specific Project Updates

Construction Projects

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Logan CSO Basin

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Logan CSO Basin - Schedule

- Contract Amount: $49,538,628.40
  - Walsh Construction
- Consent Decree Deadline: December 31, 2017
- Contract Substantial Completion: October 18, 2017
- Percent Complete (by Time): 90%
- Percent Complete (by Budget): 90%
  - Control buildings constructed
  - Electrical panels

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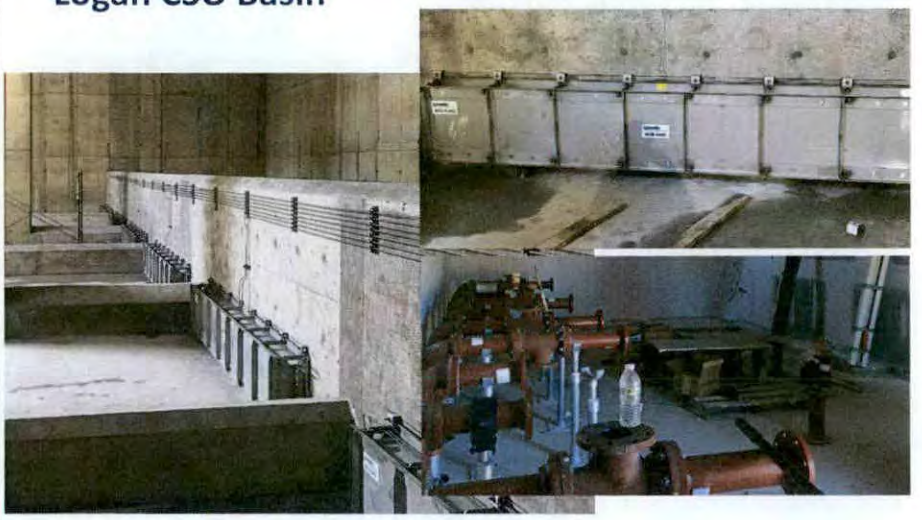
Logan CSO Basin

Logan CSO Basin

Logan CSO Basin



Logan CSO Basin

Site Design Community Engagement

- MSD will transfer the site to Louisville Metro Housing Authority (LMHA)and retain an easement for MSD facilities and access.
  - Letter of Intent between MSD and LMHA
  - Parcels purchased from CSX --- MSD is working with CSX to re-do the deed because the recorded deed does not properly specify property location
- Site improvement costs:
  - Form Liner for Flushing Gate Bldg: $ 12K
  - Contaminated soil remediation: $ 505K
  - Site Fencing and CMU Walls: $ 190K

  Total $707K

Portland CSO Basin

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Portland CSO Basin - Schedule

- Contract Amount: $28,175,316.00
  - Dugan & Meyers LLC
- Consent Decree Deadline: December 31, 2019
- Contract Substantially Operational: May 17, 2019
- Contract Substantial Completion: July 16, 2019
- Percent Complete (by Time): < 1%
- Percent Complete (by Budget): < 1%
- Construction Schedule
  - Notice to Proceed issued for June 26, 2017
  - Change Order No 1 for Value Engineering
    - Total cost is $1,108,239
    - MSD share is $664,943.40

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Portland CSO Basin

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Portland CSO Basin

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Southwestern Parkway CSO Basin

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Project Summary

- Basin storage volume is 20 Million Gallons
- Basin will be underground and covered
  - Within the Great Lawn of Shawnee Park
- Addresses three (3) CSO locations: 104, 105 and 189
- Level of Control (per Typical Year) is eight
- Consent Decree Deadline: December 31, 2018

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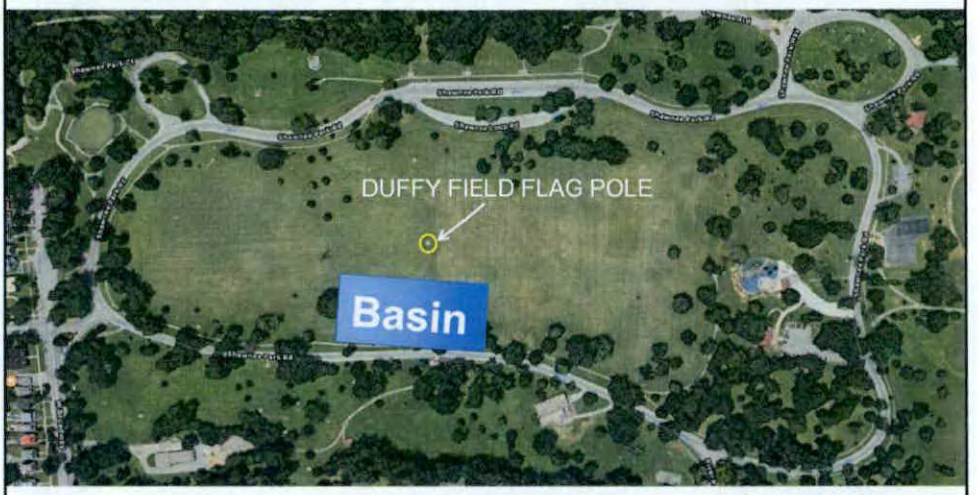
Basin Location

- 480' x 207.5'
- Average 55 ft total depth
- Average soil cover of 12 ft



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Renderings

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Renderings

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Southwestern Pkwy CSO Basin - Schedule

- Contract Amount: $73,450,738,64
  - Ulliman Schutte Construction
- Consent Decree Deadline: December 31, 2018
- Contract Substantially Operational: December 31, 2018
- Projected Substantially Operational: April 1, 2019
- Percent Complete (by Time): 16%
- Percent Complete (by Budget): 5%
- Construction Schedule
  - Sheet pile driving will be complete in mid-August
  - Next excavation phase will begin in late July to allow early start of tie back installation
  - Procurement of final bid packages to begin in coming weeks

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Southwestern Pkwy CSO Basin

Southwestern Pkwy CSO Basin

Southwestern Pkwy CSO Basin

Early Works Package

- The Early Works Package activities commenced on April 3, 2017
- The Early Works Package (Phase 1, Stage 2 Services) includes:
  - Basin Excavation
  - Support of Excavation (Sheeting/shoring)
  - Deep Foundation (Tension piles)
  - Dewatering
  - SWPPP BMPs
  - Traffic Control Measures
  - Temporary Fencing
  - Permitting
  - Design Services from 60% to 90%
- The Early Works Package GMP is $19,219,485.21.

Phase 2, Stage 2 Services

- The Phase 2, Stage 2 Services includes:
  - Design services from 90% to 100%
  - Design engineer services during construction
  - Remainder of construction work not included in the Early Works Package
- The Phase 2, Stage 2 activities are planned to commence in early Fall 2017
- The Phase 2, Stage 2 GMP is $57,654,069.92.

Project Schedule and Budget

- Stage 1 GMP = $2,955,719.58
- Phase 1, Stage 2 GMP = $19,219,485.21
- Phase 2 Stage 2 GMP = $57,654,069.92

- Project 100% Submittal May 2017

Project Website

A project website and toll free number was established for project communication throughout the life of the project

www.shawneeparkbasinproject.org

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Clifton Heights CSO Basin

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Clifton Heights CSO Basin - Schedule

- Contract Amount: $24,693,869
  - MAC Construction
- Consent Decree Deadline: December 31, 2018
- Contract Substantial Completion: June 1, 2018
- Percent Complete (by Time): 58%
- Percent Complete (by Budget): 37%
- Construction tasks
  - Basin & Wet well : mud mat complete
  - Wall anchors: complete
  - Foundation slab concrete pour: 50% complete
  - Basin wall concrete pour: 15% complete

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Clifton Heights CSO Basin - Update

MAC continued installing rebars and concrete pour on basin walls

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Clifton Heights CSO Basin - Update

MAC poured concrete wet well floor slab

Completed the second floor slab pour

Completed rebars on trough area

Clifton Heights CSO Basin - Update

MAC also worked on CSO 154

I-64 & Grinstead CSO Basin

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Project Summary

- Basin storage volume is 8.5 Million Gallons
- Basin will be underground and covered
- Addresses three (3) CSO locations: 125, 127 and 166
- Level of Control (per Typical Year) is zero
- Consent Decree Deadline: December 31, 2020

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Site Plan

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Site Plan

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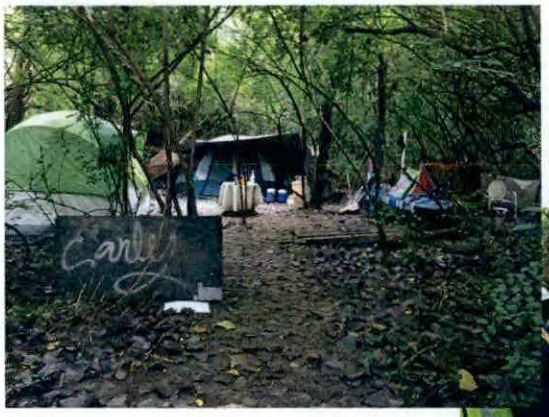
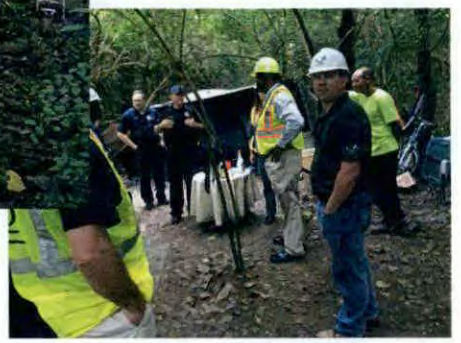
I-64 and Grinstead CSO Basin

- Contract Amount: $23,019,000
  - Thieneman Construction, Inc.
- Consent Decree Deadline: December 31, 2020
- Contract Substantial Operational: September 16, 2019
- Contract Substantial Completion: December 15, 2019
- Percent Complete (by Time): 0%
- Percent Complete (by Budget): 0%
  - Bid opening 05/16/17
  - Pre-construction Meeting 07/17/17
  - Notice to Proceed 08/07/17

I-64 and Grinstead CSO Basin

I-64 and Grinstead CSO Basin





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Critical Repair & Reinvestment Plan Implementation Opportunities

Wet Weather Team Meeting

August 23, 2017

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Potential CRRP External Funding Sources

- MSD staff is actively seeking out grant and other opportunities to assist with Critical Repair Plan implementation
  - 100 Resilient Cities
  - USACE Flood Protection
  - FEMA Flood Mitigation Grants
  - KY Infrastructure Authority (KIA) State Revolving Fund
  - Water Infrastructure Finance and Innovation Act (WIFIA)
  - White House infrastructure investment

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Managing Expectations…

- Leveraging these opportunities requires the availability of local matching funds and resources
- Grant opportunities are typically for smaller projects supporting programs smaller than MSD
- Program funding from these sources is typically less than 1%
- Many funding opportunities have up-front costs
- Federal funding comes with limiting stipulations

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100 Resilient Cities

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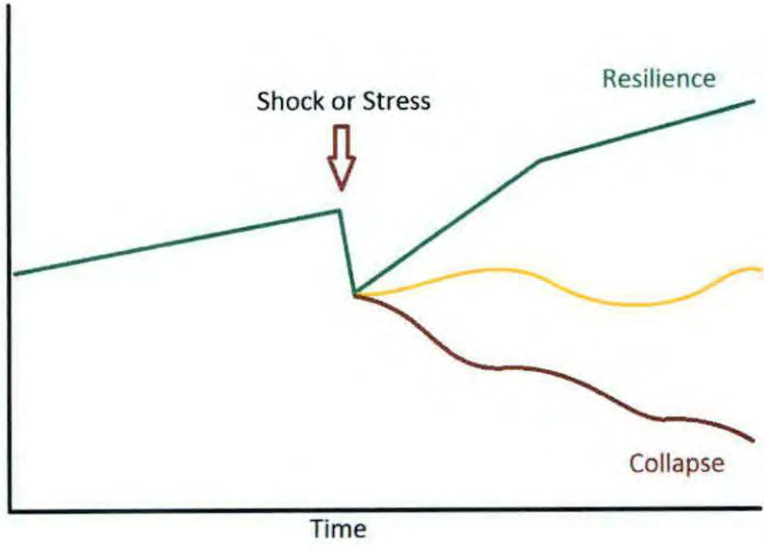
Resilient Louisville
Agenda Setting Workshop

- What does resilience mean for Louisville?



PIONEERED BY THE ROCKEFELLER FOUNDATION
100 RESILIENT CITIES

Urban resilience is the capacity of individuals, communities, institutions, businesses, and systems within a city to survive, adapt, and grow no matter what kinds of chronic stresses and acute shocks they experience.

CHRONIC STRESSES

weaken the fabric of a city on a day-to-day or cyclical basis

Examples include: high unemployment, inefficient public transportation systems, endemic violence, and chronic food and water shortages.

ACUTE SHOCKS

are sudden, sharp events that threaten a city

Examples include: earthquakes, floods, disease outbreaks, and terrorist attacks.

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Louisville is Committed to Becoming a Resilient City

metro

100 RESILIENT CITIES

Attendees for a conference on resilience mingle ahead of the start of the conference Tuesday morning

February 1, 2017, Courier-Journal article on 100Resilient Cities Workshop

CITY GETTING HELP TO FACE THREATS

Effort aims to protect Louisville from shocks, stresses

JAMES BRUGGERS
@JBRUGGERS

Louisville may be able to tap into millions of dollars of free services from some of the world's leading companies or organizations as part of its participation in a network of 100 global cities trying to become more adaptable in the face of serious threats.

But first the city will have to narrow its focus on the problems it will seek to solve.

Among the priorities that made the

Top six shocks identified by workgroups

- Economic crisis
- Severe or catastrophic weather.
- Infrastructure vulnerability or failure.
- Riot or civil unrest.
- Hazardous materials accident.
- Cyber attack.

Top seven stresses identified by workgroups

- Poverty and inequity.
- Lack of wellbeing and poor health.
- Low-performing education systems.
- Aging infrastructure.
- Racial and lack of social cohesion.
- Degradation of built and natural environment.
- Climate change.

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- Climate change.

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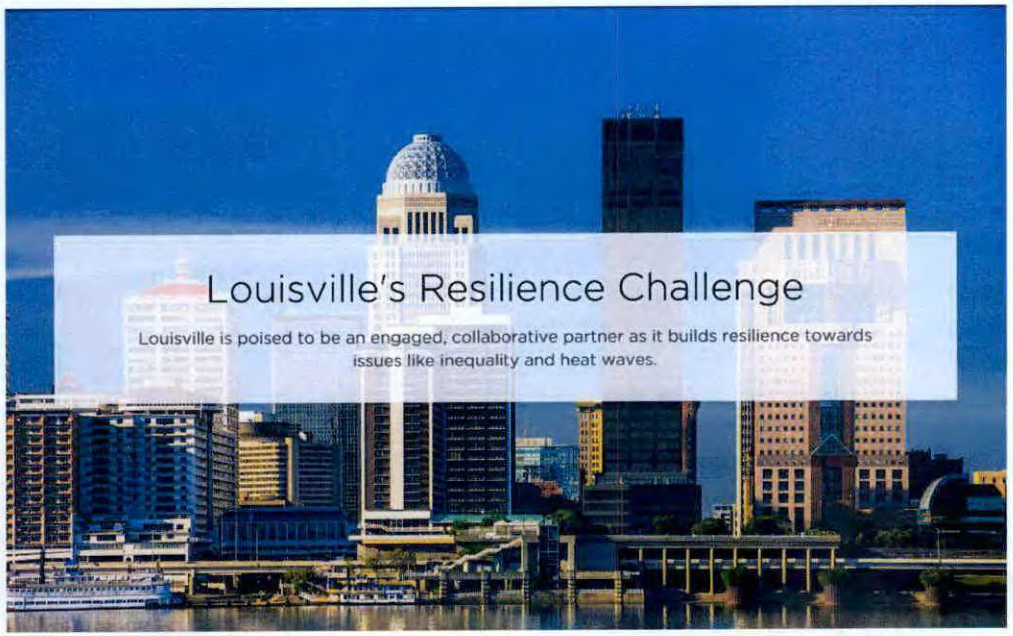
100 Resilient Cities
Coordination with Chief Resilience Officer

- Opportunities for synergies between Chief Resilience Officer and Critical Repair & Reinvestment Plan
- 100RC funds CRO position for 2 years
- Platform Partners
  - 100+ National Partners
  - Value (ROI) of partnerships to be determined



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USACE Flood Protection

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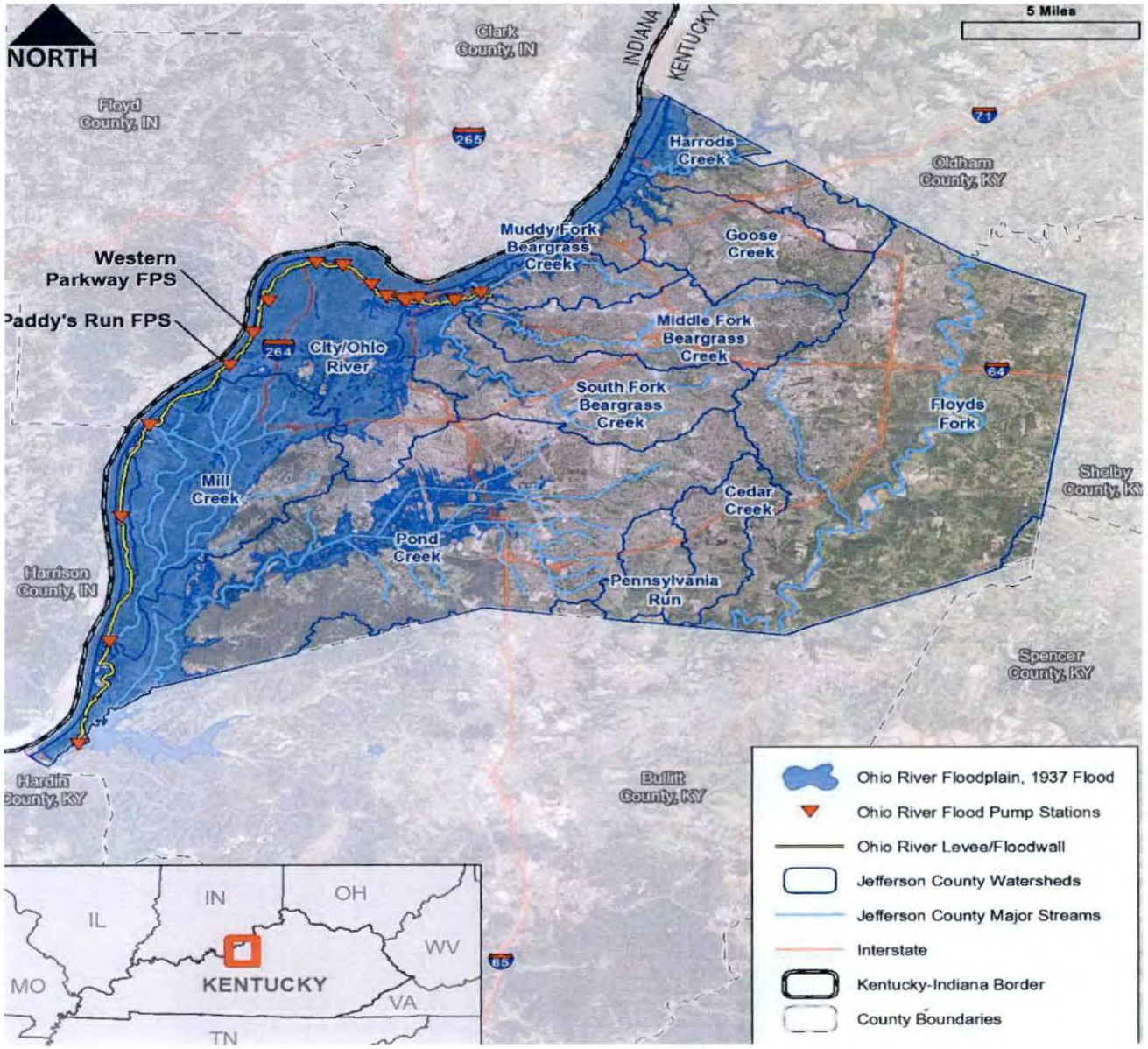
Floodplain Equivalent to 1937 Flood



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Paddy's Run FPS - Value at Risk by Storm and Operational Scenario

Scenario	2-year Storm		10-year Storm		25-year Storm		100-year Storm	
	Struct Count	$ Value	Struct Count	$ Value	Struct Count	$ Value	Struct Count	$ Value
Blocked Outlet	23	$11,030,000	286	$197,076,400	432	$278,395,000	688	$487,552,300
50% Capacity	1*	$203,900	125	$32,768,500	340	$249,205,100	401	$273,873,400
Existing Capacity	1*	$203,900	53	$20,038,900	182	$75,591,700	362	$266,200,600

* The single structure at risk here is the Paddy's Run FPS itself.

- Structures value from PVA
- Structure values, typical depreciated replacement value, and vehicle value from Corps model
- Does not include MSD facility replacement value
- Real property only - Does not include injury, loss of life, business losses, etc.

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USACE Flood Protection

- Timeframe extended by federal bureaucracy
- Selection dependent on congressional approval
- 65%/35% Federal/Local cost sharing
- Section 205 Process
  - Small projects (<$10M)
  - P3 opportunities
- Section 203 Process
  - Larger projects (flood pump stations)
  - "Accelerated" via self-performance of Feasibility Study (50%/50%)

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FEMA Flood Mitigation Grants

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FEMA Flood Mitigation Grants

- Federal requirements applicable to project in entirety, regardless of funding amount (prevailing wage, NEPA review, procurement requirements, etc.)
- Current approved grants
  - $18.5 million in active approved projects
  - MSD local share is $3.5 million
  - 190 properties in 11 council districts
- Grants under review by FEMA
  - $8.9 million total value
  - MSD local share is $1.2 million
  - 56 properties in 7 council districts

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KIA State Revolving Fund Opportunities

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KIA State Revolving Fund

- $50 million federal funding for Kentucky
- Favorable interest rates, with typical 20-year repayment term
- Current rate is 2.75%
- Federal requirements applicable to project in entirety, regardless of funding amount (prevailing wage, American iron and steel, NEPA review, procurement requirements, etc.)
- Consent Decree and environmental projects have highest priority
- Clean Water Project Profiles developed for FY19 submittal

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WIFIA

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WIFIA

- Minimum project size is $20 million with 49% maximum funding
- 35-year term
- $100,000 non-refundable application fee
- Required credit processing fees of up to $700,000
- Federal requirements applicable to project in entirety, regardless of funding amount (prevailing wage, American iron and steel, NEPA review, procurement requirements, etc.)

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White House Infrastructure Investment

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White House Infrastructure Investment

- Trillion-dollar campaign promise over 10-years
  - $200 billion federal share
  - $800 billion state and local
- FY18 budget proposal has minimal funding
- ASCE Infrastructure Report Card identifies $3 trillion in needs across the country (with $1 trillion already planned to be spent over 10 years)

Trump promises "first-class" infrastructure system for US

President Donald **Trump** promised Wednesday to create a "first-class" system of roads, bridges and waterways by using $200 billion in ...

MSN News | 1 hour ago

Trump touts 'new era' with $1 trillion infrastructure plan

Fox News | 13 hours ago

Questions?

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Tough Choices

Potential Impacts of Revenue-Related Spending Limitations

August 23, 2017

Wet Weather Team Stakeholder Group

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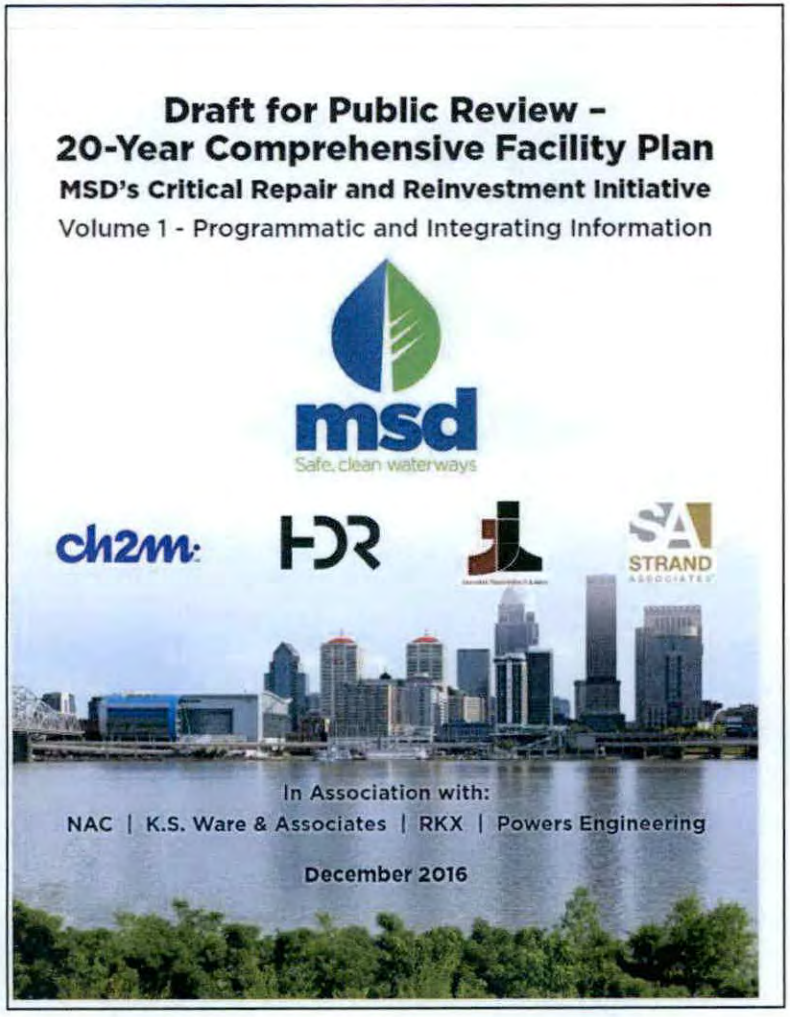
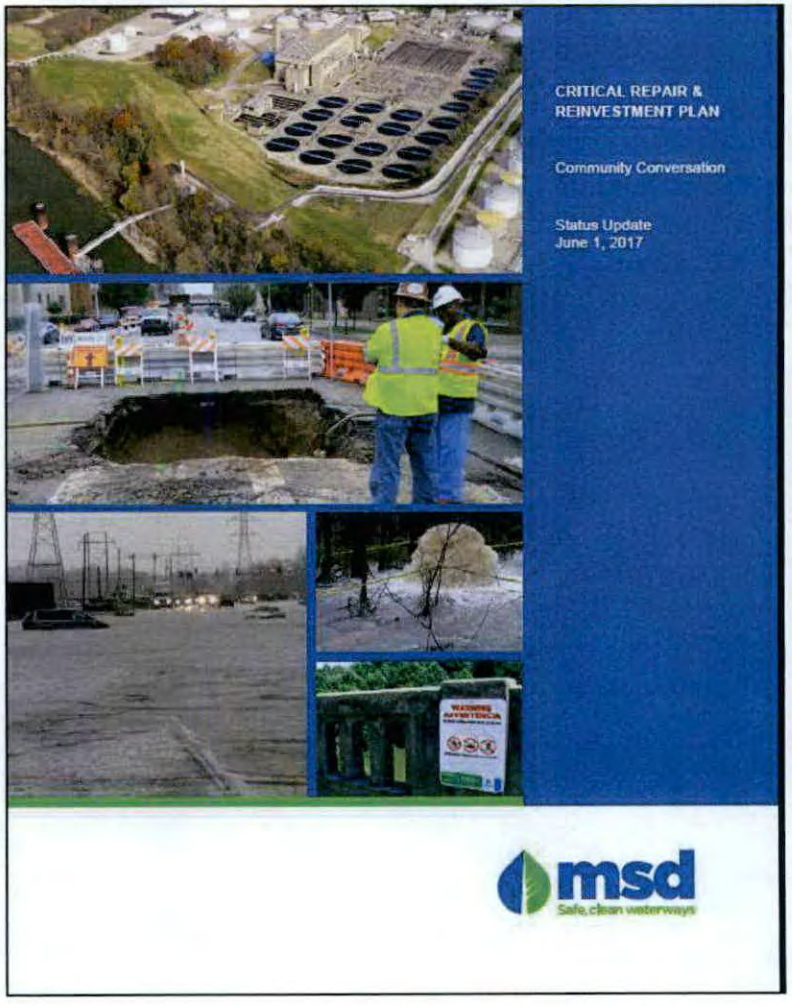
Critical Repair and Reinvestment Plan Background





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MSD's Critical Repair & Reinvestment Plan

Addresses Public Health and Safety Risks

Upgrade Ohio River Flood Protection

Reduce Neighborhood Flooding

Minimize Viaduct Flooding

Upgrade Wastewater Treatment Facilities

Prevent Collapsing Sewers

Comply with Consent Decree

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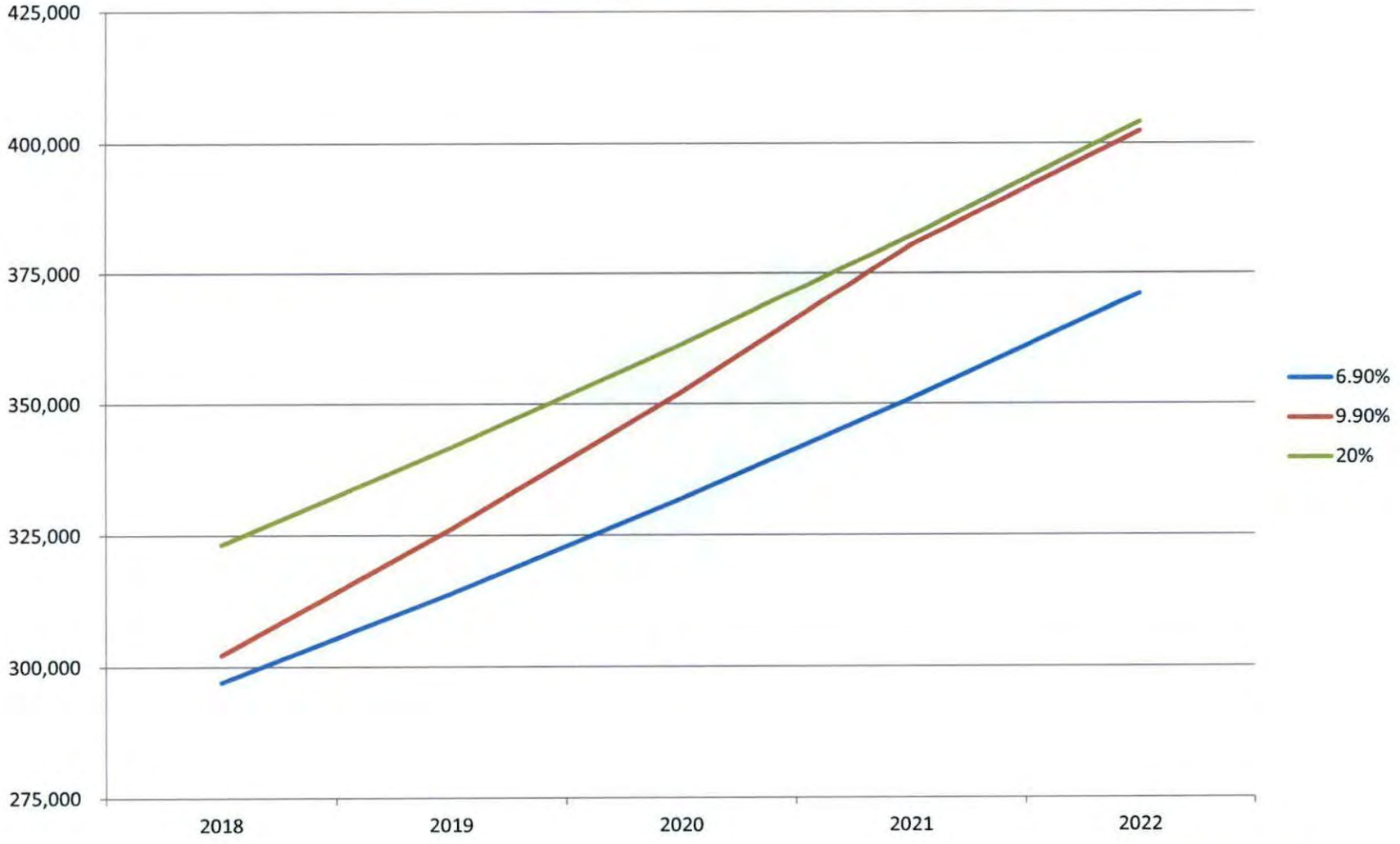
MSD infrastructure solutions

More than two years of analysis and careful planning

$4.3 billion

Revenue per Rate Change



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Why Do We Expect Tough Choices Ahead?

- Current MSD CIP based on 6.9% maximum rate increase for FY 19 – FY 36
- FY 18 – FY 20 CIP budgets very lean for anything not related to Consent Decree Compliance
- Ohio River Tunnel System will bid estimated $200 million in next 5 months
- Tunnel System bids will impact cash flow projections in FY 19 – FY 21
- If bids unfavorable, MSD must either cut CIP further or borrow more money than recommended by Financial Advisor
  - Risks bond rating downgrade
  - Associated increase in interest costs
- MSD, Metro Council, and Mayor's office continue to work on increased rate increase authority for MSD

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Engineering CIP
Initial Board Approved Plan May 2017

CMOM	$34.8-M	$47.5-M	$52.1-M	$66.4-M	$90.5-M	$291.3-M
NMC	$20.0-M	$13.9-M	$23.6-M	$21.0-M	$8.4-M	$86.9-M
Stormwater	**$15.8-M**	**$26.3-M**	**$50.1-M**	**$111.6-M**	**$109.9-M**	**$313.8-M**

$692 million investment in aging WW infrastructure and improved drainage and flood protection

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Engineering CIP
Revised Board Approved Plan July 2017

CMOM	$22.5-M	$11.8-M	$25.3-M	$78.3-M	$65.3-M	$203.3-M
NMC	$15.1-M	$5.4-M	$2.2-M	$6.3-M	$13.7-M	$42.6-M
Stormwater	**$9.7-M**	**$7.6-M**	**$8.4-M**	**$21.3-M**	**$63.3-M**	**$110.3-M**

$335 million reduction in aging WW infrastructure and drainage and flood protection

FY 18, FY 19, FY 20 very limited in additional cuts that can be made

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Engineering CIP

Aging Infrastructure and Stormwater Took Deep Cuts

Approved	Program	FY18	FY19	FY20	FY21	FY22	FY18-FY22
May 2017	CMOM	$34.8-M	$47.5-M	$52.1-M	$66.4-M	$90.5-M	**$291.3-M**
July 2017	CMOM	$22.5-M	$11.8-M	$25.3-M	$78.3-M	$65.3-M	**$203.3-M**
May 2017	NMC	$20.0-M	$13.9-M	$23.6M	$21.0-M	$8.4-M	**$86.9-M**
July 2017	NMC	$15.1-M	$5.4 -M	$2.2-M	$6.3-M	$13.7-M	**$42.6-M**
May 2017	Stormwater	$15.8-M	$26.3-M	$50.1-M	$111.6-M	$109.9-M	**$313.8-M**
July 2017	Stormwater	$9.7-M	$7.6-M	$8.4-M	21.3-M	$63.3-M	**$110.3-M**

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Engineering CIP

IOAP Basin/Tunnel Spending Dominates FY 19 & FY 20

6.9% in FY18, 6.9% in FY19-FY22 ~$4/mo in FY18	FY18	FY19	FY20	FY21	FY22	FY18-FY22
Wastewater	**$167.7-M**	**$171.8-M**	**$125.1-M**	**$118.6-M**	**$90.6-M**	**$673.9-M**
CMOM	$22.5-M	$11.8-M	$25.3-M	$78.3-M	$65.3-M	$203.3-M
Consent Decree (IOAP)	$128.9-M	$153.6-M	$96.5-M	$32.9-M	$8.0-M	$419.9-M
Development	$1.1-M	$1.1-M	$1.1-M	$1.1-M	$3.7-M	$8.1-M
NMC	$15.1-M	$5.4-M	$2.2-M	$6.3-M	$13.7-M	$42.6-M
Stormwater	**$9.7-M**	**$7.6-M**	**$8.4-M**	**$21.3-M**	**$63.3-M**	**$110.3-M**
Drainage	$2.8-M	$2.8-M	$2.8-M	$3.2-M	$20.2-M	$31.8-M
Floodplain Management	$0.4-M	$0.0-M	$0.0-M	$0.0-M	$0.0-M	$0.4-M
Ohio River Flood Protection	$4.3-M	$3.5-M	$3.8-M	$16.4-M	$40.3-M	$68.3-M
Stormwater Quality (MS4)	$2.3-M	$1.3-M	$1.8-M	$1.7-M	$2.7-M	$9.7-M
Support Systems	**$17.6-M**	**$5.6-M**	**$6.5-M**	**$10.1-M**	**$6.1-M**	**$45.8-M**
Capital Equipment	$2.3-M	$1.8-M	$2.8-M	$2.8-M	$2.8-M	$12.3-M
Facilities	$14.3-M	$3.4-M	$3.0-M	$6.9-M	$2.3-M	$29.9-M
IT	$0.7-M	$0.3-M	$0.3-M	$0.3-M	$0.6-M	$2.1-M
LOJIC	$0.4-M	$0.1-M	$0.5-M	$0.3-M	$0.4-M	$1.6-M
Grand Total	**$195.0-M**	**$185.0-M**	**$140.0-M**	**$150.0-M**	**$160.0-M**	**$830.0-M**

Ohio River Tunnel System bid will impact Consent Decree Spending FY 19 – FY 21

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CIP Spending Limits Related to Bond Rating

Moody's

Broad Scorecard Factors	Factor Weighting	Scorecard Subfactor	Subfactor Weighting
System Characteristics	30%	Asset Condition (Remaining Useful Life)	10%
		Service Area Wealth (Median Family Income)	12.5%
		System Size (O&M)	7.5%
Financial Strength	40%	Annual Debt Service Coverage	15%
		Days Cash on Hand	15%
		Debt to Operating Revenues	10%
Management	20%	Rate Management	10%
		Regulatory Compliance and Capital Planning	10%
Legal Provisions	10%	Rate Covenant	5%
		Debt Service Reserve Requirement	5%
Total	100%	Total	100%

These 2 ratios account for 25% of the Moody's rating

- **History of matching appropriate rates with amount of debt**
- **Current rates level considered average relative to peers**

Source: Hilliard Lyons LLC presentation to MSD Finance Committee, April 18, 2017

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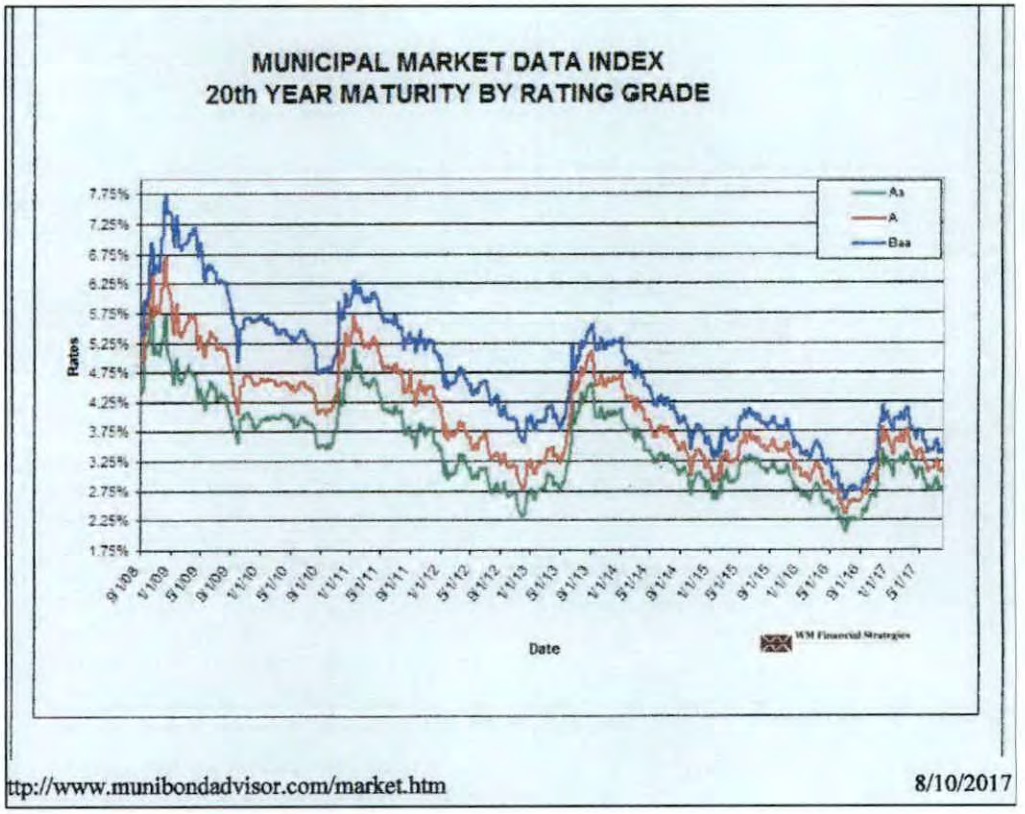
Bond Rating Affects Cost of Borrowing
MSD's Current Aa3/AA at Risk

- Per Hilliard Lyons, downgrading bond rating could result in 50 basis point increase in bond interest rates
- Total borrowing for CRRP could approach $3 billion
- 50 basis points on $3 billion result in $300 - $450 million in additional interest costs for CRRP implementation
- This is in addition to $250 million increase due to inflationary impacts on project costs



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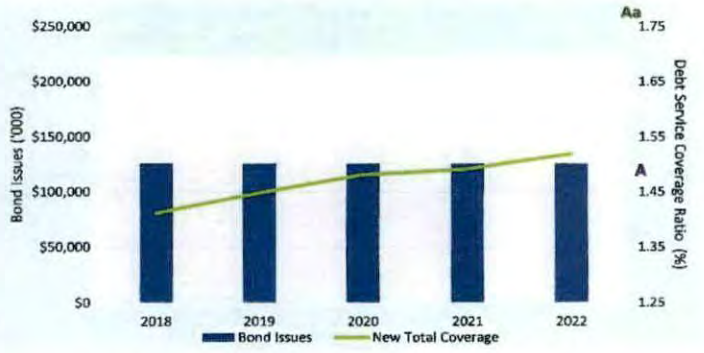
Increased Revenue Allows Increased CIP Spending w/o Negatively Affecting Scorecard

Current rate increase authority (6.9%) limits bonding capacity to $625 million if constrained to improve DSCR every year

Bond Capacity at 6.9% max annual rate increase FY 18 – FY 22

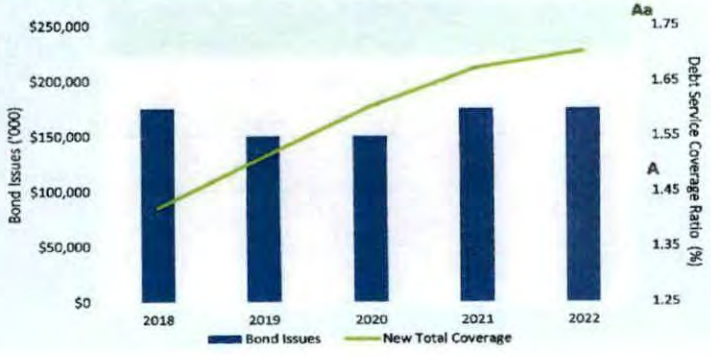
FY	Bond Issuance
2018	$125 million
2019	$125 million
2020	$125 million
2021	$125 million
2022	$125 million
Total	$625 million



Increasing rate increase authority to 9.9% increases bonding capacity to $825 million while still improving DSCR every year

Bond Capacity at 9.9% max annual rate increase FY 18 – FY 21

FY	Bond Issuance
2018	$175 million
2019	$150 million
2020	$150 million
2021	$175 million
2022	$175 million
Total	$825 million



Source: Hilliard Lyons LLC presentation to MSD Finance Committee, April 18, 2017

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Increased Revenue
Reduces Overall Cost of CRRP Implementation

Rate Increase Scenario	Total Capital Cost with Escalation	Total Bonds FY 17 - FY 36	Total Interest @ 4.5% 30-year Bond Maturity	Total Capital Cost plus Total Interest	Difference from CRRP Recommendation
CRRP Recommendation 23% in FY 18 6.9% max annual after that	$4.28 Billion	$1.9 billion	$1.65 billion	$5.93 billion	$0
Staff Recommendation 20% in FY 18 6.9% max annual after that	$4.36 billion	$2.22 billion	$1.93 billion	$6.29 billion	$0.36 billion
Compromise Proposal 9.9% FY 18 - FY 21 6.9% max annual after that	$4.42 billion	$2.63 billion	$2.28 billion	$6.70 billion	$0.77 billion
Current Authority 6.9% max annual	$4.53 bllion	$3.2 billion	$2.77 billion	$7.30 billion	$1.37 billion

Temporarily increasing MSD Board limits for rate setting could reduce 20-year CRRP cost by $600 million compared to current authority limit

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Tough Choices Ahead

If Current Rate Increase Limits Remain

- Funding CSO basins and Ohio River Tunnel System is a regulatory requirement – we must do this
- CSO Basins and Tunnel System may require borrowing to exceed recommended levels in FY 19 & FY 20
  - Accept risk of bond rating downgrade?
  - Further cuts in CIP spending?
  - Have we already cut too much?

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Questions?

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