



Minutes
October 9, 2020
Virtual

WAC Members: Mary Adelstein, Zhanna Davidovitz, Wayne Chinouard (vice chair), Martin Pillsbury, Dan Winograd, **Taber Keally, Karen Lachmayr (chair)**, Phillip Ashcroft, **Adrianna Cillo, Stephen Greene, James Guidod, Craig Allen**, George Atallah, **Kannan Vembu** (bold=present)

Staff: Andreae Downs

MWRA: Wendy Leo, Sean Navin (intergovernmental affairs), Ria Convery (communications), Carl Leone (community support), Dave Duest (Director of WWT at Deer Island), Israel Alvarez (planning, works with Carl on I/I program); Katie Ronan (environmental analyst), Steve Estes-Smargiassi (Planning and Sustainability), Leo Norton (rates & revenue manager), Brian Kubaska

Guests: Lou Taverna (Advisory Board), Joe Nerden (DEP wastewater engineer, compliance permitting and I/I), Bob Pickering (Haley & Ward, Natick I/I consultants), Kerry Malloy Snyder (NepRWA), Patrick Hogan (NepRWA), Maria Rose (Newton), Tim McGivern (Medford)

VOTE: June Minutes

REPORTS:

MWRA—Wendy Leo: Clinton has a new superintendent--Keith Perrin. Various construction projects are proceeding— Chelsea Creek headworks, DI gravity thickeners, Nut Island odor-control rebuild. Upcoming: Hayes pump station in Reading, Prison Point has a major overhaul, next year--DI big clarifier project. Lots going on with CSO assessment & working on semi-annual report—particularly locations where additional CSO reduction can be eked out, also receiving water models (WAC will have a meeting on CSO progress in December).

Advisory Board—James Guidod: Matt Romero starting soon. Rate survey out and collecting data from that. Nov. meeting will share preliminary findings. No Oct. meeting.

WAC Chair—Boston Globe showcasing COVID tracking in wastewater at MWRA.

PRESENTATIONS:

MWRA: Ria Convery--**MWRA and COVID Sewage Testing:**

Biobot was doing opiate testing in the MWRA sewers before COVID. Provided testing (initially, for free) of COVID once pandemic started as proof of concept, and now MWRA has a pilot contract with them.

Valuable tool for public health. Tracking rate of infection & using to gauge response. Lots of positive press, including in Boston Globe.

Getting positive feedback from residents, academics and scientists for providing this service.

TABER—great idea to do. Who gets the information? The Department of Public Health and the Covid command center. It is also posted on the MWRA [website](#)

Just report North & South because the system is so big. They collect and archive the samples from each headworks so that when cases start to climb, DPH has more granular geographic data if they want it.

Balance level of effort against information. To do community-level testing would need community access and buy-in. Some communities are doing themselves.

This contract ends at the end of Dec. Before that, MWRA will produce an RFP for the next contract, since people feel the testing is useful. It's up to DPH & the command center to decide what to do if Covid in the samples is creeping up. Saw spike in summer and increased sampling frequency.

MWRA job just to collect and archive the data.

Rates & Budget (Leo Norton) and how they provide incentives to communities

Rate revenue 96% of total revenue—
Water assessment is pretty straightforward.



MWRA ASSESSMENT METHODOLOGIES

WATER UTILITY ASSESSMENT

The Rate Revenue Requirement (RRR) for the MWRA Water Utility is allocated to member communities using the amount of metered water provided to each community in the most recent calendar year relative to the system as a whole.

Example:

$$\frac{\text{Community's Total Water Use}}{\text{Total Metro System-Wide Water Use}} = \text{Community's System Share}$$

$$\text{Water Utility RRR} \times \text{Community's System Share} = \text{Assessment}$$

Boston uses just over 36% of MWRA water, so they pay ~36% of the water rate revenue requirement.

It's a pretty direct incentive to plug leaks

Sewer: flow & strength of flow, total population, sewer population... about 50/50 based on flow vs population.

Rate requirement is divided between operating expenses & capital expenses of sewers

Operating—strictly based on average daily flow, but take the 3-year average to smooth the rates.

Capital- 25% is based on average maximum flow and strength. Rest based on share of the system-wide population

Steve—you need to be managing your water flow and w/w flow in proportion to your neighbors. If you are doing a better job than your neighbors, your share will decrease. And the reverse is true. Strong incentive to do at least as well as system-wide average.

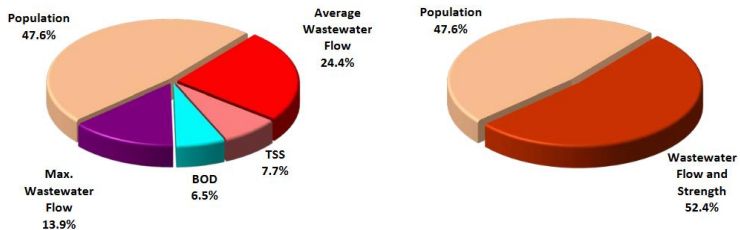
Karen: what was the rationale for basing the rates on population, why not go all based on flow?



MWRA ASSESSMENT METHODOLOGIES

SEWER UTILITY ASSESSMENT

Based on the FY2021 budget, on average 52% of the preliminary FY2021 sewer assessment is allocated based on flow and strength of flow, and 48% based on population.



Stephen: it was a compromise. Prior to this methodology, it was fully based on population. This is a transition. Positives and negatives for different communities. The reason we include sewerage & total population is--we are obligated to take all the flow from a community—if some of them move to more sewers and less septic, MWRA has to accept that flow. We need to be prepared for that, so they pay a little more than if we were only looking at total flows or current sewerage population. Capturing some of capital investment for the infrastructure sizing needed for future flows.

People are seeing a pretty strong price signal on both water & wastewater to think about water conservation and I/I reduction. To set these rates was a monumental effort, and I have heard reluctance to do it again.

When Leo sends out his monthly numbers and charts, we get calls checking the measurements, particularly if a % share has changed significantly.

Water & sewer flows are assessed separately and measured separately.

Carl Leone—Inflow/infiltration assistance

Every Sept. 1 MWRA issues an annual report to the DEP and EPA. That's where to go for more detail. Our goal is long-term reductions.

Using remote control cameras, take videos of significant flow into the sewer, both inflow and infiltration



Infiltration Groundwater via physical defects **Inflow** Stormwater via direct connections

History—see slides at

<http://www.mwra.com/monthly/wac/presentations/2020/WAC%20Meeting%20October%202020.pdf>

I/I regional flow reduction plans in 1990s

Original DI facilities plan had a projected 400-700 mgd dry level flow.

Meter data analysis to communities in 1994, I/I grants started in 1993. Flow based rates began in FY1996.

Severe storms in 1996 and 1998 -- had long duration SSOs

1990s--more emphasis on SSOs. Deer Island wasn't fully commissioned until 1999 with the cross-harbor tunnel from the south.

FY 1996 meters in and flow-based rates imposed.

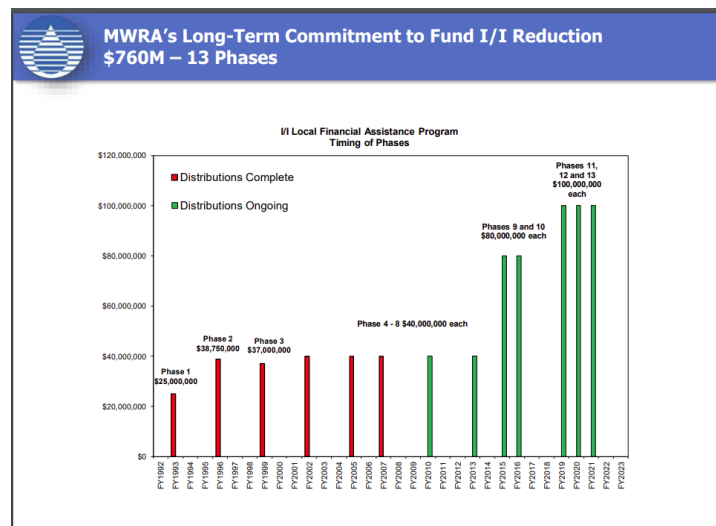
2000 dry day permitted flow (average) lower than in 1996. Elimination of excessive I/I in permit.

Reduction plan in 2002 and requirement for an annual report.

MWRA reduces own I/I and works with member communities to minimize SSOs and reduce I/I

Why financial assistance? It seems to be working for us. Offset system deterioration and provide for future economic development without increasing wastewater flows. Minimize SSOs. Foster effective O&M

Long-term funding of community assistance



All 43 communities have participated. 82 ongoing projects now. Every quarter do more funding/4 per year. 5-10 projects each quarter. Trying to close out earlier projects. 79% of \$\$ out go into construction.


\$447m distributed to date. Over the last few years significantly increased \$\$ distributed.

DEP regulations changed in 2014, and required a plan for I/I by Dec. 2017. That may have stimulated communities to take more \$\$.

The average community has taken 59% of its funding.

Sunset provision for phase 7, so Malden and Holbrook should be coming in soon for their \$\$.
Another 2 communities haven't taken all Phase 8 \$\$,

8 communities have already taken all \$\$\$. Need to start thinking about the next phase of funding.



I/I Financial Assistance - Funding Summary by Community

**MWRA III LOCAL FINANCIAL ASSISTANCE PROGRAM
FUNDING SUMMARY AS OF AUGUST 2020**

Community	Total Allocations (Phases 1 - 13)	Total Distributions (Phases 1 - 13)	Percent Distributed	Funds Remaining
Arlington	\$13,703,000	\$10,023,000	73%	\$3,680,000
Ashland	\$3,818,500	\$1,742,450	46%	\$2,076,050
Bedford	\$5,854,600	\$2,439,658	43%	\$3,214,942
Belmont	\$8,255,100	\$4,287,100	52%	\$3,968,000
Boston	\$218,001,200	\$97,064,876	45%	\$120,936,324
Braintree	\$14,419,000	\$9,928,840	69%	\$4,490,160
Brookline	\$21,355,200	\$10,666,200	50%	\$10,689,000
Burlington	\$8,432,800	\$6,212,800	74%	\$2,220,000
Cambridge	\$39,250,100	\$28,830,100	73%	\$10,420,000
Canton	\$6,635,900	\$2,675,900	40%	\$3,960,000
Chelsea	\$11,760,100	\$10,130,100	86%	\$1,630,000
Dedham	\$9,220,000	\$6,900,000	75%	\$2,320,000
Everett	\$13,381,500	\$6,650,500	50%	\$6,731,000
Frammingham	\$20,375,000	\$13,671,000	67%	\$6,704,000
Hingham	\$2,802,500	\$2,412,500	86%	\$390,000
Hollbrook	\$2,779,600	\$896,562	32%	\$1,883,038
Lexington	\$12,125,300	\$10,565,300	87%	\$1,560,000
Malden	\$20,683,900	\$5,641,900	27%	\$15,042,000
Medford	\$19,537,600	\$7,961,600	41%	\$11,576,000
Melrose	\$10,126,300	\$8,657,300	85%	\$1,469,000
Milton	\$9,014,500	\$7,864,500	87%	\$1,150,000
Natick	\$9,332,600	\$5,582,600	60%	\$3,750,000
Needham	\$9,977,600	\$4,018,600	40%	\$5,959,000
Newton	\$34,937,400	\$30,357,400	87%	\$4,580,000
Norwood	\$11,589,400	\$6,879,400	59%	\$4,710,000
Quincy	\$32,780,000	\$25,082,239	77%	\$7,697,761
Randolph	\$10,070,800	\$4,971,058	49%	\$5,099,742
Reading	\$7,749,100	\$5,669,100	73%	\$2,080,000
Revere	\$16,940,900	\$5,502,900	32%	\$11,438,000
Somerville	\$25,955,800	\$12,116,900	47%	\$13,838,900
Stoneham	\$7,829,900	\$5,889,900	75%	\$1,940,000
Stoughton	\$7,902,900	\$6,427,900	81%	\$1,475,000
Wakefield	\$9,806,900	\$8,526,900	87%	\$1,280,000
Walpole	\$6,110,000	\$4,490,000	73%	\$1,620,000
Waltham	\$22,282,400	\$15,226,900	68%	\$7,055,500
Watertown	\$10,155,800	\$6,285,800	62%	\$3,870,000
Wellesley	\$9,249,700	\$4,739,700	51%	\$4,510,000
Westwood	\$4,302,300	\$2,091,300	49%	\$2,211,000
Weymouth	\$19,100,900	\$10,425,900	55%	\$8,675,000
Wilmington	\$4,232,000	\$2,462,000	58%	\$1,770,000
Winchester	\$6,793,000	\$5,923,000	87%	\$870,000
Wintthrop	\$5,553,400	\$4,561,150	82%	\$992,250
Woburn	\$16,665,500	\$14,675,500	88%	\$1,990,000
Totals	\$760,750,000	\$447,128,333	59%	\$313,621,667

Last 8 Years I/I Funding	\$111.5 Million
FY13	\$27.4 Million
FY14	\$12.8 Million
FY15	\$26.6 Million
FY16	\$22.4 Million
FY17	\$22.3 Million
FY18	\$21.7 Million
FY19	\$46.4 Million
FY20	\$40.4 Million

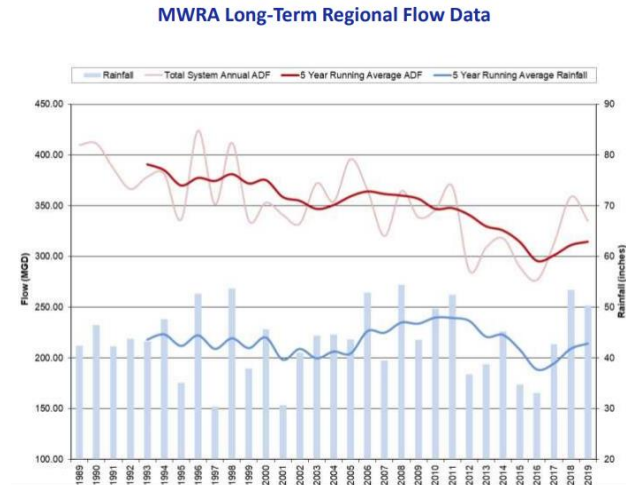
**Note: MassDEP Regulation 314
CMR 12.00 (Revised 2014)
Required Statewide I/I Plan
Submittals by December 2017**

Joe Nerden: why not taking \$\$\$ Lack of need or political will.

Holden is expanding its sewer system (newer pipes)—less need for I/I funds. Malden doing a lot of water work, behind in wastewater work. Have a big wastewater project in the planning phase. Phase 7 sunsets June 2021.

Mostly competing priorities rather than lack of will.

What effect? Long term regional flow data



1988 facilities plan projected flow between 400-600 dry weather average flow. Now down in annual flow (not just dry day flow) below 350 mgd. Before sewer metering, those were the predicted flows, but after metering, realized that flows would be lower.

Running average of rainfall has recently been a little higher than predicted (43"/year), but fairly consistent average over 5 years.

Karen: water usage clearly impacts flow. Is this graph normalizing for that? No

We know water usage has declined. Wouldn't that be the reason wastewater flow is going down?

Yes—that line on wastewater flow is both water usage flow, inflow and infiltration.

Water use includes outdoor water use and leaks, which aren't reflected in sewer flow. Water and sewer systems don't overlap precisely. Reductions in indoor water use is probably reflected here. But the population and employment has grown by a fair amount this period. So, there is some inflow and infiltration reduction. Disaggregating all of those pieces is fairly complicated.

Carl—in the MWRA's I/I annual report, there's a similar graph, with more detailed explanations. I estimate a 20mgd reduction in water use once you also consider the increased sewer population.

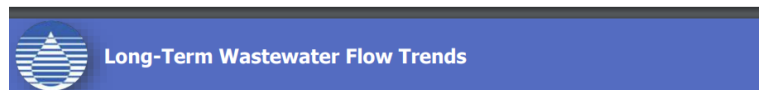
Nerden—would be interesting that graph to see with water usage added to it.

Carl—issue is while we can do that, it only really is indoor water change use that impacts sanitary sewer flow.

MWRA is requiring bi-annual leak detection report. Many communities find doing that survey annually is more useful and not that expensive--and you can save a lot of money if you detect water leaks earlier.

Carl thinks the water leaks trend over time has balanced out—4-5mgd range. MWRA also requires a water demand management report. There are new leaks, and communities are fixing the leaks, so the rate is pretty constant over the last 5 years or so.

Steve: in the last 10-12 years ago the rate of decrease in indoor water use has stabilized. The indoor water use trend line has been pretty flat for over a decade, despite new customers. Seeing actual reductions in I/I here, more so in the recent past.

The slide header features a blue background with a white circular logo on the left containing a stylized water drop and waves. To the right of the logo, the text "Long-Term Wastewater Flow Trends" is written in white.

Long-Term Wastewater Flow Trends


- 391 MGD for average 5-year flow 1989 – 1993
- 315 MGD for average 5-year flow 2015 – 2019
- 76 MGD (19%) slow decline in flow to DITP over 31 Years
- Last 5-year average (315 MGD) is 11% below the 31-year average (353 MGD) while rainfall was consistent with 43-inches-per-year average
- SSOs still occur during large storms during high groundwater periods; but frequency and duration of SSOs are lower

19% flow decline over 31 years, partly water use decline. Need to stay at that lower range for the treatment plant. For the environment, want less and lower duration SSOs, and are seeing that.

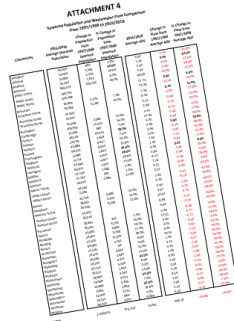
W/W flows community vs community over 20 years is not really meaningful—the comparison is [here](#) (attachment 4)

Average is 16% decrease.

Communities with the largest flow decreases:

 Community Comparison - % Change in Wastewater Flow – 20 Year Snapshot

ATTACHMENT 4
 Summary Report of the Massachusetts Department of Environmental Protection
 Wastewater Flow and Sewerage System Performance Report
 2010-2011




Largest Flow % Decrease	
Dedham	40%
Belmont	37%
Needham	39%
Woburn	37%
Stoneham	36%
Milton	33%
Nine Communities	25-30%

Some communities went up—some you would expect, because had increases in sewer population.

Looking forward—we continue to need I/I reduction—obviously, sewers continue to deteriorate. Also continued regulatory requirements, the next permit, can't add treatment or tunnel capacity.

MS4 permits are competing for money, so helps communities to have some grants and loans for I/I. Not clear if there will be federal or state \$\$

Climate trends: Warmer temperatures, lower groundwater table, varying seasonal snowfall.

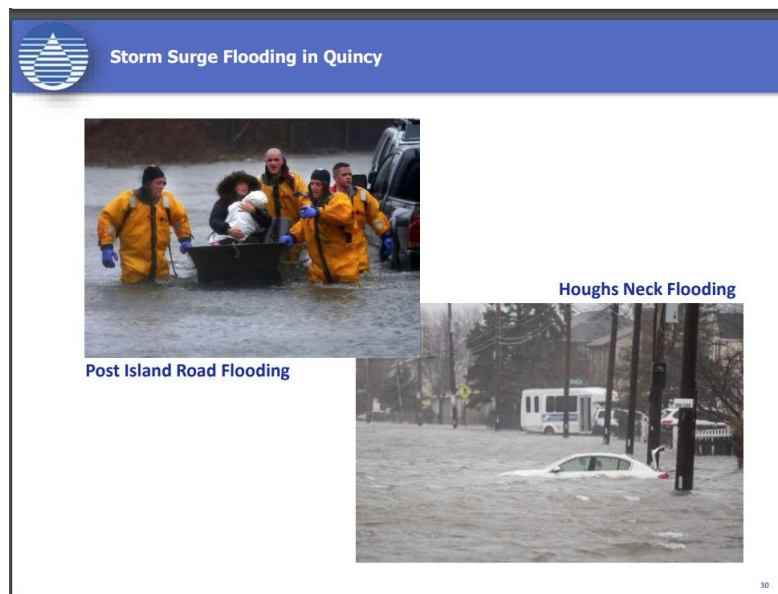
Want I/I reduction to maintain groundwater levels--especially in communities with well water.

- Increased annual precipitation, frequency of heavy rains. May see increased flood magnitude and frequency—preventing SSOs will need reduction in inflow
- Sea level rise, higher storm surges may increase coastal flooding—reducing tidal inflow is important

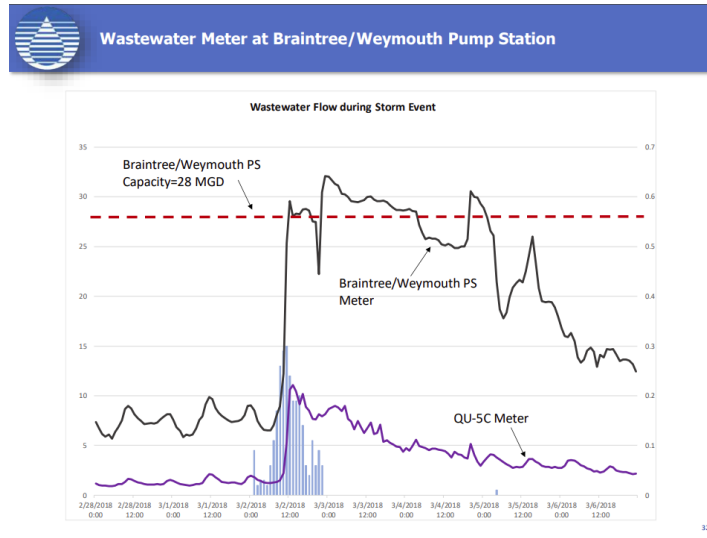
Example: March 2-3, 2018 storm

Not a huge storm, but affected Quincy →

Roads flooded, head houses for siphons flooded and overflowed.



Took 4-5 days to bring flow down. 5–7x the normal flow. Braintree Weymouth maxed out for a week or more. The storm surge will continue to be difficult to handle and MWRA starting to think about how to manage for our own structures.



What the MWRA is doing for I/I Operations & Management: The Orange Notebook shows targets and completed

- manhole and structural replacement-- inspections—650/year
- CCTV inspections and pipe cleanings—36 miles/year (out of 240 miles)
- Siphon inspections—easy clogging from grit and grease. Target 48 barrels/year
- Manhole inspections/rehab
- Sewer rehab projects—interceptor and siphons. \$\$ in CIP and in Master Plan.
- Raising siphon headhouses, fix concrete...

Do we still see significant infiltration from laterals? How much of a contribution does that present, percentage-wise?

Private portion we see in both infiltration and inflow. Sump pumps that run constantly during the spring look like infiltration. Roof leaders and driveway drains look like inflow. If people have sewer connection above the groundwater level, that leaks with rainfall and looks like inflow. If below the groundwater table will look like infiltration.

DEP looking to address private inflow. Our communities—in MWRA annual questionnaire which is in MWRA's annual report and gives you an idea of where each community is at. Some have gone house to house and removed sump pumps and smoke detected for roof drains. It's a critical political decision. Not hard to line a portion of the lateral, but very hard to decide to enter homes looking for sump pumps and telling people to remove them.

Used to be over 50% now at 45% I/I. We'll continue to work on that.

Karen—why is I/I a WAC priority—because only about 50% of what flows to DI is sanitary sewage. That's millions of \$\$ for stormwater/groundwater treatment. In the 1990s some WAC members referred to the planned DI plant as a white elephant. Felt more resources should go to I/I and sewer separation. That's why it's important for WAC to keep I/I on the front burner.

Are any MWRA communities addressing sewer lateral lining and if so, what mechanisms are they using?

When sewer lining is done on the street, very common for communities to do a "boot" up the lateral for the first 5-10 feet. Often that will get most of the infiltration. Most common fix for the lateral, and can be done without accessing the house.

Another method is to do cured-in-form from house. Or foam filler that fills wet gaps, but comes from the basement of the house. Not clear how long that lasts. Don't know of any private people fixing their own laterals without a collapse or a clog. There's an incentive for homeowners to replace their lead water service--MWRA lead service \$ helps--but we don't see wholesale sewer lateral replacement, but do see some communities using TV inspection and deciding to line laterals.

Can communities use MWRA I/I funds to do that kind of work? Yes.

Karen: Heard idea of lateral inspections from the home as a sort of Title 5 type at point of sale. Heard people talk about that idea?

Even getting disclosure of lead service line upon sale has been difficult to get through the legislature. Significant pushback to anything that would impede real estate sales. We would love to see that. How to get there is a great political debate.

Chat—will answer flow strength questions later. Newton did basement inspections at same time as meter replacements. A good idea to look for sump pumps, meter bypasses, lead service lines & other things when in a private basement there for any other reason.

Wastewater meter program: at long last about to award the contract. \$3.3 million for 174 WW meters. Will be a big help for our staff.

Doesn't relate enormously to I/I. One of our goals to reduce total estimated flow. Looked at all 634 unmetered areas to adjust estimates. Now have updated ratios. Will mean flow estimates keep up with the condition of the sewers in those areas. All helpful on the margin towards I/I program. Primary benefit is confidence in billing on flows. MWRA will be installing the new meters over the course of calendar 2021. Finished by December '21. Can give WAC an update in early 2022 on how the program has gone.

Technology—in some areas will be better. Laser-based flow in higher diameter pipes. Slightly more accurate and easier to maintain. 21 sites. Will compare new and old meters in some areas. Don't anticipate big differences. Goal for regular replacement, rather than whole system.

During the pandemic, MWRA had to let some meters go dark because it couldn't risk personnel going into manholes to replace batteries and repair meters. These are now back up.

DI and a more concentrated sanitary flow. The system at DI should be able to handle more concentrated flow, so if more I/I is removed, the system would be fine. Actually, DI flows are on the fairly weak flows now, and would be more efficient to treat as flows get more concentrated.

Director's report: Looking good for wipes labeling legislation in the new state legislative term.

Next Meeting: Nov. 6th, 10:30 am