



Honolulu Board of Water Supply Stakeholder Advisory Group

Meeting 14 – Wednesday April 19, 2017 4:00 to 6:30 pm
Honolulu Club Training Rooms, First Floor
932 Ward Ave. Honolulu, HI 96814

Meeting Notes

PURPOSE AND ORGANIZATION OF MEETING NOTES

The purpose of these notes is to provide an overview of the Board of Water Supply (BWS) Stakeholder Advisory Group meeting. They are not intended as a transcript or as minutes. Major points of the presentations are summarized herein, primarily for context. Copies of presentation materials were provided to all participants and are available on the BWS website. Participants made many comments and asked many questions during the meeting. These are paraphrased to be more concise.

ATTENDEES

There were 18 stakeholders present, as well as BWS and CDM Smith staff. The stakeholders represent diverse interests and communities island-wide.

The following Stakeholders Advisory Group members attended:

Jackie Boland	AARP Hawaii
Pono Chong	Chamber of Commerce Hawaii
Bill Clark	Resident of Council District 6
Mark Fox	The Nature Conservancy
Shari Ishikawa	Hawaiian Electric Company
Will Kane	Mililani Town Association
Micah Kane	Hawaii Community Foundation
Gladys Marrone	Building Industry Association of Hawaii
Helen Nakano	Resident of City Council District 5
Robbie Nicholas	Resident of Council District 3
Alison Omura	Coca-Cola Bottling Co.
Bob Leinau	Resident of Council District 2
Dick Poirier	Resident of Council District 9
Cynthia Rezentes	Resident of Council District 1
Francois Rogers	Blue Planet Foundation
Cruz Vina Jr.	Resident of Council District 8
Christopher Wong	Resident of City Council District 7
Suzanne Young	Honolulu Board of Realtors

MEETING AGENDA

- Welcome
- Public Comment on Agenda
- BWS Updates
- Accept Notes from Meeting 13
- Stakeholders' Recommendations on Financial Policies on Revenue Requirement (For Possible Action)
- Correlation of Pipeline Repairs and Main Breaks, Including Costs (For Possible Action)
- Existing Water Rate Structure and How Funds Are Used (Postponed)
- Summary and Next Steps

WELCOME

Dave Ebersold, meeting facilitator and Vice President of CDM Smith, welcomed the group and thanked Shari Ishikawa for hosting the Stakeholder Advisory Group meeting in the Hawaiian Electric Training Rooms. Dave reviewed the agenda, and noted that the last several meetings have focused on financial policies as part of developing a financial plan. He said the BWS team applied input from the Stakeholder Advisory Group received to-date to straw man financial policies. Stakeholders' recommendations will be carried forward to the BWS Board for their consideration in early May.

Dave said that the group would also learn about the pipe break rate study and then give feedback on scenarios for the purposes of the financial plan. He said that the meeting would close with a presentation about the BWS's rate structure, which will be a large topic of discussion for the remainder of 2017.

PUBLIC COMMENT ON AGENDA ITEMS

None.

ACCEPTANCE OF NOTES FROM MEETING 13

Accepted.

BWS UPDATE

Ernest Lau, BWS Manager and Chief Engineer, greeted the group and welcomed BWS Board Chair Brian Andaya. Ernest told the group that Honolulu's Mayor had recently announced that one of his administration's major priorities is to address the issue of affordable housing on Oahu. The Mayor plans to appear before the BWS Board at its April meeting to request implementing incentives centered on waiving impact fees for affordable housing units. Ernest shared a letter with the Stakeholder Advisory Group that the Mayor sent to the Board.

Ernest said that he supports the development of affordable housing but also wants to keep rates fair and affordable for the other ratepayers in Honolulu. He explained that the impact fees, called water systems facilities charge (WSFC), are charged when

new developments join the existing water system. The fee is used to pay for the cost of additional capacity needed to support the developer's project, and to put money toward financing capacity expansion projects. (Capacity projects include well sources, reservoir storage, and pipeline system expansion). If the impact fee is waived for affordable housing, another customer class might have to pay more to make up for the cost. For example, Ernest reminded the group that agricultural water rates are already subsidized; this has been part of the policy and rate structure of BWS for the last 35-40 years.

Ernest stated that the Stakeholder Advisory Group will be asked to give input on this issue. Ultimately the Board will make the policy decision. He concluded by encouraging the group to keep in mind that the BWS's sources of revenue are water rates and related charges, and that waiving fees for some groups results in increasing fees for others.

Ernest let the group know that Ellen Kitamura will provide updates for the next couple of meetings. He encouraged the stakeholders to continue working hard as this is the start of critical discussions about water rates and that he will see them in a few meetings. "I can't repeat it enough: Thank you very much. Your input, your participation in our stakeholder group is invaluable to the Board of Water Supply and to our customers, the community of Honolulu, and Oahu."

QUESTIONS, ANSWERS AND COMMENTS

Comment: The BWS should take a look at what's going on nationally with upkeep of the water systems and related financial decisions. There are a number of cities (East Chicago, Detroit, Philadelphia, DC, and Flint, Michigan) that are having a hard time trying to balance keeping water rates affordable for a significant number of low and moderate income families, and continuing to maintain the water infrastructure with those revenues. Different water groups are trying to figure out how we're going to be doing this nationally and I'm part of an EPA federal advisory committee. When you read the Flint, Michigan water scenario, they couldn't have planned it any worse. Our committee has examined a lot of different facets that got them into even deeper trouble than they would have been in if they had attempted to manage it more properly from the beginning. Michigan's situation raised issues for many cities with similar problems of declining economic engines, driving middle and upper middle class families to move out and leave people behind who don't have the financial resources to support needed infrastructure improvements. It is not just us who are fighting these issues so I am asking that you keep an eye out on that because it's really percolating out there.

We've drafted a letter to the EPA Administrator and expect to finalize it on Thursday of next week so it becomes a public document. I'll make sure that we provide that to you once approved. It shows recommendations that we're providing as an organization to mitigate some of the issues that made bad situations worse.

A. That's a really good point, and it would be great if you can share some insights with the group when we meet next month. Some of the older cities, especially inner cities, are basically made up of neighborhoods. When people move out of the neighborhoods, you lose your customers and, in turn, your sources of revenue. However, water utilities are still obligated to maintain the infrastructure in a safe and dependable approach and this requires them to spend money.

Ernest also told the group that Erwin Kawata, head of the BWS's Water Quality division, just attended the Association of Metropolitan Water Agencies Water Policy Conference in Washington DC. Ernest told the group that BWS monitors what's happening in the proposed federal budget cuts. Those proposed cuts include a reduction of EPA's budget by approximately 30% and would downsize financial support for issues like climate change. The states, local governments, and communities have the responsibility to maintain the science, data collection, analyses, and preparations related to climate change. It is very important for our community.

Q. At the last meeting, I asked about General Plan modifications or revisions pending, and if the Board of Water Supply had any hot button issues, or things that you might want us to advocate that are in your best interests. Can you share those with us?

A. Our staff is preparing comments for my review. We haven't officially responded yet.

STAKEHOLDERS' RECOMMENDATIONS ON FINANCIAL POLICIES ON REVENUE REQUIREMENTS

Dave reviewed recent discussions about financial policies and the schedule for the Financial Plan and Water Rate Study. The group has engaged in conversations about financial policies over the last three meetings and that input was utilized in the development and edits to the straw man financial policies. Dave said that if stakeholders reach consensus today, the group could make a recommendation on proposed financial policies for the BWS Board's consideration and possible adoption on May 8th.

Dave reviewed the schedule for 2017 and explained that it's time to begin discussions about rates, and that today, the group will hear an overview of the existing rate structure and how funds are currently used.

He reviewed existing and proposed new financial policies as follows:

1. Fund Balance / Working Capital (amount of cash on hand)

Problem/Need

- Ensure timely funding of operating and maintenance expenses, debt service and construction payments

- Allow for differences between when costs are incurred and when revenues are received
- Cover contingencies, including disasters and other unforeseen events
- Provide sufficient flexibility and strength to support credit rating objectives.

Straw Man Policy

- Target 180 days fund balance; never less than 60 days
- Exclude annual debt service (for consistency)
- Cover disasters and unforeseen circumstances
- Large enough to provide some rate stabilization
- >180 days may be re-programmed to fund the CIP

Dave explained that working capital is the amount of cash that the entity has on hand. He said that it provides funds needed for things like rate stabilization and assistance in disaster recovery efforts. Discussions in the April Stakeholder Advisory Group meeting reflected a general agreement that having 180 days cash on hand is about the right amount. Some stakeholders thought that this was not enough and asked if other financial instruments could be used to balance the impact on rates, while other stakeholders had concerns that building up too much cash could become a target for other city agencies that might like to find a way to access it for their purposes. The current BWS policy is to maintain 45 days of cash on hand. This amount is just enough to cover costs during a normal billing cycle. The draft policy shows a target of 180 days, but never less than 60. The straw man policy was updated to reflect the discussion we heard at the last meeting.

We would achieve this target gradually over 10 years to minimize the rate impacts resulting from it. The BWS will have the ability to supplement cash with other cost-effective financial tools like insurance, lines of credit, or commercial paper. In the event that the BWS has more than 180 days cash on hand, that money would be reprogrammed to the capital improvement program, and not used for operational expenditures.

QUESTIONS, ANSWERS AND COMMENTS

Q. With regard to a plan or a policy, it's always sort of a guess and you have to “go for it”. So, if you go for it and it (the financial policy) does not produce the results you expected, what's the time frame associated with amending policies to achieve a different outcome?

A. That's a good question. This is a Board decision and it would take a minimum of one meeting. We'd have to notice it, and present it to the Board, and see if they are willing to take an action to amend it. In this case, we're using two meetings -- April 24th and May 8th. So, amending a policy can happen pretty quickly.

Q. I missed the last meeting and want to know what was the mindset behind the target of 180 days? If this is just a target and the extra cash gets rerouted to the CIP, then my concern is that this could be an extra conduit for putting away more money to fund projects.

A. Dave asked if a stakeholder would explain the discussion that the group had in the last meeting of “why 180 days” and Cynthia Rezendes summarized as follows:

Consideration was given to what happens in case of a major disaster. At the last meeting the BWS team showed where all of the 24-inch mains on bridges around the perimeter of the island could be damaged if Oahu is hit by a hurricane or a major tsunami. If any of them go down, you're going to need immediate cash plus resources to go take care of that emergency. The 45 days cash on hand of the current policy is essentially enough to get through the salaries and basic things for 45 days or less. Whereas if you increase working capital up to 180 days, that means you're guaranteed to have enough cash on hand to accommodate the crazy things that might happen. Once in 20 years, or once in 50 years things might happen where you need extraordinary efforts to get us back up and running. We asked for information about what did Kauai look like after Iniki, and what did other cities look like after hurricanes related to their ability to recover.

The other aspect to consider was bond ratings. When there is little cash on hand, your bond ratings aren't as good. When you have more cash on hand, it allows you to borrow money at a lower rate. So, 180 days appeared to be on balance with other municipalities. Others had between 90 and 200 days of cash on hand.

Between both of those factors, we said 180 days of cash on hand seems reasonable, given what was presented about other municipalities plus what we knew about disaster recovery potentials, especially considering being out in the middle of the Pacific where resources have to be flown in. We're looking at spending about \$80 million a year for projects, so if the working capital exceeds the 180 days limit, and is allocated towards the improvement projects, we figured that was also reasonable. We don't want to build up cash without having a maximum that would make BWS a target for other agencies. We know what's happened over the years with other large funds within the city that was targeted and all of a sudden an agency gets a consent decree for 20 times as much as it has on hand.

Q. A catastrophic event might happen once in 25-100 years, so is keeping large amounts of cash on hand the best way to plan for emergencies, versus other funding mechanisms? Secondly, a chart from the last meeting looks like it shows the rate of revenue loss ranging from 3% to 90%. Kauai experienced a 3% loss over nine months after Iniki. New Orleans (Katrina) doesn't have the military there like Oahu does. I'm assuming the military customers are still going to pay their bills. Considering our demographics, what is the revenue structure to tend repairs?

A. Most of the military, especially the Navy, has their own water sources and infrastructure so they really do not buy water from the BWS. The Marine Corps is our largest military customer.

The draft financial policy includes options to look at cash, commercial paper, or even property insurance. We already have some property insurance, and we are exploring whether or not we should increase the amount of coverage. Also, instead of 45 days working capital, the draft policy would set 60 days as the minimum and reach for 180 days over a period of years.

We try to balance the needs with funding the projects and operations necessary to meet the needs, and with keeping rates affordable for our customers because we are very sensitive to the impacts of increased utility cost to our community. We agree that we need to continue try to manage this balance in a very responsible way. One of the other ideas was whether or not we should set some intermediate targets along the way, but we would definitely need a combination of cash and other funding vehicles.

Another aspect to planning for catastrophic events is to consider the differences in the density of populations. Isolated, smaller communities exist in Kauai. Oahu has close to a million people not counting visitors (increasing the density on any single day), and a lot of older structures. If a person's home is destroyed and/or they can't live there anymore because it's unsafe, this means they're not going to use water. This goes to Cynthia's point about what's happening in other older/inner cities, with people migrating out of them because of the economy. You lose the ability to collect revenue. We're on an island and it takes at least 5-7 days to bring resources to Honolulu by ship to our port here. We have to be more self-sufficient than other states that might be able to drive in resources and use manpower closer to their communities. When we did the comparison of other locations that went through catastrophic events, the impacts to the utilities varied, but some were major and some needed more days of working capital to deal with those catastrophic events.

There is a UHERO study about the impacts of Hurricane Iniki on Kauai's economy. It showed a 75% drop in tourism and a 10% permanent drop in population after the event. Those are the types of major revenue losses that the group was looking at to try and provide some buffer for having that kind of occurrence here.

Comment: The preference for 180 days working capital also reflects a concern about bonds. Having only 45 days cash on hand puts you way below the bond agencies' A or AA bond rating criteria. They are looking for 150-365 days of accessible cash on hand. So, if you're looking to borrow money at cheaper rates, that's another important reason to increase cash on hand.

A. That's a very good point. It would be a heavy burden for our customers to completely fund the anticipated capital improvement program solely from rates. We need to be able to leverage debt and wisely borrow money to help balance the

impacts on rates for existing and future customers. Bond ratings are important and agencies do look at how much cash is on hand in addition to other factors.

Joe Cooper added that the BWS doesn't have a crystal ball to know the costs of a future emergency, but we can be better prepared with information from the comparative studies. The upper limit of 180 days cash on hand was proposed to help stabilize rates in case of extreme economic issues or traumas. It gives us enough time to adjust to whatever happens. This target seemed like a reasonable compromise to strive for and provide some financial flexibility.

Comment: I think having the range of 60 to 180 days is a good idea. My concern in having a massive disaster happen is just to getting water to people. I remember a big water main break and we didn't have any running water for five days, but they brought the water truck in everyday so the people could get water to drink and to flush their toilets. If we get into a disaster situation where the pipes are bursting, you need to have something to support all of these people that will be without water.

Comment: What restraints are being put on this money, so that it doesn't become a slush fund? It can't become like the hurricane fund, with bait and switch and all of a sudden the money's gone. This pot of money ought to have pretty clear definitions regarding access to it.

Comment: I'm going to take a crystal ball to look at the future and it doesn't look very good. We have a President who looks like he's going to pick a fight with lots of people and organizations, so the chances are pretty good that we'll be targeted too. Also, the weather is going to be more and more severe, which is why we just hired Josh Stanbro to run our new Climate Change Department. That's why groups like us in Manoa are trying to figure out how we're going to save our people and take care of emergencies ourselves, because we don't think anybody's going to come and help us. It would behoove us to be more conservative and have a sufficient emergency fund. I think we're going to need it.

Q. How long does it take to implement a rate increase and what are the mechanics to ensure that the public is aware of that increase?

A. Not counting public education, it would require a minimum of two to three BWS Board meetings – about two to three months. It will take longer including public education and testing of systems. We have a billing system called Customer Care and Billing (CC&B), and it takes a minimum of six months to reprogram and test the rate increases before we can actually implement them. We want to make sure that the billing is accurate. It can take six months and more to actually implement a rate increase after the BWS Board takes action.

Comment: This seems like a logical bandwidth. As Robbie mentioned, the range of having 60 to 180 days working capital makes sense.

Q. Does Hawaiian Electric have a safety net?

A. Shari Ishikawa said she's sure they do, but didn't know the exact target. Hawaiian Electric tries to keep 30 days of fuel on hand for a catastrophic event; financial reserves could be about 30 to 60 days. She wholeheartedly supports Ernest's comment about the value of time spent to properly reprogram the billing system.

Comment: The law mandates community associations to have a certain amount of reserves set aside to cover all assets. We can't just go and spend it on whatever we like. Does the Board of Water Supply have a similar mandate? If there is a working capital fund, the money has to be used specifically for infrastructure improvement, replacement, repair, and all those other things. I think the Board would be cognizant of that and wouldn't be able to just use working capital as a slush fund.

Dave asked Ernest if working capital is subject to the Board's budgeting process? So, in the event of a disaster, you need to spend more money in a short period of time, what is the emergency authorization process?

Ernest said that the BWS Board has to approve operating and capital improvement program funding. When the Board authorizes our 12-month budget at a certain amount, that's our ceiling. If an emergency is encountered or if there is a cost that is beyond what the budget allows, then we'd have to go back to the Board to amend the budget. This requires a public hearing, and probably two Board meetings to propose and take an action. We would probably call emergency meetings if a disaster like a tsunami hit – that suddenly impacted our infrastructure around the island.

Q. Does the Board have the right to hold emergency meetings? If there was a hurricane or an emergency like that, do they not have a right to do that?

A. That's a very good question and we have to check on the answer. Subject to legal counsel, Ernest said he would phone the Board chair, let him know what's happening, along with the actions we need to take, make sure he concurs, and take action. We have to provide safe water for our community for health and safety reasons.

Comment: We're talking about 60 to 180 days of working capital. If there's a catastrophic condition over here, and we don't have 180 days worth of emergency funds, then what happens? That's what I'm concerned about. As previously mentioned, you don't want anybody else picking off this cash on hand. That's what happened with the hurricane fund and the sewer fund. You have to put the money in a safe with only two people knowing the combination.

A. Fortunately, the BWS is a semi-autonomous organization that is under the direction of its Board.

Comment: I recommend moving the policy forward, as it is currently drafted.

Q. What constitutes an emergency related to fuel? We've seen oil price spikes in the past. They could happen overnight but is that really an emergency and does that fall under this scenario? I'm trying to identify what is emergency and what is not.

A. We have the ability to pass through some spikes in the cost of fuel. But it is possible that an unanticipated event would incur large costs that we would have to pass on to our ratepayers through an adjustment. We should probably continue to have this ability, but we've been trying to avoid exercising it to the extent possible. In these discussions, we have focused on the catastrophic emergencies, but if fuel prices go up substantially, we don't want to have to implement rate increases. We really want to avoid what's called rate shock. Working capital would allow us to stabilize things over a one or two-year period. Having 180 days cash on hand seems like a reasonable compromise that would give us flexibility but not too much flexibility.

Dave asked the group if anyone wanted to propose a change to the draft policy or recommend “as is”? The group agreed with keeping it “as is” and the consensus was to recommend moving it forward to BWS's Board.

2. Purposes and Uses of Debt (when and why I'll borrow)

Problem/Need

- Ability to finance growing need for system repair and replacement
- Align payment for projects with useful life of facility
- More effectively allocate facility costs with customers who benefit
- Mitigate spikes in capital investment needs, thus stabilizing rate impacts

Straw Man Policy

- Select the most economical financing source
- Term of debt limited to life of the facility it is funding
- Cannot fund operations and maintenance
- No more than 20% variable rate debt

Dave told the group that the purposes and uses of debt policy addresses when and why to borrow money. The existing policy states that the BWS can use “pay as you go funding in a range in conjunction with debt to net assets ratio,” and this didn't seem useful so this was not included in the draft straw man policy. There were early discussions about changing the amount of variable rate debt from the current policy of 20% up to 25%. However, the BWS does not have any variable rate debt and they do not feel like they need this flexibility so it remained at 20% in the draft policy shown to the stakeholders.

Dave asked the group if they had questions or comments about this policy. The group did not have any comments or concerns about this draft policy and the consensus was to recommend it to the Board.

3. Debt to Net Assets Ratio (how much I can borrow)

Problem/Need

- Manage financial leverage, the amount of debt being used to build new assets
- Provide flexibility for additional borrowing to meet needs
- Maintain strong credit ratings

Straw Man Policy

- No more than 50% debt to net assets ratio

Dave told the group that this policy is about how much money can be borrowed. The existing policy indicates a range of 40 to 50% for the debt to net assets ratio and could incorrectly imply that having a ratio less than 40% is negative. For clarity, it was suggested to remove the range and specify a percentage of no more than 50%. Joe said that he did not foresee that a higher ratio would be needed in the next 10 years.

Dave told the group that this is a no cost policy change and asked if they had any questions or comments.

QUESTIONS, ANSWERS AND COMMENTS

Q. Did you say that you don't foresee anything that would require a higher percentage within the next 10 years?

A. Joe said that he does not see 50% as a limiting factor for the BWS. What this policy limits is borrowing capacity to a certain percentage. Currently, BWS's debt is 28% of net assets. He does not envision that the BWS would have to borrow more than the 50% debt to net assets ratio in the next 10 years.

Q. What dollar amount is the net asset? I thought your net assets are about a billion dollars.

A. Yes, that's right. With net assets of a billion dollars, under the proposed policy, we could borrow another 500 million dollars. If we borrowed 500 million dollars to put towards capital improvement projects, our net assets would increase. So, it's kind of a rolling process, and you don't want to borrow more than the value your assets. You really don't want to borrow more than the value of your house, for example, which would be 100%. We wouldn't borrow more than 50% our assets.

Q. I appreciate your analogy about borrowing against your house but want to ask what happens if the BWS does not make bond payments? I think that the bank can foreclose on my house if I don't make my payments, but they can't actually foreclose on your capital assets if you're having trouble making your bond payments, can they?

A. That is a great point. Yes, we can incur problems if we default on municipal bonds, but they probably won't foreclose on the assets. The debt to net service coverage

ratio is really a much more important policy because it reassures bondholders and is part of our bond covenants that we are managing the water system and generating enough revenue to pay off our debt.

Dave asked the group if they would like to make a recommendation and the consensus was to move this policy forward for the Board's consideration.

4. Debt Service Coverage (DSC) Ratio (ability to make loan payments)

Problem/Need

- Manage ability to pay debts after also paying for all operating and maintenance expenses
- Provide flexibility for additional borrowing to meet needs
- Maintain strong credit ratings

Straw Man Policy

- 1.7x senior annual debt service
- 1.3x junior annual debt service
- 1.6x total annual debt service (including State Revolving Fund loans)

Dave explained that the debt service coverage ratio is a measure of the BWS's ability to make loan payments and a very important factor in bond ratings. The current policy is 1.6 times the senior debt service and 1.3 times the junior debt. Senior debt is like your first mortgage. Junior debt is like a second mortgage. The proposal is to bump the ratio slightly to 1.7x on senior debt and to use an "all in" ratio of 1.6x, which was recommended a couple meetings ago.

QUESTIONS, ANSWERS AND COMMENTS

Q. This does not add more funding on top of the working capital policy, right?

A. No.

Dave asked if there were any more comments or questions about the debt service coverage ratio. The group reached consensus to move this draft policy to the Board.

Dave said that the BWS Board is anticipated to take action on the full set of recommended financial policies on May 8th. Ernest thanked the group for the discussion and for raising many very good points.

CORRELATION OF PIPELINE REPLACEMENT AND MAIN BREAKS

Dave introduced Carl Lundin, who played a key role in development of the Water Master Plan and who has been conducting analyses of the causes and impacts of main breaks including number of breaks and financial impacts of breaks.

Several meetings back, Carl presented three pipeline replacement scenarios for potential use in financial modeling for BWS revenue requirements. Today's presentation focuses on findings from further analysis of the viability and appropriateness of these scenarios. This sort of analysis is relatively innovative in the water industry.

Carl began with an overview of the current status of water main breaks in the BWS system, presenting a chart of breaks since 1970. The number of breaks peaked in the early 1990s and has been trending downward since. The current 5-year average of 300 breaks per year in the BWS system is on par with the American Water Works Association (AWWA) average for utilities of similar size. The average pipe age in the BWS system is about 40 years.

Based on these and other data points, BWS projected 60 years into the future to forecast water main breaks for the financial planning scenarios. Historic BWS data back to the 70s was used in this analysis, rather than the traditional use of industry-wide estimates. This is a significant differentiator of this analysis.

Carl walked the group through a series of charts showing results for five analysis scenarios, described below and shown on charts that follow.

Scenario 1: Status Quo, continuing the current BWS level of pipeline replacement at 6-miles per year through the 30-year planning horizon, then ramping up to replace the entire system within the remaining portion of the 100-year horizon.

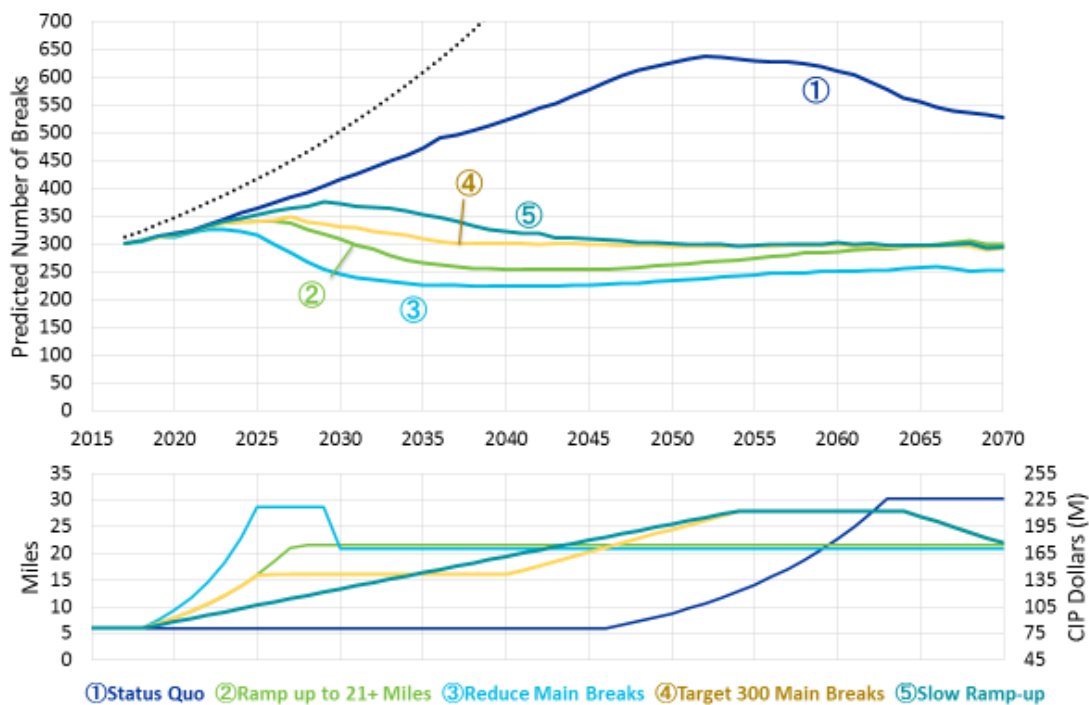
Scenario 2: Ramp up to 21+ miles of pipeline replacement per year, building over the course of 10 years to replace slightly more than 1% of pipelines annually, as recommended by AWWA.

Scenario 3: Reduce Main Breaks, aggressively replacing a large quantity of pipes to drive down the rate of breaks in the shorter term, including early replacement of priority pipelines, then leveling back to 1% per year.

Scenario 4: Target 300 Main Breaks, focusing on reaching and sustaining the current level of breaks.

Scenario 5: Slow Ramp Up, providing a steady, straight-line increase over the current rate of replacement.

Break Prediction by Replacement Scenario



Carl explained the charts above.

The dotted line at the upper left above represents making no pipeline replacements, only as a baseline comparison for the 5 scenarios. Without any replacement, the number of breaks quickly escalates, reaching 700 main breaks annually before 2040.

In all of the scenarios, the break rate first climbs up a bit as the replacement process gets underway, but it then comes down again. Also, note that the right, vertical axis starts at \$45 million. This represents CIP costs for water infrastructure other than pipes. Expenditures on these facilities are similar year after year.

Scenario 1 shows us that 30 years of modest pipeline replacement takes a toll on the system. Breaks peak at nearly 650 per year in the middle of the century, before the number of breaks starts moving back down as pipe replacement increases through the 2050s.

Scenario 2 had results that surprised us. We expected that when we increased to a 1% annual pipe replacement rate, the number of breaks would stop increasing. However, we didn't expect that the break rate would take a downward trend with replacement rates of less than 1%. This demonstrates that prioritization and getting to the worst pipes first is effective in reducing the number of main breaks.

Scenario 3 The number of projected breaks heads downward quickly, dropping to 300 breaks per year by 2025, then way down to about 220 breaks per year by mid-century.

Two scenarios were added to assess other options in the middle of scenarios 1-3. The purpose of these scenarios was to see if breaks could be substantially reduced at lower costs.

Scenario 4 ramps up like Scenario 2, then focuses in on what's needed to return to and sustain 300 breaks per year. Pipeline replacement ramps up to about 16 miles per year and holds there for about 15 years. After that, replacement ramps up to address the large number of pipes installed in the 1950s, 1960s, and 1970s, as they come due for replacement after 100 years of service.

Scenario 5 flattens the rate of replacement curve in Scenario 4, providing simpler implementation. Less pipe is being replaced early on, so breaks climb to about 375 per year before the break curve starts bending back towards 300.

For the purposes of this presentation, we have assumed that escalating to 650 breaks per year, as would be the case in Scenario 1, would not be acceptable. As a result, the analysis focused in on the other four scenarios for further consideration and examination.

Carl shared a chart summarizing a comparison of results expected from Scenarios 2, 3, 4, and 5. Key points were:

- *Miles of Pipe Replaced* is very similar among scenarios. Even the most aggressive scenario (3) differs by only 3%.
- Differences in performance are largely attributable to when pipelines are replaced. *Total Breaks and Average Breaks per Year* are lower for those scenarios in which more pipes are replaced earlier on.
- Total breaks between the highest scenario (5) and the lowest scenario (3) is about 4,000 over 50 plus years.
- The milestone of 200 miles of pipe per year is a critical milestone, as it represents 10% of the BWS pipeline system and includes the highest risk pipes as identified in the Water Master Plan.

	② Ramp up to 21+ Miles	③ Reduce Main Breaks	④ Target 300 Breaks	⑤ Slow Ramp-up
Total Breaks	15,545	13,778	16,647	17,339
Miles of Pipe	1,057	1,094	1,067	1,060
Avg. Breaks/Year	293	260	314	327
Year 200 miles is reached	2030	2028	2032	2034
Total Revenue Increase in 10-yrs	19.1%	51.2%	16.2%	9.3%
Pros	-Reduces breaks in the medium-term -Steadier long-term rate of replacement -Steady long-term revenue requirements	-Reduces breaks sooner -Removes higher-risk pipes sooner	-Maintains 300 breaks in the medium to long-term -More feasible increase in rate of replacement	-Steady pace of pipe replacement -Lower near-term costs -Most feasible increase in rate of replacement -Steady increases in costs
Cons	-Higher near-term costs	-Difficult to implement -Highest near-term costs -Modest long-term benefit for near-term costs	-More variable pipe replacement rates and costs -Moderate near-term costs -Pushes some costs to future generations	-Moderately higher break rate -Pushes more costs to future generations

This evaluation shows outcomes in terms of performance. But what about costs? Each of the scenarios was assessed in terms of their impact on the revenue requirement. Numbers below reflect a cumulative total over a 10 year period compared to the Status Quo scenario. As such, they do not reflect the total change in revenue requirement that may be required.

Near-Term Revenue Requirement Impacts of Different CIP Scenarios

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	Cumulative Total
⑤ Slow Ramp-up	0	0	0	2.5	0	0	3.0	3.0	0.5	0	0	9.3%
④ Target 300 Main Breaks	0	0	0	4.0	2.25	2.5	3.0	3.0	0.5	0	0	16.2%
② Ramp up to 21+ Miles	0	0	0	4.0	2.25	2.5	3.0	3.0	1.0	1.0	1.0	19.1%
③ Reduce Main Breaks	0	0	0	7.0	3.5	3.5	4.0	4.5	6.5	6.5	7.0	51.2%

- Only shows changes resulting from pipe replacement
- Compared to status quo CIP of \$80 million escalated by CPI

Results include:

- Scenario 5, the Slow Ramp-up over the next 10 years, has a modest impact on the revenue requirement of just over 9%, compared to status quo.

- Scenario 4, Targeting 300 Main Breaks, that ramps up to about 16 miles replacement per year and holds there for a while, impacts the revenue requirement at just over 16%, compared to status quo.
- Two scenarios ramp up to 21 miles of pipeline replaced per year. Scenario 2 has a 19.1% impact on the revenue requirement compared to status quo. Scenario 3, Reduce Main Breaks, would impact the revenue requirement at over 50% compared to status quo.

QUESTIONS, ANSWERS AND COMMENTS

Q. A CIP budget of \$80 million per year is status quo. The 9.3% for Scenario 5 means you would add another \$7.8 million to that. . .making it \$88 million. And, for Scenario 3, at 51%, we're talking about \$120 million. Is that how we read this?

A. The increase here is the increase in the *revenue requirement*. For example, if we look at the existing revenue requirement, a 9.3% increase would be about \$22 million. That would increase the existing CIP budget to slightly over \$100 million per year.

Comment: It would have helped if there was a chart that shows what we need for the CIP per year for each of the 5 scenarios and what the revenue requirement would be for the same years matching. When we started this discussion we were talking about an \$80 million CIP to replace however many miles of pipe that \$80 million would get us. Now we're talking about different rates of replacement and how it could benefit rate payers so we don't have systems go down and impact people and businesses.

Carl went on to discuss the pros and cons of the different scenarios.

Comparison (2017-2070)

② Ramp up to 21+ Miles	③ Reduce Main Breaks	④ Target 300 Main Breaks	⑤ Slow Ramp-up
PROS			
-Reduces breaks in the medium-term -Steadier long-term rate of replacement -Steady long-term revenue requirements	-Reduces breaks sooner -Removes higher-risk pipes sooner	-Maintains 300 breaks in the medium to long-term -More feasible increase in rate of replacement	-Steady pace of pipe replacement -Lower near-term costs -Most feasible increase in rate of replacement -Steady increases in costs
CONS			
-Higher near-term costs	-Difficult to implement -Highest near-term costs -Modest long-term benefit for near-term costs	-More variable pipe replacement rates and costs -Moderate near-term costs -Pushes some costs to future generations	-Moderately higher break rate -Pushes more costs to future generations

Carl summarized the key points:

- **Scenario 5** is the slow ramp up with a steady, predictable increase in pipe replacement that's the same every year. It would have lower near-term costs and a steady increase in costs over time. Given the predictability it would be the easiest pace for the BWS to implement. It would have a moderately higher break rate and pushes more costs into the future.
- **Scenario 4** maintains 300 breaks (the current rate) into the medium and long term. It offers a more feasible increase in pipe replacement compared to some of the aggressive scenarios. Pipe replacement is more variable over time. It goes up some years, then flattens, then goes up again. However, that might provide the ability, as the years go on, to judge how this approach is working and see if it needs to change going forward. It pushes some of the costs into the future.
- **Scenario 2** reduces the number of breaks in the medium term. It provides a steadier long-term rate of replacement and steady long-term revenue requirement. It gets up to the desired replacement of 1% of the pipeline system per year and stays there. It has higher near-term costs.
- **Scenario 3** reduces the number of breaks sooner, by removing higher risk pipes sooner. But there are implementation difficulties, including workload, traffic disruption, and whether there are enough contractors to install the expected quantity of pipeline within the given time period. This scenario has the highest near-term costs and, for those costs, relatively modest long-term benefits.

Dave ask the group for feedback on Scenario 1, with the number of water main breaks peaking at nearly 650 per year. Can this be an acceptable level of main breaks? The BWS can go in and fix those breaks, and we've seen that it costs but a fraction to repair a break compared to preventing it. The system would work, but in terms of level of service for the community, does it make sense?

Comments:

- Most people are more upset when the water main breaks than when the electricity goes off. The fewer water breaks there are, the better. If you're proactive and let the people know that you're proactive, it's better than seeming like you're just waiting for things to break and then react.
- Some of the problem is with allowing breaks to go as high as you're projecting. You're looking at two water main breaks a day. Any time there's two of three breaks consecutively, people get very upset whether they're in that area or not. Often they have to travel through that area. It impacts traffic. It impacts so many things other than the people who are not getting water. It's a major nuisance and annoyance. If we say we're going to allow breaks per year to get up to 600 from a financial standpoint, you're going to get blasted – not because people don't have water, but because of the multiple impacts on people's lives.

QUESTIONS, ANSWERS AND COMMENTS

Q. If we go to another scenario, where the revenue requirement has to be increased to 16.2%, what would it look like on an average customer's water bill? For many, it's not a case of not wanting to be stuck in traffic or have their lives upset, but can they pay it in relation to all their other bills?

A. We've expressed it in terms of total revenue requirement assuming it would apply equally on everybody's bill. We're going to have a discussion in the coming months about whether there should be changes to the structure of the water rates, meaning we might change how the pie gets divvied up. We're not talking about how much these scenarios would impact a specific customer on their bill because we haven't had these discussions yet with the Stakeholder Advisory Group. We need to get through the financial planning process and determine what to carry forward to the rate models, before we get there.

Q. Is there a different technology like placing new pipe inside the existing pipe, that's maybe half the price of digging out the old pipe and putting a new one in? Could you replace a larger amount of pipe for the same price?

A. There is technology, like pipe bursting or slipping a pipe into an existing pipe, to extend the usefulness of the pipe without digging up so much of the road. Unfortunately, there are challenges in the materials used for these techniques. They might be cheaper up front, but in the long term there could be more frequent breaks. But we are looking at technologies that reflect the goals of this suggestion. These include horizontal directional drilling, slip lining, and pipe bursting. Any of these might be appropriate if we have to cross a very busy intersection or go under a freeway to replace a 60-year-old pipe without shutting down the freeway. We would experience some loss in hydraulic capacity from those types of techniques. Also these technologies don't eliminate trenching. We would still need to dig access holes every 300 feet or so.

Comment: How much of the work on these lines is put out to bid on a contract basis, where you're feeding somebody else's profit margin? Is there a way to reduce some of those expenses? Maybe some of the repaving could be coordinated with the city and county, as they've got a lot of roads they need to patch or pave. We're going to get hit with higher property taxes, rail, and electric, and on, and on. Everybody's going to want a bigger chunk of our wallet, and for that reason it might be better to get in the game early.

Q. When you repair a break, does that make the pipeline better?

A. The only thing it changes is that little area where the break got repaired. If the pipe is in poor condition overall, then it has the same break potential 100 feet away.

Q. So, does the repair make the pipe worse? Is it more risky?

A. There's some thought that disruption of the pipe in one area might exacerbate something a little further down.

Dave commented that one of the things the BWS is grappling with is whether 300 main breaks a year is OK? The BWS is looking for input from the stakeholder group, to try and figure out how to proceed. From a technical or economic perspective, most of the options are completely feasible. Now it's more a question of what's the community's tolerance for main breaks and at what cost.

Q. It looks like Scenario 5 would carry the cost all the way through generations. Right?

A. Yes. And there's a peak at the end to be paid for by future generations.

Q. Has anyone looked at combinations? If you start with Scenario 5, it crosses the line for Scenarios 2 further on. We could start with Scenario 2 and then see how things work out. Who knows what the picture will look like at that point. You don't necessarily need to take the same path all the way. You can make course corrections.

A. We agree, it's important to periodically reassess system needs. We're trying to make the best decisions to position ourselves to be going in the right direction. We then can pivot along the way.

Q. I'm looking at the percentages of revenue increases. Is that the total accumulated over the ten years, or is that the revenue increase you would need?

A. It's the revenue requirement above the status quo for pipeline replacement, accumulated over 10 years. It's the change in revenue requirement without looking at how to finance it, whether we would use bonds or other methods to help finance it. These percentages are not rate increases.

Comment: I'm less concerned with the number of miles of replacement and more focused on the number of breaks. I think the same is true for ratepayers. I like the fact that Scenario 3 addresses those quickly. I don't like the cost increase, but sometimes you're willing to pay more for a more significant change. It's hard though, because we don't know the impact on customers' bills.

Comment: If a break affects you, you get mad. But here we are 120 days into the year. At 300 breaks annually, that means statistically there should have already been 90 water breaks. Has anyone heard of that many main breaks? I'm just trying to give a customer perspective. It's bad if you're impacted by the break, but do you want to pay to mitigate it, or are you willing to live through that in some sense? We're going

through this process of expenditure and planning, but really it's going to come down to what's the final bill.

Q. At what point will the BWS go out to the public with this information? Are you planning to survey benefits vs. willingness to pay?

A. Willingness to pay is an interesting concept, because most answers come down to a political decision rather than what the system needs. What the BWS has done with the Water Master Plan is to identify the need of the water system then figure out how to get that done. The number of main breaks is one aspect of level of service. The ultimate question is: What's the public's expectations regarding main breaks and the cost to address them? There will be extensive public outreach, as there was for the Water Master Plan.

Comment: I work with a lot of policy issues and have come to realize that when you save people money or aggravation they never knew they were going to have, they don't thank you for it – they hate you. You can save millions and millions of dollars on a healthcare law, but because they never experienced it, they just know what they're paying now. That's the conundrum with reducing the number of main breaks that people never knew they were going to experience. You have to figure out a way to make it real.

Q. Have you looked at models of municipalities where they're looking at 300 breaks a year or less and what they are doing to drive that number down? Is there any kind of feedback from their constituents?

A. The American Water Works Association just came out with a benchmarking survey of utilities across the country. BWS is right at the national average in terms of main breaks. The survey indicates that replacing 1% of pipelines annually in the long run is where you want to be. As a trend, we see a lot of utilities trying to move towards that 1%. As one example, the Los Angeles Department of Water and Power's replacement rate for their pipelines was taking around 400 years for total renewal of the system. A year ago they got rate increases that will allow them to decrease that to about every 200 years. That's substantial progress, but the LA City Council wasn't willing to support a drop down to 1% of the system per year.

Ernest shared insights into BWS's participation in local, national, and international organizations, to keep pace with developments, collaborate in cutting edge research, and share experiences and advancements by the BWS.

Dave offered some thoughts on the scenarios and their impacts. Scenario 1 is a nightmare, letting the system age to a point that the current break rate more than doubles and also pushing paying the bill off to future generations. Scenario 3 is the most aggressive and would require a ramp up to replace almost 30 miles of pipeline a year. Securing all the resources to replace the pipes, whether staffing or construction

contractors, would be an immense effort and the amount of disruption in the streets would be terrible. Additionally, peak pipeline work (2025 to 2030) would be concurrent with the peak for rail construction.

Dave indicated more details will be presented on Scenarios 2, 4, and 5 in the future, and the group will not be expected to make a recommendation until presented the impact on bills.

He thanked everyone for coming and said that we look forward to the next BWS Stakeholder Advisory Group meeting, May 18, 2017 at the State Capitol, House Conference Room 309.