REGULAR MEETING AGENDA OF THE
CUSTOMER ADVISORY COMMITTEE OF
CITRUS HEIGHTS WATER DISTRICT (CHWD)
TUESDAY, FEBRUARY 26, 2019 beginning at 6:30 PM

CITRUS HEIGHTS COMMUNITY CENTER
6300 FOUNTAIN SQUARE DRIVE, CITRUS HEIGHTS, CA

CITRUS HEIGHTS WATER DISTRICT

In compliance with the Americans with Disabilities Act, if you have a disability and need a disability-related modification or accommodation to participate in this meeting, please contact the General Manager at (916) 725-6873. Requests must be made as early as possible, and at least one full business day before the start of the meeting.

Customer Advisory Committee meetings are video recorded, and available for web streaming at www.chwd.org and www.youtube.com.

CALL TO ORDER:

ROLL CALL OF COMMITTEE MEMBERS:

PLEDGE OF ALLEGIANCE:

PUBLIC COMMENT:

The Public shall have the opportunity to directly address the Customer Advisory Committee on any item of interest to the public before or during the Committee's consideration of that item pursuant to Government Code Section 54954.3. Public comment on items of interest within the jurisdiction of the Committee is welcome. The Committee Chair will limit comments to three (3) minutes per speaker.

REVIEW AND REORDERING OF THE AGENDA:

Agenda items may be moved to accommodate those in attendance wishing to address that item. Please inform staff at (916) 725-6873 or at cac@chwd.org, if you feel that you may need an accommodation.

(A) Action Item (D) Discussion Item (I) Information Item

BUSINESS:

B-1. Approval of Meeting #4 Summary Including Member Questions and District Answers – February 5, 2019 (A)

B-2. Review and Identify Top Spending and Funding Alternatives (A)
Discuss Spending and Funding Alternatives and Select Top Alternatives for deliberation at the March 19 Customer Advisory Committee Meeting.

COMMITTEE MEMBERS' AND FACILITATOR REPORTS:

C-1. Facilitator's Report (I)
C-2. Committee Members' Reports (I)

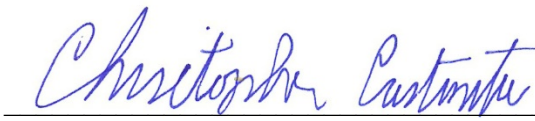
FUTURE CHWD COMMUNITY ADVISORY COMMITTEE MEETING DATES:

March 19, 2019	6:30 PM	Regular Meeting
June 11, 2019	6:30 PM	Regular Meeting
September 10, 2019	6:30 PM	Regular Meeting

ADJOURNMENT:

CERTIFICATION:

I do hereby declare and certify that this agenda for this Regular Meeting of the Customer Advisory Committee of the Citrus Heights Water District was posted in a location accessible to the public at the District Administrative Office Building, 6230 Sylvan Road, Citrus Heights, CA 95610 and the Citrus Heights Community Center, 6300 Fountain Square Drive, Citrus Heights, CA 95610 at least 72 hours prior to the regular meeting in accordance with Government Code Section 54954.2.



Dated: February 21, 2019

Christopher Castruita, Management Services Supervisor/Chief Board Clerk

PROJECT 2030
WATER MAIN REPLACEMENT

Customer Advisory Committee Meeting #4 Summary

Tuesday, February 5, 2019, 6:30-9:15 pm

INTRODUCTION

Richard Moses, Vice Chair of the Customer Advisory Committee (CAC), called the meeting to order at 6:32 p.m. After welcoming the members of the CAC, he turned the meeting over to Laura Mason-Smith, the CAC meeting facilitator, who reviewed with the CAC the **Meeting Agenda:**

1. Introductions
2. Public Comment
3. Approve minutes of December 11, 2018 CAC Meeting #3
4. Spending and Funding Options (Technical Memorandum 4)
    a. Spending Overview
    b. Funding Overview
    c. Spending/Funding Alternatives
    d. Questions/Answers and Group Dialogue
5. Public Comment
6. Next Steps
7. Close

Laura reiterated that meeting materials are provided electronically to the CAC members in advance of and following their meetings and are posted on the CHWD website, Customer Advisory Committee Section. In addition, meeting summaries that provide an overview of each of the CAC meetings as well as a video of the meetings are posted to the website to be available to the CAC members and the general public.

Customer Advisory Committee Meeting #4 Summary

Tuesday, February 5, 2019, 6:30-9:15 pm

ATTENDEES

CAC Members:

Kimberly Berg	Commercial Representative
Julie Beyers	Residential Representative
Ray Bohlke	Residential Representative
Patti Catalano	Residential Representative
Katherine Cooley	Institutional Representative
Michael Goble	Residential Representative
Suzanne Guthrie	Residential Representative
Andrew Johnson	Residential Alternate
Doug MacTaggart	Residential Representative
Bren Martinez	Residential Representative
Dave Mitchell	Institutional Representative
Richard Moses	Residential Representative and CAC Vice Chair
Mike Nishimura	Commercial Representative
David Paige	Residential Representative
Aimee Pfaff	Residential Representative
Peg Pinard	Residential Representative
Chris Ralston	Institutional Representative
Ray Riehle	CHWD Director
Noe Villa	Institutional Representative

Unable to attend were:

Deborah Cartwright	Residential Represent
Wes Ervin	Commercial Representative
James Monteton	Residential Representative
Richard Moore	Residential Representative
Jenna Moser	Residential Representative and CAC Chair
Cyndi Price	Institutional Representative
Javed Siddiqui	Residential Representative

CHWD Staff:

Chris Castruita	Management Services Supervisor/Chief Board Clerk
Tamar Dawson	Assistant Engineer
Paul Dietrich	Project Manager
David Gordon	Operations Manager
Madeline Henry	Management Services Specialist/Deputy Board Clerk
Rex Meurer	Water Efficiency Supervisor
Missy Pieri	Engineering Manager/District Engineer
Susan Sohal	Administrative Services Manager
Hilary Straus	General Manager

Consultants:

Roger Kohne	Harris & Associates
Andrew MacDonald	Harris & Associates
Habib Isaac	Raftelis Financial Consultants, Inc.
Laura Mason-Smith	Mason-Smith Success Strategies
Steve Winchester	Harris & Associates

Customer Advisory Committee Meeting #4 Summary

Tuesday, February 5, 2019, 6:30-9:15 pm

PUBLIC COMMENT

There was no public comment.

APPROVAL OF DECEMBER 11, 2018, CAC MEETING #1 MINUTES

The minutes of the December 11, 2018, CAC Meeting #3 were unanimously approved without comments or changes.

SPENDING AND FUNDING OPTIONS – Technical Memorandum #4

Project 2030 Manager Missy Pieri reviewed the 2019 CAC Meeting Schedule, progress to date, and the topics for the upcoming CAC meetings. She also referenced the Technical Memorandum #4 which outlined the background for the evening's meeting (please see the CHWD Website section on Project 2030 CAC Meeting #4 for the slide presentation detail).

Spending Overview

Roger Kohne provided a recap of previously discussed spending concepts such as risk factors (likelihood of failure and consequence of failure), benchmarks, replacement costs, and water main survival probability. He then outlined seven potential spending options.

Funding Overview

Habib Isaac provided a recap of previously discussed funding concepts:

- Funding 101 Review
- General Funding Example
- Funding Options
- Funding Applied to Spending

Spending/Funding Alternatives

Habib then reviewed with the CAC members twenty-one different spending/funding alternatives, how they would work, and their implications to the District and its customers.

CAC members identified questions about the spending/funding alternatives which were then answered by the District Staff and Consultants (please see the summary of questions and answers below).

CAC MEMBER QUESTIONS AND DISTRICT ANSWERS

Q1: What happens to water main replacements not completed after 2080?
A1: *The amount of water mains to be replaced varies based on the spending option selected by the CAC. The District will need to continue with main replacement work beyond 2080. The findings of this study will be revisited in the future. The District will continue to update the capital improvement program and revisit assumptions as necessary.*

Q2: Can the entire project be broken up into smaller scopes, which can have different funding/prefunding/debt options to better spread costs to specific expenses?
A2: *At this stage in the project, the Project Team has not gone into that level of detail. The phasing plan will show pipeline prioritization using principles derived with input by the CAC. This pipeline prioritization will continue to be analyzed during the implementation phase at the operational level, after the Project 2030 Study is complete.*

Q3: Does CHWD have a survival probability goal?
A3: *The District has not established a survival probability goal. There are benchmarks for replacement; however, there is not an industry standard for survival probability. To date, the Project Team has used the survival probability numbers as a point of comparison across the alternatives.*

Q4: What is the population expectation over 50 years?
A4: *Technical Memorandum 1 Water Demand Forecast covers population and water demand forecast through year 2050. This analysis was completed using Sacramento Area Council of Governments (SACOG) projections. There is a lot of variability in assumptions going into projections after 2050, and they become less accurate. The Technical Memorandum 1 Water Demand Forecast predicts a population increase of 18% by 2050.*

Q5: Would remaining bad pipe be replaced after 2080? We will still have 28% bad pipe?
A5: *Please refer to answer A2.*

Q6: How is the prefund rate calculated?
A6: *Prefunding is used to reduce impact to revenue adjustments in the first ten years of the project, as well as level out revenue adjustments throughout the project duration.*

Q7: Are funding increases placed in general fund or reserve?
A7: *Proposition 218 states that the District can only generate revenue based on costs incurred. Costs of the utility also include reserve funding. Anything above normal operating expenses goes into the reserve funds. Reserve policies are established by the Board, and targets are identified. If Project 2030 includes prefunding, the CAC could recommend that a designated reserve be established by the Board to set aside those funds.*

Q8: How much do we consider is sufficient for a prefunding reserve until 2030? Does that set the monthly impact at $2.85?
A8: *There are ten alternatives within the 21 provided that include prefunding which the CAC can review for consideration. The purpose of prefunding is explained in Q&A7. The monthly bill impact at the current baseline case is $2.85. Prefunding is not part of the baseline case.*

Q9: What is the rate increase in dollars for FY 30-40?
A9: *The Project Team could break it down for each decade but it would be a lot of information. Once the CAC has selected four options, the Project Team will provide this information for each decade. The Project 2030 Study is a long-term capital improvement program/financial strategy for water mains. A multi-year rate adoption could be recommended as part of the plan (a potential prefunding alternative). However, Proposition 218 only allows agencies to set rates over a five-year time period.*

Q10: What is the historic interest rate on bonds?
A10: *Over the past twenty years the interest rate on bonds has averaged in the low 4%. The model assumes a conservative interest rate on bonds at 5%. Given the District's current financial position, if the market increases and rates are higher the District may not need to issue debt if it is not advantageous.*

Q11: Could Board members be expected to vote for this constant increase without public "outcry?"

A11: *The project team would not speak for current or future Board Members, but based on experience when an agency's budget is tight and revenues are low, capital expenses are cut. Capital expenses do not go away, they just get deferred. That deferment becomes higher risk to the agency and its rate payers. Given that higher level of risk, reserves should be increased to address unplanned repairs in the system. Typically, agencies that need significant revenue adjustments do so to pay for capital improvements needs.*

Q12: What are the percentage increases related to actual bills? We need key numbers for a typical family of four for the various Alternatives.

A12: *Information was provided for all alternatives for 2020-2030, and can be viewed within all alternatives in the February 5, 2019 presentation posted at http://chwd.org/customer-advisory-committee/. Those monthly bill impacts reflect a typical single family residence with a one-inch meter using 20 units of water.*

Customer Advisory Committee Meeting #4 Summary

Tuesday, February 5, 2019, 6:30-9:15 pm

CAC PROCESS AND LOGISTICS OVERVIEW

The CAC reviewed the updated schedule of 2019 CAC meetings (see the CAC Document Library on the website for the schedule graphic). These after-dinner meetings and the high-level topics anticipated for each of the meetings are shown below.

Workshop #5: February 26, 2019, 6:30-9:15 pm, Citrus Heights Community Center
Analyze the Considerations Related to the Spending/Funding Alternatives Select up to 4 Spending/Funding Alternatives
Workshop #6: March 2019, 6:30-9:15 pm, Citrus Heights Community Center
Market Research Primer Review the Pros and Cons of the Spending/Funding Alternatives Selection of up to 2-3 Spending/Funding Alternatives for Market Research
Workshop #7: March 2019, 6:30-9:15 pm, Citrus Heights Community Center
Market Research Results Develop Final Recommendation to the Board Steps for Implementation Plan
Workshop #8: September 10, 2019, 6:30-9:15 pm, Citrus Heights Community Center
Review Implementation Review Final Board Recommendation

Executive Director Hilary Straus indicated that the Presentation Materials would be available on the Project 2030 website on Wednesday, February 6. In addition, he encouraged any of the Committee members who would like to review the topics further can call Missy Pieri or Chris Castruita to schedule a meeting. Ms. Pieri indicated that the Alternatives Matrix will be emailed to the CAC members and available online and in a hard-copy 11 x 17" format in the District Office.

CAC MEMBER COMMENTS

The CAC members indicated what they were taking away from the Meeting as:

1. I appreciate everyone's active participation throughout this process.
2. This has been a lot of information to absorb and review.
3. I wonder if we should poll people at the beginning to narrow down our discussions.
4. I am disappointed to not be able to attend the meeting on February 26.
5. This is a lot to absorb, and I am curious which projects we will replace year by year.
6. We need to keep in mind that the Meter Replacement Project isn't incorporated in this project.
7. It would be clearer if we could see all other impacts at once (such as the Meter Replacement Project).
8. It will be very important to continue to demonstrate transparency in the funding process.
9. It is amazing how a small change in funding can make a big difference.
10. The preparation for this and the other CAC meetings has been outstanding, and it is always presented in an interesting way to help everyone understand and learn.
11. This complicated material has been presented in a well-thought-out way.
12. I appreciate seeing all twenty-one alternatives; it is a lot of information to digest.
13. I spent several days trying to figure this out, and it's been very helpful to get the explanations at tonight's meeting.
14. I'm thinking a lot about inter-generational equity and how we can best put the costs on those that will really benefit from the replacements.
15. I appreciate the group, the questions, and everyone's skills and abilities.
16. It was very helpful to have the handouts printed on paper so that we could take notes on them.
17. It was good to look at the numbers, the monthly rate increases, and the impact on different generations.
18. We had very interesting conversations with each other. Sixty years is a long time, and we need to face the reality of what we want to do and what the public will bear. This will be a hard sell. We need to determine a realistic replacement level and assess that reality over the next twenty-thirty years.
19. All that we've learned is starting to come together for me, and I'm looking forward to the next meeting.
20. I so appreciate the staff for their time and effort.

Customer Advisory Committee Meeting #4 Summary

Tuesday, February 5, 2019, 6:30-9:15 pm

PUBLIC COMMENTS

None

CLOSE

CAC Vice Chair Richard Moses thanked the CAC members, District staff, and consultants for their participation and adjourned the meeting at 9:15 p.m.

APPROVED:

CHRISTOPHER CASTRUITA Deputy Secretary Citrus Heights Water District	JENNA MOSER, Chair Customer Advisory Committee Citrus Heights Water District

AGENDA ITEM: B-2

CITRUS HEIGHTS WATER DISTRICT

DISTRICT STAFF REPORT TO
CUSTOMER ADVISORY COMMITTEE OF CITRUS HEIGHTS WATER DISTRICT
FEBRUARY 26, 2019 REGULAR MEETING

SUBJECT : REVIEW AND IDENTIFY TOP SPENDING AND FUNDING ALTERNATIVES
STATUS : Action Item
REPORT DATE : February 18, 2019
PREPARED BY : Missy Pieri, Engineering Manager/District Engineer

---

OBJECTIVE:
Discuss Spending and Funding Alternatives and Select Top Alternatives for deliberation at the March 19 Customer Advisory Committee Meeting.

BACKGROUND AND ANALYSIS:
At the October 18, 2017 Board Meeting, the Citrus Heights Water District (CHWD) Board of Directors approved the Professional Services Agreement with Harris & Associates for the Project 2030 Water Main Replacement Study (Study).

The building blocks of the Study include:

- Asset Inventory
- Water Demand Forecast
- Water Main Replacement and Costs
- Water Main Replacement Phasing Plan
- Funding Strategy/Rate Options Analysis
- Implementation Plan
- Market Research on the final 2 options.

At Customer Advisory Committee (CAC) Meeting #2, held on August 28, 2018, the Project Team provided a briefing on the Water Demand Forecast, summarized in Technical Memorandum No. 1: Water Demand Forecast. This memo considers key assumptions such as population change, land development, legislative/regulatory mandates and other factors that could impact future District-wide water usage. The water demands will be used to determine future water main sizes that are proposed to be replaced and will assist in the prioritization of water main replacements.

At CAC Meeting #3, held on December 11, 2018, the Project Team provided a briefing on the Infrastructure Challenges, summarized in Technical Memorandum No. 2: Infrastructure Challenges (Technical Memo No. 2) and Water Main Assessment summarized in Technical Memorandum No. 3: Water Main Assessment (Technical Memo No. 3).

Technical Memo No. 2 identifies the infrastructure challenges, water supply challenges, and regulatory challenges that will likely impact the replacement of water mains beginning in 2030 and beyond.

Technical Memo No. 3 summarizes the key assumptions and methodology used to create the water main assessment and replacement cost estimates. This information will serve as the foundation for developing water main replacement phasing options and associated funding strategies.

At the CAC Meeting #4, held on February 5, 2019, the Project Team provided a briefing on the Spending and Funding Options, summarized in Technical Memorandum No. 4: Spending and Funding Options (Technical Memo No. 4).

Technical Memo No. 4 identifies various Spending and Funding Options and analyzes twenty-one (21) unique Spending and Funding Alternatives (Alternatives). The key considerations used to evaluate each Alternative include, but are not limited to, the amount of water main replaced, revenue adjustments and fluctuations, and pipe survival probability/relative risk.

At the February 5 Meeting, staff reviewed each of the 21 unique Alternatives along with key considerations for each Alternative with the CAC, and requested feedback on both Technical Memo No. 4 and the Alternatives presented.

At the CAC Meeting #5, to be held on February 26, 2019, the Project Team will provide a brief background and review previously presented information including the 21 unique Alternatives. Key considerations of each Alternative will also be reviewed. Then CAC members will be invited to break into smaller groups to discuss the Alternatives in greater detail. Access to the financial models will be provided through the use of computers with preloaded dashboards to better visualize and compare the data discussed in Technical Memo No. 4. Each small group will have access to (rotating) members of the Project Team. Each group will select their top Alternatives and be invited to briefly report back to the full CAC their reasoning/priorities and resulting top Alternatives. The CAC workshop facilitator will gather and provide a visual summary of the small group selections. Finally, individual voting will be used to gain consensus on the top Alternatives to move forward to the next CAC Meeting scheduled in March.

At the CAC Meeting #6, in March, the Project Team will facilitate the review of the top Alternatives and the selection of two or three alternatives for market testing. The CAC will also be presented with an overview of the market research process and schedule, and feedback will be requested.

RECOMMENDATION

Discuss Spending and Funding Alternatives and Select Top Alternatives for deliberation at the March 19 Customer Advisory Committee Meeting.

ATTACHMENTS:

Technical Memorandum No. 4: Spending and Funding Options

DRAFT

Technical Memorandum No. 4 Spending and Funding Options

Project 2030 Water Main Replacement

February 2019

Prepared for:

CITRUS HEIGHTS WATER DISTRICT

PROJECT 2030
WATER MAIN REPLACEMENT

6230 Sylvan Road
Citrus Heights, CA 95610

Prepared by:

(Spending)

Harris & Associates

(Funding)

RAFTELIS

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

EXECUTIVE SUMMARY

This memorandum (Memo) summarizes the methodology on how various spending and funding options including rate revenue, pre-funding, debt, and a combination of the three were developed. By combining these various spending and funding options, a total of twenty-one (21) unique spending and funding alternatives were developed. These 21 alternatives will be analyzed and key considerations of the various alternatives will be discussed.

SPENDING

The Citrus Heights Water District (CHWD or District) currently spends approximately $2 million annually on water main replacement, which equates to an annual rate of replacement of less than 0.5%. As water mains age throughout the District, the likelihood of failure increases. Through the Project 2030 Study (Study), the District is evaluating various spending options to update its replacement program.

Seven (7) different levels of spending between the years 2030 and 2080 have been developed. The first spending option is to remain at current spending levels, $2 million annually (in 2018 dollars). This spending option represents the highest relative risk. The other bookend of the spending options is a $10.2 million annual rate of spending (in 2018 dollars). This represents the lowest relative risk as 94 percent of the water mains would be replaced by the year 2080.

FUNDING

The Citrus Heights Water District is currently reviewing the replacement of the utility's water mains, which will commence in 2030 and span decades to complete. This endeavor requires significant capital spending to achieve the full replacement of all water mains and development of a Long-Term Financial Plan (LTFP) which will assist the District to determine the most viable options available to consider for funding The Study. There are many ways to fund ongoing capital needs, which include pay-as-you-go (PAYGO), debt financing, grants (when available), and advance funding by appropriating available funds today for future needs. When developing a comprehensive financial plan for a utility, reviewing the agency's long-term capital plan is a critical component to ensure revenue needs of the utility over the long-term are part of what's considered when setting rates in the short-term.

When determining available funding options for the 7 different levels of spending, certain spending options include multiple funding options by including prefunding, debt financing, or both. As such, as the spending levels increase between spending options, up to four funding options are considered for review and comparison. Through the review and comparison of each spending/funding Alternative, the relative risk of the water system will vary based on level of reinvestment and the revenue requirements to achieve the water main reinvestment will impact the level of revenue increases, amount of debt incurred, and how setting aside funding now may mitigate and smooth out revenue increases over the project schedule. Each of the 21 alternatives are listed separately with a brief summary, specific metrics and key considerations.

NEXT STEPS

Through upcoming workshops, the District will evaluate the 21 different spending and funding alternatives and compare the key considerations of each. Through a series of Customer Advisory Committee (CAC) meetings, these 21 alternatives will be winnowed down to the top two (2) or three (3) alternatives. A market research firm will then conduct a hybrid internet and telephone survey of 500 District customers and property owners of the top 2 or 3 alternatives to provide additional input to the District and CAC members. With this information and through workshops, the District will develop an implementation plan to recommend to the District's Board of Directors for discussion and possible action.

INTRODUCTION

Renewal and replacement of infrastructure, funding of improvements and public understanding of the value of water are key issues to water system managers. The District is currently using a 30-year Capital Improvement Plan (Plan) that was developed in 1998 as a key planning tool in determining annual capital improvement projects, which includes water main replacement. As the above Plan is nearing the end of its term, the District is undertaking a process to review and refine its long term water main replacement program, which the District titled Project 2030 - Water Main Replacement Study (Study). Key elements of this Study include: 1) Asset Inventory and Project Polygon Development, 2) Water Demand Forecast, 3) Water Main Assessment, 4) Phasing Plan, 5) Cost Estimates, 6) Funding Options, including Water Rate Options and Debt Service Options, and 7) Implementation Plan (see Figure 1).

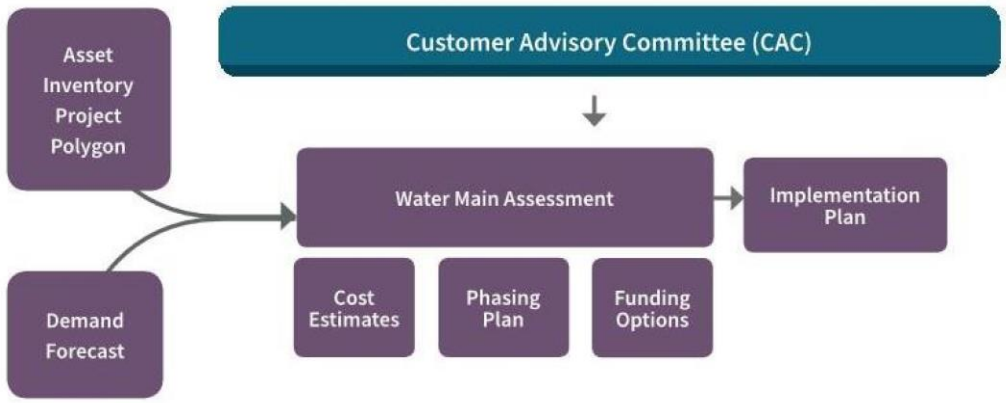


Figure 1. Water Main Replacement Study

This memorandum (Memo) summarizes the methodology on how various spending and funding options including rate revenue, pre-funding, debt, and a combination of the three (item 6 above) were developed. By combining these various spending and funding options, a total of twenty-one (21) unique spending and funding alternatives were developed. These 21 alternatives will be analyzed and key considerations of the various alternatives will be discussed.

This memorandum will be incorporated into the Final Project 2030 Plan.

ASSUMPTIONS

Below is a summary of the assumptions that were made for the spending and funding of the Study.

- All total and average annual spending costs in this section are expressed in 2018 dollars. This allows a meaningful comparison to current practices. In addition, total spending when expressed in 2018 dollars reflects a present construction value, which in turn represents a physical quantity of water main replacement, and therefore allows these values to be compared directly.
- Construction cost escalation (inflation) will be factored into the funding options analysis.
- The planning period for all of the spending and funding options is expressed over a 50-year planning period.
- An inflation rate of 3.2% was incorporated in all funding options, based on a 20-year average of the construction cost index.
- For debt financing, a 30-year term at 5% interest was used.

CURRENT MAIN REPLACEMENT PRACTICE

The District currently spends approximately $2 million annually on water main replacement. This equates to an annual rate of replacement of less than 0.5%. Currently, this rate of replacement is

sufficient since water mains are still in good condition; however, it is expected most of the District's water mains will require replacement over the next 60-years since the majority of the District's water mains were installed during the development boom from 1960 through the mid 1980's. Since the life of a water main ranges from 70 – 100 years, it is expected that starting in the year 2030 these water mains will need to be replaced.

METHODOLOGY

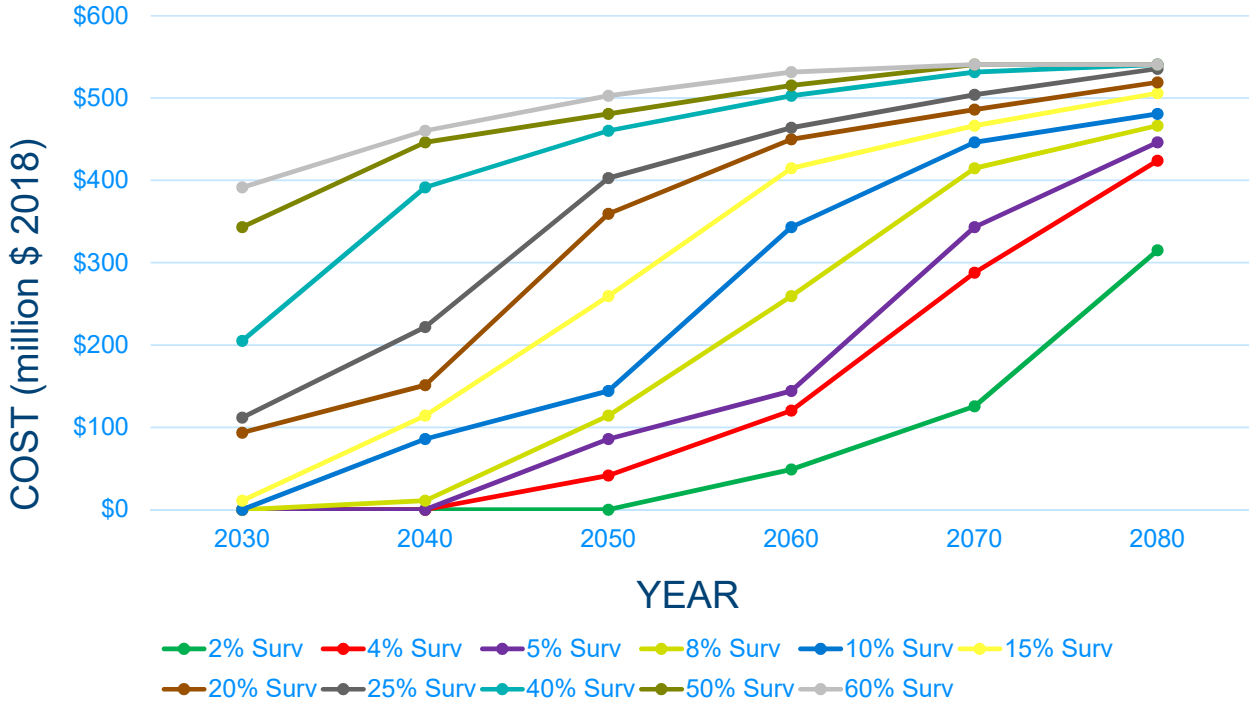
The Likelihood of Failure (LOF) factor for Pipe Age/Survival Probability (LOF #1, 50% weighting factor) was used as the primary tool to develop relative risk of different spending options. Survival Probability is defined as the likelihood that a pipe won't experience a "failure". The Survival Probability was determined using risk analysis software called InfoMaster by Innovyze. Survival Probabilities (SP) in the year 2080 (50-year Project Period) and relative risk are shown in Table 1. The lower the Survival Probability, the higher the likelihood of failure. Conversely, the higher the Survival Probability, the lower the likelihood of failure. The 2% Survival Probability is the Highest Risk of all curves; however, it is important to note the Survival Probability varies over the 50-year period as shown in Figure 1.

The Survival Probability curves along with the Relative Risk and Cost will be used to evaluate and compare the various spending options.

Table 1. Water Main Replacement Metrics for Various Survival Probabilities

Water Main Replacement by 2080	Relative Risk	Miles of Water Main Replaced through 2080	Cost (2018 $)	Incremental Cost (from row above)
2% Survival Probability	Highest	143	$315M	N/A
4% Survival Probability	Medium	195	$424M	$108M
5% Survival Probability	Medium	207	$446M	$22M
8% Survival Probability	Medium Low	216	$466M	$20M
10% Survival Probability	Medium Low	223	$480M	$14M
15% Survival Probability	Low	233	$506M	$25M
20% Survival Probability	Very Low	239	$519M	$13M
25% Survival Probability	Very Low	247	$535M	$16M
Total System Replacement	Lowest	250	$540M	$5M

Figure 1.5 Survival Probability Spending Curves



SPENDING OPTIONS

The spending options that will be evaluated are presented in Table 2. All spending options are assumed to begin in the year 2030 and span over a 50-year period.

Each spending option is presented along with the percent of the water system that would be replaced and the approximate survival probability of the system in the years 2040, 2060, and 2080. The District's current annual water main replacement rate of $2.0 million is included in the Spending Options as Option 1 and also named "Baseline". This Baseline option accounts for increased operational costs, other annual repair and replacement projects, and reserve funding, but does not include the planned meter replacement project.

Table 2. Spending Options

Spending Option Name	Average Annual Spending (2018 $)	Total Spending by 2080 (2018 $)	Percent of system replaced in 2080	Approx. Survival Probability in 2040	Approx. Survival Probability in 2060	Approx. Survival Probability in 2080
Option 1 (Baseline)	$2.0M	$100M	18%	7.8%	2.1%	less than 1%
Option 2 (1.5x Baseline)	$3.0M	$150M	28%	7.9%	2.4%	1.0%
Option 3 (2x Baseline)	$4.0M	$200M	37%	8.1%	3.9%	1.4%
Option 4	$6.4M	$320M	59%	9.4%	6.4%	2.1%
Option 5	$7.8M	$390M	72%	9.6%	7.3%	3.1%
Option 6	$9.6M	$480M	89%	11.2%	8.2%	10.0%
Option 7	$10.2M	$510M	94%	12.1%	8.6%	16.5%

FUNDING INTRODUCTION

Funding a Water Agency's Capital Improvement Plan (CIP) is a significant driver to the overall financial health of the utility. Agencies that adequately fund their repair and replacement needs on an annual basis are typically able to mitigate high rate increases and may gradually adjust rates to keep up with inflation. Conversely, agencies that do not fully fund their depreciating assets are more susceptible to higher construction costs resulting from fixing capital needs through a reactive approach and failures occur. As such, rate increases could spike in certain years as capital costs fluctuate with more variance from year-to-year.

FUNDING OPTIONS

There are many ways to fund ongoing capital needs, which include pay-as-you-go (PAYGO), debt financing, grants (when available), and advance funding by appropriating available funds today for future needs (Prefund). When developing a comprehensive financial plan for a utility, reviewing the agency's long-term capital plan is a critical component to ensure revenue needs of the utility over the long-term are part of what's considered when setting rates in the short-term. Doing so allows a more measured approach with revenue adjustments while minimizing a substantial increase in one particular year.

In this Study, the Citrus Heights Water District (District) will review the replacement of the utility's water mains, which will commence in 2030 and span decades to complete. This endeavor requires significant capital spending to achieve the full replacement of all water mains and the District is reviewing various funding options for the Study. The Study's capital costs are above and beyond current operations, existing debt and already scheduled capital. As part of the funding, the District is considering the impacts of issuing debt and how slowly increasing rates today can assist with offsetting costs from 2030 and beyond.

As described in the Spending Options Section, there are seven (7) different spending options which range from limited funding equal to $2M per year, based on what is currently set aside for water main line replacement, up to $510M with an annual spending amount of $10.2M per year. For consistency, each of the spending options span a 50-year time period with a commencement date of 2030.

When reviewing the funding options available for each spending option, one spending option could have up to four (4) alternative ways to fund the total project. These available funding options, include whether debt will be utilized and if the District will start prefunding the project today or wait until the project actually starts before adjusting revenue and corresponding rates. As such, funding alternatives include: 1) No Prefunding and no Debt, 2) Prefunding without Debt, 3) No Prefunding with Debt, and 4) Prefunding with Debt. Each funding alternatives will also include rate funding on a PAYGO basis. Figures 2-5 provides an illustration of how the various funding options may be applied to a specific spending option.

Figure 2.

Figure 3.

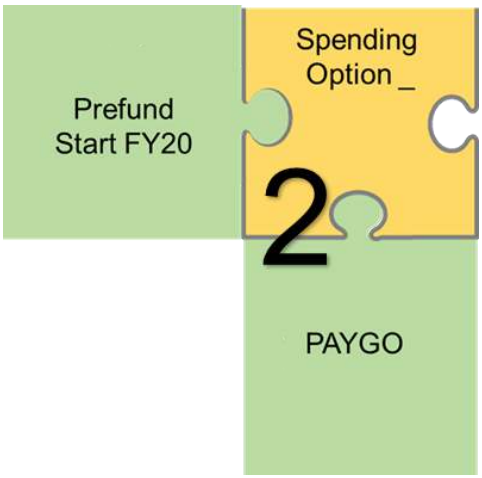


Figure 4.

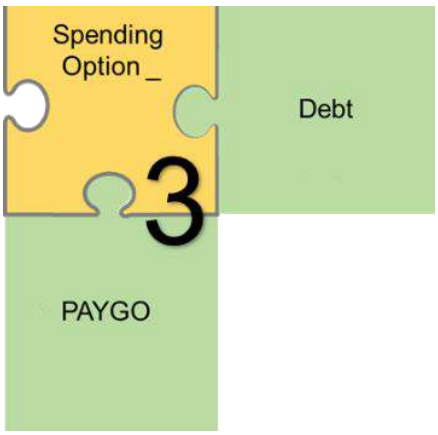
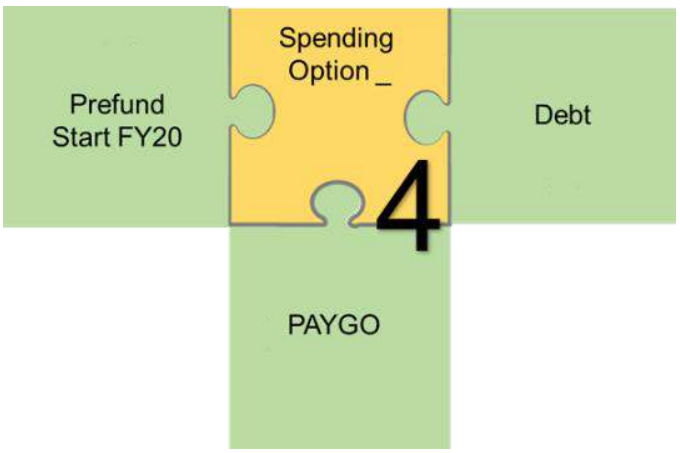


Figure 5.



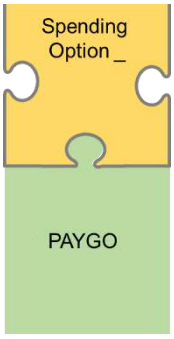
SPENDING AND FUNDING ALTERNATIVES

Through the selection of whether prefunding and debt financing will be incorporated as part of the funding for each spending option, 21 unique spending/funding alternatives were generated to review and consider. Each of the 21 alternatives are summarized and attached hereto as Exhibit A and includes the average rate increases necessary to meet the Study revenue requirements. Although our analysis extends through the project completion of 2080, it is important to note that revenue adjustments and setting corresponding rates are typically limited to no more than the next five (5) years and notices are required to be mailed to all customers pursuant to the provisions of Proposition 218. In addition, there are many independent variables that could impact the long-term forecast of each alternative, including, but not limited to: 1) new requirements and mandates from the State, 2) increases to costs outside District control, such as, purchased water and SMUD electricity charges. 3) water quality and increased treatment requirements, 4) drought emergencies, 5) population growth, 6) behavioral changes to consumption trends, and 7) technology efficiencies.

Below is a summary of each alternative which describes water main replacement investment including other obligations included as part of Baseline. See Exhibit A for a detailed summary.

Alternative 1: Baseline Funding

When evaluating a District's current financial position and future revenue needs, a long-term financial plan must be developed to account for all District expenses, including annual costs related to water supply, labor, power, materials, capital expenditures, operating and maintenance (O&M) expenses, reserve contributions, depreciation, and existing and proposed debt service payments. The resulting forecast reflect the District's expected revenue requirements over the planning horizon based on what is known today. Projecting revenue adjustments over a long planning horizon can illustrate future rate impacts and potential challenges to the District's financial situation. This will allow the District to adjust its capital project scheduling to smooth rate impacts while maintaining financial stability and adequate levels of reserves.

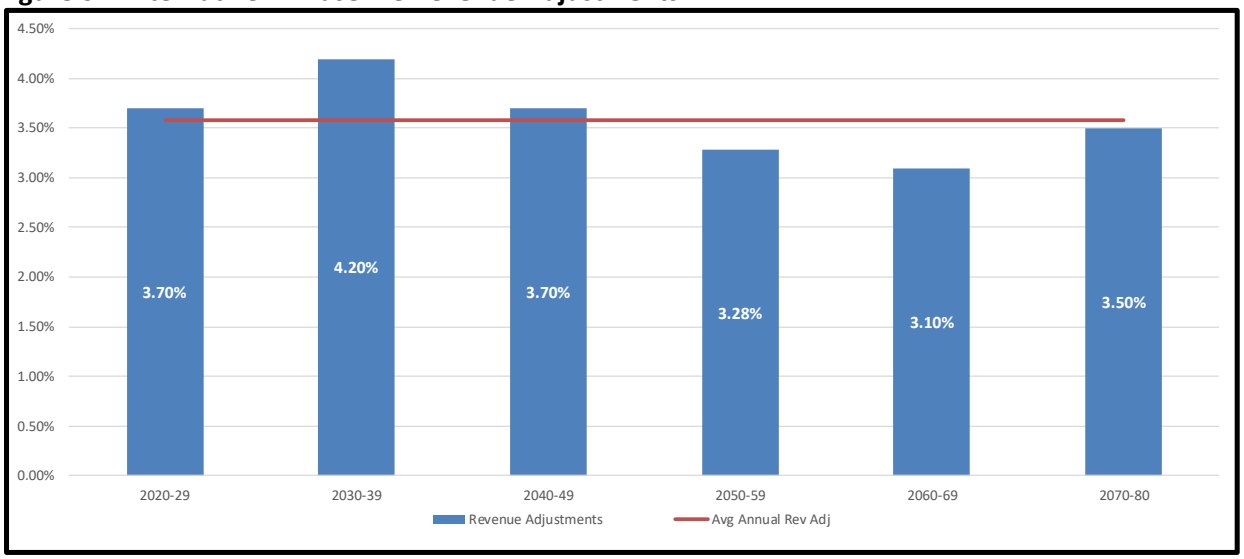


Before incorporating various spending options for the Study, the District's existing revenue requirements were modeled to generate a baseline level of funding needed based on the District's current budgetary expenses, planned capital, and reserve funding. With this multi-year cash flow analysis, anticipated revenue adjustments over the planning period were determined, while minimizing rate fluctuations. The Baseline Financial Plan requires an average annual revenue adjustment through 2080 of 3.58%, with a recommended adjustment of 3.7% for FY 2020 through FY 2029. The Baseline Alternative does not take into account prefunding or any debt. Table 3 provides a summary of the Baseline financial plan with key metrics in relation to the Study and Figure 6 identifies the expected revenue adjustments between 2020 through 2080.

Table 3. Baseline

Spending	Total Cost	Water Main % Replaced	2080 Survival Probability	Annual Rev Increase	Debt	Prefund
Baseline	$100M	18%	less than 1%	3.58%	No	N/A

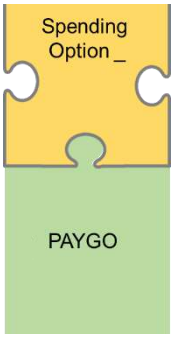
Figure 6. Alternative 1 - Baseline Revenue Adjustments



Key Considerations:

- Reflects current water main repair and replacement investment.
- Replaces 18% of the water main system by 2080.
- Minimum reinvestment generates a low survival probability with inherent high relative risk.

Alternative 2.1: $150M – 1.5x Baseline (No Prefunding and No Debt)

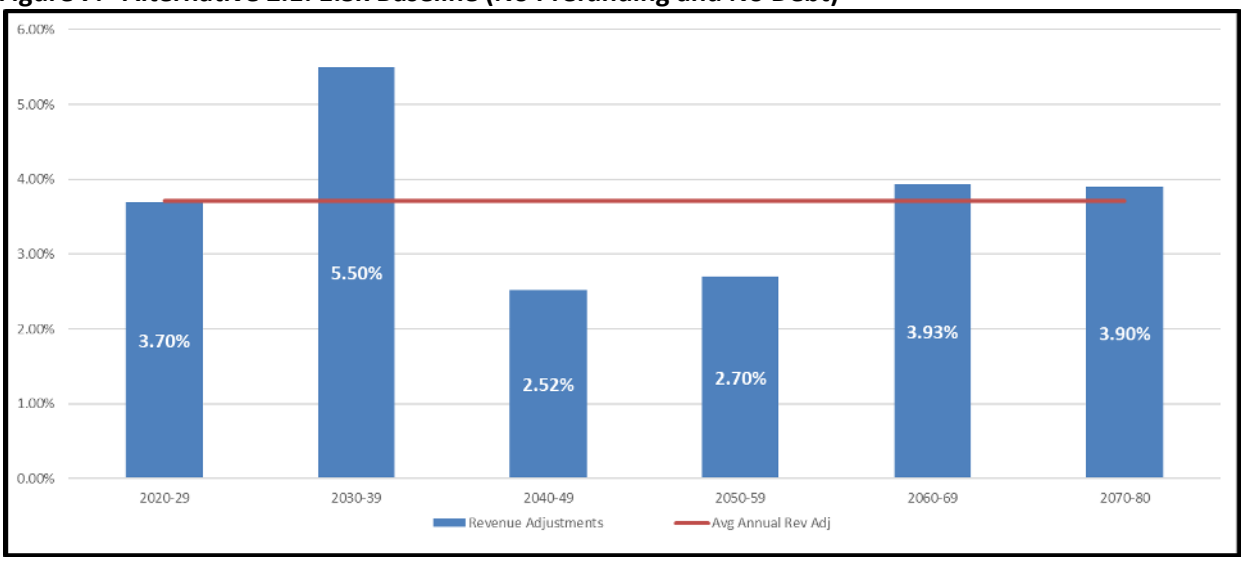


Alternative 2.1 slightly increases the reinvestment of water main replacement commencing in 2030 from $2M per year in 2018 dollars up to $3M a year in 2018 dollars and does not take into account prefunding or debt. With this level of spending, a slight increase in revenue would be required between 2030 and 2080 when compared to baseline since no prefunding is used in this alternative. When an Alternative does not include prefunding, revenue adjustments between FY 2020 and FY 2029 will be equivalent to the Baseline adjustments during that period which is equal to 3.7%. Table 4 provides a summary of Alternative 2.1 financial plan with key metrics in relation to the Study and Figure 7 identifies the expected revenue adjustments between 2020 through 2080.

Table 4. Alternative 2.1: 1.5x Baseline (No Prefunding and No Debt)

Spending	Total Cost	Water Main % Replaced	2080 Survival Probability	Annual Rev Increase	Debt	Prefund
Baseline	$150M	28%	1%	3.71%	No	No

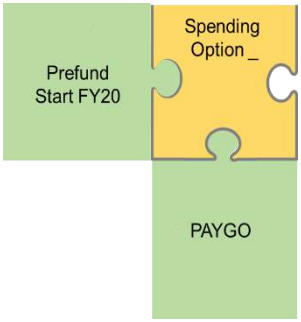
Figure 7. Alternative 2.1: 1.5x Baseline (No Prefunding and No Debt)



Key Considerations:

- No prefunding requires higher revenue adjustments between 2030-2039.
- Revenue adjustments fluctuate due to ramping up in early years of project.
- 10% more water main replacement when compared to Baseline.
- Survival probability is low with level of reinvestment, generating a high relative risk.

Alternative 2.2: $150M – 1.5x Baseline (Prefunding with No Debt)

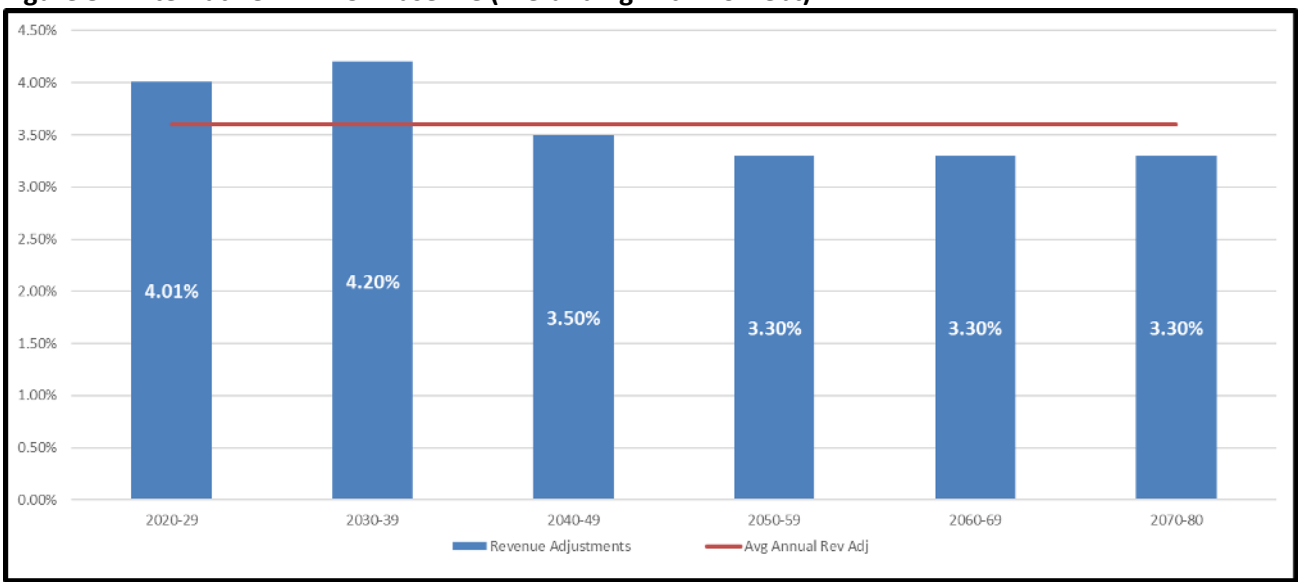


Alternative 2.2 is the same as Alternative 2.1, but with prefunding included. Prefunding permits a smoothing of future required revenue adjustments by building up funding in advance of the project without the need to ratchet up funding during the first year of project commencement. Therefore, Alternative 2.2 slightly increases revenue during FY 2020 through FY 2029 up to 4.01%, while mitigating the proposed increases in Alternative 2.1 during the first 10 years of the project down to 4.20%. Table 5 provides a summary of Alternative 2.2 financial plan with key metrics in relation to The Study and Figure 8 identifies the expected revenue adjustments between 2020 through 2080.

Table 5. Alternative 2.2: 1.5x Baseline (Prefunding with No Debt)

Spending	Total Cost	Water Main % Replaced	2080 Survival Probability	Annual Rev Increase	Debt	Prefund
Baseline	$150M	28%	1%	3.60%	No	**Yes**

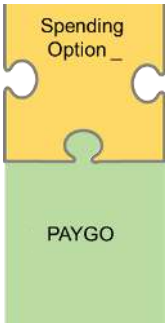
Figure 8. Alternative 2.2: 1.5x Baseline (Prefunding with No Debt)



Key Considerations:

- Prefunding reduces higher revenue adjustments between 2030-2039.
- Overall annual revenue adjustments over project duration equals 3.60%.
- 10% more water main replacement when compared to Baseline while difference in average annual revenue adjustments is 0.02%.
- Survival probability is low with level of reinvestment, generating a high relative risk.

Alternative 3.1: $200M – 2x Baseline (No Prefunding and No Debt)

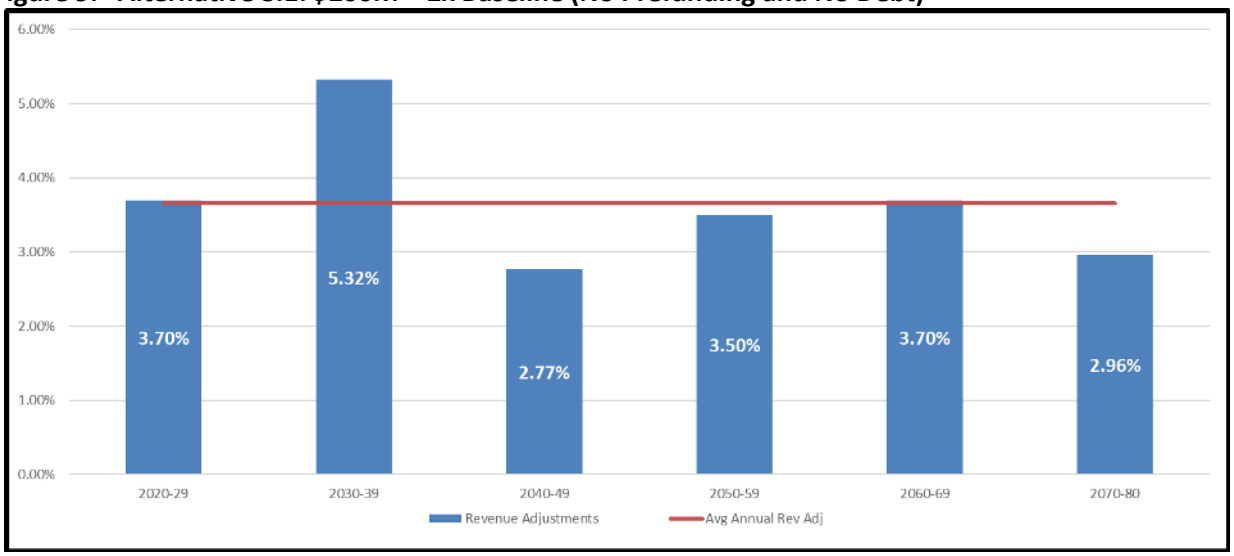


Alternative 3.1 doubles the current reinvestment of water main replacement commencing in 2030 from $2M per year in 2018 dollars up to $4M a year in 2018 dollars. With this level of spending, higher increases are needed when no prefunding is included as additional funding for the project starts when the project commences. As such, revenue adjustments between FY 2020 and FY 2029 are equivalent to the Baseline adjustments equal to 3.7% and a spike in funding is required equal to 5.32% each year between FY 2030 and FY 2039. However, due to cashflow needs and ensuring adequate District reserves remain intact, 9% revenue adjustments are required for the first three years of the project between FY 2030 and FY 2032. Table 6 provides a summary of Alternative 3.1 financial plan with key metrics in relation to the Study and Figure 9 identifies the expected revenue adjustments between 2020 through 2080.

Table 6. Alternative 3.1: $200M – 2x Baseline (No Prefunding and No Debt)

Spending	Total Cost	Water Main % Replaced	2080 Survival Probability	Annual Rev Increase	Debt	Prefund
Baseline	$200M	37%	1.4%	3.66%	No	No

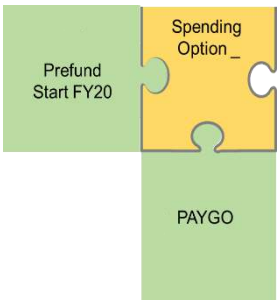
Figure 9. Alternative 3.1: $200M – 2x Baseline (No Prefunding and No Debt)



Key Considerations:

- No prefunding requires a spike in revenue adjustments between 2030-2039.
- 9% increases in FY 2030, FY 2031 and FY 2032
- Revenue adjustments fluctuate due to ramping up in early years of project.
- Approximately 20% more water main replacement when compared to Baseline.
- Survival probability is low with level of reinvestment, generating a high relative risk.

Alternative 3.2: $200M – 2x Baseline (Prefunding with No Debt)

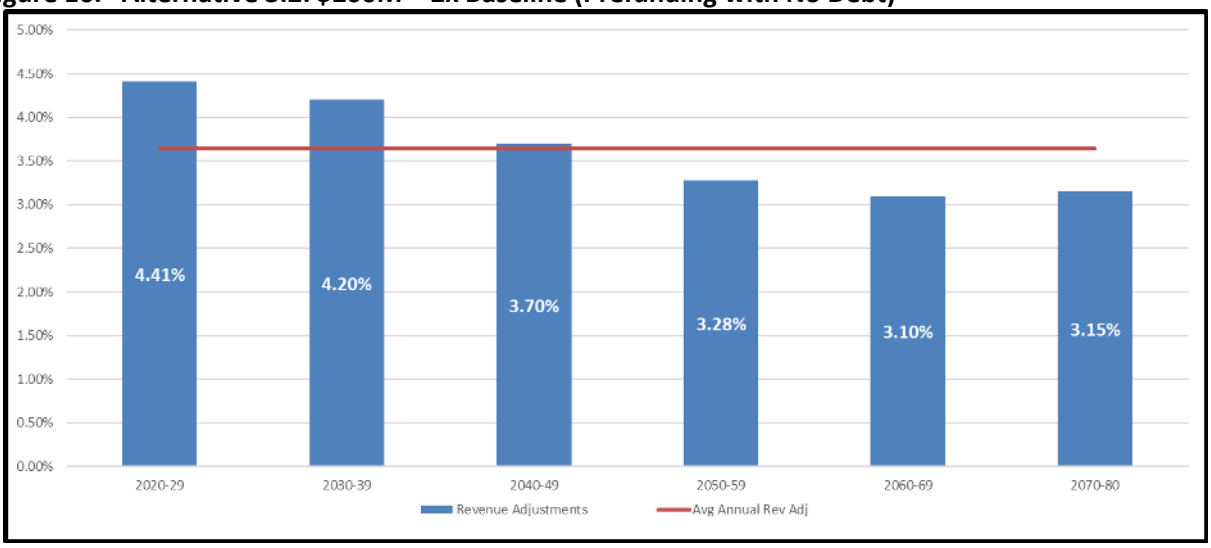


Alternative 3.2 is the same as Alternative 3.1, but with prefunding included. With slightly higher revenue adjustments in advance of the project during FY 2020 through FY 2029 of 4.41% annually, the projected revenue adjustments during the first 10 years of the project can be reduced to 4.20%. Table 7 provides a summary of Alternative 3.2 financial plan with key metrics in relation to the Study and Figure 10 identifies the expected revenue adjustments between 2020 through 2080.

Table 7. Alternative 3.2: $200M – 2x Baseline (Prefunding with No Debt)

Spending	Total Cost	Water Main % Replaced	2080 Survival Probability	Annual Rev Increase	Debt	Prefund
Baseline	$150M	28%	1%	3.64%	No	**Yes**

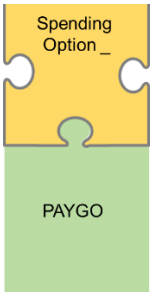
Figure 10. Alternative 3.2: $200M – 2x Baseline (Prefunding with No Debt)



Key Considerations:

- Prefunding smooths out required revenue adjustments between 2030-2039.
- Revenue adjustments are also more leveled throughout project.
- Approximately 20% more water main replacement when compared to Baseline.
- Survival probability is low with level of reinvestment, generating a high relative risk.

Alternative 4.1: $320M – (No Prefunding and No Debt)

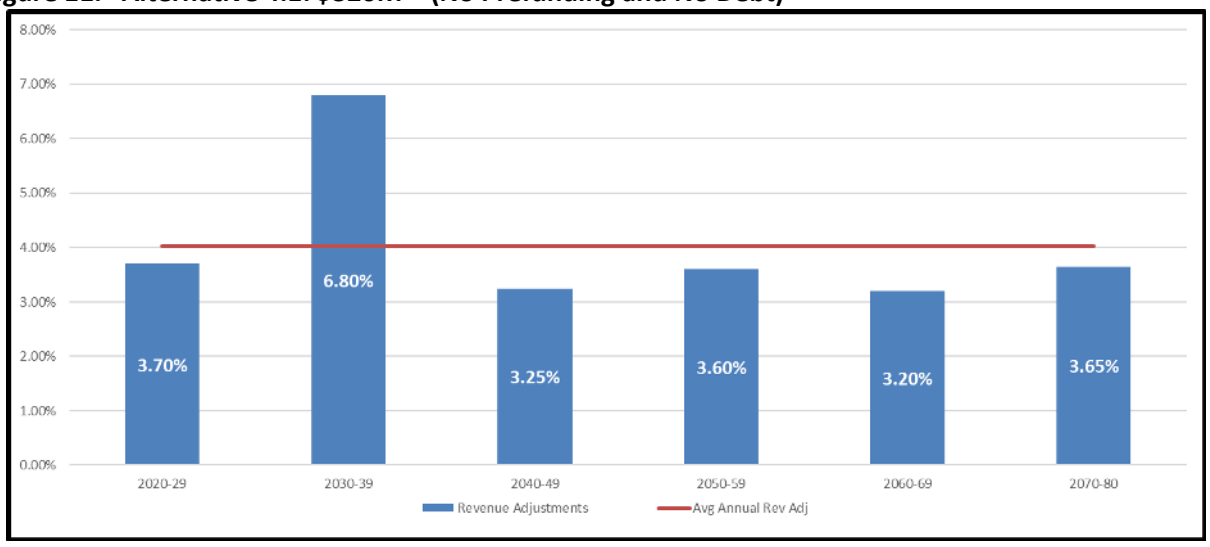


Alternative 4.1 increases reinvestment to main line replacement up to $320M, resulting in annual spending equal to $6.4M in 2018 dollars. With Alternative 4.1, prefunding and debt are not included. Therefore, steeper increases are necessary to ramp up funding at the start of the project in 2030, equal to 6.8% revenue adjustments year-over-year. In addition, due to cashflow needs and maintaining adequate District reserves, a 50% revenue adjustment is required in FY 2030. Overall, the average annual rate increase through project completion at 4.03% is not much higher than Alternatives 3.1 and 3.2; but the revenue spike in FY 2030 would cause significant rate shock to customers. Table 8 provides a summary of Alternative 4.1 financial plan with key metrics in relation to the Study and Figure 11 identifies the expected revenue adjustments between 2020 through 2080.

Table 8. Alternative 4.1: $320M – (No Prefunding and No Debt)

Spending	Total Cost	Water Main % Replaced	2080 Survival Probability	Annual Rev Increase	Debt	Prefund
Baseline	$320M	59%	2.10%	4.03%	No	No

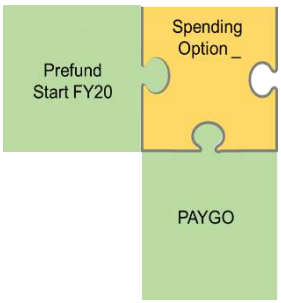
Figure 11. Alternative 4.1: $320M – (No Prefunding and No Debt)



Key Considerations:

- No prefunding requires higher revenue adjustments between 2030-2039.
- 50% increase in required in FY 2030 to meet spending needs.
- Future increases from FY 2040 and beyond average 3.43% due to the ramp up in revenue during the first 10 years of construction.
- Revenue needs generate inter-generational inequity
- Revenue adjustments fluctuate due to ramping up in early years of project.
- More than 50% of water mains replaced.

Alternative 4.2: $320M – (Prefunding with No Debt)

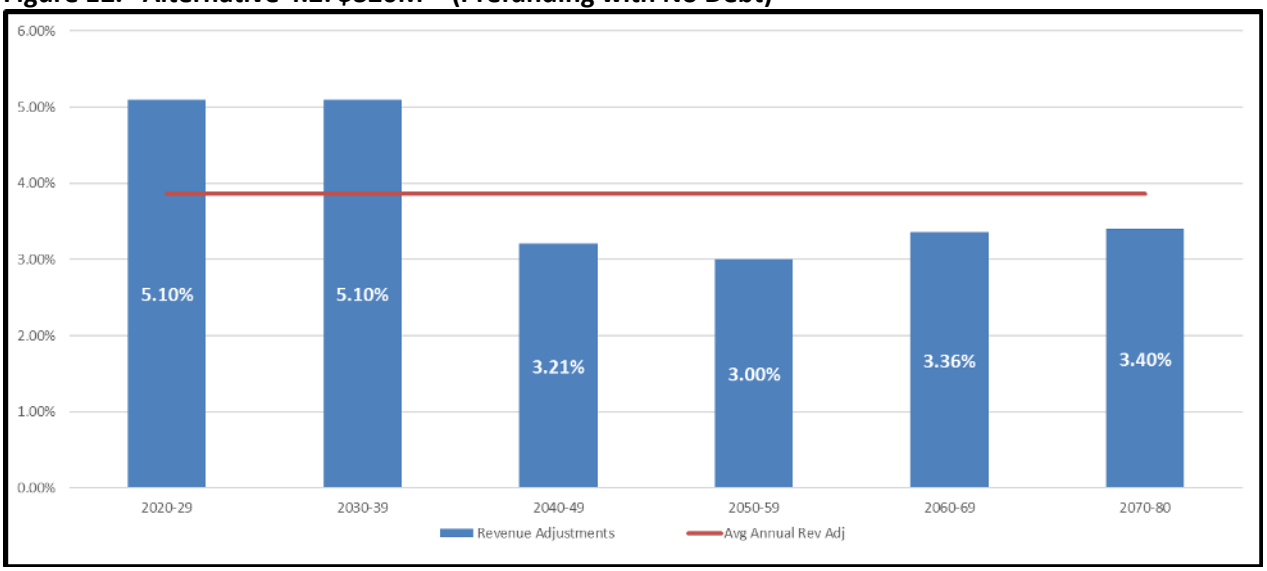


Alternative 4.2 is the same as Alternative 4.1, but with prefunding included. Prefunding primarily mitigates the increases during the first 10 years of the project shown in Alternative 4.1, while very modestly also reducing future revenue adjustments when compared to Alternative 4.1. Revenue adjustments increase up to 5.10% from FY 2020 through FY 20209 and reduces the 6.8% increases in Alternative 4.1 down to 5.1%. Table 9 provides a summary of Alternative 4.2 financial plan with key metrics in relation to the Study and Figure 12 identifies the expected revenue adjustments between 2020 through 2080.

Table 9. Alternative 4.2: $320M – (Prefunding with No Debt)

Spending	Total Cost	Water Main % Replaced	2080 Survival Probability	Annual Rev Increase	Debt	Prefund
Baseline	$320M	59%	2.10%	3.86%	No	**Yes**

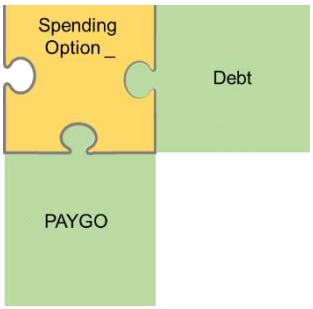
Figure 12. Alternative 4.2: $320M – (Prefunding with No Debt)



Key Considerations:

- Prefunding smooths out revenue adjustments during first 10 years of project.
- Annual revenue adjustments equal 5.10% for next 20 years.
- Future increases from FY 2040 and beyond average 3.24% due to the ramp up in revenue during the first 20 years of planning period.
- Revenue needs generate inter-generational inequity
- More than 50% of water mains replaced.

Alternative 4.3: $320M – (No Prefunding with Debt)

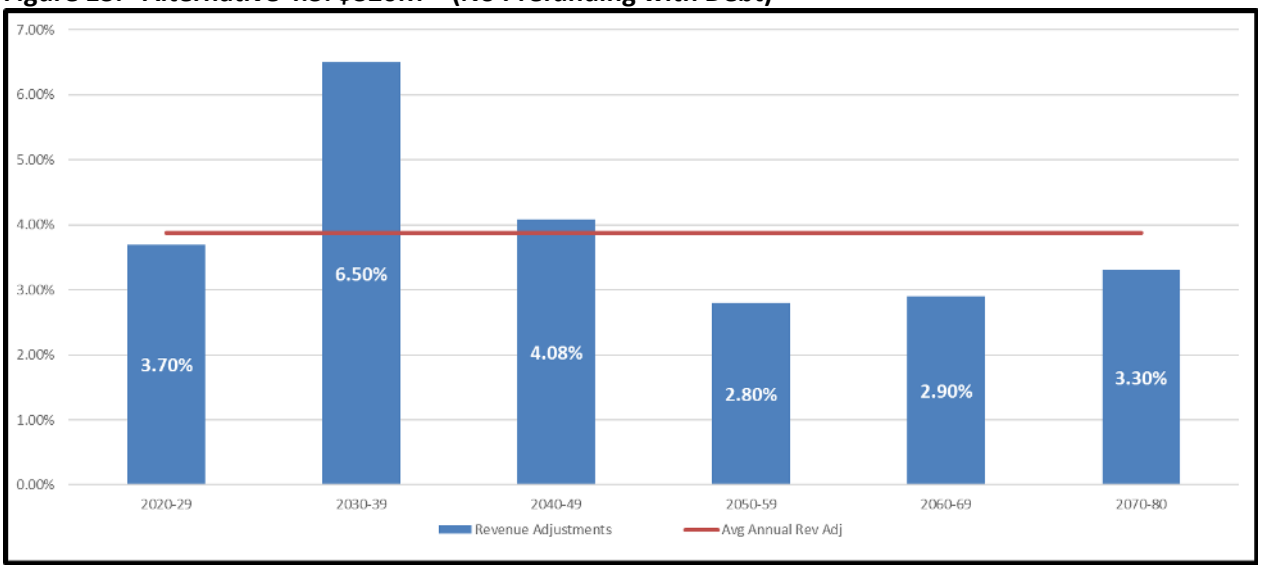


Alternative 4.3 is the first spending Alternative where debt is introduced to mitigate revenue increases by funding a portion of the Study cost with bond proceeds while incurring debt payments amortized over a 30-year amortization schedule. Within Alternative 4.3, 8% of the project is funded with debt with an initial bond issue in FY 2030 to reduce the revenue increase shown in Alternative 4.1. With the inclusion of debt, interest would add $78M to the total project cost; however, there may be opportunities to pay off debt early and eliminate future interest payments. Table 10 provides a summary of Alternative 4.3 financial plan with key metrics in relation to the Study and Figure 13 identifies the expected revenue adjustments between 2020 through 2080.

Table 10. Alternative 4.3: $320M – (No Prefunding with Debt)

Spending	Total Cost	Water Main % Replaced	2080 Survival Probability	Annual Rev Increase	Debt	Prefund
Baseline	$320M	59%	2.10%	3.60%	8%	No

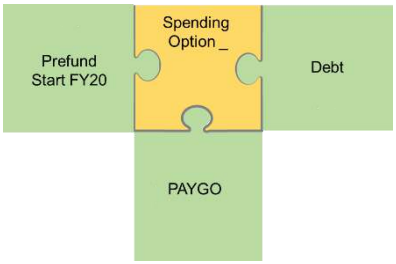
Figure 13. Alternative 4.3: $320M – (No Prefunding with Debt)



Key Considerations:

- Debt represents 8% of funding
- Slight reduced revenue needs during first 10 years of project when compared to Alternative 4.1.
- Interest on bonds adds $78M to project cost assuming no early redemption on bonds.
- More than 50% of water mains replaced.

Alternative 4.4: $320M – (Prefunding with Debt)

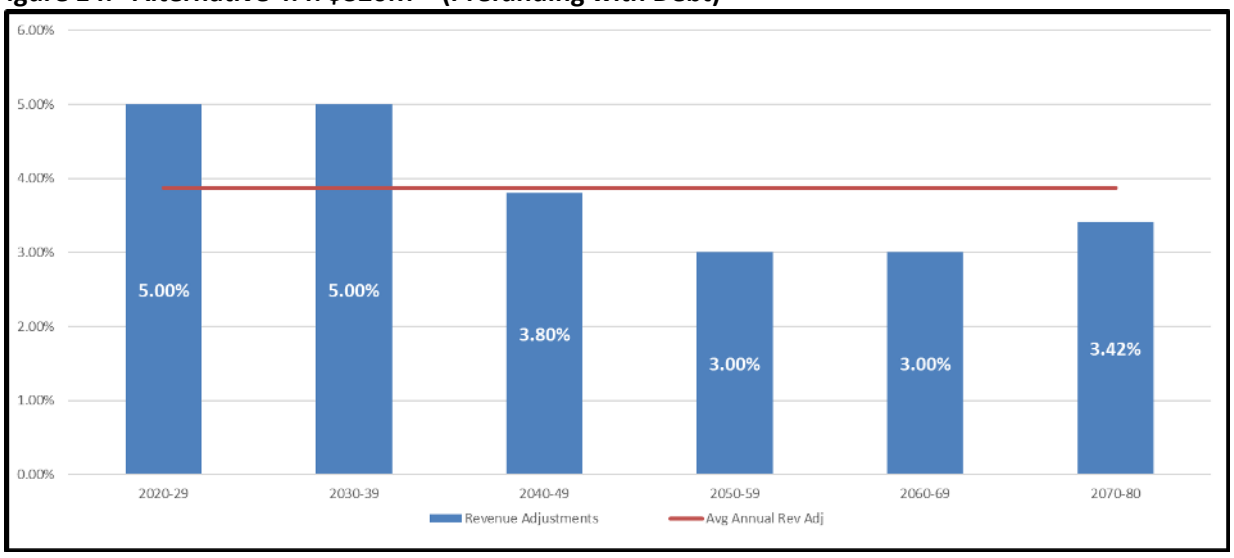


Alternative 4.4 includes both prefunding as well as debt. With the inclusion of prefunding, the amount of debt may be reduced and is primarily used to offset funding shortages and maintain reserves at adequate levels. Within Alternative 4.4, 5% of the project is funded with debt while funding is slowly increased commencing in FY 2020. With the inclusion of debt, interest would add $48M to the total project cost; however, there may be opportunities to pay off debt early and eliminate future interest payments. Table 11 provides a summary of Alternative 4.4 financial plan with key metrics in relation to the Study and Figure 14 identifies the expected revenue adjustments between 2020 through 2080.

Table 11. Alternative 4.4: $320M – (Prefunding with Debt)

Spending	Total Cost	Water Main % Replaced	2080 Survival Probability	Annual Rev Increase	Debt	Prefund
Baseline	$320M	59%	2.10%	3.87%	5%	**Yes**

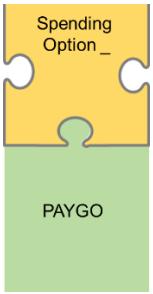
Figure 14. Alternative 4.4: $320M – (Prefunding with Debt)



Key Considerations:

- Average annual rate increase is slightly higher than Alternative 4.3, but interest reduced by $30M.
- Revenue needs in first 10 years of project reduced by prefunding.
- No significant revenue spikes in a specific year.
- Interest on bonds adds $48M to project cost assuming no early redemption on bonds.
- More than 50% of water mains replaced.

Alternative 5.1: $390M – (No Prefunding and No Debt)

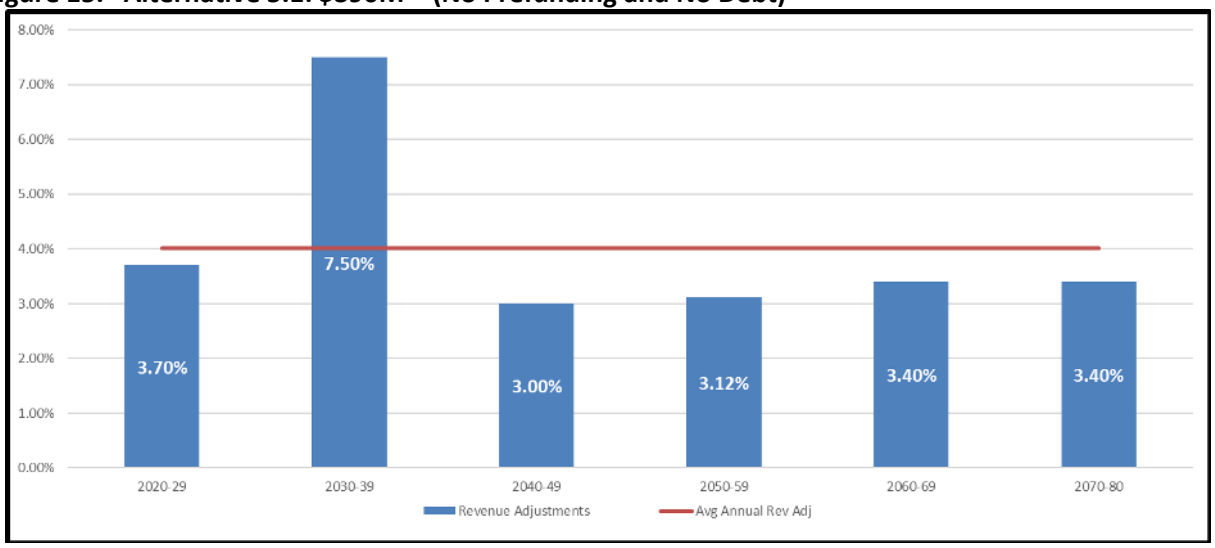


Alternative 5.1 reflects a significant increase in water main replacement for a total project cost of $390M with annual spending of $7.8M in 2018 dollars. At this level of spending, the exclusion of Prefunding and Debt requires significant spikes in funding. During the first two years of construction, revenue would need to increase by 30% and 20% in FY 2030 and FY 2031, respectively. With these substantial increases, this funding Alternative approach for this level of spending would not be viable. Table 12 provides a summary of Alternative 5.1 financial plan with key metrics in relation to the Study and Figure 15 identifies the expected revenue adjustments between 2020 through 2080.

Table 12. Alternative 5.1: $390M – (No Prefunding and No Debt)

Spending	Total Cost	Water Main % Replaced	2080 Survival Probability	Annual Rev Increase	Debt	Prefund
Baseline	$390M	72%	3.10%	4.02%	No	No

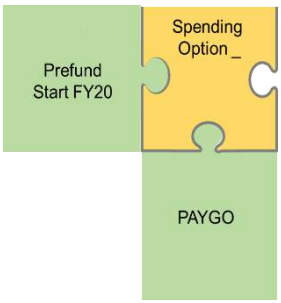
Figure 15. Alternative 5.1: $390M – (No Prefunding and No Debt)



Key Considerations:

- No prefunding requires higher revenue adjustments between 2030-2039.
- 30% increase in revenue required in FY 2030 followed by 20% increase in FY 2031.
- Revenue needs generate inter-generational inequity with existing customers primarily impacted.
- Revenue adjustments significantly fluctuate due to need to ramp up in early years of project.
- More than 72% of water mains replaced.

Alternative 5.2: $390M – (Prefunding with No Debt)

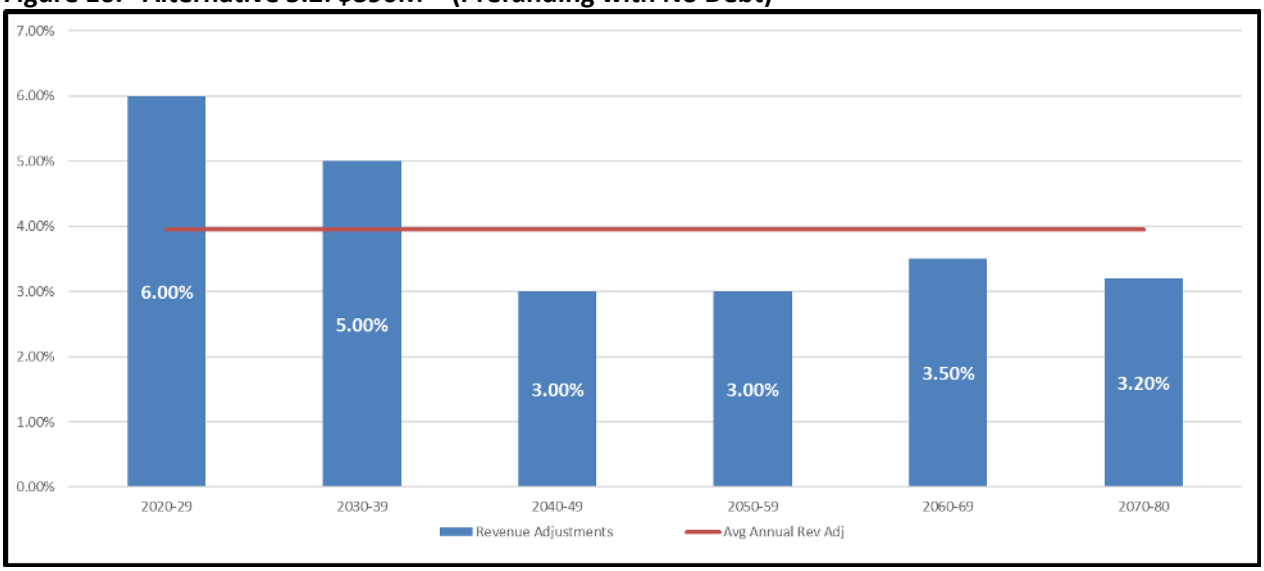


Alternative 5.2 incorporates prefunding with the primary goal to eliminate the significant revenue increases at the start of the project identified in Alternative 5.1. By adjusting revenue commencing in FY 2020, adjustments during the first 10 years of the project are reduced to 5% from 7.5% and eliminates the significant revenue spikes in FY 2030 and FY 2031. Table 13 provides a summary of Alternative 5.2 financial plan with key metrics in relation to the Study and Figure 16 identifies the expected revenue adjustments between 2020 through 2080.

Table 13. Alternative 5.2: $390M – (Prefunding with No Debt)

Spending	Total Cost	Water Main % Replaced	2080 Survival Probability	Annual Rev Increase	Debt	Prefund
Baseline	$390M	72%	3.10%	3.95%	No	**Yes**

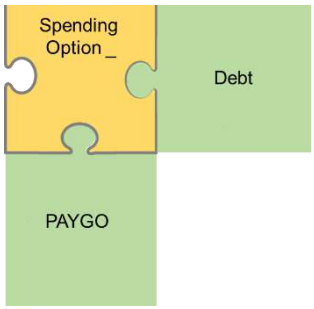
Figure 16. Alternative 5.2: $390M – (Prefunding with No Debt)



Key Considerations:

- Prefunding smooths out revenue adjustments during first 10 years of project.
- Eliminates significant increases in revenue in FY 2030 and FY 2031 identified in Alternative 5.1.
- Annual average revenue adjustments equal 3.95% over project completion.
- Future revenue increases from FY 2040 and beyond average 3.18% due to the ramp up in revenue during the first 20 years of planning period.
- More than 72% of water mains replaced.

Alternative 5.3: $390M – (No Prefunding with Debt)

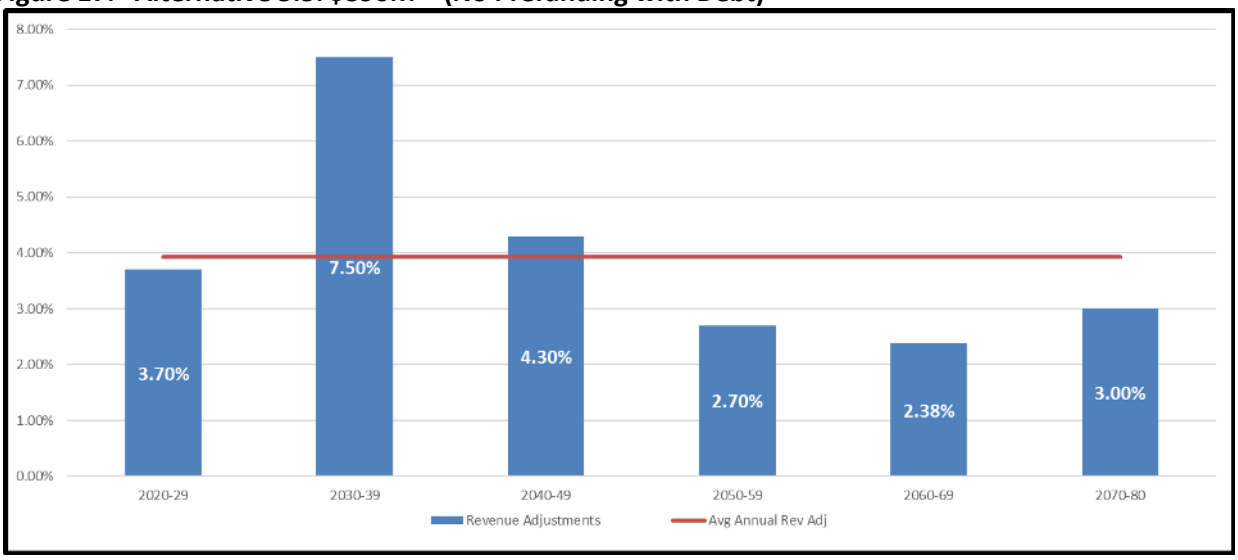


Alternative 5.3 removes prefunding but includes debt financing. Within Alternative 5.3, 10% of the project is funded with debt with an initial bond issue in FY 2030. This Alternative isn't much different from Alternative 5.1 when comparing average annual revenue adjustments of 4.02% in Alternative 5.1 to 3.93% in Alternative 5.3; however, the significant increases in FY 2030 and FY 2031 are eliminated with the introduction of debt financing. With the inclusion of debt, interest would add $122M to the total project cost; however, there may be opportunities to pay off debt early and eliminate future interest payments. Table 14 provides a summary of Alternative 5.3 financial plan with key metrics in relation to the Study and Figure 17 identifies the expected revenue adjustments between 2020 through 2080.

Table 14. Alternative 5.3: $390M – (No Prefunding with Debt)

Spending	Total Cost	Water Main % Replaced	2080 Survival Probability	Annual Rev Increase	Debt	Prefund
Baseline	$390M	72%	3.10%	3.93%	10%	No

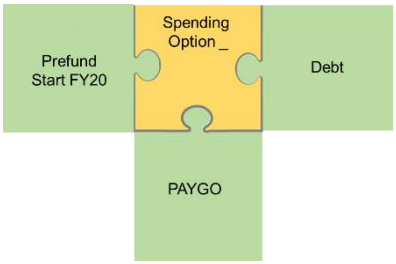
Figure 17. Alternative 5.3: $390M – (No Prefunding with Debt)



Key Considerations:

- Inclusion of debt eliminates revenue spikes in FY 2030 and FY 2031 as shown in Alternative 5.1.
- Debt represents 10% of funding
- Interest on bonds adds $122M to project cost assuming no early redemption on bonds.
- More than 72% of water mains replaced.

Alternative 5.4: $390M – (Prefunding with Debt)

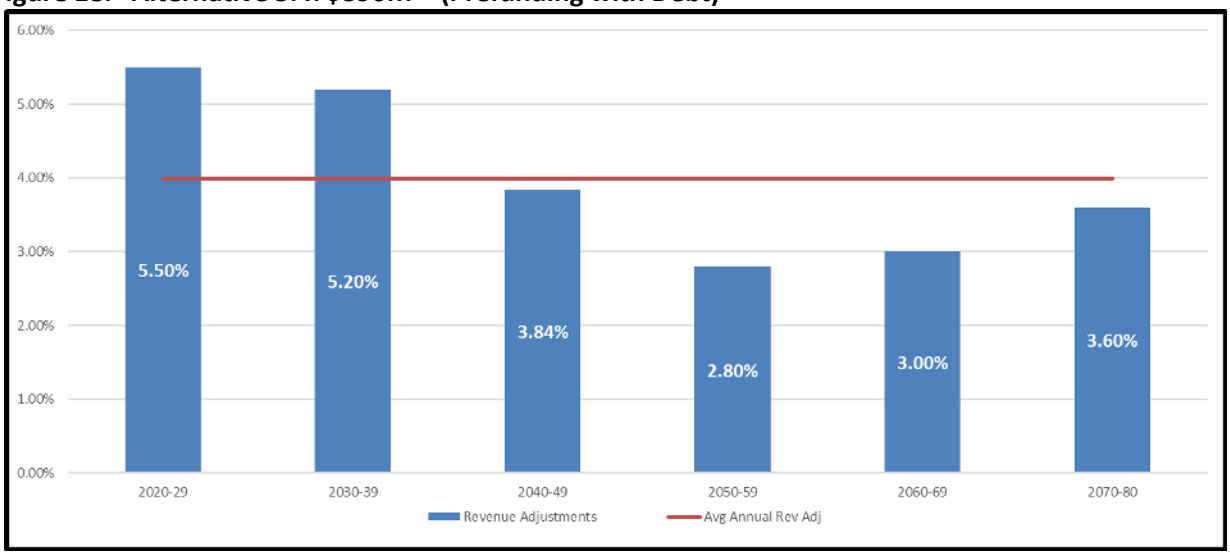


Alternative 5.4 includes both prefunding as well as debt. With the inclusion of prefunding, the amount of debt may be reduced and is primarily used to offset funding shortages for annual cashflow and maintain reserves at adequate levels. Within Alternative 5.4, 4% of the project is funded with debt as funding is slowly increased commencing in FY 2020. With the inclusion of debt, interest would add $48M to the total project cost; however, there may be opportunities to pay off debt early and eliminate future interest payments. Table 15 provides a summary of Alternative 5.4 financial plan with key metrics in relation to the Study and Figure 18 identifies the expected revenue adjustments between 2020 through 2080.

Table 15. Alternative 5.4: $390M – (Prefunding with Debt)

Spending	Total Cost	Water Main % Replaced	2080 Survival Probability	Annual Rev Increase	Debt	Prefund
Baseline	$390M	72%	3.10%	3.99%	4%	Yes

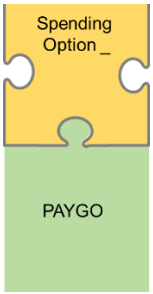
Figure 18. Alternative 5.4: $390M – (Prefunding with Debt)



Key Considerations:

- Average annual rate increase is slightly higher than Alternative 5.3, but interest reduced by $74M.
- Revenue needs in first 10 years of project reduced by prefunding.
- No significant spikes in a specific year.
- Interest on bonds adds $48M to project cost assuming no early redemption on bonds.
- More than 72% of water mains replaced.

Alternative 6.1: $480M – (No Prefunding and No Debt)

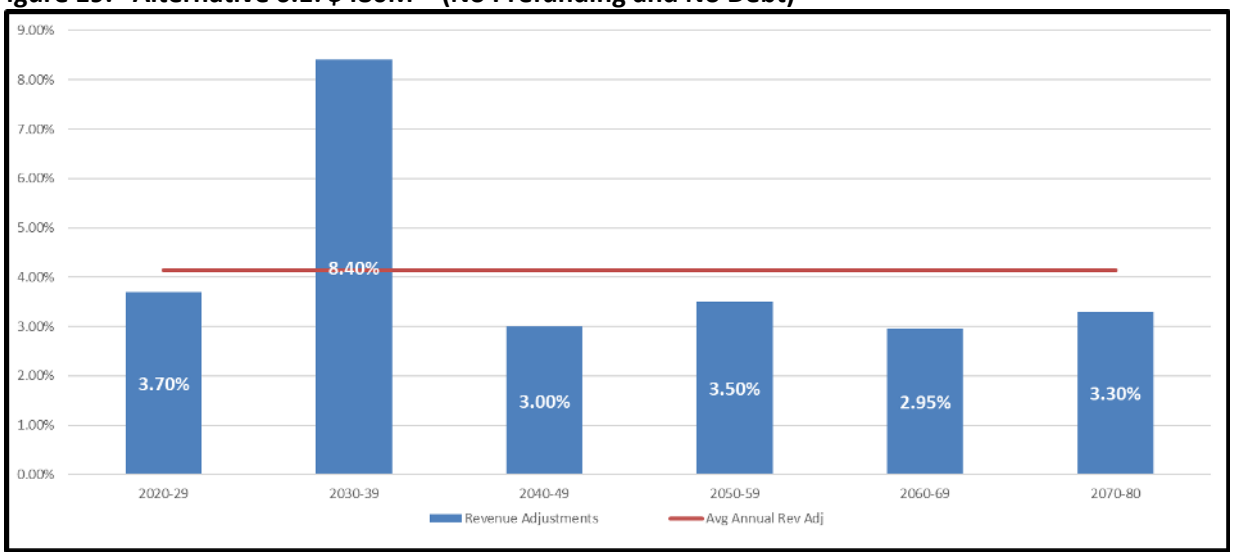


Alternative 6.1 reflects a significant increase in water main replacement for a total project cost of $480M with annual spending of $9.6M in 2018 dollars. At this level of spending, the exclusion of prefunding and debt requires significant spikes in funding. During the first two years of construction, revenue would need to increase by 30% and 30% in FY 2030 and FY 2031, respectively. With these substantial increases, this funding Alternative approach for this level of spending would not be viable. Table 16 provides a summary of Alternative 6.1 financial plan with key metrics in relation to the Study and Figure 19 identifies the expected revenue adjustments between 2020 through 2080.

Table 16. Alternative 6.1: $480M – (No Prefunding and No Debt)

Spending	Total Cost	Water Main % Replaced	2080 Survival Probability	Annual Rev Increase	Debt	Prefund
Baseline	$480M	89%	10%	3.60%	No	No

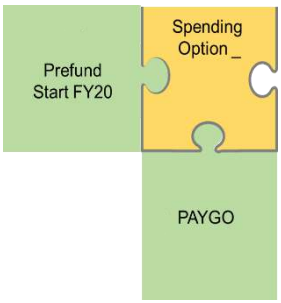
Figure 19. Alternative 6.1: $480M – (No Prefunding and No Debt)



Key Considerations:

- No prefunding requires higher revenue adjustments between 2030-2039.
- 30% increase in revenue required in FY 2030 and FY 2031.
- Revenue adjustments significantly fluctuate due to need to ramp up in early years of project.
- Revenue needs generate inter-generational inequity with existing customers primarily impacted
- More than 89% of water mains replaced.

Alternative 6.2: $480M – (Prefunding with No Debt)

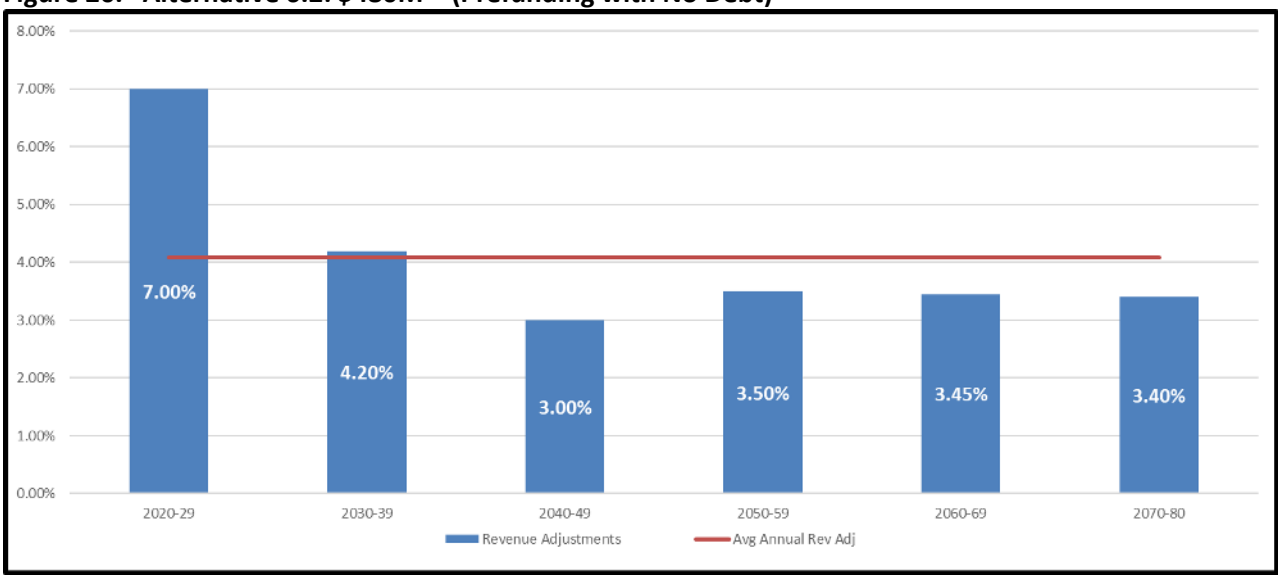


Alternative 6.2 incorporates prefunding with the primary goal to eliminate the significant revenue increases at the start of the project identified in Alternative 6.1. By adjusting revenue commencing in FY 2020, adjustments during the first 10 years of the project are reduced to 4.2% from 8.4% and eliminates the significant revenue spikes in FY 2030 and FY 2031. Table 17 provides a summary of Alternative 6.2 financial plan with key metrics in relation to the Study and Figure 20 identifies the expected revenue adjustments between 2020 through 2080.

Table 17. Alternative 6.2: $480M – (Prefunding with No Debt)

Spending	Total Cost	Water Main % Replaced	2080 Survival Probability	Annual Rev Increase	Debt	Prefund
Baseline	$480M	89%	10%	4.09%	No	**Yes**

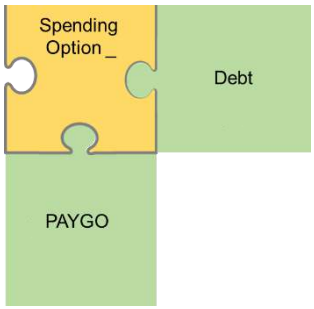
Figure 20. Alternative 6.2: $480M – (Prefunding with No Debt)



Key Considerations:

- Prefunding smooths out revenue adjustments during first 10 years of project.
- Eliminates significant revenue increases in FY 2030 and FY 2031 identified in Alternative 6.1.
- Annual average revenue adjustments equal 4.09% over project completion.
- Future revenue increases from FY 2040 and beyond average 3.34% due to the ramp up in revenue during the first 20 years of planning period.
- More than 89% of water mains replaced.

Alternative 6.3: $480M – (No Prefunding with Debt)

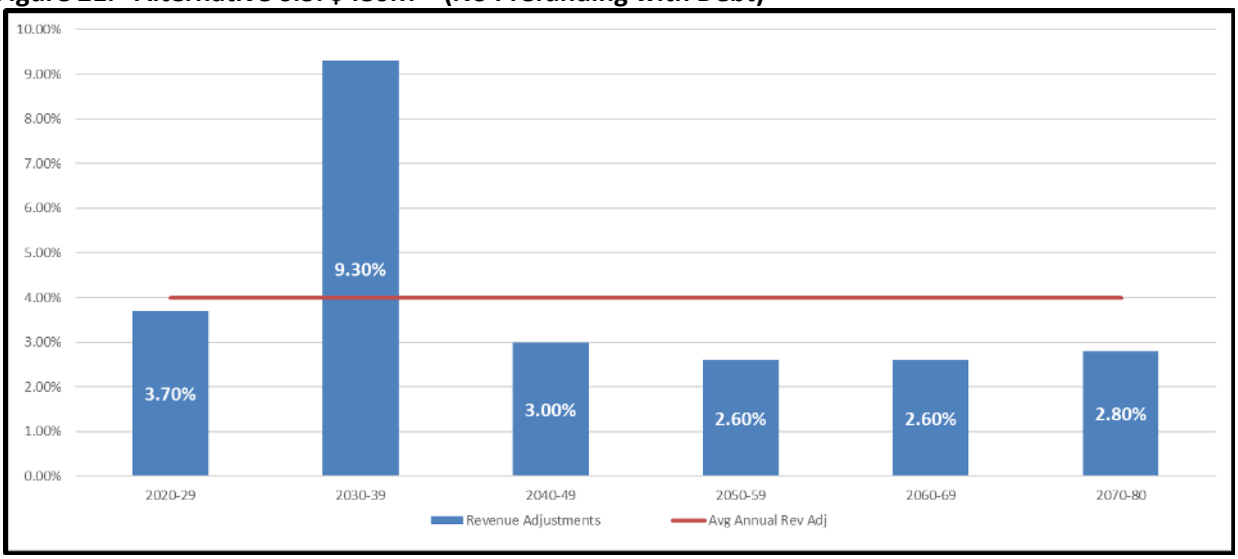


Alternative 6.3 removes prefunding but includes debt financing. Within Alternative 5.3, 6% of the project is funded with debt with an initial bond issue in FY 2030. This Alternative eliminates the significant increases in FY 2030 and FY 2031. However, without prefunding, revenue increases are still relatively high during the first ten years of the project to cover increased spending and additional debt serve payments. With the inclusion of debt, interest would add $96M to the total project cost; however, the debt service payments extend over 34 years and there may be opportunities to pay off debt early and eliminate future interest payments. Table 18 provides a summary of Alternative 6.3 financial plan with key metrics in relation to the Study and Figure 21 identifies the expected revenue adjustments between 2020 through 2080.

Table 18. Alternative 6.3: $480M – (No Prefunding with Debt)

Spending	Total Cost	Water Main % Replaced	2080 Survival Probability	Annual Rev Increase	Debt	Prefund
Baseline	$480M	89%	10%	4.00%	6%	No

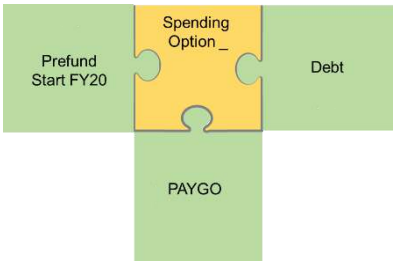
Figure 21. Alternative 6.3: $480M – (No Prefunding with Debt)



Key Considerations:

- Inclusion of debt eliminates revenue spikes in FY 2030 and FY 2031 as shown in Alternative 6.1.
- Revenue adjustments are still high for first 10 years due to no Prefunding
- Debt represents 6% of funding
- Interest on bonds adds $96M to project cost but extends over 34 years.
- More than 89% of water mains replaced.

Alternative 6.4: $480M – (Prefunding with Debt)

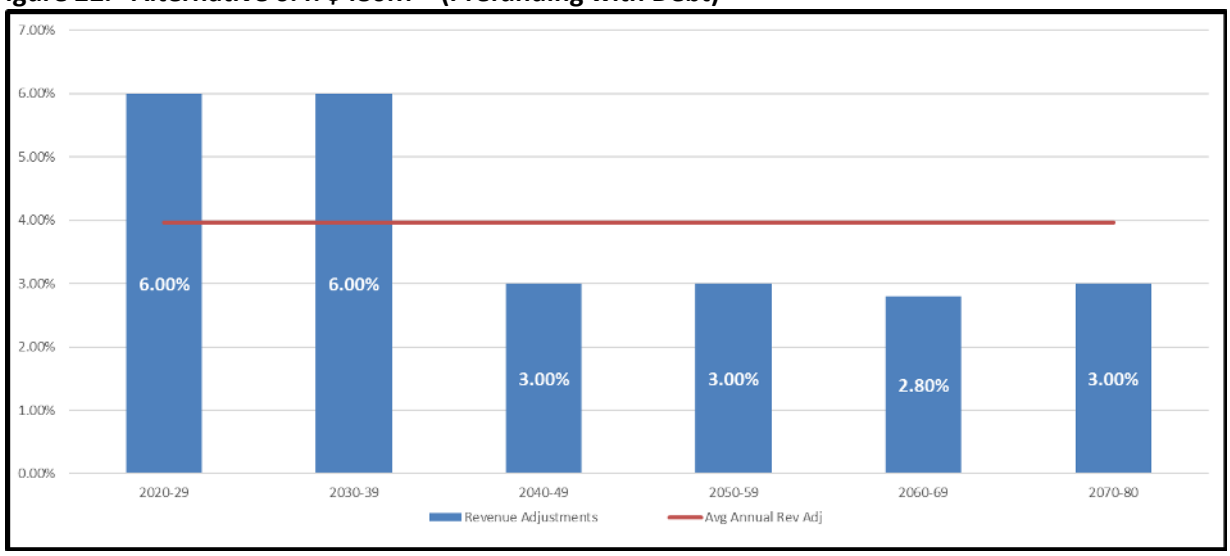


Alternative 6.4 includes both prefunding as well as debt. With the inclusion of prefunding, debt is slightly increased within this Alternative whereas in previous similar Alternatives, debt was reduced. With prefunding and 9% of the project funded through debt financing, the average annual revenue increase through project completion is 3.97%. Interest would add $132M to the total project cost; however, the debt service payments extend over 72 years and there may be opportunities to pay off debt early and eliminate future interest payments. Table 19 provides a summary of Alternative 6.4 financial plan with key metrics in relation to the Study and Figure 22 identifies the expected revenue adjustments between 2020 through 2080.

Table 19. Alternative 6.4: $480M – (Prefunding with Debt)

Spending	Total Cost	Water Main % Replaced	2080 Survival Probability	Annual Rev Increase	Debt	Prefund
Baseline	$480M	89%	10%	3.97%	9%	**Yes**

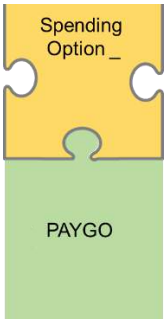
Figure 22. Alternative 6.4: $480M – (Prefunding with Debt)



Key Considerations:

- First 20 years, average annual revenue increase limited to 6%
- Future years, average annual revenue increase limited to 3%
- Revenue needs in first 10 years of project reduced by prefunding.
- No significant revenue spikes in a specific year.
- Interest on bonds adds $132M to project cost but extends over 72 years.
- More than 89% of water mains replaced.

Alternative 7.1: $510M – (No Prefunding and No Debt)

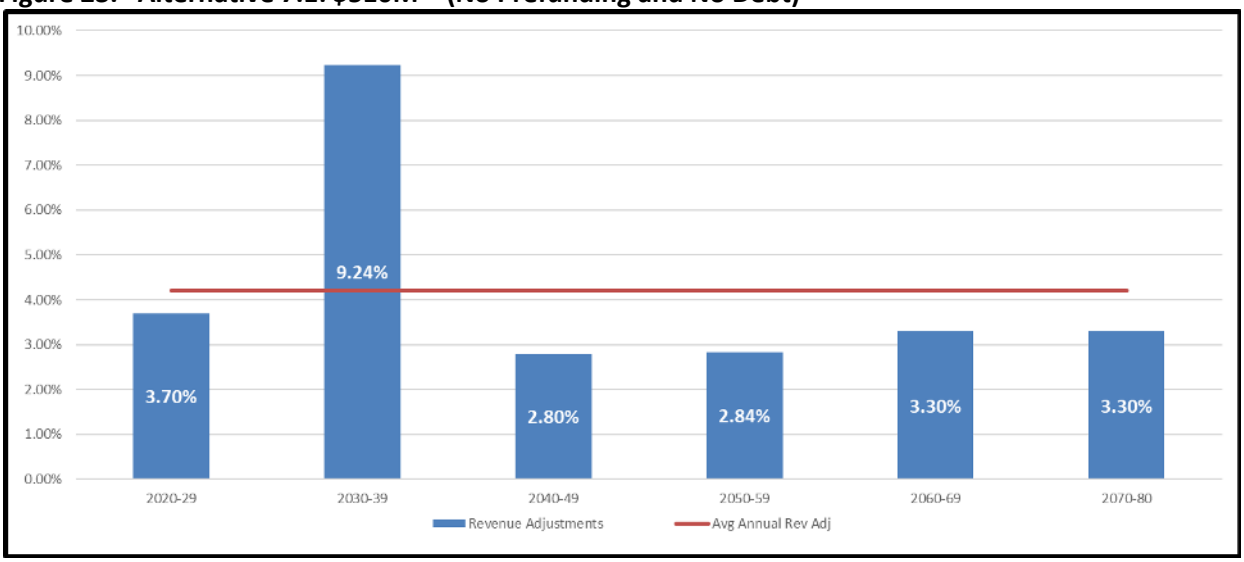


Alternative 7.1 reflects a greatest reinvestment in water main replacement for a total project cost of $510M with annual spending of $10.2M in 2018 dollars. At this level of spending, the exclusion of prefunding and debt requires significant spikes in funding. During the first two years of construction, revenue would need to increase by 35% for FY 2030 and FY 2031. With these substantial increases, this funding Alternative approach for this level of spending would not be a viable Alternative but is included for comparison purposes. Table 20 provides a summary of Alternative 7.1 financial plan with key metrics in relation to the Study and Figure 23 identifies the expected revenue adjustments between 2020 through 2080.

Table 20. Alternative 7.1: $510M – (No Prefunding and No Debt)

Spending	Total Cost	Water Main % Replaced	2080 Survival Probability	Annual Rev Increase	Debt	Prefund
Baseline	$510M	94%	16.50%	4.20%	No	Yes

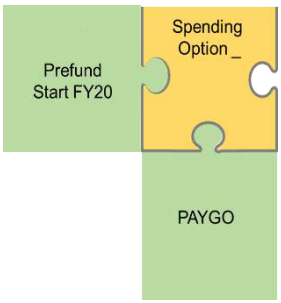
Figure 23. Alternative 7.1: $510M – (No Prefunding and No Debt)



Key Considerations:

- No prefunding requires significant revenue adjustments between 2030-2039.
- 35% increase in revenue required in FY 2030 followed by 20% increase in FY 2031.
- Revenue needs generate inter-generational inequity with existing customers primarily impacted
- Revenue adjustments significantly fluctuate due to need to ramp up in early years of project.
- Approximately 94% of water mains replaced.

Alternative 7.2: $510M – (Prefunding with No Debt)

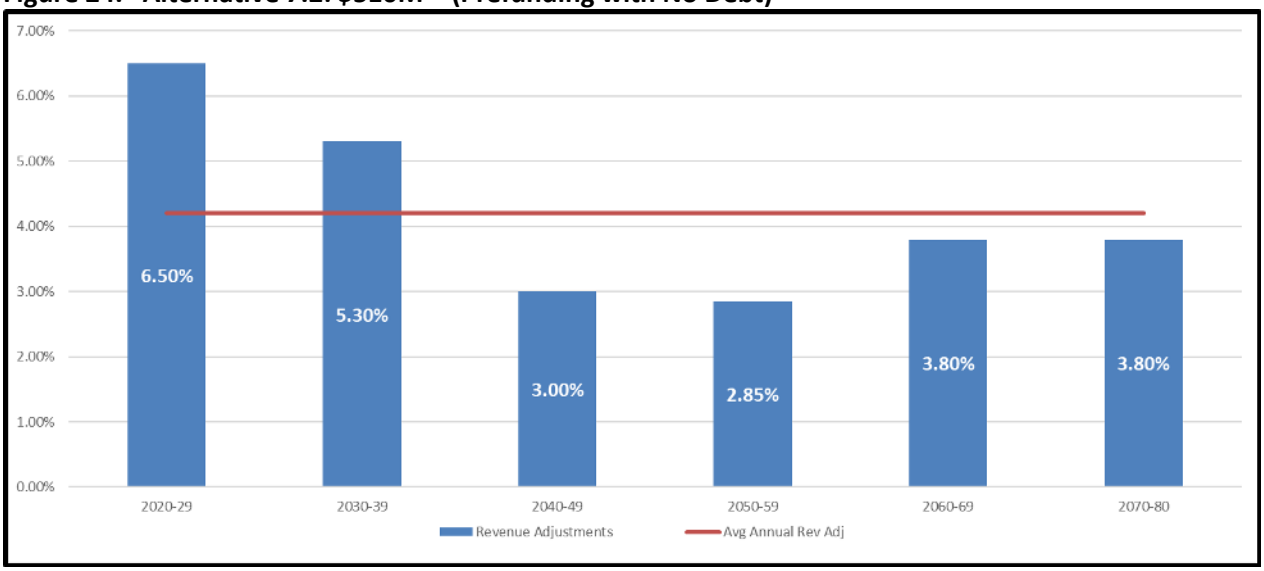


Alternative 7.2 incorporates prefunding with the primary goal to eliminate the significant revenue increases at the start of the project identified in Alternative 7.1. By adjusting revenue commencing in FY 2020, adjustments during the first 10 years of the project are reduced to 5.3% from 9.24% and eliminates the significant revenue spikes in FY 2030 and FY 2031. Table 21 provides a summary of Alternative 7.2 financial plan with key metrics in relation to the Study and Figure 24 identifies the expected revenue adjustments between 2020 through 2080.

Table 21. Alternative 7.2: $510M – (Prefunding with No Debt)

Spending	Total Cost	Water Main % Replaced	2080 Survival Probability	Annual Rev Increase	Debt	Prefund
Baseline	$510M	94%	16.50%	4.21%	No	**Yes**

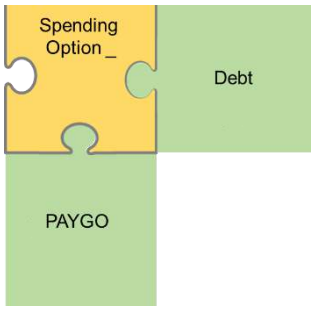
Figure 24. Alternative 7.2: $510M – (Prefunding with No Debt)



Key Considerations:

- Prefunding smooths out revenue adjustments during first 10 years of project.
- Eliminates significant revenue increases in FY 2030 and FY 2031 identified in Alternative 7.1.
- Revenue needs front loaded during first 20 years.
- Future revenue increases from FY 2040 and beyond average 3.36% due to the ramp up in revenue during the first 20 years of planning period.
- Approximately 94% of water mains replaced.

Alternative 7.3: $510M – (No Prefunding with Debt)

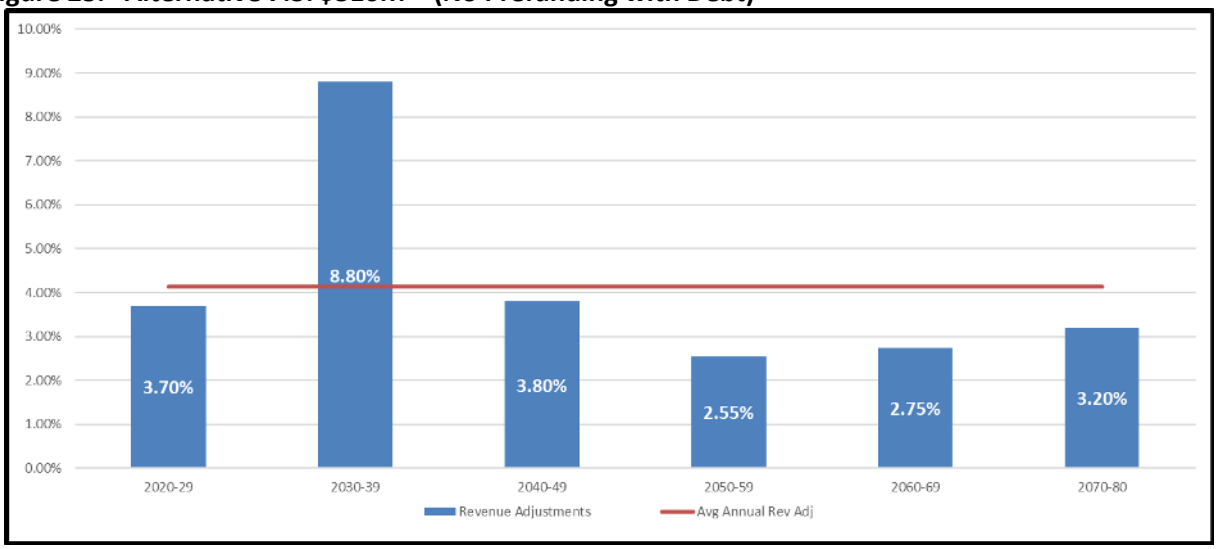


Alternative 7.3 removes prefunding but includes debt financing. Within Alternative 7.3, 6% of the project is funded with debt with an initial bond issue in FY 2030. This Alternative isn't much different from Alternative 7.1 when comparing average annual revenue adjustments of 4.20% in Alternative 7.1 to 4.13% in Alternative 7.3; however, the significant revenue increases in FY 2030 and FY 2031 are eliminated with the introduction of debt financing. With the inclusion of debt, interest would add $96M to the total project cost; however, there may be opportunities to pay off debt early and eliminate future interest payments. Table 22 provides a summary of Alternative 7.3 financial plan with key metrics in relation to the Study and Figure 24 identifies the expected revenue adjustments between 2020 through 2080.

Table 22. Alternative 7.3: $510M – (No Prefunding with Debt)

Spending	Total Cost	Water Main % Replaced	2080 Survival Probability	Annual Rev Increase	Debt	Prefund
Baseline	$510M	94%	16.50%	4.13%	6%	No

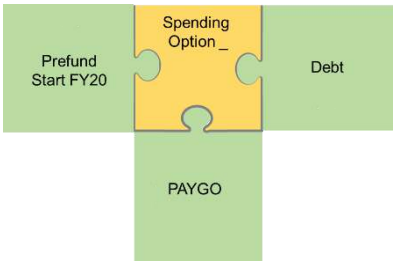
Figure 25. Alternative 7.3: $510M – (No Prefunding with Debt)



Key Considerations:

- Inclusion of debt eliminates revenue spikes in FY 2030 and FY 2031 as shown in Alternative 7.1.
- Debt represents 6% of funding.
- Interest on bonds adds $96M to project cost but extends over 34 years.
- Approximately 94% of water mains replaced.

Alternative 7.4: $510M – (Prefunding with Debt)

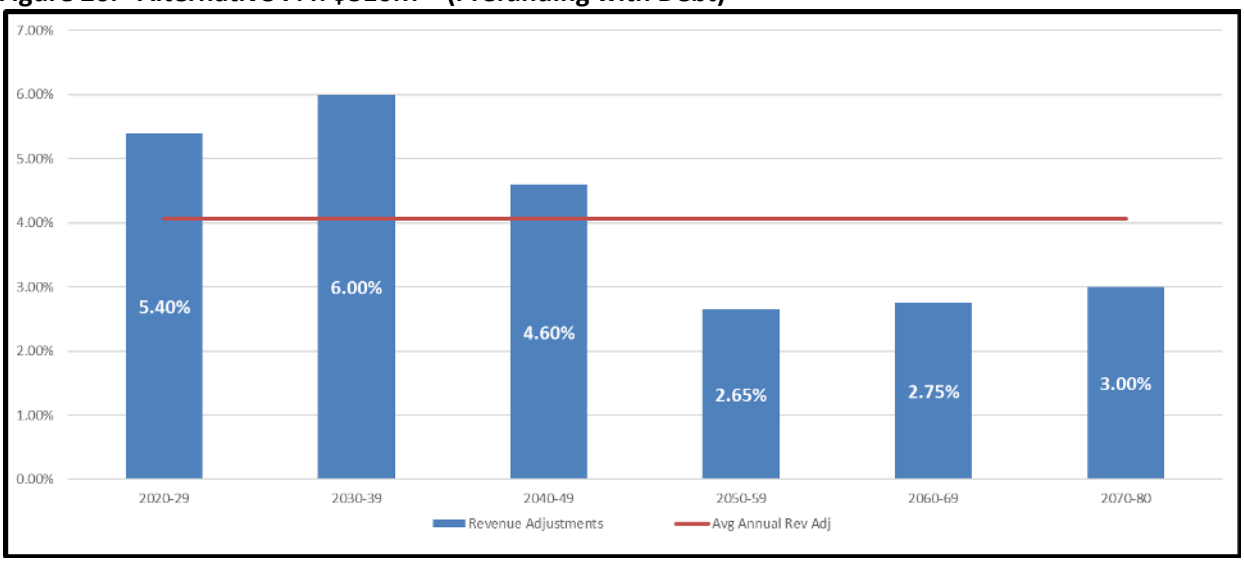


Alternative 7.4 includes both prefunding as well as debt. With the inclusion of prefunding, debt is slightly increased within this Alternative whereas in certain previous similar Alternatives, debt was reduced. With prefunding and 15% of the project funded through debt financing, the average annual revenue increase through project completion is 4.07%. Interest would add $249M to the total project cost over 74 years; however, there may be opportunities to pay off debt early and eliminate future interest payments. Table 23 provides a summary of Alternative 7.4 financial plan with key metrics in relation to the Study and Figure 26 identifies the expected revenue adjustments between 2020 through 2080.

Table 23. Alternative 7.4: $510M – (Prefunding with Debt)

Spending	Total Cost	Water Main % Replaced	2080 Survival Probability	Annual Rev Increase	Debt	Prefund
Baseline	$510M	94%	16.50%	4.07%	15%	**Yes**

Figure 26. Alternative 7.4: $510M – (Prefunding with Debt)



Key Considerations:

- First 20 years, average annual revenue increase limited to 5.7%
- Future years, average annual revenue increase limited to 3.25%
- Revenue needs in first 10 years of project reduced by prefunding.
- No significant revenue spikes in a specific year.
- Interest on bonds adds $249M to project cost but extends over 74 years.
- More than 89% of water mains replaced.

NEXT STEPS

Through upcoming workshops, the District will evaluate these 21 different spending and funding alternatives and compare the key considerations of each. Through a series of CAC meetings, these 21 alternatives will be winnowed down to the top two (2) or three (3) alternatives. A market research firm will then conduct a hybrid internet and telephone survey of 500 District customers and property owners of the top 2 or 3 alternatives to provide additional input to the District and CAC members. With this information and through workshops, the District will develop an implementation plan to recommend to the District's Board of Directors for discussion and possible action.

EXHIBIT A

		Spending			Funding									
Alternative	Funding Description	Project Cost 2018	Years to Complete	Annual Spending	Total Cost (Inflated)	Percent Debt	Interest	Avg Annual Rate Increase (2020-2029)	Avg Annual Rate Increase (2030-2039)	Avg Annual Rate Increase (2040-2049)	Avg Annual Rate Increase (2050-2059)	Avg Annual Rate Increase (2060-2069)	Avg Annual Rate Increase (2070-2080)	Avg Annual Rate Increase (Through 2079)
1	Baseline	$100	50	$2.0	$759	0%	$0	3.70%	4.20%	3.70%	3.28%	3.10%	3.50%	3.58%
2.1	No-Prefunding; No Debt	"	"	"	"	0%	$0	3.70%	5.50%	2.52%	2.70%	3.93%	3.90%	3.71%
2.2	Prefunding; No Debt	$150	50	$3.0	$507	0%	$0	4.01%	4.20%	3.50%	3.30%	3.30%	3.30%	3.60%
3.1	No-Prefunding; No Debt	"	"	"	"	0%	$0	3.70%	5.32%	2.77%	3.50%	3.70%	2.96%	3.66%
3.2	Prefunding; No Debt	$200	50	$4.0	$677	0%	$0	4.41%	4.20%	3.70%	3.28%	3.10%	3.15%	3.64%
4.1	No-Prefunding; No Debt	"	"	"	"	0%	$0	3.70%	6.80%	3.25%	3.60%	3.20%	3.65%	4.03%
4.2	Prefunding; No Debt	"	"	"	"	0%	$0	5.10%	5.10%	3.21%	3.00%	3.36%	3.40%	3.86%
4.3	No-Prefunding w/ Debt	"	"	"	$1,080	8%	$78	3.70%	6.50%	4.08%	2.80%	2.90%	3.30%	3.88%
4.4	Prefunding w/ Debt	$320	50	$6.4	$1,080	5%	$48	5.00%	5.00%	3.80%	3.00%	3.00%	3.42%	3.87%
5.1	No-Prefunding; No Debt	"	"	"	"	0%	$0	3.70%	7.50%	3.00%	3.12%	3.40%	3.40%	4.02%
5.2	Prefunding; No Debt	"	"	"	"	0%	$0	6.00%	5.00%	3.00%	3.00%	3.50%	3.20%	3.95%
5.3	No-Prefunding w/ Debt	"	"	"	$1,300	10%	$122	3.70%	7.50%	4.30%	2.70%	2.38%	3.00%	3.93%
5.4	Prefunding w/ Debt	$390	50	$7.8	$1,300	4%	$48	5.50%	5.20%	3.84%	2.80%	3.00%	3.60%	3.99%
6.1	No-Prefunding; No Debt	"	"	"	"	0%	$0	3.70%	8.40%	3.00%	3.50%	2.95%	3.30%	4.14%
6.2	Prefunding; No Debt	"	"	"	"	0%	$0	7.00%	4.20%	3.00%	3.50%	3.45%	3.40%	4.09%
6.3	No-Prefunding w/ Debt	"	"	"	$1,600	6%	$96	3.70%	9.30%	3.00%	2.60%	2.60%	2.80%	4.00%
6.4	Prefunding w/ Debt	$480	50	$9.6	$1,600	9%	$132	6.00%	6.00%	3.00%	3.00%	2.80%	3.00%	3.97%
7.1	No-Prefunding; No Debt	"	"	"	"	0%	$0	3.70%	9.24%	2.80%	2.84%	3.30%	3.30%	4.20%
7.2	Prefunding; No Debt	"	"	"	"	0%	$0	6.50%	5.30%	3.00%	2.85%	3.80%	3.80%	4.21%
7.3	No-Prefunding w/ Debt	"	"	"	$1,700	6%	$96	3.70%	8.80%	3.80%	2.55%	2.75%	3.20%	4.13%
7.4	Prefunding w/ Debt	$510	50	$10.2	$1,700	15%	$249	5.40%	6.00%	4.60%	2.65%	2.75%	3.00%	4.07%