



Wastewater Capacity Charge: Unclear Whether Growth Is Paying for Growth

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Executive Summary

The purpose of the capacity charge is to ensure that new customers pay the costs of expanding the wastewater system. The model that calculates the annual amount of the capacity charge is highly complex, not transparent, not independently verifiable, and susceptible to errors. Furthermore, ambiguous policies and unsupported methodology choices make it difficult to determine whether the model is achieving its purpose. A simpler approach to ensuring that growth pays for growth could provide greater transparency and accountability.



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Wastewater Capacity Charge: Unclear Whether Growth Is Paying for Growth

Report Highlights

August 23, 2016

Why This Audit Is Important

King County charges new customers to the wastewater treatment system with a capacity charge of over \$10,000. This revenue is intended to pay for the costs necessary to expand the system, which could total more than \$3 billion through 2030.¹ The capacity charge raised over \$60 million in 2015, and is projected to collect twice that amount in 2030. Each year the proposed capacity charge amount is based on a highly-sophisticated computer model that is not widely understood. Any errors in this model could potentially shift the responsibility to pay hundreds of millions of dollars between new and existing customers. This audit reviewed the logic and calculations of the model to ensure that its outputs are consistent with county policies.

What We Found

The capacity charge model is very complex, and this complexity means that it lacks transparency to stakeholders, its accuracy cannot be independently verified, and it is susceptible to errors. The Auditor's Office discovered errors that would have shifted over \$137 million in growth costs from new to existing customers had they not been resolved. The Auditor's Office also noted methodology choices, which appear contrary to the intent of Council-enacted policies that shift over \$100 million in growth costs between existing and new customers. Furthermore, we found the financial policies governing the calculation of the capacity charge contain ambiguous sections that are potentially contradictory and might contain drafting errors.

What We Recommend

We recommend that the Wastewater Treatment Division develop a simpler and more transparent approach to calculating the capacity charge, which would also allow for independent and periodic review. The division should work with Council and other stakeholders to align its methodology with the Council-enacted financial policies, and these policies should be modified to provide clear guidance to the division.

¹ Unless otherwise specified, dollar amounts in this report are expressed in real 2016 dollars, assuming three percent inflation.

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Does Growth Pay for Growth? Unclear for Three Reasons.

Section Summary

It is unclear whether current practices are achieving King County’s policy that growth revenues from new customers should pay for the growth costs of expanding the capacity of the wastewater system. This is due to several issues related to a complex computer model, methodology choices that appear contrary to policy intent, and certain ambiguous financial policies. Since existing customers pay for initial growth costs, and growth revenues cannot pay for all growth costs in the same year, the capacity charge eventually allows existing customers to pay lower rates. The financial policies do not specify over what time period growth revenues should equal growth costs, but the current practice is to balance these amounts over a 28-year period.

How does King County pay for growth in the wastewater treatment system?

King County imposes a “capacity charge” on all new customers so that growth pays for growth. As the population of King County expands, so too must the wastewater treatment system. Expanding the capacity of the system, however, can sometimes cost billions of dollars. The County Council enacted financial policies stating that new connections to the system should bear the cost of expanding its capacity.

To accomplish the goal of growth paying for growth, new customers pay a capacity charge based on when they first connect to the system. Each year the County Executive proposes a new capacity charge amount for the County Council to adopt. This proposed capacity charge amount comes from a computer model developed by the Wastewater Treatment Division (WTD).

Is growth paying for growth?

It is unclear whether new customers are paying the correct amount in order for growth to pay for growth. This lack of clarity is due to a number of interrelated issues that fall into three categories:

1. **Computer model is too complex** – the County’s approach to determining the capacity charge has led to a highly complex model that lacks transparency, cannot be independently verified, and is susceptible to errors.
2. **Methodology choices appear contrary to policy intent** – certain decisions made when designing the model impacted the capacity charge in ways that appear contrary to the intent of Council-enacted financial policies.
3. **Ambiguous financial policies** – certain sections of the financial policies are potentially contradictory, might contain drafting errors, and have led to issues with implementation.

Does Growth Pay for Growth? Unclear for Three Reasons.

Some of the issues in these categories have opposing impacts on the capacity charge. For example, one issue might result in the capacity charge being too much, while another issue might make it too small. This means many of these issues partially cancel each other out. Even if these issues were resolved, it would be difficult to determine the “correct” amount, since there is no single definition of what “growth paying for growth” means.

Many of these issues could be resolved by adopting a simpler approach to determining the capacity charge. The remainder of this section will discuss the County’s current approach to the capacity charge. Subsequent sections will provide details on the issues we found in the three categories, as well as recommendations to address them.

Who pays the capacity charge?

Since 2003, customers who connect to the wastewater system are considered “new customers” and pay the capacity charge. Customers who connected prior to 2003 are called “existing customers” and do not pay the capacity charge.² A new customer “connects” by either creating a new connection to the system or substantially upgrading an existing connection.

It is important to note that the capacity charge follows the property, not the person. For example, if a person moved from a house with an existing sewer connection into a house with a new connection, this person would still be considered a “new customer” and liable for the capacity charge, even if they had been a customer for many years at their prior house.

The capacity charge amount adopted by Council each year is what a single-family residence pays. Multi-family residences pay more based on the number of units, while seniors and low-income households can pay less. Commercial connections pay based on how much water they use.

What is growth revenue?

“Growth revenue” is the total amount collected from new customers, and includes both the capacity charge and the monthly sewer rate. The monthly sewer rate is the primary revenue source for the wastewater system, and applies to all customers. Unlike the capacity charge, where the County bills the customer directly, the monthly sewer rate is collected from the cities and sewer districts that contract with the County. The amount collected from each district is based on the number of customers in that district. Growth revenue includes the proportion of monthly sewer rates attributable to new customers, but not existing customers.

² Customers who connected between 1990 and 2002 did pay a prior version of a capacity charge, but those legacy payments are not counted as growth revenue in the calculations of the current capacity charge.

Does Growth Pay for Growth? Unclear for Three Reasons.

New customers can pay the capacity charge over 15 years, or they can pay off their entire balance all at once at a discount. The amount a customer pays is based on the year they connect to the system and does not increase as new amounts are adopted by Council.

What are growth costs?

“Growth costs” are all the expenses necessary to serve new customers, which includes the cost of expanding the system to accommodate them. When the County constructed the existing wastewater system, it was necessary to build more capacity than what was needed at the time. This excess capacity in the existing system will eventually be used by new customers, and so the costs of this existing excess capacity are included in growth costs.

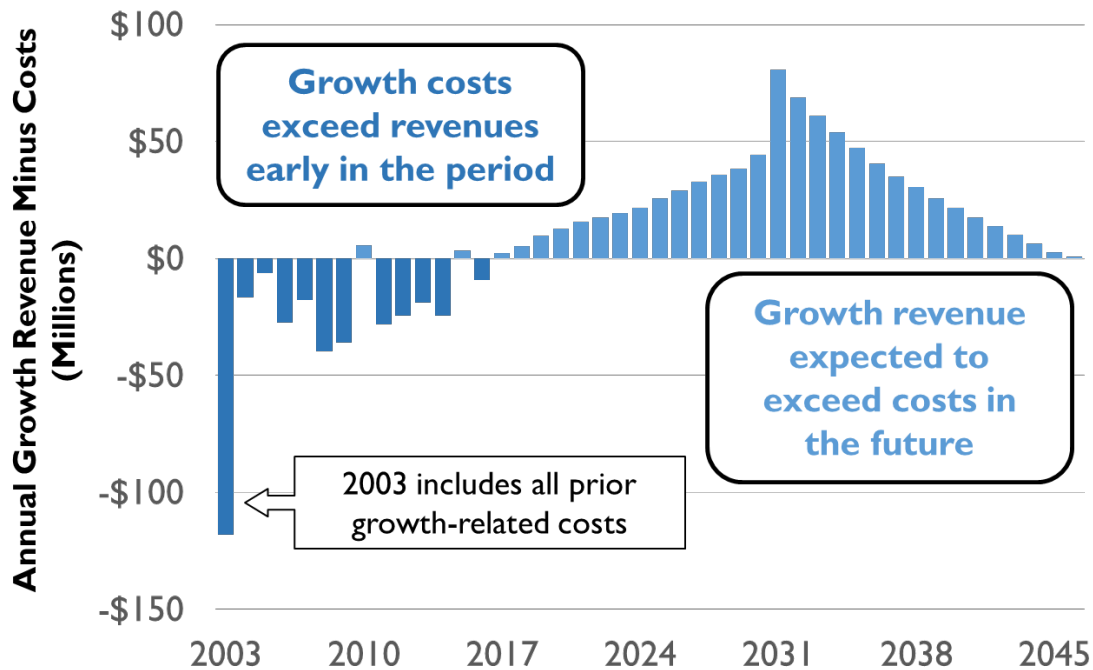
Growth costs are not limited to capital costs associated with expanding the capacity of the system. New customers also benefit from regular operations and maintenance services, as well as other non-growth related capital projects, such as the combined sewer overflow (CSO) control projects. County financial policies require new customers to pay their proportional share of these costs.

Do growth revenues equal growth costs each year?

Growth revenues do not equal growth costs each year, since some growth costs must be paid before new customers can connect to the system. Growth costs date back to at least the 1990s, when the County began building extra capacity for projected new customers; new customers only started paying growth revenue in 2003. To date, the amount of growth costs accrued each year has consistently exceeded the amount of growth revenue collected in that year. WTD projects that annual growth revenues will exceed annual growth costs in the future.

Does Growth Pay for Growth? Unclear for Three Reasons.

Exhibit A: Growth costs exceed revenues early on, growth revenues exceed costs later.



Source: King County Auditor's Office analysis, based on current methodology. All amounts adjusted for inflation. The increase in 2031 is because this methodology does not include any growth costs that must be paid after 2030, but does include capacity charge revenues collected after 2030. This is because the financial policies allow new customers to pay off their capacity charge amount over 15 years.

Who pays for growth costs when there is not enough growth revenue?

Existing customers initially pay for growth costs with their monthly sewer rates, but will eventually pay lower rates once enough new customers are in the system. Capacity charge revenue does not necessarily pay for growth costs directly. Instead, this additional revenue stream allows the monthly sewer rate to be lower, which benefits existing customers.

Eventually the total amount of growth revenues should equal the total amount of growth costs. At this point, new customers (as a group) will have effectively "paid back" existing customers (as a group) for the growth costs that existing customers initially had to pay. To reiterate, this effective "repayment" only occurs between groups that are defined by what property they own at the time. Any individual ratepayer can change from a new customer to an existing customer by moving from a new house to an old house (and vice versa).

When will growth revenues equal growth costs?

There is no fixed timeline in policy, but the County currently attempts to balance growth costs and revenues over a 28-year period. This is based on the timeframe of the Regional Wastewater Service Plan, which covers the time period of 2003 through 2030.

Does Growth Pay for Growth? Unclear for Three Reasons.

WTD calculates what amount the capacity charge should be each year in order for growth revenues to equal growth costs over this time period, with some exceptions:

- WTD excludes growth costs that will be paid after 2030, which could total around \$800 million. This includes debt service on growth-related projects, such as the Brightwater Treatment Plant. It is unclear how these costs will be allocated between new and existing customers. WTD stated it would need authorization from Council to collect the capacity charge from customers who connect after 2030. However, the financial policies do not limit growth costs, new customers, or the timeframe of calculations to the 2003-2030 period.
- WTD includes all capacity charge revenue from customers who connect through 2030. Customers can choose to pay off their capacity charge over 15 years, so some revenue will be collected after 2030. As a result, growth revenue will equal growth costs (less any post-2030 debt service) only after these capacity charge payments have been collected, sometime around 2045.

Who ultimately determines what the capacity charge should be?

The County Council sets the capacity charge amount each year by adoption of an ordinance. Under state law, the Council has broad legal discretion to adopt capacity charge amounts it determines to be appropriate. This means the Council is not necessarily bound by the financial policies it enacted in 2001 or the Executive's proposed amount.

I. Computer Model Is Too Complex

Section Summary

To calculate a capacity charge proposal for Council adoption, WTD uses a highly complex computer model that is not transparent, cannot be independently verified, and is susceptible to errors. During our review we discovered errors that misallocated \$137 million between new and existing customers, which WTD subsequently fixed for the 2017 capacity charge proposal. Simpler approaches are available to determine a capacity charge that would also ensure that growth pays for growth.

Current approach uses a complex model to calculate the capacity charge

To calculate the proposed capacity charge, WTD has developed a highly sophisticated and detailed computer model. The capacity charge model is separate from the model WTD uses when proposing the monthly sewer rate. WTD uses the sewer rate model to evaluate the short-term impact of different rate proposals, but not to calculate the proposed rate. Conversely, the capacity charge model does determine the proposed capacity charge amount, using over 30 years of historic and forecasted revenues and costs. This audit focuses on the capacity charge model, since it determines the amount proposed to Council.

Model's complexity creates issues

Despite its sophistication, there are significant issues with using such a complex model to determine the proposed capacity charge amount. Due to its complexity, the model lacks transparency, cannot be independently verified, and is susceptible to errors. These issues make it difficult to determine to what extent growth is paying for growth.

Complexity decreases transparency to councilmembers and other stakeholders

The model's complexity reduces its transparency and puts councilmembers in the position of considering capacity charge proposals without an independent confirmation that the proposed amount is the amount necessary for growth to pay for growth. By design, the model uses circular and iterative calculations that require a high level of technical expertise to understand. There are a small number of employees within WTD who have a deep understanding of its inner workings, it is difficult to explain how it works to new people, and it is not reviewed by any outside entity for accuracy when it is updated.

Complexity decreases ability to verify model is working properly

A reviewer cannot verify that growth is paying for growth without first understanding all of the model's complex logic. This is because the model does not track information that would be necessary to do a high-level check to compare growth costs and growth revenues. Instead, both growth costs and revenues are created by the model at the same time using trial and error.

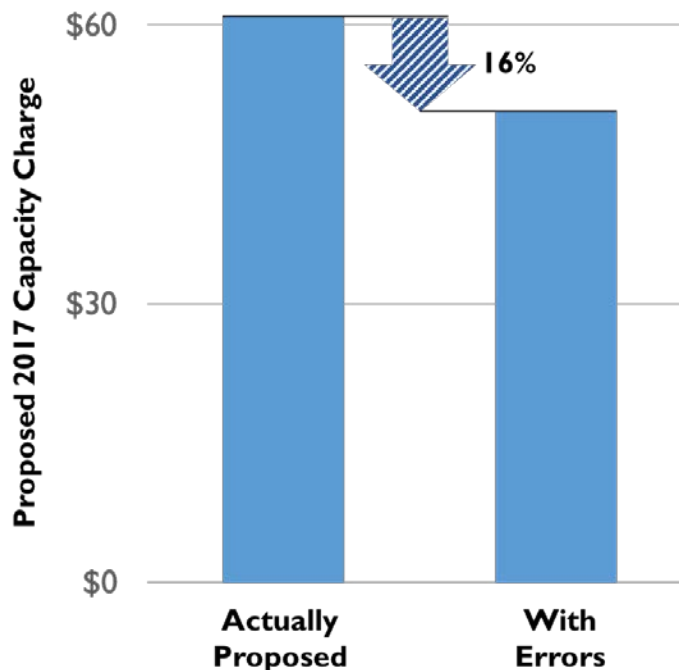
I. Computer Model Is Too Complex

Additionally, these calculations are interrelated: growth revenues are calculated based on growth costs, and growth costs are calculated based on growth revenues. This means it is not readily apparent from the model how growth costs compare to growth revenues within any given year. Such a comparison would be one way for an external reviewer to verify that growth is paying for growth without first developing a deep understanding of the model's complicated logic.

Complexity increases risk of hidden errors

The complexity of the model makes it susceptible to errors and increases the risk that those errors will not be discovered. For example, as WTD was submitting its 2017 proposal to the County Executive for review, we discovered two substantive errors in the model's logic that impacted the calculation of the capacity charge. The draft model was effectively double counting certain values, which artificially reduced growth costs in the model by \$137 million. As a result, we calculate that these errors would have lowered the capacity charge amount proposed for 2017 by over 16 percent. WTD resolved these errors before proposing the 2017 capacity charge amount to the County Council for adoption.

Exhibit B: Errors would have reduced capacity charge amount by 16 percent.



Source: King County Auditor's Office analysis.

I. Computer Model Is Too Complex

These errors were not easy to discover due to the complexity of the model's methodology. Similarly, updates to the model's assumptions, historic amounts, and forecasts all impact the model's calculations in ways that are difficult to track. Changes or updates to the model risk introducing additional errors in the future, and the complexity of the model makes it more likely that such errors could go undetected.

Alternative approaches are available

A different approach could lead to a simpler model that would be more transparent, easier to verify, and less susceptible to errors. The complexity of the model is largely a result of the approach the County and WTD take to calculating the capacity charge. For example, the current approach involves balancing costs and revenues over a 28-year time period. This requires looking both backwards at historic actuals as well as forward to projected costs and revenues. As we noted in the first phase of this audit, such long-term projections are inherently uncertain and subject to change. A simpler approach might only look backwards to actual amounts and not involve uncertain long-term projections.

All approaches have advantages and disadvantages that must be weighed by policy-makers. For example, a very simple approach might include setting the capacity charge once and only increasing it for inflation. Instead of trying to balance over a certain time period (e.g., 28 years), the capacity charge could continue to apply until growth revenues had paid for growth costs. This approach has the advantage of being a simple, equitable, and predictable method that would ensure growth paid for growth. A possible disadvantage is that growth might not pay for growth by a certain fixed date.

Recommendation 1

The Wastewater Treatment Division, working with its component agencies, should develop an approach to determining the capacity charge that leads to a simpler and more transparent model, and propose for consideration by the Regional Water Quality Committee and the County Council any changes to the financial policies necessary to implement such an approach.

Recommendation 2

The Wastewater Treatment Division should have an independent party review the validity of the model's methodology and calculations on a regularly scheduled basis.

Recommendation 3

The Wastewater Treatment Division should ensure that the approach developed in Recommendation 1 allows a reviewer to verify the extent to which growth costs equal growth revenues based on values estimated independently of the model.

2. Methodology Choices Appear Contrary to Policy Intent

Section Summary

During our review, we found two areas where the methodology used in the capacity charge model does not appear to align with the intent of Council-adopted policies. These two areas have opposing impacts on the capacity charge calculation, partially cancelling each other out. Both areas involve how the model estimates the total amount of growth costs allocated to new customers.

Methodology choice effectively charges new customers interest

A methodology choice in the model adjusts projected costs and revenues by more than just inflation, which allocates substantially more growth costs to new customers. WTD states that this methodology choice is effectively charging new customers “interest” on the initial growth costs paid by existing customers. As mentioned in the first section of this report, existing customers initially pay for growth costs in early years, and later on new customers “pay back” existing customers by providing enough revenue to lower the monthly sewer rate. Over time, total growth revenues should equal growth costs. Using this methodology, however, total growth revenues will eventually be greater than total growth costs.

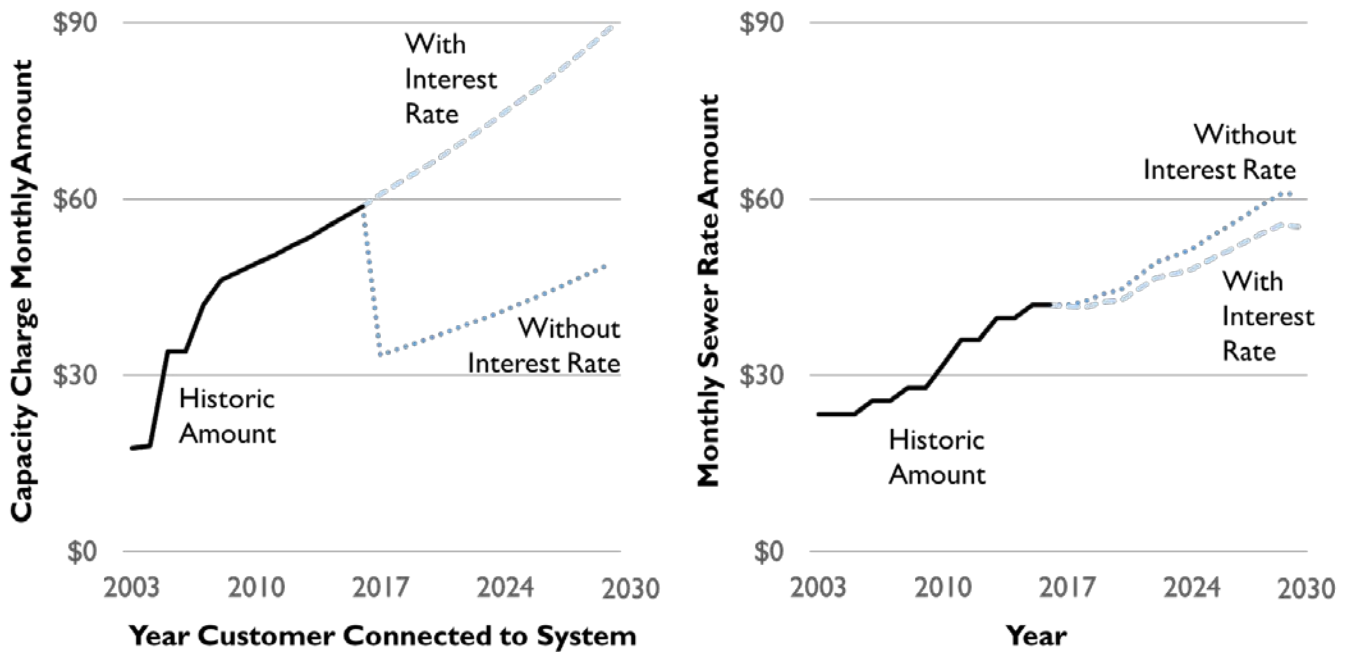
Financial policies do not provide for charging interest

Based on our analysis, this methodology is effectively applying an interest rate of three percent per year above inflation, even though the financial policies do not include any explicit provision for charging interest. Instead, the financial policies state that new customers should pay costs associated with expanding the system and providing service to new customers. To the extent that the financial policies discuss deviations from this amount, the policies include language that growth revenues should not exceed actual growth costs. Since the current methodology effectively increases growth costs, it appears to be contrary to the intent of the financial policies.

Based on our analysis, this methodology choice increases costs allocated to new customers by approximately \$470 million. If instead the model only adjusted for inflation, it could lower future proposed capacity charges by 45 percent. This methodology change could also increase future monthly sewer rates by an average of five percent in the next 10 years. See Exhibit C, below.

2. Methodology Choices Appear Contrary to Policy Intent

Exhibit C: Future capacity charge amounts could be lower by not imposing an “interest rate.”



Source: King County Auditor's Office analysis, based on projected amounts from the WTD capacity charge model. These amounts represent what would happen in the future if the methodology changed now, not what these amounts would have been using the different methodology since 2003. These projections do not take into account policy changes enacted in 2016.

Recommendation 4

The Wastewater Treatment Division should either stop discounting growth costs and revenues in the capacity charge model by more than the inflation rate or propose that the County Council modify the financial policies to explicitly authorize such a practice, consistent with state law.

Methodology underestimates pre-2003 growth costs

The methodology used to estimate pre-2003 growth costs results in substantially lower costs for new customers. This is contrary to the intent of the financial policies, which state that new customers shall pay costs associated with the portion of the existing system that serves new customers. When they connect to the system, some new customers use capacity at the existing West Point and South Treatment Plants. WTD expanded the capacity at these plants years before 2003, partially in anticipation of post-2003 growth. It is therefore necessary to estimate, to the extent possible, what proportion of those expansion costs is attributable to post-2003 growth.

Based on our analysis, the current methodology significantly underestimates the share of expansion costs that is attributable to growth, likely by at least \$100 million. The precise amount is unclear, however, since WTD does not currently have complete information about capacity built during past

2. Methodology Choices Appear Contrary to Policy Intent

expansion projects that is used by new customers. Based on this lack of information, WTD chose to underestimate growth costs to minimize the impact to new customers.

WTD states that it is planning to fundamentally change how it estimates these costs, which will likely impact the capacity charge proposals in future years. WTD was planning to make these revisions before we notified them of the methodology issues we discovered.

Recommendation 5

The Wastewater Treatment Division should continue developing a new methodology that fully estimates how much existing excess capacity should be allocated to growth costs.

3. Ambiguous Financial Policies

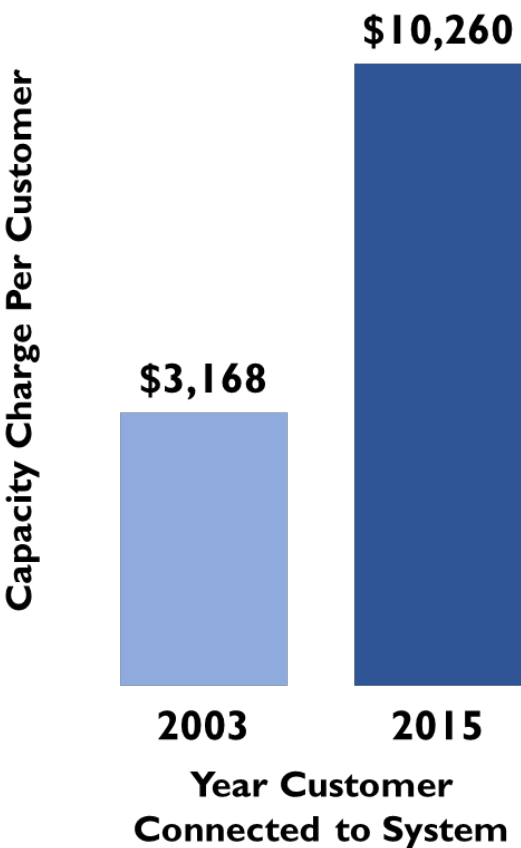
**Section
Summary**

Some sections of the financial policies are potentially contradictory and might contain drafting errors. We found two instances of ambiguity in the financial policies where the Council may wish to clarify its intent. Under the current approach, it is difficult to reconcile the policy that growth should pay for growth with a policy that each customer should pay an equal share. Additionally, a different section of the policies does not match its own stated intent, legislative history, or interpretation by WTD.

**Equal-share
policy not
feasible to
implement under
current approach**

The financial policies state that all new customers should pay an “equal share” of growth costs, regardless of what year the customer connects to the system. In practice, however, new customers pay different amounts, which depend entirely on what year they connect to the system. Furthermore, it might not be feasible to fully implement this policy under the County’s current approach to determining the capacity charge.

Exhibit D: Customers paid different capacity charge amounts depending on the year connected.



Source: King County Auditor’s Office analysis. Scale of graph has been adjusted for inflation, but amounts are in nominal dollars.

3. Ambiguous Financial Policies

Current approach sets up conflict between policies

The current approach requires compromising the policy of each customer paying an equal share in order to ensure that growth will pay for growth. This is because the model balances growth costs and revenues over a fixed time frame, so any changes to growth costs will require a change in future capacity charge amounts to make up the difference. Such changes are inevitable, since the model uses long-range forecasts to determine both growth costs and growth revenues. As we stated in the first phase of this audit, long-range forecasts are inherently inaccurate.³ When the actual costs of growth or the actual numbers of new customers end up being different than the forecasts (or if the forecasts change), then it requires a modification to the capacity charge to ensure that growth continues to pay for growth.

In practice, the policy of growth paying for growth has consistently outweighed the policy that each new customer should pay an equal share. To ensure that each customer pays an equal share, it would be necessary to retroactively bill customers who have already paid their capacity charge. Since such charges would be administratively problematic and are not contemplated in the financial policies, WTD increases the capacity charge on future customers instead. The Council-enacted financial policies do not specify which policy to prioritize and which policy should be compromised when such conflicts occur.

Different approach might avoid conflicting policies

However, different approaches might permit modifying different aspects of the capacity charge, and it is not inevitable that these two policies should come into conflict. For example, under the very simple approach described earlier it would be possible to avoid retroactive payments, have each customer pay an equal share, and still have growth pay for growth. Rather than modifying the amount of the capacity charge, it would instead be possible to modify the last year the county imposes a capacity charge. Under this alternate approach, each customer would pay an equal share and growth would pay for growth eventually, but not over a fixed number of years.

Recommendation 6

The Wastewater Treatment Division should propose to the County Council, as part of the proposal in Recommendation 1, a way to resolve conflicts between other financial policies and KCC 28.86.160(C)(3)(FP-15)(3)(d), which mandates that each new customer pay an equal share.

³ See our report published on October 13, 2015: “Utility Rates: Long-Term Forecasts Should Reflect Uncertainty.”

**Cost allocation
policy language
does not match
likely intent**

One section of the financial policies might contain two drafting errors, based on its stated intent, legislative history, and interpretation by WTD. As with other issues noted earlier, these two potential errors partially cancel each other out. It is necessary to address both errors at the same time, rather than independently, since they impact each other.

This section of code states (emphasis added):

To ensure that the capacity charge will not exceed the costs of facilities needed to serve new customers, costs assigned and allocated to new customers shall be at a minimum ninety five percent of the projected capital costs of new and existing treatment, conveyance and biosolids capacity needed to serve new customers.⁴

**Policy’s use of
“minimum” does
not limit cost
allocations as
intended**

The first potential drafting error creates a conflict between the language used in the code and the likely intent of the code. The first clause of this section indicates that its purpose is to limit the amount of costs allocated to new customers, in order to make sure that the capacity charge does not exceed actual growth costs. However, the second clause does not actually limit the amount of costs allocated to new customers. Instead, it sets a floor (“at a minimum”) rather than a ceiling (e.g., “at a maximum”) on these cost allocations. For instance, under the section’s current language it would still be permissible to allocate more than 95 percent (or even more than 100 percent) of these costs to new customers.

Using a “minimum” in this section also appears contrary to the legislative history. At the time the policy was being drafted, there was an intent expressed to target the capacity charge at an amount less than 100 percent of capital costs to avoid a potential violation of state law.

**Ambiguity in
policy creates
confusion during
implementation**

The second potential drafting error makes it unclear how to allocate costs to new customers. This section attempts to limit how much is allocated to new customers, but it is ambiguous exactly how to implement this section. There are three likely interpretations:

1. All cost allocations are limited by 95% of capital costs.
2. Capital cost allocations are limited by 95% of capital costs.
3. All cost allocations are limited by 95% of all costs.

⁴ King County Code § 28.86.160(C)(3)(FP-15)(3)(g)

3. Ambiguous Financial Policies

The first interpretation is a literal reading of the language used in the policy section, but if all cost allocations were set equal to 95 percent of capital costs then it would effectively allocate all non-capital growth costs to existing customers. This would directly contradict a separate section in code that allocates non-capital costs.

The second interpretation reflects the likely intent of the section, based on the legislative history and the other sections in this financial policy. Other sections address the allocation of other types of costs, while this section is the only one that addresses the capital costs of building capacity for new customers.

The third interpretation is how WTD implements this section in practice. WTD has allocated five percent of all growth costs to existing customers, which could be inconsistent with other sections in code that allocate non-capital costs. Despite this, WTD is still in compliance with this ambiguous section, since due to the first drafting error there is no effective maximum limit on allocations.

Recommendation 7

The Wastewater Treatment Division should propose to the County Council, as part of the proposal in Recommendation 1, a way to resolve the ambiguities in KCC 28.86.160(C)(3)(FP-15)(3)(g), which allocates growth-related capital costs.

Conclusion

Without a simpler approach to calculating the capacity charge, the county risks relying on a model that is not transparent, not independently verifiable, and susceptible to errors. Such errors could have the potential to shift hundreds of millions of dollars in costs between new and existing customer groups. A less complex model, along with a methodology aligned with clear financial policies, has the potential to be more transparent, verifiable, equitable, predictable, sustainable, and at lower risk of error.

Appendix I

Detailed Description of Model and Simple Alternative

The model used by the Wastewater Treatment Division (WTD) to calculate the proposed capacity charge amount is highly sophisticated and also highly complex. As part of this audit, we reviewed both the logic of the model as well as each formula that led to the proposed capacity charge amount. We also created a map of the model's logic, which is included in Appendix 2. It should be noted that there are many assumptions and values used in the model that feed into its calculations. Evaluating all of these assumptions and values was not within the scope of this audit; instead, the audit focused on the model's methodology and how it used those values and assumptions to calculate a capacity charge proposal.

This technical appendix includes a detailed description of how the current model works in practice, as well as an example of a simple alternative approach to making growth pay for growth.

How the Model Works

The purpose of the model is to determine the appropriate capacity charge amount for customers connecting to the system in 2017, such that growth revenues and costs will balance over a 28-year time period (2003 through 2030, with some additional revenue collected through 2051). In its calculation of the capacity charge, the amounts of growth costs and growth revenues are expressed as net present values in 2002 dollars, discounted by six percent per year. The model assumes a three percent inflation rate. WTD states that the additional discounting is based on the opportunity cost experienced by the existing customers when building growth capacity, which is discussed further in the main report and the Auditor's Comment, below.

In addition to balancing growth over a 28-year time frame, the model also attempts to balance total costs and revenues in every individual year in the future (i.e., 2017 through 2051). To do this, the model determines an appropriate monthly sewer rate and bond issuance amount for each of these 35 years. The combination of capacity charge, monthly sewer rate, and bond issuances make up the core of expected revenue, with other forecasted revenues and costs derived from those three values.

Iterative Subroutines

The model uses programmed subroutines to calculate the capacity charge. Once activated, there are four main "runs" of the model's program that happen in sequence:

1. Total Requirements Run
2. No-Growth Run
3. Final CC Input Run
4. Final Run

Appendix I (continued)

Within each of these main four runs, there are 35 nested subroutines that solve for each year from 2017 through 2051. In order to solve for each year, it is necessary to determine the correct balance of capacity charge revenue, monthly sewer rate revenue, and bond issuance amounts. In order to solve for these three different but interrelated values at the same time, the model uses multiple iterations of subroutines to test different combinations of values (i.e., a high-speed and sophisticated trial and error).

As each different combination of sewer rates, bond issuances, and capacity charges are tried, they have an impact on that year's calculated ending fund balance and the debt service coverage ratios. There are nine different criteria that these different values are evaluated against. The nine criteria are:

1. Either the debt service coverage ratio is 1.15, or the parity debt service coverage ratio is 1.25.
2. The debt service coverage ratio is greater than or equal to 1.15.
3. The parity debt service coverage ratio is greater than or equal to 1.25.
4. The end balance equals \$5 million.
5. The end balance is greater than \$4 million.
6. The bond amount for that year is greater than zero.
7. The bond amount for that year is less than the prior year's.
8. The bond amount for that year is within \$500,000 of the prior year's.
9. The bond amount for that year is equal to zero.

There are three different combinations of these criteria that would constitute an acceptable monthly sewer rate and bond issuance amount for the year in question. These three "gates" are:

- A. Criteria 2, 3, 4, and 8 are true; or
- B. Criteria 1, 2, 3, 4, 6, and 7 are true; or
- C. Criteria 1, 2, 3, 5, and 9 are true.

If the combination of sewer rate and bond issuance does not pass any of those three gates, then those values are modified slightly and tested again. Once a combination passes one of these gates, then that year is complete for that particular subroutine. The model then proceeds to the next year and repeats the process. Once it finished all 35 years, the model will proceed to the next major run. In short, there are innumerable iterations per subroutine, 35 subroutines per run, and four runs per activation of the model.

Four Main Runs in Model

The first run is the "Total Requirements Run." During this run, the model assumes that the capacity charge amount in 2017 is \$50.00 and inflated by three percent per year thereafter. The model first attempts to determine what the monthly sewer rate and bond issuance amounts would be from 2017 through 2051. From those results, the model calculates the amount of revenue that would be collected from all customers (both new and existing) for each year from the monthly sewer rate.

The second run is the "No-Growth Run." During this run, the model assumes that no additional customers have connected to the system since 2002, and that there were no associated growth costs. After recalculating what monthly sewer rates and bond issuance amounts would be between 2017 and

Appendix I (continued)

2051, the model calculates the amount of revenue that would be collected each year from existing customers.

The model then finds the difference between the monthly sewer rate revenue collected when the capacity charge was \$50 and the amount collected when there were no growth customers or growth costs. The model calculates this difference for the years 2017 through 2030, and then uses this difference in revenue collections as part of its estimate of growth costs.

The model then takes this difference in revenues and adds the amount of forecast capacity charge revenues from 2017 through 2030 (assuming that the capacity charge was \$50 in 2017 and grown by inflation thereafter). The model also adds the actual growth costs from 2003 through 2016 as well as the estimated costs of existing excess capacity built before 2003. The model then multiplies this total amount by 95 percent based on WTD's interpretation of the financial policies. This combination of capacity charge revenues, monthly sewer rate revenues, actual expenditures, and pre-2003 allocations is what the model uses as the total estimate of growth costs.

The model then compares the total estimate of growth costs against the total expected amount of revenue collected from new customers. This total revenue amount includes both the monthly sewer rates collected from 2003 through 2030 as well as the capacity charge revenues collected from 2003 through 2051, but only from customers who connected to the system from 2003 through 2030. For this comparison, the model still assumes that the capacity charge is \$50 in 2017 and grown by inflation thereafter. The difference between total growth costs and total growth revenues is called the residual, which is saved in the model for later use.

The third run is the "Final CC Input Run." During this run, the model recalculates monthly sewer rates and bond issuances assuming that the capacity charge was \$60 in 2017 and grown by inflation thereafter. The model then determines what total growth revenues would be using these recalculated amounts. The model does not recalculate growth costs during this run, but does compare growth costs from the second run to the newly recalculated growth revenues to determine a second residual amount. The fourth run is the "Final Run." During this run, the model uses a ratio of the two residual amounts to calculate what capacity charge amount in 2017 would be necessary in order to produce a residual of zero dollars. It then uses this capacity charge amount, instead of either \$50 or \$60, in order to recalculate monthly sewer rates and bond issuance amounts for 2017 through 2051. The resulting residual amount is usually within a few thousand dollars of zero.

Simple Alternate Approach

There is a wide variety of approaches that the County could use in designing a capacity charge system. The authorization for the County to impose a capacity charge is provided for in state law, which gives broad discretion to the legislative body (i.e., the King County Council) to determine the appropriate amount to be charged. State law provides that the capacity charge must be 1) based on capacity costs; 2) charged monthly; and 3) equitably share costs among property owners.

Appendix I (continued)

Example of a Simple Approach

The monthly capacity charge could be initially set based on the cost of expanding capacity to new customers. There are a number of possible ways to determine this initial amount (including using the most recent product of the current model). For each subsequent year, the King County Council could update the amount of the monthly capacity charge to account for inflation. Once total capacity charge revenues equal the total capital costs of expanding capacity for new customers, Council could discontinue the capacity charge.

Depending on how it was implemented, this simple approach would likely meet the standards set out by state law. So long as it only continued until growth costs had been paid in full, this inflation-adjusted capacity charge would be monthly, reviewed and approved annually by the Council, and each property owner would pay an equal share of the costs.

This simple approach would ensure that growth revenue eventually paid for growth costs. In addition, this method would be:

Simpler: The amount would only be updated for inflation, which is a simple calculation to make each year. To check whether growth revenues had met growth costs would only require a calculation based on actual amounts received, requiring little to no forecasting.

Transparent: With such a simple methodology, the calculations could be easily understood by council staff, component agencies, and other stakeholders.

Verifiable: Growth revenues would be easy to calculate, since they would be based on actual amounts received and a simple forecast of outstanding balances (given that customers still have 15 years to pay their balance). Growth costs would be easy to calculate, since they would be based on actual amounts paid and a simple forecast of outstanding debt. Comparing these two amounts would allow any reviewer to quickly verify whether growth had paid for growth.

Error-proof: Given the simplicity of the calculations involved, and the increased ability for outside parties to review and verify the calculations, the risk of errors impacting the amount would be negligible.

Equitable: After implementing the simple approach, all new customers would pay the same capacity charge regardless of what year they connected to the system, since the capacity charge would only be adjusted for inflation. This approach could still use the same adjustments for multifamily, senior, and low-income residences, as well as for commercial and industrial customers.

Predictable: The inflation-adjusted cost of future capacity charges would be known many years in advance, since it would be the same as the current year. The nominal amount could be easily estimated by council staff, component agencies, and other stakeholders.

Sustainable: This approach could be implemented and continue past the end of the current Regional Wastewater Services Plan without any modification to the existing financial policies. Future growth projects would not require a change to the capacity charge amount, but would extend the end date of the capacity charge program instead.

Appendix I (continued)

This simple approach shares some disadvantages with the current approach. For example, neither approach charges customers based on the costs of the capacity they actually use, but rather spreads aggregate costs over a large group. Unlike the current approach, one possible disadvantage to this simple approach is:

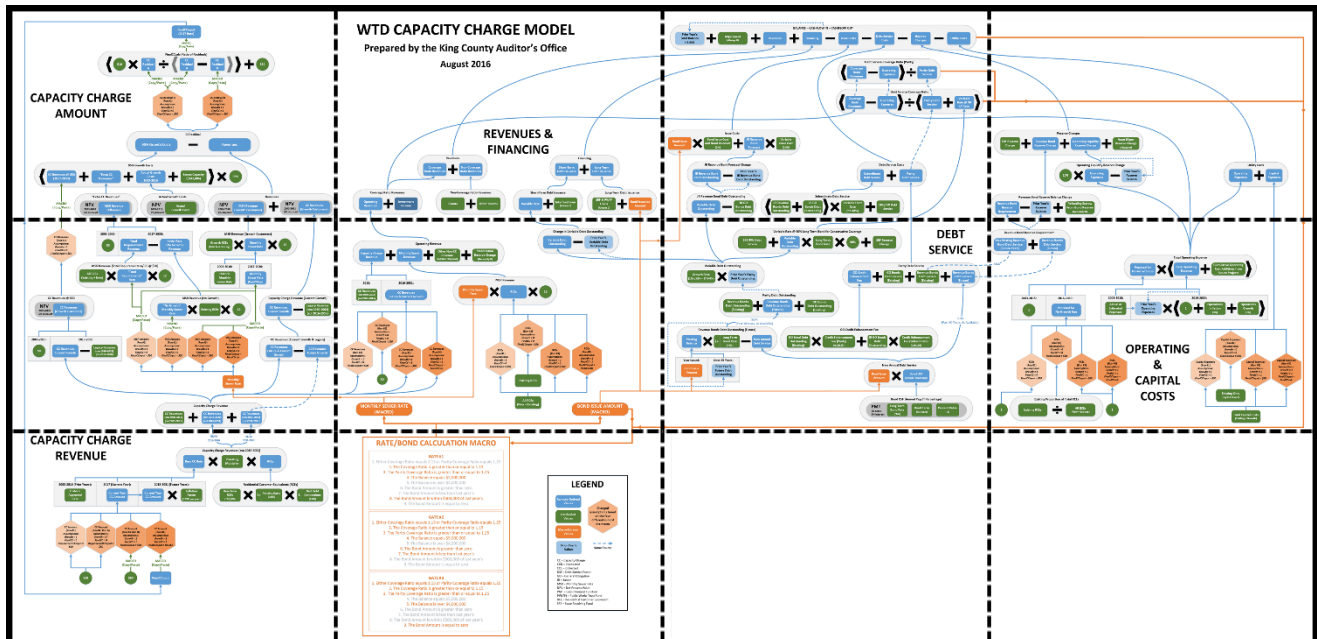
No Fixed End Date: To the extent that there are substantial growth costs that still need to be paid, it would be difficult to forecast the exact year in which the capacity charge would no longer be necessary. This is because making this determination would rely on forecasts of several future values that are difficult to predict, similar to the predictions made by the current model. The difficulty in making these predictions would decrease over time, as growth revenues began to approach growth costs.

The current approach has a fixed end date of 2030. In order to keep this date fixed, it must make difficult and complex forecasts of future growth costs, customer connections, sewer rates, and bond issuances. This increased complexity achieves a fixed end date at the expense of simplicity, transparency, verifiability, equity, predictability, sustainability, and a lower risk of errors.

Appendix 2

Map of WTD's Capacity Charge Model

The model used by the Wastewater Treatment Division (WTD) to calculate the proposed capacity charge amount is highly sophisticated and also highly complex. The Auditor's Office created a simplified map of the model's logic in order to illustrate the model's complexity. The entire map is included on the next page, while detailed sections are on subsequent pages, as indicated below.



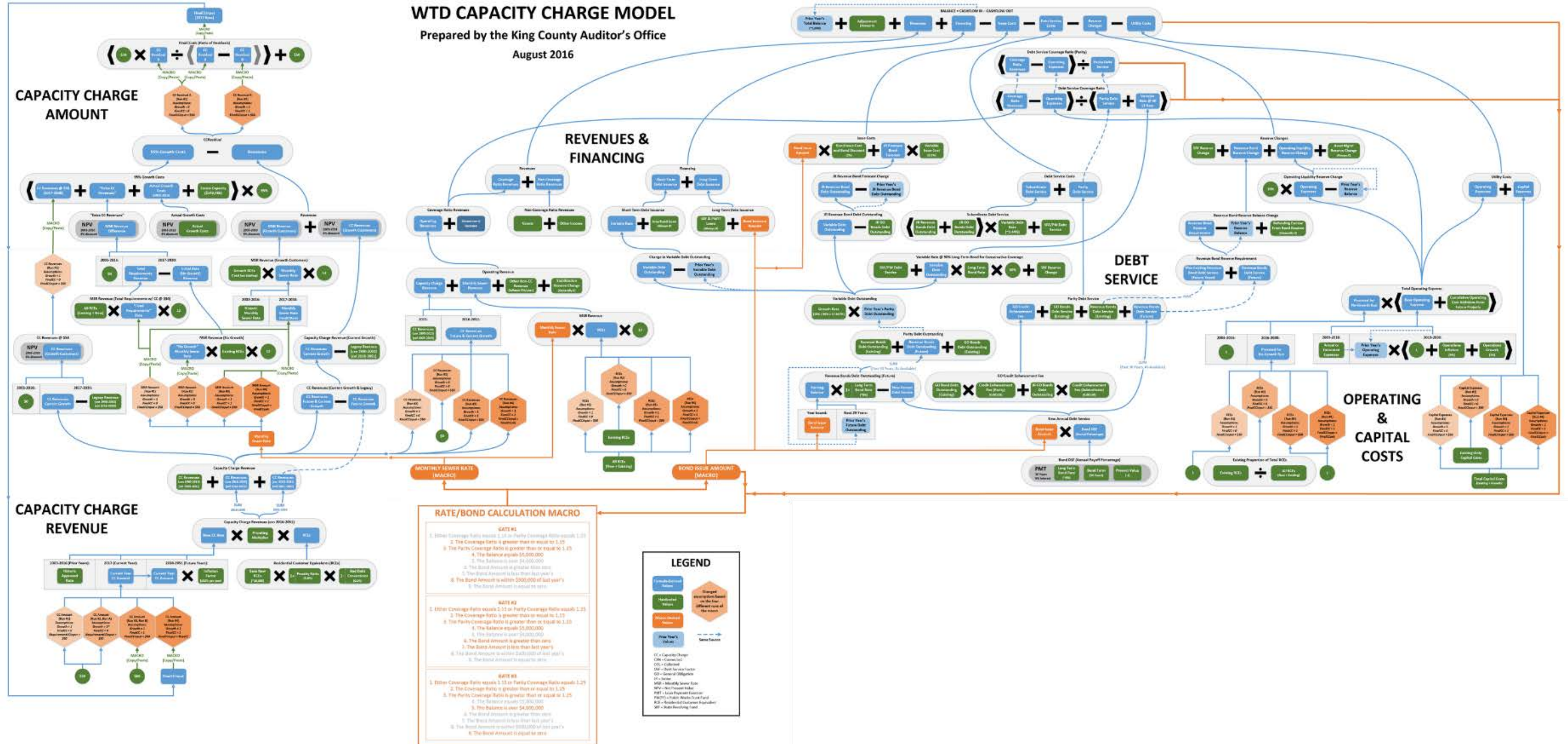
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p. 27	p. 28	p. 29	p. 30
p. 31	p. 32	n/a	n/a

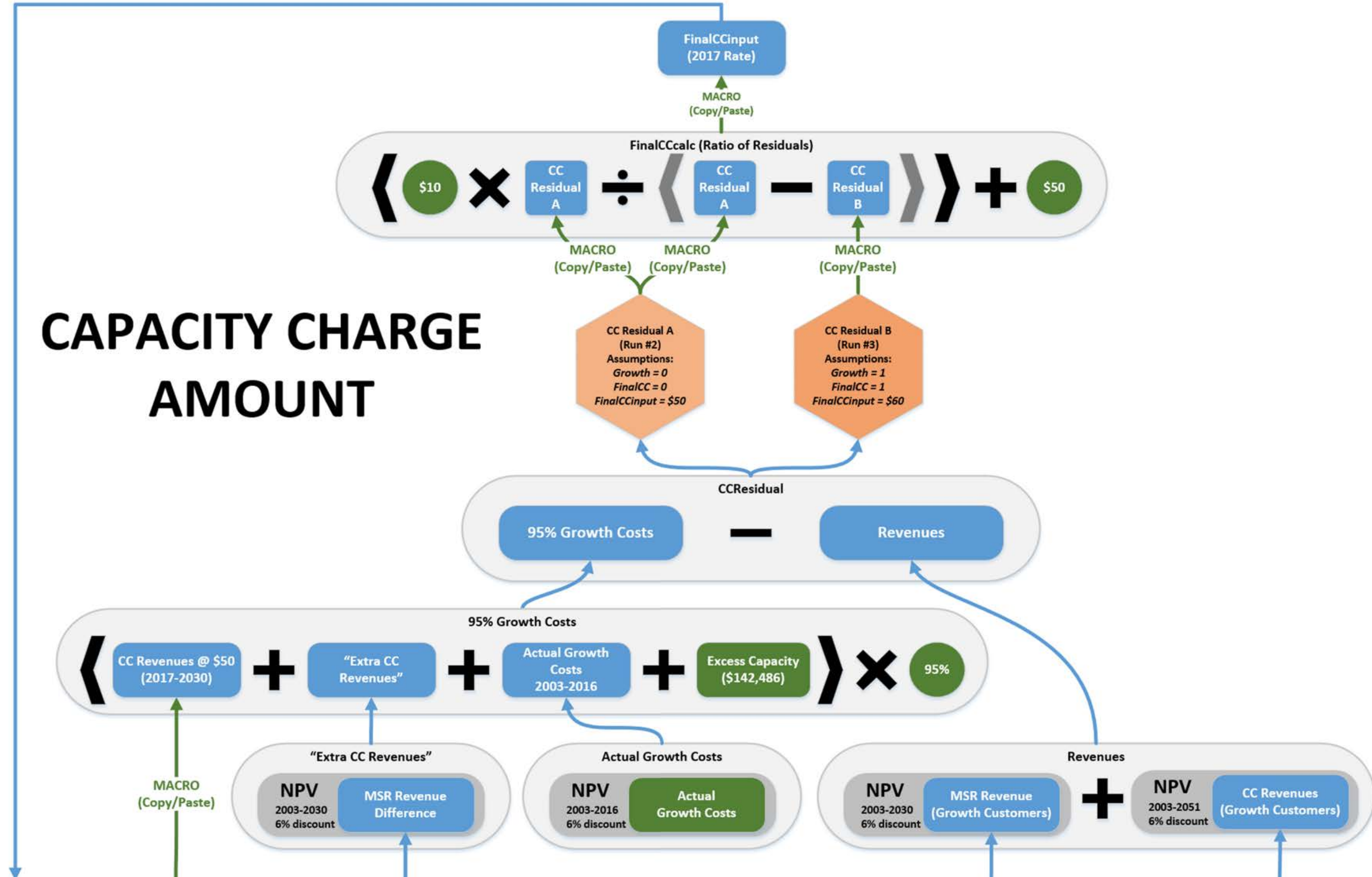
Appendix 2 (continued)

WTD CAPACITY CHARGE MODEL

Prepared by the King County Auditor's Office

August 2016



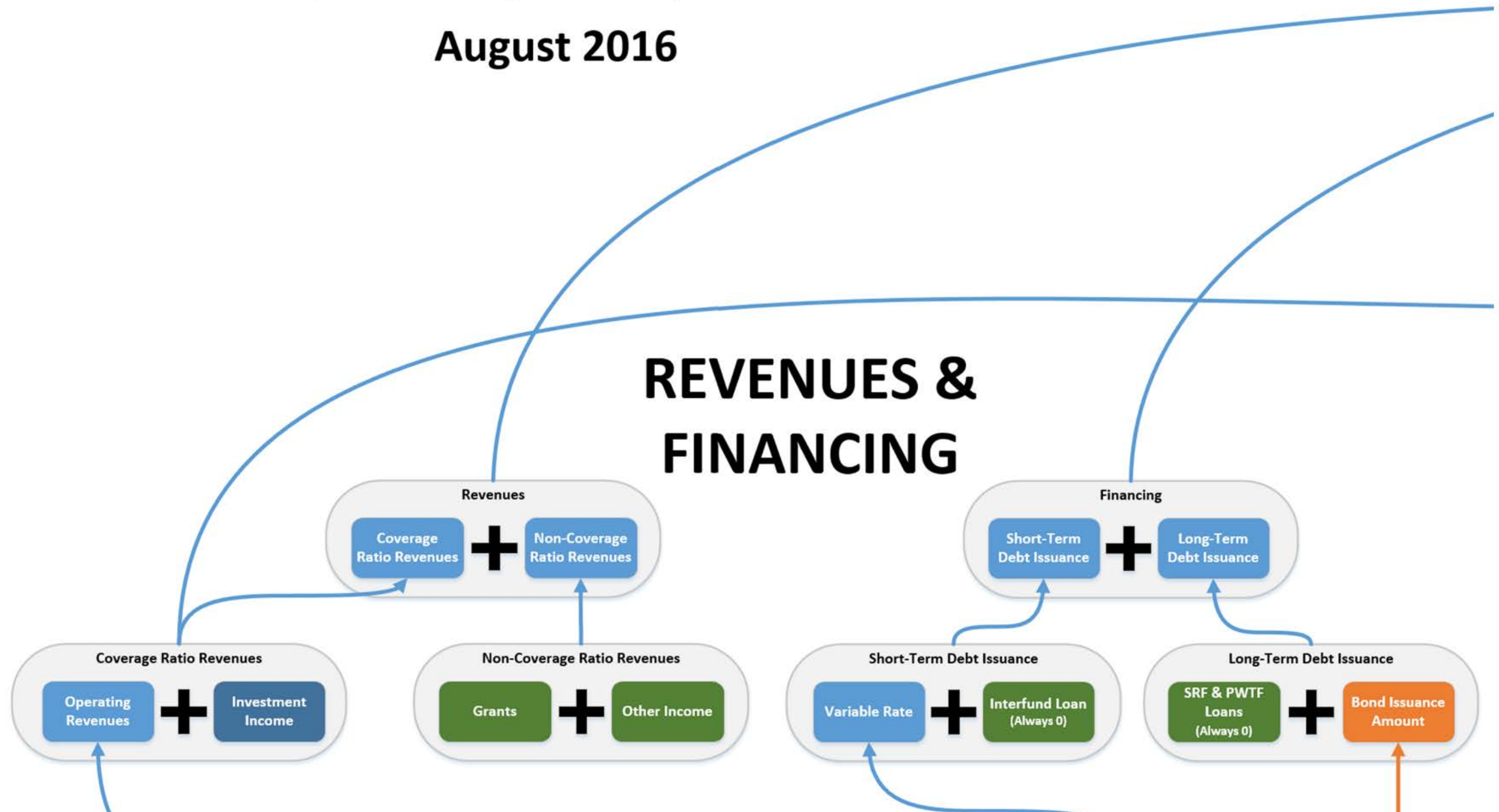


CAPACITY CHARGE AMOUNT

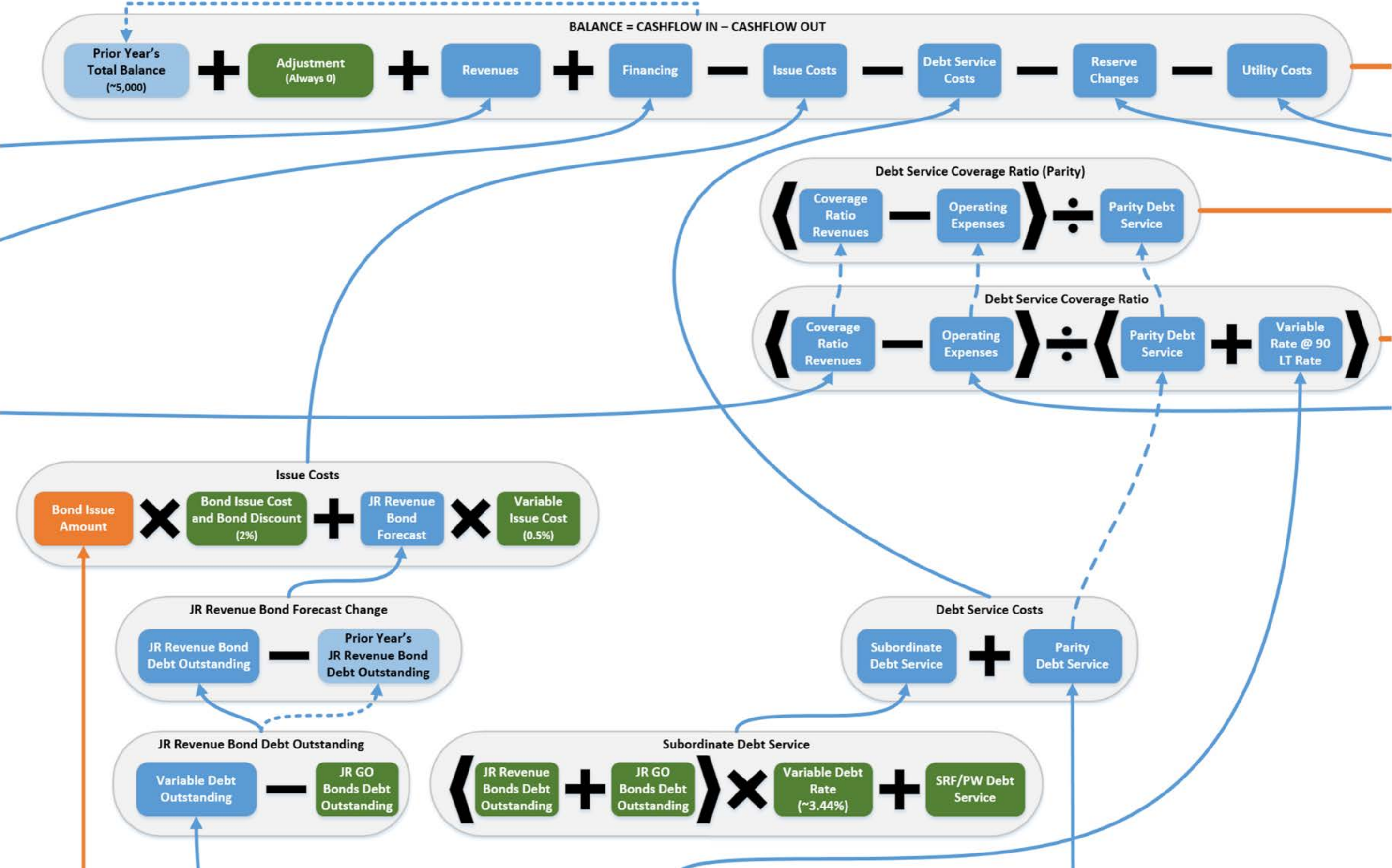
WTD CAPACITY CHARGE MODEL

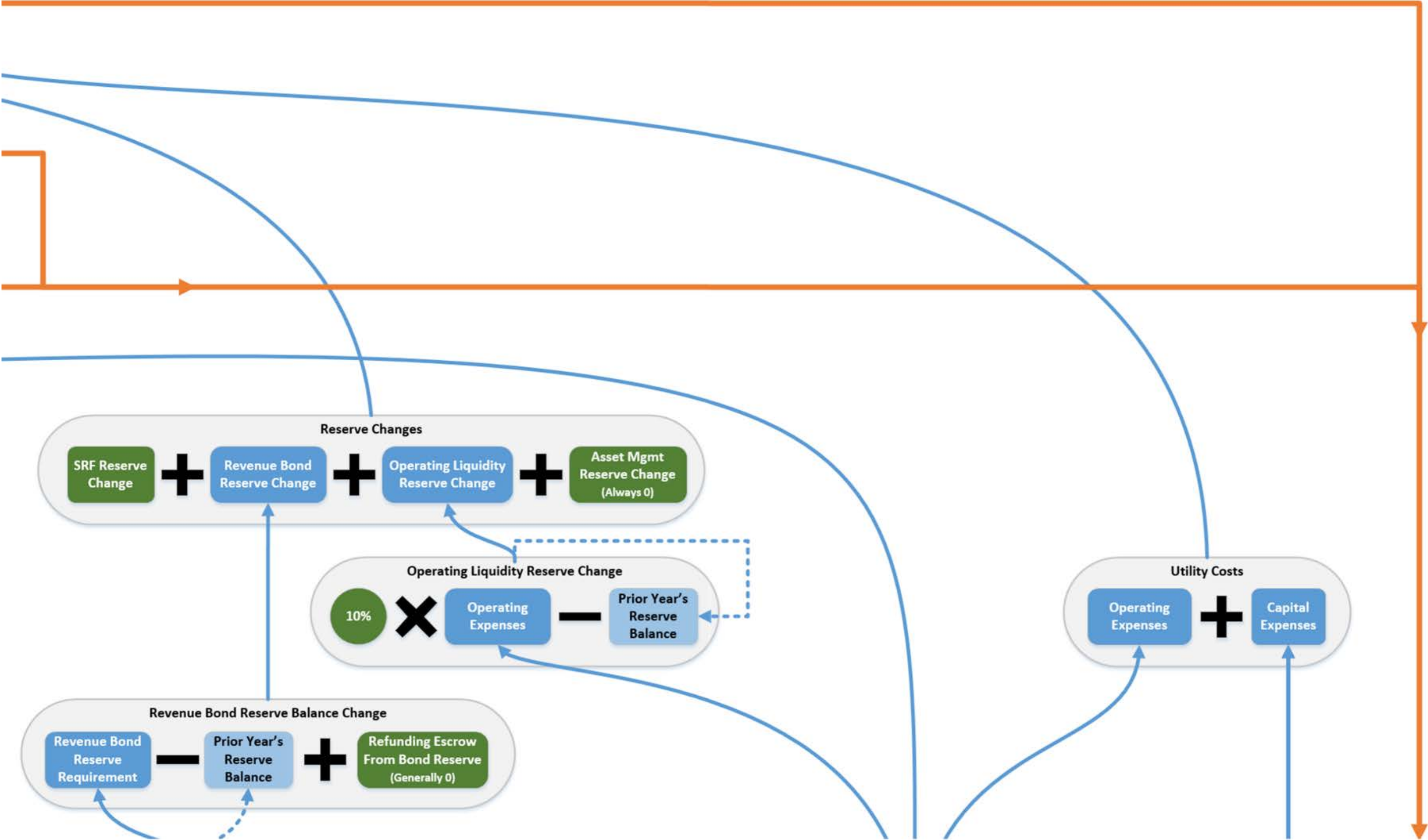
Prepared by the King County Auditor's Office

August 2016

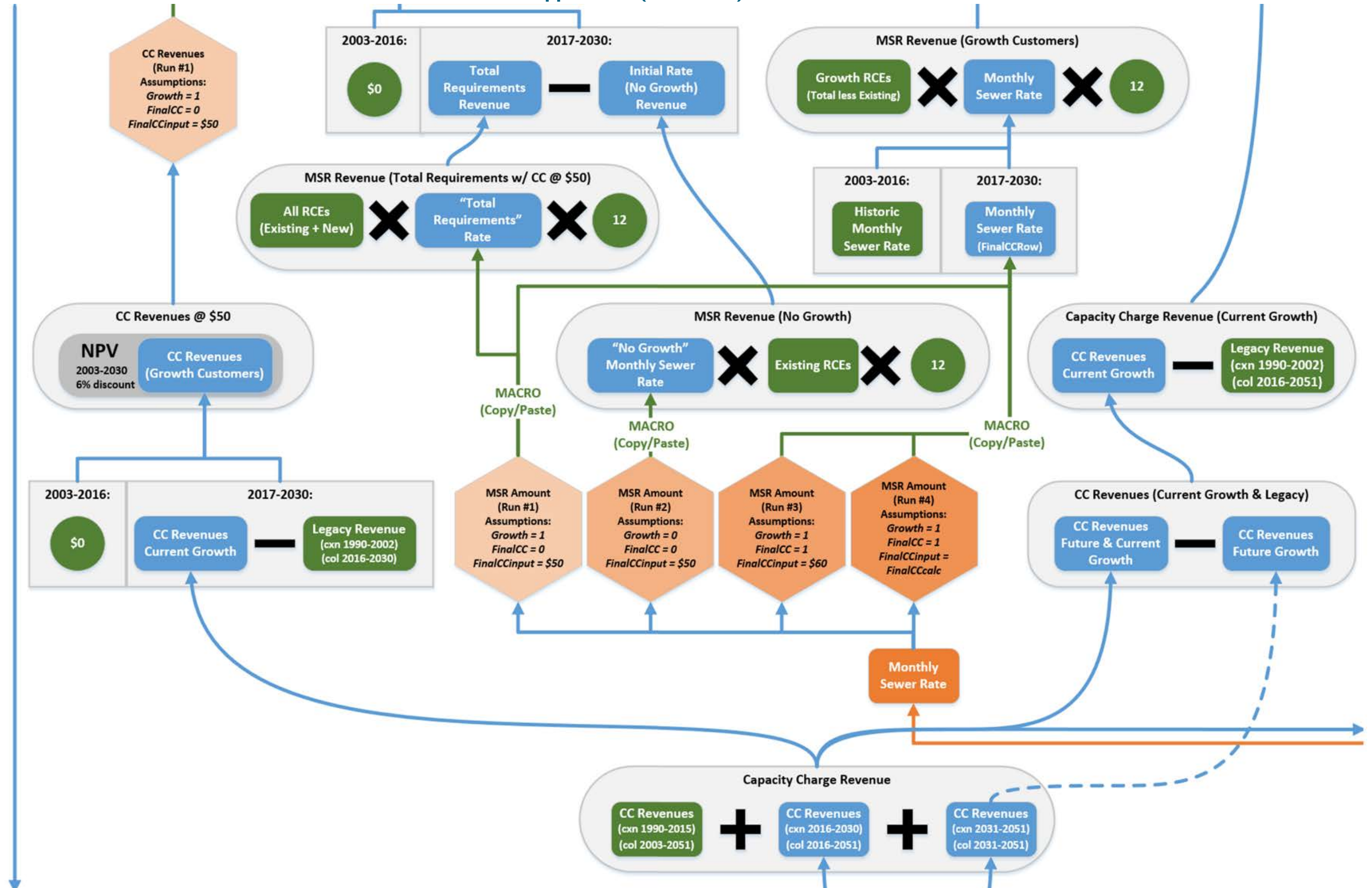


Appendix 2 (continued)

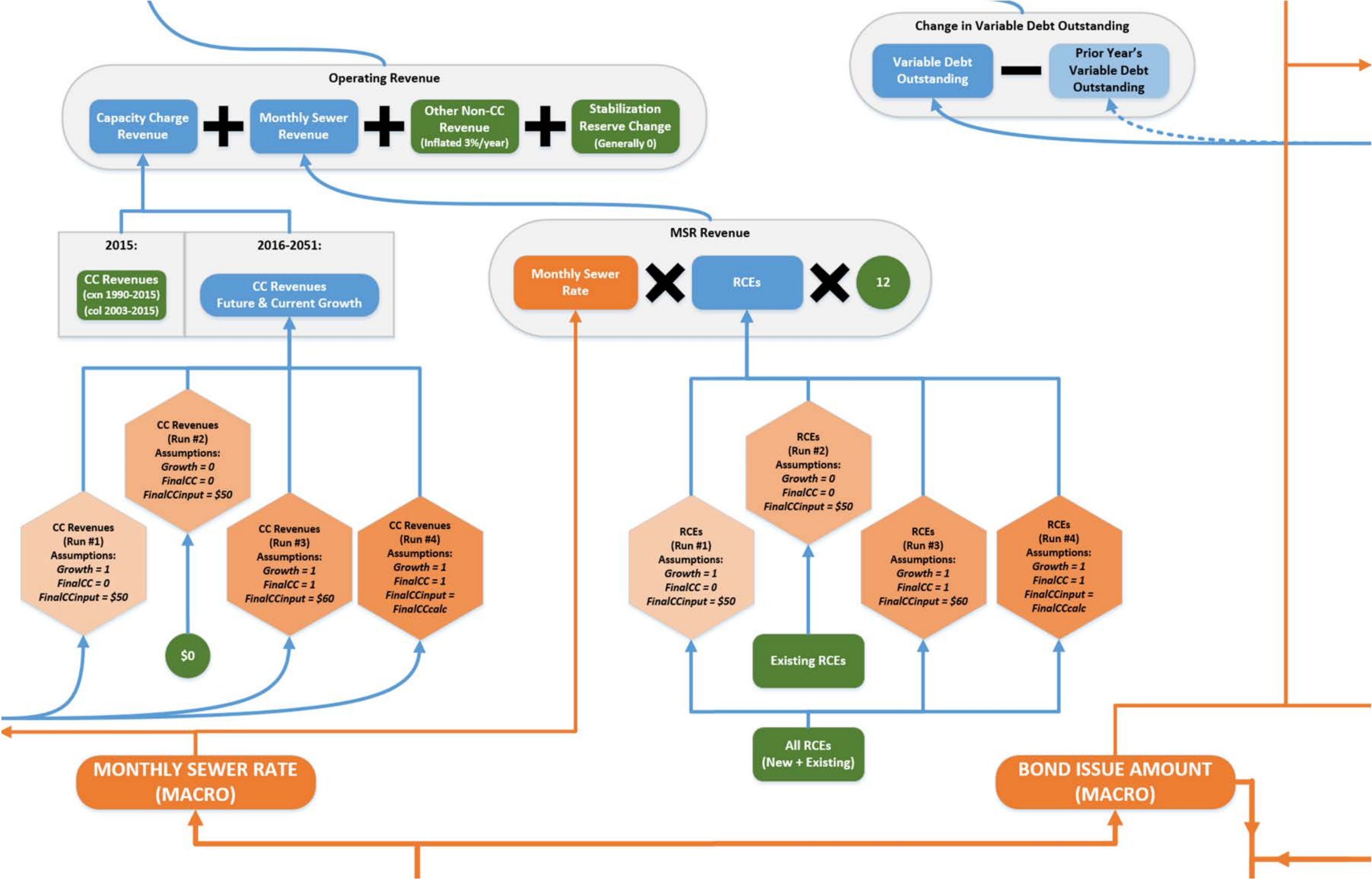


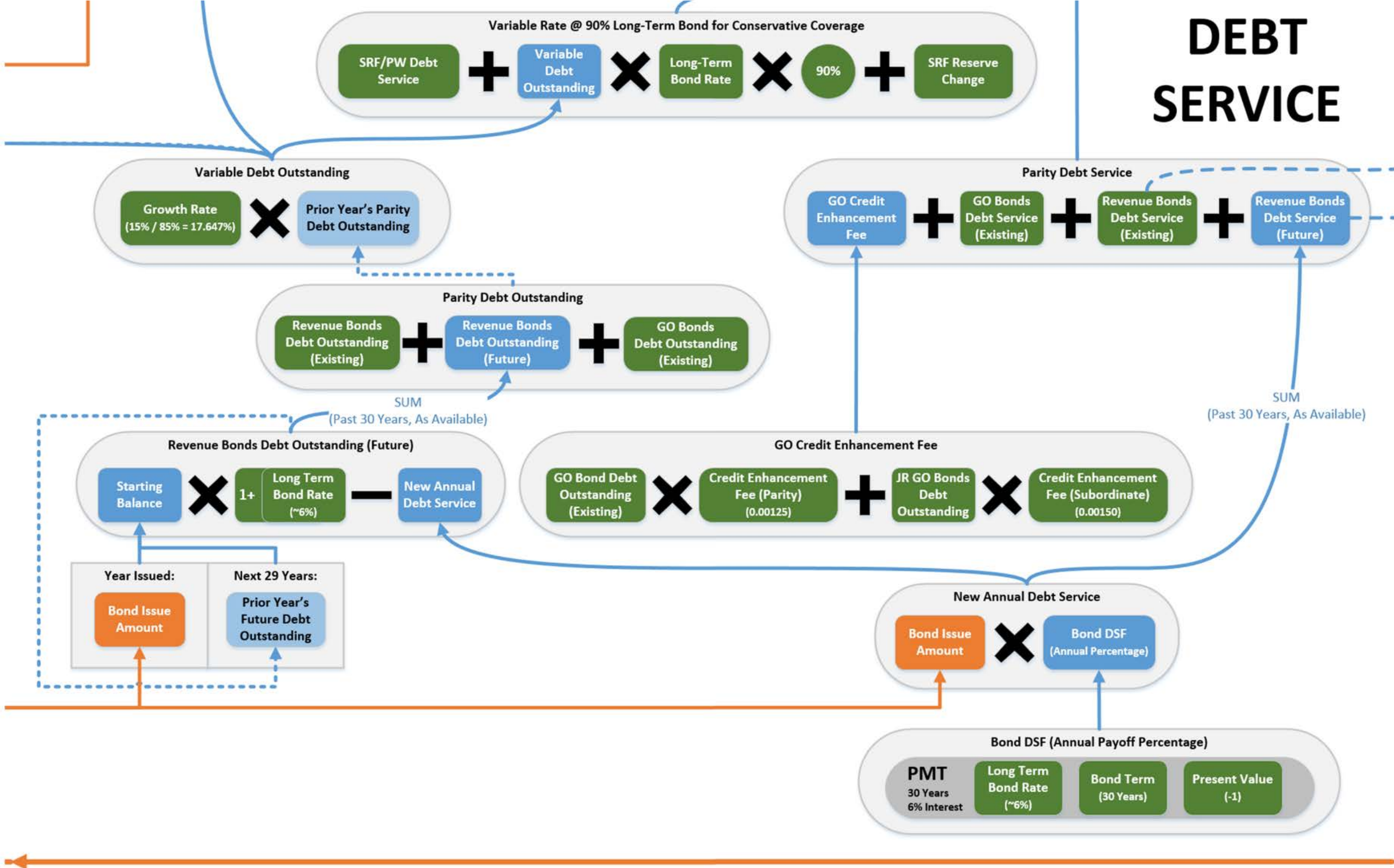


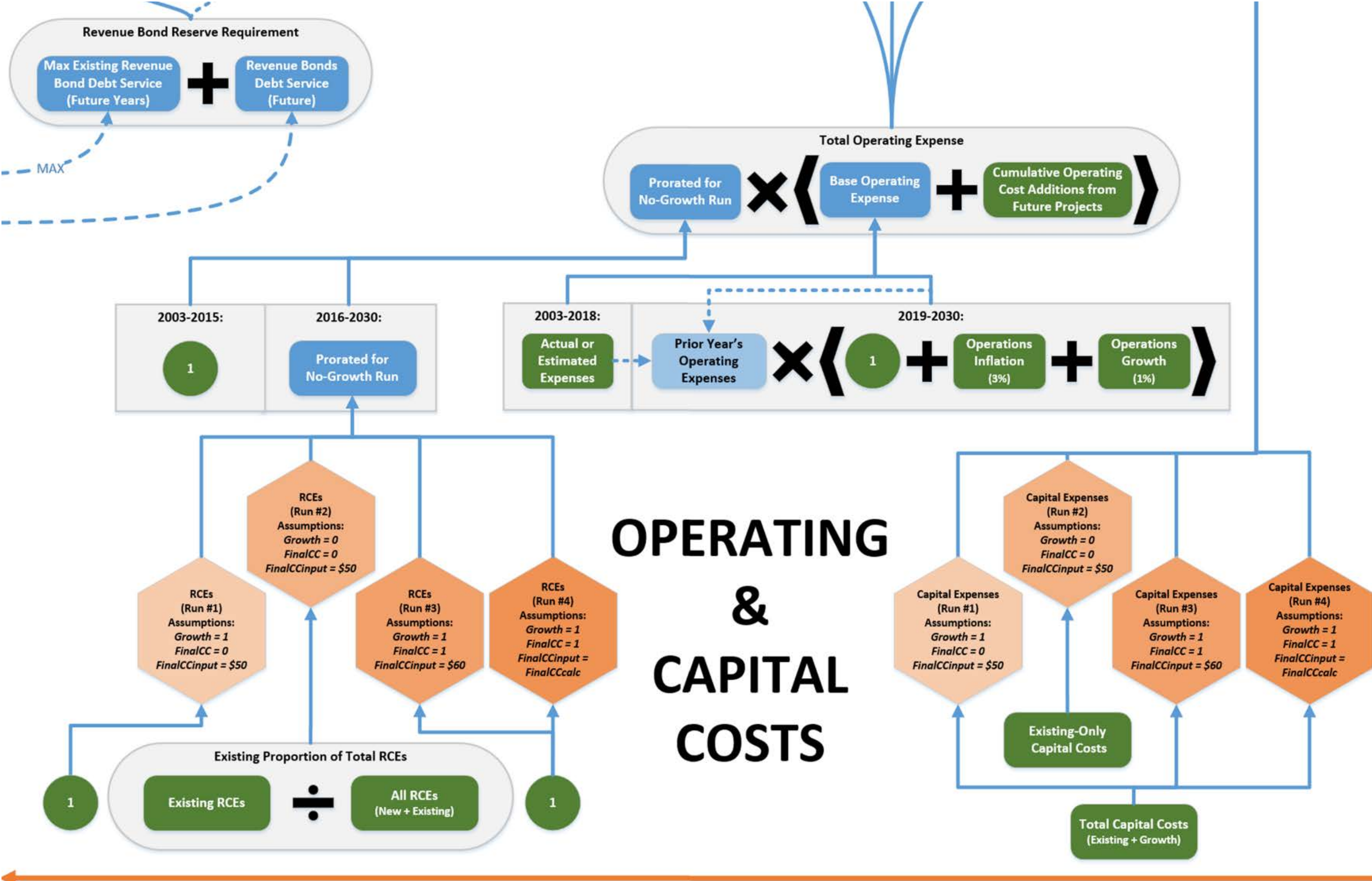
Appendix 2 (continued)



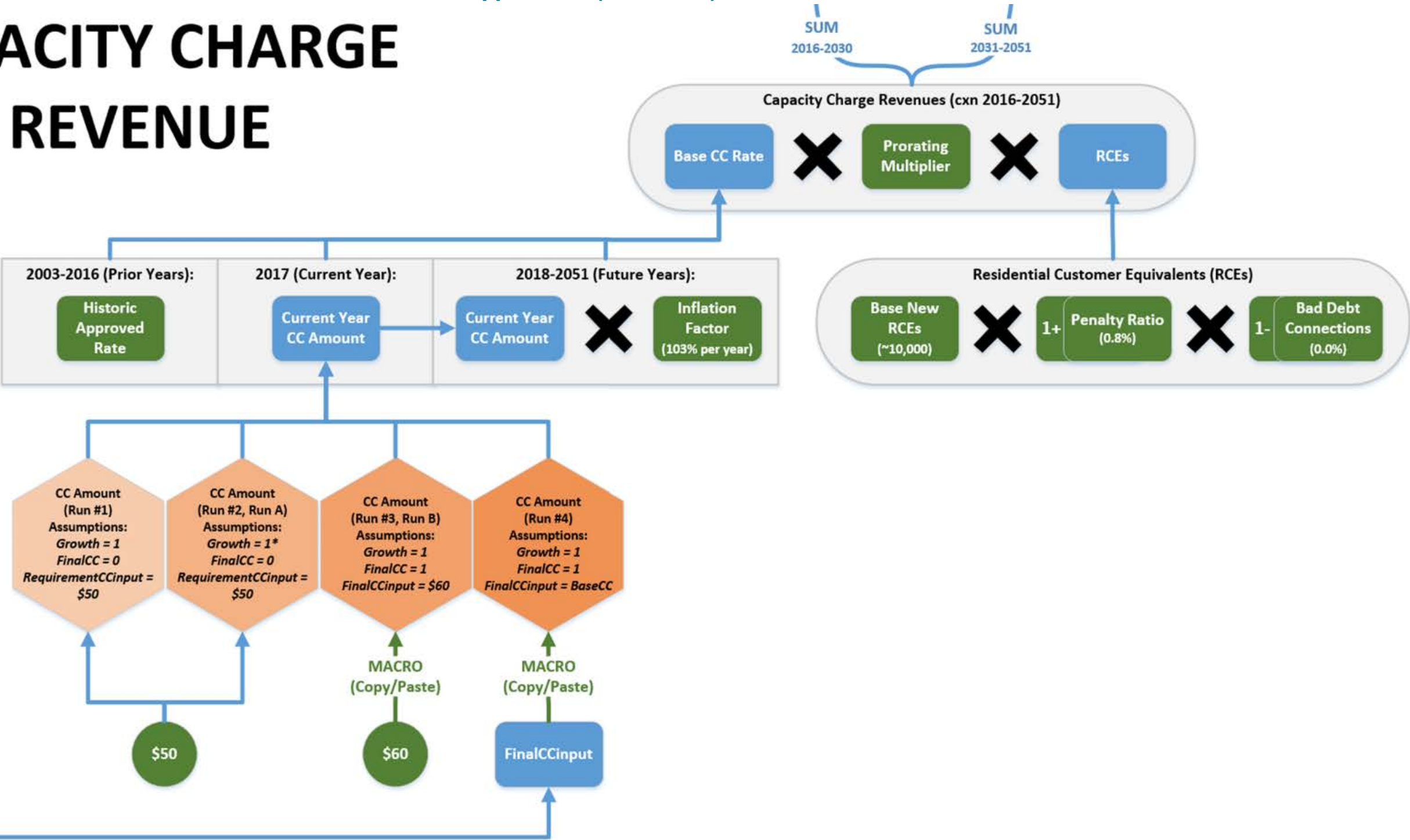
Appendix 2 (continued)







CAPACITY CHARGE REVENUE



RATE/BOND CALCULATION MACRO

GATE #1

1. Either Coverage Ratio equals 1.15 or Parity Coverage Ratio equals 1.25
2. The Coverage Ratio is greater than or equal to 1.15
3. The Parity Coverage Ratio is greater than or equal to 1.25
4. The Balance equals \$5,000,000
5. The Balance is over \$4,000,000
6. The Bond Amount is greater than zero
7. The Bond Amount is less than last year's
8. The Bond Amount is within \$500,000 of last year's
9. The Bond Amount is equal to zero

GATE #2

1. Either Coverage Ratio equals 1.15 or Parity Coverage Ratio equals 1.25
2. The Coverage Ratio is greater than or equal to 1.15
3. The Parity Coverage Ratio is greater than or equal to 1.25
4. The Balance equals \$5,000,000
5. The Balance is over \$4,000,000
6. The Bond Amount is greater than zero
7. The Bond Amount is less than last year's
8. The Bond Amount is within \$500,000 of last year's
9. The Bond Amount is equal to zero

GATE #3

1. Either Coverage Ratio equals 1.15 or Parity Coverage Ratio equals 1.25
2. The Coverage Ratio is greater than or equal to 1.15
3. The Parity Coverage Ratio is greater than or equal to 1.25
4. The Balance equals \$5,000,000
5. The Balance is over \$4,000,000
6. The Bond Amount is greater than zero
7. The Bond Amount is less than last year's
8. The Bond Amount is within \$500,000 of last year's
9. The Bond Amount is equal to zero

LEGEND

Formula-Derived Values

Hardcoded Values

Macro-Derived Values

Prior Year's Values

Changed assumptions based on the four different runs of the macro

Same Source

CC = Capacity Charge
CXN = Connected
COL = Collected
DSF = Debt Service Factor
GO = General Obligation
JR = Junior
MSR = Monthly Sewer Rate
NPV = Net Present Value
PMT = Loan Payment Function
PW(TF) = Public Works Trust Fund
RCE = Residential Customer Equivalent
SRF = State Revolving Fund

Executive Response



King County

Dow Constantine

King County Executive
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KING COUNTY AUDITOR
AUG 17 2016
RECEIVED

August 16, 2016

Kymber Waltnunson
King County Auditor
Room 1033
COURTHOUSE

Dear Ms. Waltnunson:

Thank you for the opportunity to review and comment on the proposed final report
“Wastewater Capacity Charge: Unclear Whether Growth is Paying for Growth.”

We generally concur with the audit recommendations, and appreciate the auditor’s cooperative work with Wastewater Treatment Division (WTD) employees during the development of this report. In general, the recommendations focus on the desire for a simpler capacity charge approach, which is a long-held goal of WTD. As a regional provider of wholesale sewage treatment services, WTD has contracts with 34 local sewer utilities (i.e., 17 cities and 17 sewer districts). Most of the suggested changes in the Audit would require significant engagement with our customers, the local sewer utilities as well as King County Council action.

In 2001, King County Council adopted the capacity charge methodology, currently found in Financial Policy 15, with the support of our customers. The existing methodology allows for efficient and effective system development, and equitably spreads the costs of the new facilities needed to serve new growth over the lifetime of the Regional Wastewater Services Plan. The capacity charge amount is adopted annually by the King County Council and every three years, there is an update of the charge based on actual costs and changes to the forecast.

WTD concurs with Audit Recommendation No. 1, provided that any proposal to change the financial policies must involve the participation of the local sewer utilities. WTD has been engaged in developing a new model and procedures for calculating the capacity charge. The new model will emphasize more visible explanations for data used in the calculation and further enhance the transparency of the update process. These changes will facilitate the independent review of the capacity charge calculation as suggested in Audit Recommendation No. 2. This independent review would also include an assessment of how growth costs compare to revenues over the period of the Regional Wastewater Services Plan in response to Audit Recommendation No. 3.



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and complies with the Americans with Disabilities Act*

Executive Response (continued)

Kymber Waltmunson
August 16, 2016
Page 2

In response to Audit Recommendation No. 4, WTD concurs that Council may wish to consider adopting an explicit policy affirming the use of present value when calculating the capacity charge. WTD's use of present value is a long-standing practice, having been incorporated into the capacity charge calculation since the current methodology was adopted by Council in 2001. The audit describes the time value of money as an "interest charge" implying something over and above the time value of money. We do not think this is the case. Rather, utilizing present value recognizes the cost to existing customers of carrying the costs of creating new capacity, in addition to the effects of inflation, thus helping ensure growth is paying a fair share. It is a core financial principle that revenues and costs received or incurred in different periods of time have different values relative to a current dollar, reflecting the effects of inflation and forgone alternative uses of those funds.

In terms of Audit Recommendation No. 5, WTD concurs with the recommendation and will update its capital costs once we have sufficient data to provide a foundation for such an estimate. Work is underway to update the timing of future expansions at our treatment facilities in terms of solids and liquid stream capacity. This work will be completed in 2018. We also concur with Audit Recommendation No. 6 that recommends clarifying any ambiguities in financial policies to ensure alignment between Council's intent and the capacity charge methodology. Finally, WTD concurs with Audit Recommendation No. 7 and will work with the King County Council and our local sewer utilities on potential changes to King County Code 28.86.160(c)(3)(FP-15)(3)(g).

Thank you again for collaborating on this work. If you have any questions regarding our audit response, please contact Gunars Sreibers, Acting Director of the Wastewater Treatment Division, Department of Natural Resources and Parks, at 206-263-9473.

Sincerely,



Dow Constantine
King County Executive

Enclosure

cc: Fred Jarrett, Deputy County Executive, King County Executive Office (KCEO)
Rhonda Berry, Deputy Executive for Operations, KCEO
Christie True, Director, Department of Natural Resources and Parks (DNRP)
Gunars Sreibers, Acting Division Director, Wastewater Treatment Division, DNRP

Executive Response (continued)

Recommendation No. 1

The Wastewater Treatment Division, working with its component agencies, should develop an approach to determining the capacity charge that leads to a simpler and more transparent model, and propose for consideration by the Regional Water Quality Committee and the King County Council any changes to the financial policies necessary to implement such an approach.

Select concurrence below	Implementation date or N/A	Responsible agency
Concur	Estimated Completion: 12/2017 Deliverables: 1. Document agreed upon approach by working with our local sewer utilities. 2. Policy modification recommendation(s) to Council	Wastewater Treatment Division
Agency concurrence comment, or reason for partial or non-concurrence for Recommendation 1		

Recommendation No. 2

The Wastewater Treatment Division should have an independent party review the validity of the model's methodology and calculations on a regularly scheduled basis.

Select concurrence below	Implementation date or N/A	Responsible agency
Concur	Estimated Completion: 1Q 2018 Deliverables: 1. RFP for consultant expertise and annual review processes 2. Executed Contract with Scheduled Reviews 3. First Report 2018	Wastewater Treatment Division
Agency concurrence comment, or reason for partial or non-concurrence for Recommendation 2		

Executive Response (continued)

Recommendation No. 3

The Wastewater Treatment Division should ensure that the approach developed in Recommendation 1 allows a reviewer to verify the extent to which growth costs equal growth revenues based on values estimated independently of the model.

Select concurrence below	Implementation date or N/A	Responsible agency
Concur	Estimated Completion: 1Q 2019 to coincide with the next three-year update of the capacity charge Deliverables: Assessment, to be included in response to Recommendation No. 2, of how growth costs compare to growth revenues over the period of the Regional Wastewater Services Plan.	Wastewater Treatment Division
Agency concurrence comment, or reason for partial or non-concurrence for Recommendation 3		

Recommendation No. 4

The Wastewater Treatment Division should either stop discounting growth costs and revenues in the capacity charge model by more than the inflation rate or propose that the County Council modify the financial policies to explicitly authorize such a practice, consistent with state law.

Select concurrence below	Implementation date or N/A	Responsible agency
Concur	Estimated Completion: To be included with response to Recommendation No. 1 in 4Q 2017 Deliverables: 1. Document agreed upon approach by working with our local sewer utilities. 2. Policy modification recommendation(s) to Council	Wastewater Treatment Division
Agency concurrence comment, or reason for partial or non-concurrence for Recommendation 4		
Concur with seeking a policy explicitly affirming the use of present value. WTD believes it is following the intent of the existing policy; however, WTD will work with the local component agencies, other stakeholders and Council to refine and clarify the policy with specific attention to applying time value to capacity charge calculations.		

Executive Response (continued)

Recommendation No. 5

The Wastewater Treatment Division should continue developing a new methodology that fully estimates how much existing excess capacity should be allocated to growth costs.

Select concurrence below	Implementation date or N/A	Responsible agency
Concur	Estimated Completion: On-Going element of the capacity charge calculation. Next iteration available in Q4 2018 following completion of study on future treatment plant expansion needs. Deliverables: Documentation of updated capital costs.	Wastewater Treatment Division
Agency concurrence comment, or reason for partial or non-concurrence for Recommendation 5		

Recommendation No. 6

The Wastewater Treatment Division should propose to the County Council, as part of the proposal in Recommendation 1, a way to resolve conflicts between other financial policies and KCC 28.86.160(C)(3)(FP-15)(3)(d), which mandates that each new customer pay an equal share.

Select concurrence below	Implementation date or N/A	Responsible agency
Concur	Estimated Completion: To be included with response to Recommendation No. 1 in 4Q 2017 Deliverables: 1. Document agreed upon approach by working with our local sewer utilities. 2. Policy modification recommendation(s) to Council	Wastewater Treatment Division
Agency concurrence comment, or reason for partial or non-concurrence for Recommendation 6		

Executive Response (continued)

Recommendation No. 7

The Wastewater Treatment Division should propose to the County Council, as part of the proposal in Recommendation 1, a way to resolve the ambiguities in KCC 28.86.160(C)(3)(FP-15)(3)(g), which allocates growth-related capital costs.

Select concurrence below	Implementation date or N/A	Responsible agency
Concur	Estimated Completion: To be included with response to Recommendation No. 1 in 4Q 2017 Deliverables: 1. Document agreed upon approach by working with our local sewer utilities. 2. Policy modification recommendation(s) to Council	Wastewater Treatment Division
Agency concurrence comment, or reason for partial or non-concurrence for Recommendation 7		

Auditor's Comments

The Executive Response, with regard to Recommendation 4, states that:

“The audit describes the time value of money as an "interest charge" implying something over and above the time value of money. We do not think this is the case. Rather, utilizing present value recognizes the cost to existing customers of carrying the costs of creating new capacity, in addition to the effects of inflation, thus helping ensure growth is paying a fair share. It is a core financial principle that revenues and costs received or incurred in different periods of time have different values relative to a current dollar, reflecting the effects of inflation and forgone alternative uses of those funds.”

To clarify, we agree that revenues and costs received or incurred in different periods of time have different values relative to a current dollar. When comparing amounts from different years, it is necessary to make adjustments for the “time value of money” and use a present value. We also agree that the adjustment for the “time value of money” should reflect the effects of inflation. The point raised in the audit, however, is whether it is appropriate to also adjust for the effects of foregone alternative uses of funds. To the extent that it exceeds inflation, this adjustment can be characterized as effectively “charging interest” on growth costs that exceed growth revenues.

We agree that in many – if not most – instances, it is a core financial principle to make adjustments for these foregone alternatives. For example, when conducting an analysis of different alternatives it is necessary to consider the “opportunity costs” of selecting one alternative over another. Our office recently released a whitepaper on this topic, which attempts to provide guidance on how to make these adjustments. This whitepaper is titled “Cost Analysis: Best Practices for Comparing Alternatives” and can be found on our website.

In this particular case, however, given the circumstances surrounding this specific type of analysis, we would not agree that the adjustment for the time value of money should necessarily reflect the effects of foregone alternatives in addition to inflation.

The Executive Response states that including these effects “recognizes the cost to existing customers of carrying the costs of creating new capacity.” In other words, the argument is that existing customers effectively made a “loan” to new customers by paying for new capacity, and that new customers should compensate existing customers for their opportunity costs.

However, there are several arguments against including these “opportunity costs” in the adjustment:

- Existing customers have no alternative other than carrying the costs of creating new capacity. This is because capacity must be built before new customers can connect to the system, so the costs will fall to existing customers. Therefore it is not clear what the foregone alternative use of these funds would have been, or how much it should be compensated. The only alternative

Auditor's Comments (continued)

would have been to keep wastewater capacity at 2003 levels while the region experienced the rapid growth of the past 13 years. This would have likely put pressures on the existing system and the quality of life in the region, which would have added costs to existing customers. To truly reflect the effects of this foregone alternative, these unknown costs would need to be considered as well, potentially offsetting any amount saved from not building new capacity.

- Existing customers have always carried the costs of creating new capacity in the past. Before the capacity charge was instituted, customers generally did not pay for the capital expenditures necessary to create the capacity for themselves. For example, the capacity that supports most existing customers today was paid for by prior existing customers who “paid it forward.” Most existing customers did not compensate these prior customers for the full costs of their own capacity, if at all. However, these customers will be fully compensated due to the capacity charge, and compensated plus interest if the time value of money is adjusted by more than inflation.
- The “existing customers” who carried the costs of creating new capacity are not necessarily the same “existing customers” who will benefit from interest rates. Whether a ratepayer is an “existing” or “new” customer depends on what property they current own, not how long they have been paying monthly sewer rates. For example, a ratepayer could have carried the costs of creating new capacity as an existing customer and then become a “new customer” by moving into a newly-built house; this ratepayer would effectively pay for growth twice, plus interest. Alternatively, an out-of-state resident could move into a house built before 2003 and benefit from lower sewer rates as an “existing customer,” despite not having initially paid for any growth costs. In neither of these cases are there “opportunity costs” that should be compensated with interest.

We acknowledge that this is a complicated methodology question that could be reasonably argued both ways. However, given the large impact this question has on the capacity charge (see, e.g., Exhibit C on page 10), the provision in state law indicating that “interest charges” are distinct from “costs,” and the lack of explicit guidance in the financial policies, we recommended that the County stop effectively charging interest above inflation unless clearly authorized to do so by the County Council.

Statement of Compliance, Scope, Objective & Methodology

Statement of Compliance with Government Auditing Standards

We conducted this performance audit in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

Scope of Work on Internal Controls

We assessed internal controls relevant to the audit objectives. This included review of selected policies, plans, processes, and reports, as well as interviews with knowledgeable staff at the Wastewater Treatment Division. In performing our work, we identified concerns related to the model's lack of transparency, lack of independent review, and ability to catch errors as they arise, all of which are made more difficult by the model's high degree of complexity.

Scope

This audit evaluated the model that the Wastewater Treatment Division uses to set capacity charge amounts each year, with a focus on the updated model used to determine the 2017 proposed amount.

Objectives

1. Do the model's formulas calculate the capacity charge in a manner consistent with the intent of statutes and financial policies?
2. Is the model's logic and methodology structured in a manner consistent with the intent of statutes and financial policies?
3. What are the implications of current county financial policies, compared to possible alternative approaches to determining the capacity charge?

Methodology

To achieve the objectives listed above, we evaluated the Microsoft Excel workbook that the Wastewater Treatment Division uses to set the capacity charge amount, as well as several of the supplementary workbooks that feed inputs into the model as hardcoded values. We examined each formula within the model to ensure that it was performing consistently with the intent of the model's methodology. We also created a map of the model's complex logic to help identify any errors and ensure the soundness of the calculations. Additionally, we reviewed the methodology choices employed by the model and compared them to the county's enacted financial policies. We interviewed agency staff to gain a better understanding of the model and to alert them of any errors we discovered. Finally, we reviewed the financial policies in code for internal consistency and any ambiguity in providing guidance on how to structure the model's methodology.

List of Recommendations & Implementation Schedule

Recommendation 1: The Wastewater Treatment Division, working with its component agencies, should develop an approach to determining the capacity charge that leads to a simpler and more transparent model, and propose for consideration by the Regional Water Quality Committee and the County Council any changes to the financial policies necessary to implement such an approach.

Implementation Date: 12/2017

Estimate of Impact: By using a simpler approach, decision-makers will have increased confidence that proposed capacity charge amounts fulfill the policy goal of growth paying for growth. A simpler model will be more transparent, verifiable, equitable, predictable, sustainable, and at lower risk of error.

Recommendation 2: The Wastewater Treatment Division should have an independent party review the validity of the model's methodology and calculations on a regularly scheduled basis.

Implementation Date: 1Q 2018

Estimate of Impact: By having an independent party review the model, decision-makers will have increased confidence that proposed capacity charge amounts are based on error-free calculations and will fulfill the policy goal of growth paying for growth.

Recommendation 3: The Wastewater Treatment Division should ensure that the approach developed in Recommendation 1 allows a reviewer to verify the extent to which growth costs equal growth revenues based on values estimated independently of the model.

Implementation Date: 1Q 2019 to coincide with the next three-year update of the capacity charge

Estimate of Impact: By having a way to independently check the reasonableness of the model, decision-makers will have increased confidence that proposed capacity charge amounts are based on error-free calculations and will fulfill the policy goal of growth paying for growth.

List of Recommendations & Implementation Schedule (continued)

Recommendation 4: The Wastewater Treatment Division should either stop discounting growth costs and revenues in the capacity charge model by more than the inflation rate or propose that the King County Council modify the financial policies to explicitly authorize such a practice, consistent with state law.

Implementation Date: To be included with response to Recommendation No. 1 in 4Q 2017

Estimate of Impact: Aligning actual practice with the financial policies will ensure that costs will be allocated to new customers consistent with the intent of the County Council.

Recommendation 5: The Wastewater Treatment Division should continue developing a new methodology that fully estimates how much existing excess capacity should be allocated to growth costs.

Implementation Date: On-going element of the capacity charge calculation. Next iteration available in 4Q 2018 following completion of study on future treatment plant expansion needs.

Estimate of Impact: Accurately estimating how much existing excess capacity should be allocated to new customers will ensure that costs will be allocated to new customers consistent with the intent of the County Council.

Recommendation 6: The Wastewater Treatment Division should propose to the King County Council, as part of the proposal in Recommendation 1, a way to resolve conflicts between other financial policies and KCC 28.86.160(C)(3)(FP-15)(3)(d), which mandates that each new customer pay an equal share.

Implementation Date: To be included with response to Recommendation No. 1 in 4Q 2017

Estimate of Impact: Resolving conflicts between different sections of the financial policies will clarify the intent of the County Council, making it more likely for the County to achieve the policy goal of growth paying for growth as intended.

Recommendation 7: The Wastewater Treatment Division should propose to the King County Council, as part of the proposal in Recommendation 1, a way to resolve the ambiguities in KCC 28.86.160(C)(3)(FP-15)(3)(g), which allocates growth-related capital costs.

Implementation Date: To be included with response to Recommendation No. 1 in 4Q 2017

Estimate of Impact: Resolving this ambiguous section of the financial policies will clarify the intent of the County Council, making it more likely for the County to achieve the policy goal of growth paying for growth as intended.