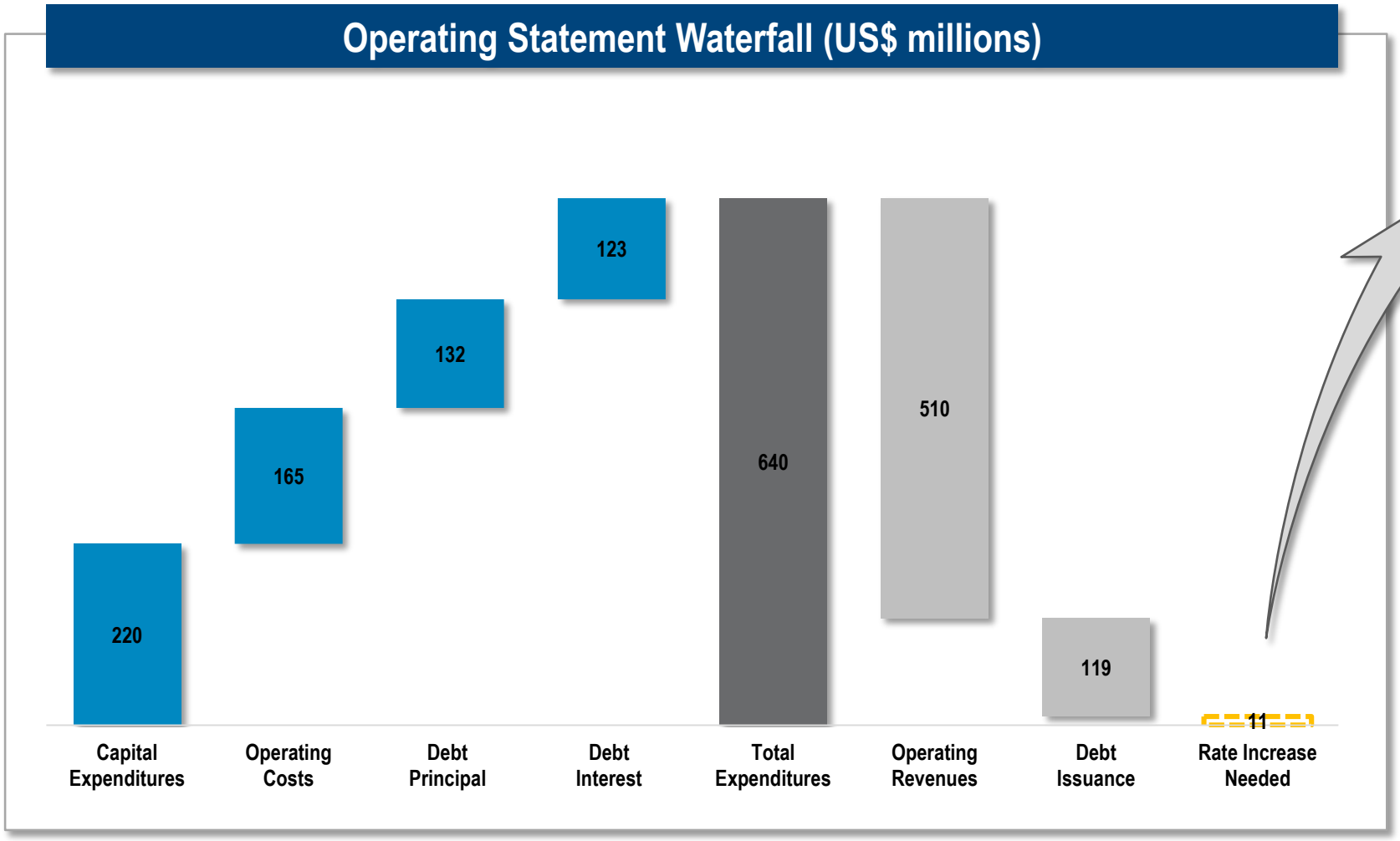
King County

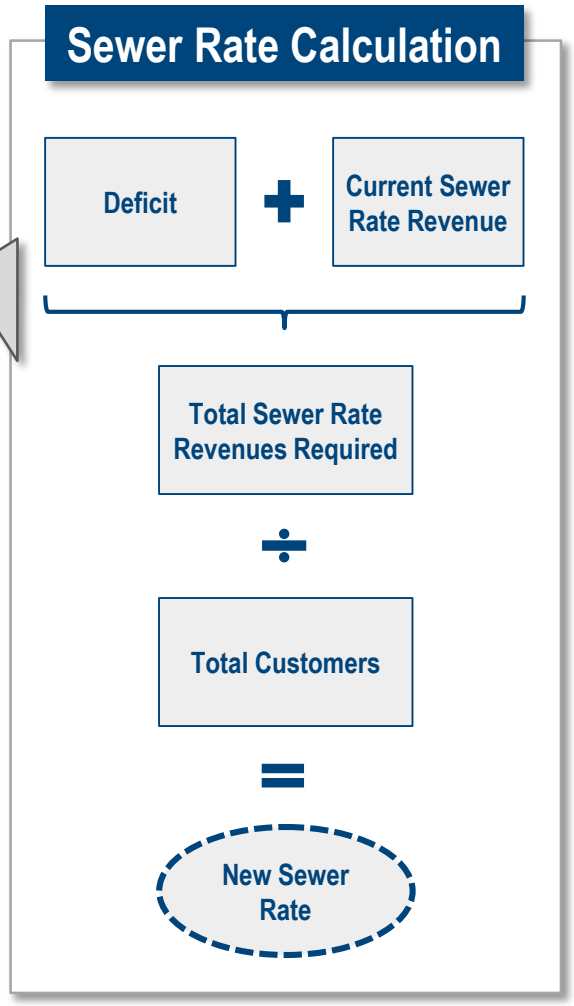
# WTD Sewer Rate-Setting

Metropolitan Water Pollution Abatement Advisory Committee
Rates and Finance Subcommittee
December 5, 2019

# Rate Setting: Relationship to Budget Process

# Sewer Rate Simplified



# Sewer Rate Model

## From Inputs to Outputs

### Revenue Forecast

**Existing Revenues**

- Capacity Charge (15%)
- Industrial Waste (1%)
- Septage (1%)
- RINs and others (2%)

**Sewer Rate Demand Factors**

- RCE Current Year Forecast
- RCE Future Growth

### Expenditures

**Operating**

- Biennial Budget + Supplementals
- Long-term Growth Assumptions
- Operating Related to New Projects

**Capital**

- Biennial Budget +Supplementals
- 6-year plan
- 2030 plan & Clean Water Plan (2060)
- Future Growth Assumptions

### Debt & Cash Management

**Debt**

- Long-term Bond Rate
- Variable Debt Rate
- Low Cost Funding Alternatives (SRF, WIFIA)

**Cash & Reserves**

- Interest Earnings Rate (KC OEA)
- Investment Income
- Reserve Requirements
- Rate Stabilization Fund & Other Reserves

Running the Model

1 **Debt Service Coverage – Rate as an Output**

What rate increases are needed for debt service coverage ratios (1.15x per bond ordinance; 1.40x for rating agencies) for current and following year

2 **Cash Funding – Rate as an Output**

What rate increase provide an average of 40% cash funding of capital investments over the 6-year forecast period?

3 **Debt Issuance as an Output**

What amount of debt issuance is needed to fund the capital program?

# Sewer Rate Process

## Detailed Calendar of Events Based on Previous Years

| Date | Task or Event |
|---|---|
| **January 28th** | RIN revenues and spending |
| **January 30th** | RCE growth rates |
| **January 31th** | Updated Rate Model (initial) |
| **February 4th** | Initial Financial Plan |
| **February 4th** | Issue Paper production begin |
| **February 5th** | Preliminary cash balances |
| **February 7th** | Initial MWPAAC R&F Briefing |
| **February 8th** | Final Decision on CIP Supplemental |
| **February 12th** | Update Project cash flows and Financial Plan with actuals |
| **February 14th - 18th** | Initial Briefing with WTD/DNRP |
| **February 21th** | Operating supplemental |
| **February 25th** | Final Draft Rate & Capacity Charge |
| **February 25th** | Year End Presentation Materials |
| **February 28th** | Final Briefing with DNRP |
| **February 28th** | Issue Paper: Draft |
| **March 1st** | Freeze the Financial Plan |

| Date | Task or Event |
|---|---|
| **March 4th** | Freeze the Financial Plan |
| **March 4th** | Briefing with Executive |
| **March 5th** | Issue Paper Finalized |
| **March 7th** | MWPAAC R&F |
| **March 7th** | Legislative package to WTD |
| **March 14th** | Legislative package to DNRP |
| **March 21st** | Updated materials for presentations |
| **March 27th** | MWPAAC R&F (Full MWPAAC) |
| **March 28th** | Legislative Package to Executive/OPSB |
| **April 18th** | Transmit to Council |
| **April 24th** | Full MWPAAC Presentation |
| **April** | Operating Budget on-going development |
| **May 1st** | RWQC Presentation |
| **May 8th** | BFM |
| **May 22nd** | BFM |
| **June 3rd** | Council action, earliest |
| **June 10th** | Council action, latest |

# Questions or discussion?

King County

# WTD Customer Forecasting

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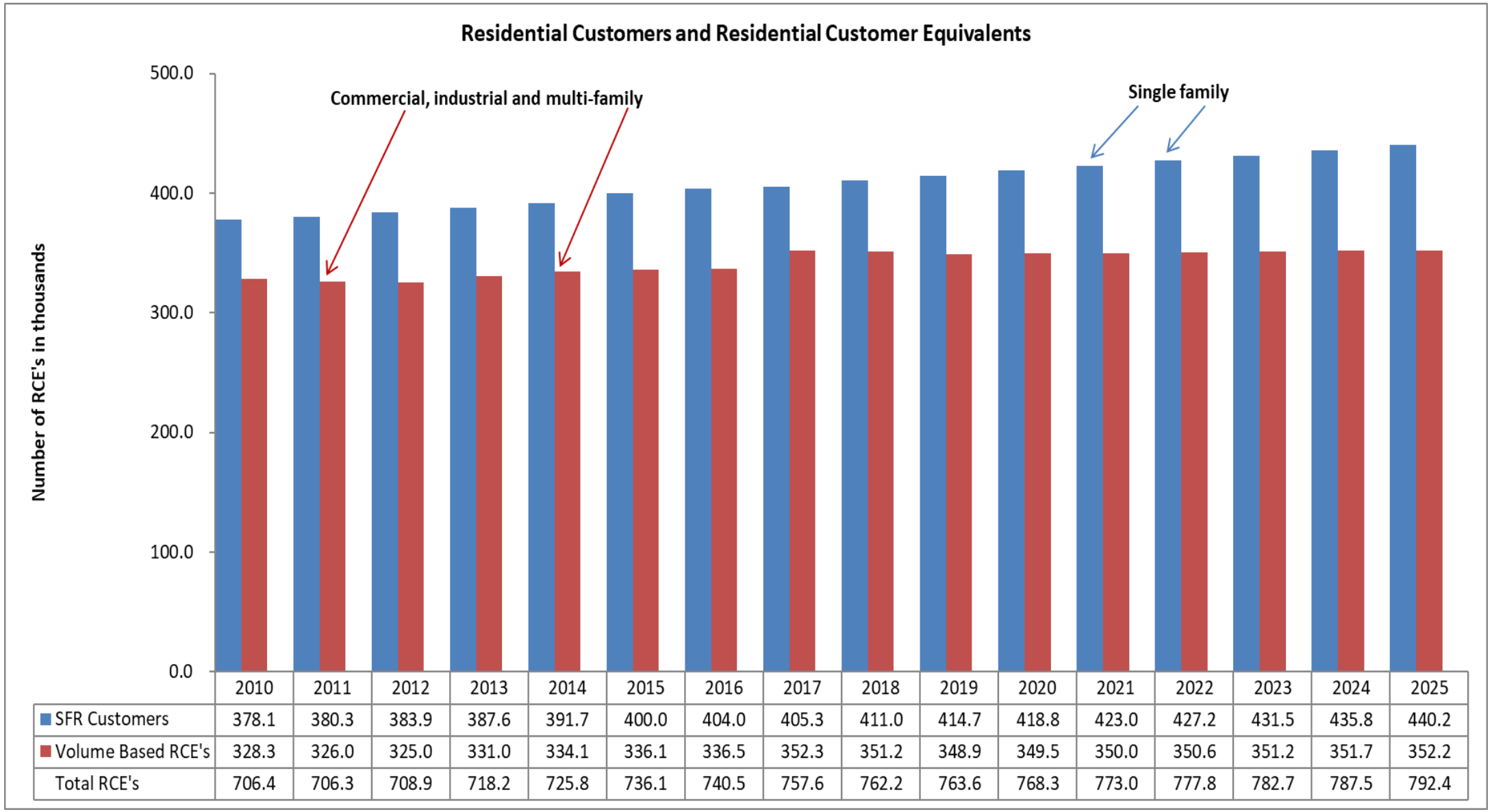
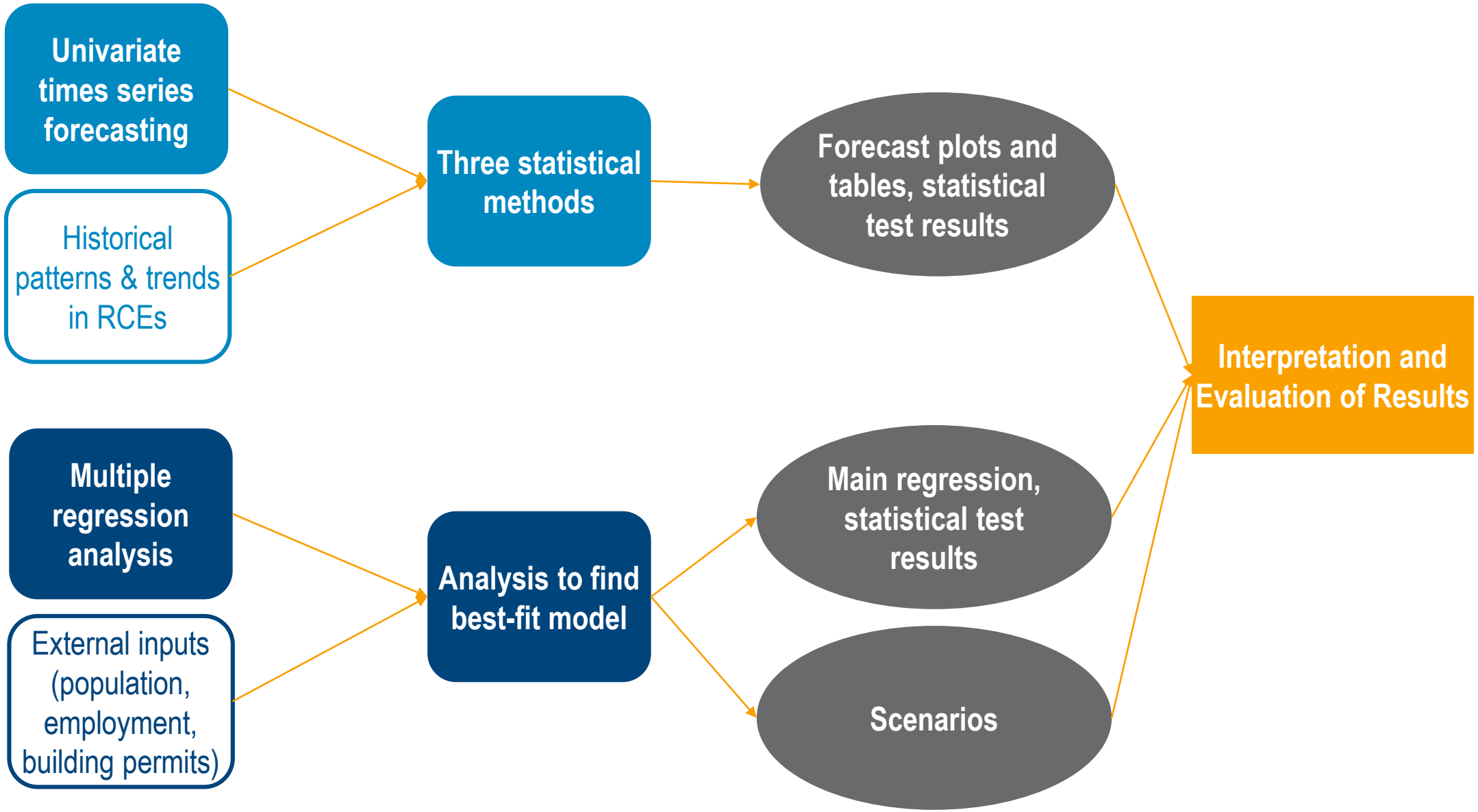
# WTD Customers—Sewer Rate

## Trends




| | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SFR Customers | 378.1 | 380.3 | 383.9 | 387.6 | 391.7 | 400.0 | 404.0 | 405.3 | 411.0 | 414.7 | 418.8 | 423.0 | 427.2 | 431.5 | 435.8 | 440.2 |
| Volume Based RCE's | 328.3 | 326.0 | 325.0 | 331.0 | 334.1 | 336.1 | 336.5 | 352.3 | 351.2 | 348.9 | 349.5 | 350.0 | 350.6 | 351.2 | 351.7 | 352.2 |
| Total RCE's | 706.4 | 706.3 | 708.9 | 718.2 | 725.8 | 736.1 | 740.5 | 757.6 | 762.2 | 763.6 | 768.3 | 773.0 | 777.8 | 782.7 | 787.5 | 792.4 |

# RCE Forecasting Models



# RCE Forecasting Model

## Univariate Time Series

**Univariate time series forecasting relies on one main assumption: past performance is the best indicator of future performance**

### 1 Data Update, Cleaning & Prep

- RCEs & SFRs data received monthly from sewer agencies
- Annual update of database, both historical corrections and addition of new data.
- Corresponding changes to statistical analysis to include new data

### 2 Model Runs

- "Run" the time series analysis using three different statistical methods
- Quality control and error check

### 3 Output Analysis

- Review statistical test results, plots, tables, and text file of model summary
- Compare the results and accuracy from the three different models

### 4 Discussions and Comparisons

- Review and discuss results
- Compare results of times series with multiple regression to inform near term forecast
- Use confidence interval to inform conservative long term forecast

**80% Confidence Intervals and Mean Point Forecast**

# RCE Forecasting Model

## Multivariate Regression

**Multivariate regression analysis looks for clues and links between different variables to predict the future, but does not establish causal relationships**

### 1 Update External Forecasts

- Yearly update of estimates for employment, housing permits and population: Puget Sound Economic Forecaster and Puget Sound Regional Council
- Update high and low scenario for housing permit projections
- Own assumptions for projections beyond 2040

### 2 Calculate Regression Equation

- Several variables tested to achieve best model fit
- Population, employment, permits and time
- Estimated coefficients and exogenous forecasts used to forecast RCEs

### 3 Populate Results Page

- Long-term forecast out to 2060 in a set of scenarios: dependent variable all customers or SFRs and RCEs separately, Multi-Unit/Commercial/Industrial models, and using low housing permits vs high

### 4 Discussions and Comparisons

- Review and discuss results
- Compare times series with multiple regression results; best results for near term, long term, sewer rate, and capacity charge
- Conservatism may call for different results in different applications

**Range of Projections Depending on Assumptions**

# Component Agencies

## Ten Largest—Sewer Rate RCEs

**Sewer System Participants as of December 31, 2018**

| Municipal Participants-Cities | Single Family Residential Customers | Commercial Multifamily Industrial RCEs | Total Customers | Percentage of System (%) |
|---|---|---|---|---|
| Seattle Public Utilities | 146,746 | 152,092 | 298,838 | 39.6% |
| Bellevue | 32,550 | 30,164 | 62,714 | 8.3% |
| Alderwood | 33,817 | 17,417 | 51,234 | 6.8% |
| Soos Creek | 31,868 | 5,640 | 37,508 | 5.0% |
| Kent | 12,966 | 23,924 | 36,890 | 4.9% |
| North Shore Utility District | 19,804 | 10,419 | 30,223 | 4.0% |
| Auburn | 13,160 | 19,123 | 32,283 | 4.3% |
| Redmond | 15,043 | 16,722 | 31,765 | 4.2% |
| Renton | 15,903 | 14,843 | 30,746 | 4.1% |
| Shoreline (Ronald) | 15,148 | 4,773 | 19,921 | 2.6% |
| **Total 10 Largest** | **337,005** | **295,117** | **632,122** | **83.8%** |
| Remaining Participants | 73,964 | 48,603 | 122,567 | 16.2% |
| Total System | 410,969 | 343,720 | 754,689 | 100.0% |

# New Connections Trends

## Percent of Total New Connections RCEs by Agency

| New Connections (RCEs) in WTD Service Area | | | | | | |
|---|---|---|---|---|---|---|
| | 2010-2014 | | 2015-2019 | | 2010-2019 | |
| Local Agency[1] | RCEs | % of Total | RCEs | % of Total | RCEs | % of Total |
| Seattle | 18,047 | 43.7% | 25,443 | 46.6% | 43,490 | 45.4% |
| Alderwood | 5,423 | 13.1% | 5,392 | 9.9% | 10,815 | 11.3% |
| Redmond | 2,259 | 5.5% | 3,207 | 5.9% | 5,466 | 5.7% |
| Bellevue | 1,530 | 3.7% | 3,486 | 6.4% | 5,016 | 5.2% |
| Soos Creek | 1,757 | 4.3% | 2,457 | 4.5% | 4,214 | 4.4% |
| Auburn | 1,984 | 4.8% | 1,515 | 2.8% | 3,499 | 3.6% |
| Sammamish Plateau | 1,244 | 3.0% | 1,912 | 3.5% | 3,156 | 3.3% |
| Renton | 1,501 | 3.6% | 1,412 | 2.6% | 2,913 | 3.0% |
| Northshore | 1,033 | 2.5% | 1,270 | 2.3% | 2,303 | 2.4% |
| Issaquah | 1,299 | 3.1% | 915 | 1.7% | 2,214 | 2.3% |
| Total 10 Largest | 36,078 | 87.4% | 47,010 | 86.1% | 83,087 | 86.7% |
| Remaining Participants | 5,206 | 12.6% | 7,587 | 13.9% | 12,793 | 13.3% |
| Total System | 41,284 | 100.0% | 54,596 | 100.0% | 95,880 | 100.0% |

[1]In order of total new connection RCEs as of December 31, 2018

# Questions or discussion?