

MEMORANDUM

TO: Mark Isaacson, Director, King County Wastewater Treatment Division (WTD)
FROM: MWPAAC Capacity Charge Rate Structure Technical Work Group
DATE: August 28, 2019
SUBJECT: Capacity Charge Rate Study and Recommendations from Work Group

BACKGROUND

The King County Capacity Charge has existed since 1990 as a way to recover a proportionate share of the cost of the wastewater system capacity from new or expanded development. Customers typically pay the charge in a lump-sum at the time of development or in quarterly installments over fifteen years.

The current system of assessing the Capacity Charge is based on the unit of a Residential Customer Equivalent (RCE). Every Single-family home is considered 1.0 RCE. Multi-family units in 2-, 3-, and 4-unit buildings are each considered 0.8 RCE, while each unit in a building with 5 or more units is considered 0.64 RCE. Commercial units are charged based on fixture units, where 20 fixture units = 1.0 RCE (additional flows are also considered).

This rate structure for the Capacity Charge has been in place since 1990. Recently, some homeowners and developers have expressed concern about the equity of the charge. Specifically, they were concerned that it was unfair to treat all Single-family homes the same (noting that there was considerable variation in size, number of bedrooms, bathrooms, occupants, and fixtures within Single-family development) and that Multi-family might need more categories to account for the “micro” apartments that are increasingly common in the region.

In early 2017, the MWPAAC Executive Board created a work group to provide expertise and evaluation of data shared in the development of a recommendation to WTD’s Director for consideration. The work group was directed to evaluate the equity of the current system and consider possible improvements. From the outset of the study, an attempt was made to consider both the equity and the administrative feasibility of each option.

The question for this study is how to best define a target basis of the capacity charge that can be applied uniformly across the diverse service area. The capacity charge reflects the growth of the County’s ongoing need to invest in capital facilities necessary to serve new development (and certain redevelopment) which occurs across varied types of land uses. To date, the charge has been apportioned uniformly across single-family development, by specific fractions of that amount for multi-family development, and by fixture-based proxies for the amount of wastewater that each type of building typically sends to the King County wastewater system.

In July of 2017, King County WTD contracted with FCS Group to assist the work group with the analysis. Gordon Wilson was the primary FCS Group project manager on this contract, with assistance from Chase Bozette of FCS and Jeff Morris, an economist with Sound Resource Management Group.

PROCESS

FCS Group was given the task of evaluating options for the basis of the capacity charge, based on two main criteria – equity and administrative feasibility – which are defined as follows:

- *Equity* – the unit basis of the charge should be related to winter average water usage

- *Administrative Feasibility* – the charge must be workable for WTD, developers, and the 34 local sewer agencies; and it must be based on information that is accessible at the time of permitting.

The consultant team began by reviewing literature on rate design structure, and structures used by other regional wastewater treatment agencies. The main point of this research was discovery of possible methods to be considered for assessing the capacity charge.

The FCS study chose actual flows (specifically winter water use, which excludes irrigation) as a target basis for flow apportionment and geared its analysis to examine how various charging options would capture variations in those flows. The team then sought data from a sample of WTD component agencies for new connections from the years 2006 – 2015. Each participating agency provided water use data by connection, which was then joined with data on property characteristics from the King County and Snohomish County Assessor’s Offices. WTD data on fixture unit counts was also included.

The goal of this local research was to find a measurable variable or variables that were the best available predictor of winter average water use. These variables could then be used as a basis for assessing the capacity charge. The final sample size was 16,262 residential buildings and 212 commercial buildings – from 14 local agencies within the WTD service area. Due to privacy concerns, some agencies were unable to provide water use data.

Jeff Morris of Sound Resource Management Group performed regression analysis, testing the relationship between water use and a select variety of dependent variables – geographic location, bedroom count, bathroom count, finished interior square footage, and meter size. Of the select variables chosen by the consultant for residential accounts, geographic location had the highest correlation to winter average water consumption, followed by finished interior square footage (heated / living space; excluding unheated garages and basements). Because of King County’s commitment to geographically neutral rates, location was not considered as a basis for the charge. Moving to the next best option, FCS developed several options using interior square footage as a basis for the capacity charge. For commercial accounts, meter size was found to have the closest correlation.

OPTIONS CONSIDERED

Based on the above research, seven residential options and two commercial options were developed for consideration. Details about each option can be found in the final report prepared by FCS Group. A summary of each option follows:

Residential options:

1. Updated Status Quo (based on RCE)

Explanation: *The same basic system is retained, although changes to equivalence factors and categories may still occur, based on available data such as the American Community Survey*

- Pros: Avoids a costly and frustrating migration to a new system; relatively easy to update regularly (especially if based on American Community Survey data); aligns with capital planning assumptions, measured average water consumption demonstrates similar relationship to existing RCE for each housing classification.
- Cons: Does not directly address some equity definitions as well as other options.

2a. Revised RCEs based on square footage tiers (Multi-family grouped with Single-family)

Explanation: *The RCE system is retained, but categories and equivalence factors are updated – based on interior finished square footage (excluding unfinished basements). Three RCE categories for Single-family (1.25, 1.0, 0.85); All Multi-family is equivalent to small Single-family (0.85 RCE).*

- Pros: based on interior square footage, which was the best available alternative basis for the charge; retains RCE system; groups Multi-family with the small Single-family category– homes of comparable size would be charged the same.
- Cons: Tiers create boundary issues - small differences in square footage can make a big difference to the charge; administrative difficulty of collecting, validating, and handling changes (i.e. expansions, basement finishes).

2b. Revised RCEs based square footage tiers (Multi-family separate from Single-family)

Explanation: *Similar to 2a, but Multi-family is split out into its own categories. Three RCE categories for Single-family (1.25, 1.0, 0.9); Two RCE categories for Multi-family (0.9, 0.75).*

- Pros: based on interior finished square footage, which was the best available alternative basis for the charge; retains RCE system;
- Cons: Tiers create boundary issues - small differences in square footage can make a big difference to the charge; adding separate categories for Multi-family makes this option more difficult to administer; administrative difficulty of collecting, validating, and handling changes (i.e. remodels) to square footage data.

3a. Per Square-Foot Uniform Charge (Straight Line)

Explanation: *All residential properties charged based on a flat charge per interior square foot, with no distinction between Single-family or Multi-family or Micro-units.*

- Pros: allows differentiation of the charge; uniform charge is simple to understand and explain.
- Cons: administrative difficulty of collecting square footage data for local agencies and WTD; would need to rely initially on self-reported interior square footage, which would be trued up after comparison to Assessor data (this would require a “de minimus” threshold within which corrections are not made, which in itself may encourage under-reporting of initial square footage data).

3b. Per Square-Foot Uniform Charge (Declining Block Rate)

Explanation: *A uniform charge based on a tiered charge per interior square foot. The first 1,000 square feet are charged at one rate, and every square foot above 1,000 is charged at roughly 20% of that rate; as in 3a, no distinction between Single-family or Multi-family or Micro-units.*

- Pros: more equitable than option 3a because it accounts for the declining water usage per square foot as a home increases in size.
- Cons: administrative difficulty of collecting square footage data for local agencies and WTD; would need to rely initially on self-reported interior square footage, which would be trued up after comparison to Assessor data (this would require a “de minimus” threshold within which corrections are not made, which in itself may encourage under-reporting of initial square footage data); block rate is more difficult to explain and administer, with more room for error; by introducing a second tier rate, the tier / base rate becomes higher – causing smaller Single-family or Multi-family units to pay a much higher rate per square foot. As with options 2a and 2b, tiers create boundary issues.

3c. Per Square-Foot Uniform Charge (Capped at 3,000 Square Feet)

Explanation: *Instead of adding a second block rate as in Option 3b, this option accounts for the declining per-square-foot water usage by capping the uniform charge at 3,000 square feet.*

- Pros: preserves the equity of allowing for differentiation of the charge, while avoiding the challenge of implementing the 2-tier block rate in option 3b.
- Cons: administrative difficulty of collecting square footage data for local agencies and WTD; would need to rely initially on self-reported interior square footage, which would be trued up after comparison to Assessor data (this would require a “de minimus” threshold within which corrections are not made, which in itself may encourage under-reporting of initial square footage data).

3d. Per Square-Foot Uniform Charge (Capped at 2,400 Square Feet)

Explanation: *this option is the same as option 3c, but the uniform charge is capped at 2,400 square feet instead of 3,000 square feet.*

- Pros: as with option 3c, it preserves the equity of allowing for differentiation of the charge, while avoiding the challenge of implementing the 2-tier block rate in option 3b.
- Cons: administrative difficulty of collecting square footage data for local agencies and WTD; would need to rely initially on self-reported interior square footage, which would be trued up after comparison to Assessor data (this would require a “de minimus” threshold within which corrections are not made, which in itself may encourage under-reporting of initial square footage data).

Commercial Options

1. Status Quo (based on fixture unit count, plus additional flows)

Explanation: *Current RCE-based system is retained, where commercial customers are charged based on fixture counts by type (where 20 “fixture units” is assumed equal to 1 RCE), plus additional flows.*

- Pros: retains the well-known system; this method is adaptable across many different types of commercial facilities.
- Cons: process is difficult to administer; fixture counts by type often not known at time of permit application, requiring considerable time for “truing-up”; Translation to RCE (20 fixture units) needs fresh analysis.

2. Based on Meter Capacity Equivalent (MCE)

Explanation: *Current RCE-based system is replaced with a charge based on meter size, similar to the Meter Capacity Equivalent (MCE) – a standard factor created by the American Water Works Association.*

- Pros: Simpler to administer than current process; recent research suggests it may be slightly more equitable for smaller meter sizes.
- Cons: For meters larger than 2”, the MCE ratio has a tendency to overestimate actual water usage – a different method would be needed for these meters; this method would not adequately account for mixed use buildings that share one meter, which is increasingly common in many urban areas; WTD would need to collect MCE data for 2-3 years to study what the actual factors should be – this method would not take effect for several years and require ongoing collection of data to maintain.

RECOMMENDATIONS

After being presented with the consultant's work, the Work Group focused on administrative feasibility of each option for both the Wastewater Treatment Division and Component Agencies. The WTD service area is diverse, covered by multiple and overlapping jurisdictions, with varying types of housing and permit requirements. This creates a complexity as each jurisdiction has its own challenges in compiling information, such as square footage, in an efficient and timely manner. When taken into context of feasible implementation and administration, the Work Group determined an update of 'Status Quo' was the most equitable method available.

Residential recommendation

For new residential customers, the Work Group recommends that WTD **retain the current system of charging based on RCE**. However, there are relatively simple modifications to the current system that should be adopted to enhance customer equity:

- **Updated equivalence factors.** The variables tested as predictors of winter water use (square footage, number of bedrooms, meter size, etc.) were all proxies for another variable – number of people. While we can't know how many people are living in a particular residence, we can find a regional average household size for different household types, based on publicly available data from the American Community Survey (ACS) and maintained by the Census Bureau. This data is free, easily accessed and updated every year. The Work Group recommends using ACS data to update the equivalence factors.
- **Create new categories for Micro-housing** to accommodate the increasing prevalence of Accessory Dwelling Units (ADUs), Detached Accessory Dwelling Units (DADUs), Small Efficiency Dwelling Units (SEDUs), and other small housing types. The Work Group specifically recommends two new categories: ADU/DADU and SEDU. These added categories will help address some of the equity issues with the capacity charge.
 - The ADU / DADU category should include a clear description of WTD's definition of this housing type. For example: "the unit must be less than 75% of the square footage of the main / original living space"; or, "the unit must be less than 1,000 square feet." A survey of local definitions for ADUs and DADUs can be found on the [MRSC website](#).
 - The definition for SEDU should also be clearly stated. This would also likely be expressed in terms of a maximum square footage per unit (including a share of a building's common areas).
 - The RCE for the ADU / DADU category should be based on household size data. Unfortunately, the ACS does not include data on household size for this housing type. A City of Portland study¹ indicates an average household size assumption of 1.36 for ADU and DADU homes. The Work Group assumes an average household size of 1 for the SEDU category. These assumptions should be validated and updated on the same schedule as all other residential and commercial assumptions.
 - The household size assumptions for these new categories can be converted to RCE by dividing each by the ACS-derived King County average household size for a Single-family residence (2.67).

¹ Portland State University Research Lab, State of Oregon Department of Environmental Quality; "Accessory Dwelling Unit Survey for Portland, Eugene, and Ashland, Oregon Final Methodology and Data Report September, 2013." <https://www.oregon.gov/deq/FilterDocs/ADU-ReportFRev.pdf>.

The Work Group recommendation is summarized in the following table:

Table 1 – Existing and Recommended RCE

Classification	Existing RCE: Status Quo	RCE if based on Average Water Consumption (FCS Sample)	RCE if based on Weighted Average People per Household (ACS)	Proposed Recommendation: “Revised Status Quo”
Single-Family	1.0	1.0	1.0	1.0
Multi-Family 2-4 Unit	0.8	0.78	0.83	0.80
Multi-Family 5-Unit +	0.64	0.77	0.66	0.64
ADU & DADU	0.6	N/A	0.51	0.51
SEDU	Fixture Unit Count	0.25	0.37	0.37
Commercial	Fixture Unit Count	N/A	N/A	Fixture Unit Count

Notes:

- The average household size for the ADU & DADU category is the 1.36 taken from the City of Portland study.
- The SEDU category assumes an average household size of 1.0.

Changing to a system based on interior square footage would create significant administrative burden on local agency and WTD staff, and in the opinion of the Work Group, offer only minimal improvements in equity. Updating the RCE system based on easily accessible data improves equity, with only minimal impacts to administrative burden. Moreover, it offers a replicable solution to updating capacity charges in the future.

Commercial recommendation

For new commercial customers, the Work Group recommends that WTD **retain the current system of charging based on RCE**. While a switch to a system based on meter size is attractive for its simplicity and lower administrative burden, there are many remaining concerns:

- Much more work would need to be done to develop a system that accounts for mixed-use buildings (residential and commercial).
- The sample size for the consultant’s commercial rate study was fairly small – only 212 accounts. A much larger and representative sample size is needed to generate options.
- Even with a switch to an MCE-based charge, there will be a need for a modified charge for all meters larger than 2”. This would leave WTD with an even more complex system of assessing the capacity charge to commercial customers.

Within the current commercial system, the Work Group recommends an **updated analysis of the equivalence factor that translates fixture unit count to RCE**. The FCS Group rate study suggests that the equivalence factor of 20 fixture units per RCE is on the high side. Although this study had a relatively small sample size for commercial customers, this finding suggests that a more expansive study of the commercial equivalence factor is warranted.