

# Updating the Plumbing Fixture Unit Table

MWPAAC Rates & Finance Subcommittee

October 7, 2021



**King County**

Department of  
Natural Resources and Parks  
**Wastewater Treatment  
Division**

# Background

The Plumbing Fixture Unit Table is developed by the Wastewater Treatment Division (WTD) and is utilized to calculate the capacity charge for **non-residential structures**.

The capacity charge is a charge billed to property owners with new sanitary sewer connections, change of use or addition made to a structure, since February 1, 1990.

The WTD Division Director has the authority to revise the Plumbing Fixture Unit Table at the director's discretion.

*"The number of residential customer equivalents for non-residential structures ... shall be determined by the department based on values of plumbing fixtures or estimates of wastewater flow from sources other than plumbing fixtures and acceptable to the department. An appropriate schedule of hydraulic capacity or loading values equating to residential customers shall be determined by the director."*

*(King County Code 28.84.050)*



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# WTD Plumbing Fixture Unit Table (1990)

## A. Fixture Units

Fixture Units x Number of Fixtures = Total Fixture Units

| Kind of Fixture               | Fixture Units |         | No. of Fixtures |         | Total Fixture Units  |
|-------------------------------|---------------|---------|-----------------|---------|----------------------|
|                               | Public        | Private | Public          | Private |                      |
| Bathtubs and/or shower        | 4             | 2       |                 |         |                      |
| Dental units or lavatory      | 1             | --      |                 |         |                      |
| Dishwasher, commercial        | 4             | --      |                 |         |                      |
| Drinking fountain (each head) | 1             | --      |                 |         |                      |
| Hose bibb or sill cock        | 5             | 3       |                 |         |                      |
| Laundry tub or clotheswasher  | 4             | 2       |                 |         |                      |
| Sink, bar or lavatory         | 2             | 1       |                 |         |                      |
| Sink, clinic flushing         | 10            | --      |                 |         |                      |
| Sink, kitchen                 | 4             | 2       |                 |         |                      |
| Sink, other                   | 4             | 2       |                 |         |                      |
| Sink wash, circle spray       | 4             | --      |                 |         |                      |
| Urinal, flush tank            | 3             | --      |                 |         |                      |
| Urinal, pedestal              | 10            | --      |                 |         |                      |
| Urinal, wall or stall         | 5             | --      |                 |         |                      |
| Water closet tank             | 5             | 3       |                 |         |                      |
| Water closet, flush valve     | 10            | 6       |                 |         |                      |
| <b>Total Fixture Units</b>    |               |         |                 |         | <input type="text"/> |

Residential Customer Equivalent (RCE)  
20 fixture units equal 1.0 RCE

Total Fixture Units =  RCE  
20

**Public Facility** -  
*Fixture(s) used to serve the public and/or serves a 100 or more employees*

**Private Facility** -  
*Fixture(s) are not used to serve the public and/or serves less than 100 employees*



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# Plumbing Fixture Unit Table Revisions

- Since 1990, there have been very few revisions to WTD's Plumbing Fixture Unit Table.
- Minor revisions included changes and adding/removing fixture types.
- In August 2001, WTD revised its Plumbing Fixture Unit Table to align with the revisions in the 2000 edition of the Uniform Plumbing Code (UPC).



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# WTD Plumbing Fixture Unit Table (2021)

## A. Fixture Units

Fixture Units x Number of Fixtures = Total Fixture Units

| Kind of Fixture                       | Fixture Units |         | No. of Fixtures |         | Total<br>Fixture Units |
|---------------------------------------|---------------|---------|-----------------|---------|------------------------|
|                                       | Public        | Private | Public          | Private |                        |
| Bathtub and Shower                    | 4             | 4       |                 |         |                        |
| Shower, per head                      | 2             | 2       |                 |         |                        |
| Dishwasher                            | 2             | 2       |                 |         |                        |
| Drinking fountain (each head)         | 1             | 0.5     |                 |         |                        |
| Hose bibb (interior)                  | 2.5           | 2.5     |                 |         |                        |
| Clothes washer or laundry tub         | 4             | 2       |                 |         |                        |
| Sink, bar or lavatory                 | 2             | 1       |                 |         |                        |
| Sink, Clinic flushing                 | 8             | 8       |                 |         |                        |
| Sink, kitchen                         | 3             | 2       |                 |         |                        |
| Sink, other (service)                 | 3             | 1.5     |                 |         |                        |
| Sink, wash fountain, circle spray     | 4             | 3       |                 |         |                        |
| Urinal, flush valve, ≤1 GPF           | 5             | 2       |                 |         |                        |
| Urinal, flush valve, >1 GPF           | 6             | 2       |                 |         |                        |
| Water closet, tank or valve, ≤1.6 GPF | 6             | 3       |                 |         |                        |
| Water closet, tank or valve, >1.6 GPF | 8             | 4       |                 |         |                        |
| <b>Total Fixture Units</b>            |               |         |                 |         | <input type="text"/>   |

Residential Customer Equivalent (RCE)  
20 fixture units equal 1.0 RCE

$\frac{\text{Total Fixture Units}}{20} = \text{RCE}$

Changes from 1990 table include:

- Shower, per head added
- GPF added to both urinal & water closet
- Dental units removed
- Urinal pedestal removed

All fixture unit measurements were updated, except for “clothes washer or laundry tub” and “sink bar or lavatory”.



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# Non-residential Capacity Charge Calculation

- The capacity charge is calculated by multiplying the Residential Customer Equivalent (RCE) by the monthly rate established by the council each year.
- RCE is based on number of total fixture units divided by 20.
- For other equipment or processes that discharge wastewater, an RCE is calculated using the estimated gallons of wastewater discharged a day divided by 187. This RCE is added to the RCE from the fixture unit table for a Total RCE.
- Total RCE x Monthly rate x 3 = quarterly bill that goes out to the customer.



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# Non-residential Calculation Example

(coffee shop, restaurant & medical clinic)

## A. Fixture Units

Fixture Units x Number of Fixtures = Total Fixture Units

| Kind of Fixture                       | Fixture Units |         | No. of Fixtures |         | Total<br>Fixture Units |
|---------------------------------------|---------------|---------|-----------------|---------|------------------------|
|                                       | Public        | Private | Public          | Private |                        |
| Bathtub and Shower                    | 4             | 4       |                 |         |                        |
| Shower, per head                      | 2             | 2       |                 |         |                        |
| Dishwasher                            | 2             | 2       |                 |         |                        |
| Drinking fountain (each head)         | 1             | 0.5     |                 |         |                        |
| Hose bibb (interior)                  | 2.5           | 2.5     |                 |         |                        |
| Clothes washer or laundry tub         | 4             | 2       |                 |         |                        |
| Sink, bar or lavatory                 | 2             | 1       | 22              |         | 44                     |
| Sink, Clinic flushing                 | 8             | 8       |                 |         |                        |
| Sink, kitchen                         | 3             | 2       | 7               | 1       | 23                     |
| Sink, other (service)                 | 3             | 1.5     | 3               |         | 9                      |
| Sink, wash fountain, circle spray     | 4             | 3       |                 |         |                        |
| Urinal, flush valve, ≤1 GPF           | 5             | 2       |                 |         |                        |
| Urinal, flush valve, >1 GPF           | 6             | 2       |                 |         |                        |
| Water closet, tank or valve, ≤1.6 GPF | 6             | 3       | 6               |         | 36                     |
| Water closet, tank or valve, >1.6 GPF | 8             | 4       |                 |         |                        |
| <b>Total Fixture Units</b>            |               |         |                 |         | <b>112</b>             |

Total Fixture Units

Residential Customer Equivalent (RCE)  
20 fixture units equal 1.0 RCE

$$\frac{\text{Total Fixture Units}}{20} = 5.6 \text{ RCE}$$

Calculated Residential Customer Equivalent

## B. Other Wastewater Flow

(in addition to Fixture Units identified in Section A)

Type of Facility/Process:

Coffee shop, restaurant, med. clinic, 2 com. dishwasher

Estimated Wastewater Discharge:  
168.3 \_\_\_\_\_ Gallons/days

Residential Customer Equivalents (RCE):  
187 gallons per day equals 1.0 RCE

$$\frac{\text{Total Discharge (gal/day)}}{187} = 0.9 \text{ RCE}$$

Other Flow Calculation

## C. Total Residential Customer Equivalents:

(add A & B)

$$A \ 5.6 + B \ 0.9 = 6.5 \text{ Total RCE}$$

Total RCE Calculation



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# Federal Changes to Plumbing Fixture Units

- In 1992, Congress passed legislation requiring that all toilets sold in the United States meet a new water conservation standard of 1.6 gallons per flush (gpf).
- Studies indicate that converting to water efficient toilets, showers and clothes washers, results in a household water savings of about 30% compared to conventional fixtures.
- A change to high-efficiency toilets alone, reduces toilet water use by over 50% and indoor water use by an average of 16%. This translates into a savings of 15,000 to 20,000 gallons per year for a family of four.

Source: U.S. Environmental Protection Agency WaterSense



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# Next Steps

WTD will be engaging a consultant to study the efficiency levels of the plumbing fixture types that are utilized to calculate the capacity charge.

## Tentative Timeline

- **Q1 2022** – Kick-off Plumbing Fixture Unit Table Update Work Group
- **Q2/Q3 2022** – Prepare scope of work and Request for Proposal, if necessary to select consultant
- **Q4 2022 – Q1 2023** – Select consultant; commence scope of work
- **Q2/Q3 2023** – Review options and finalize recommendation
- **Q4 2023** – Recommend Plumbing Fixture Unit Table revisions to WTD Division Director
- **January 2024** – Approved Plumbing Fixture Unit Table revisions, if any, go into effect



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# Questions?

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