

WAI Committee

From: James L. Jensen <James.Jensen@co.maui.hi.us>
Sent: Thursday, November 6, 2025 10:32 AM
To: WAI Committee
Subject: November 17 PPT Presentation (DWS)
Attachments: Ordinance 5759 7B Presentation.pptx

You don't often get email from james.jensen@co.maui.hi.us. [Learn why this is important](#)

Aloha WAI Committee!

Please see attached powerpoint presentation for use on 11/17. Mahalo.

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DEPARTMENT OF WATER SUPPLY

Equivalent Single Dwelling Methodology

James L. Jensen, P.E.
Chief Engineer

INTRODUCTION

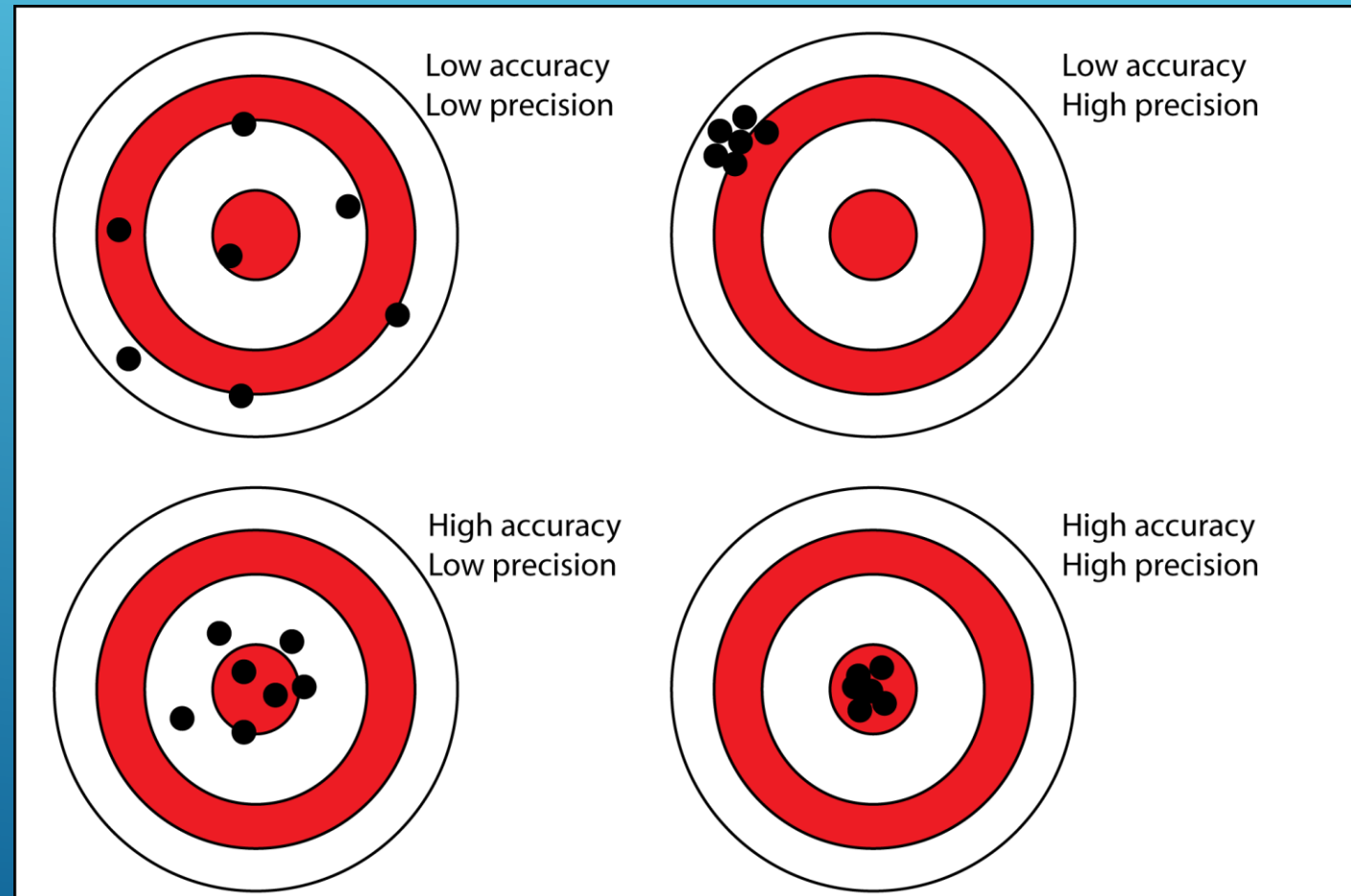
- ▶ Meter sizing current practice
 - ▶ Ordinance 5759 and focus on daily demand
 - ▶ Challenges with Hunter's Curve based approaches
 - ▶ Unit Demand principle
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IMPACT FEE SYSTEMS OF OTHER ISLANDS

- ▶ Honolulu Board of Water Supply
 - ▶ Sale of fixtures on a per-fixture basis
 - ▶ County of Hawaii
 - ▶ Based on meter size or a specific charge per lot, dwelling unit, or equivalent unit (whichever is greatest)
 - ▶ Kauai Water
 - ▶ Combination of meter size, subdivision lots, multi-family unit count, etc.
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UNIT DEMAND PRINCIPLE

- ▶ To identify a unit of usage from which all uses can be measured and/or approximated
- ▶ Process simplification
- ▶ Accuracy, not precision
- ▶ Link daily usage to cost of source development
- ▶ Makes meter size less important



NEW SYSTEM

MEET THE EQUIVALENT SINGLE DWELLING (ESD)

- ▶ What is it?
 - ▶ a fixed unit of daily water usage
- ▶ How much is it?
 - ▶ 300 gallons per day
- ▶ Why do we believe this?
 - ▶ Data analysis
 - ▶ Research

ESD DEVELOPMENT

- ▶ Analysis of 19 combinations of beds and baths from 1/1 to 7/7
 - ▶ Approximation of occupancy and concurrent water users
 - ▶ Occupancy correlation to daily usage
 - ▶ Concurrent use correlation to occupancy
- ▶ ESD assumption
 - ▶ 4 to 6 occupants in a 4 bed/2 bath home
 - ▶ Includes underlying habitation assumptions
 - ▶ One dwelling per ESD calculation



ESD DEVELOPMENT

PREDICTIVE EQUATION

► $ESD = (1.15 \times \text{Baths}^{1.3} + \text{Beds} + 3) / 10$

► Predictive Equation Test Results

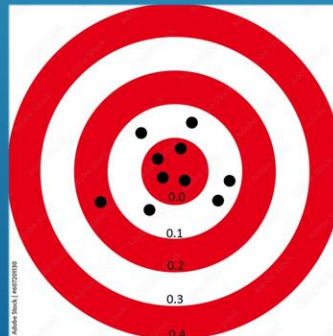
► Aggregate Results:

- Equal: 10.5%
- Within 0.1: 84.2%
- Within 0.2: 100%



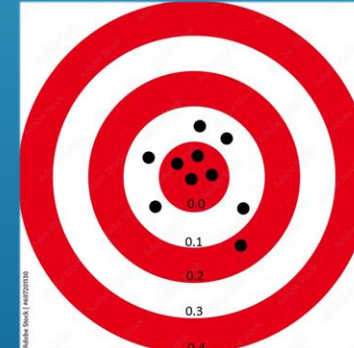
► Daily Usage Results:

- Equal: 42.1%
- Within 0.1: 94.7%
- Within 0.2: 100%



► Concurrent Use Results:

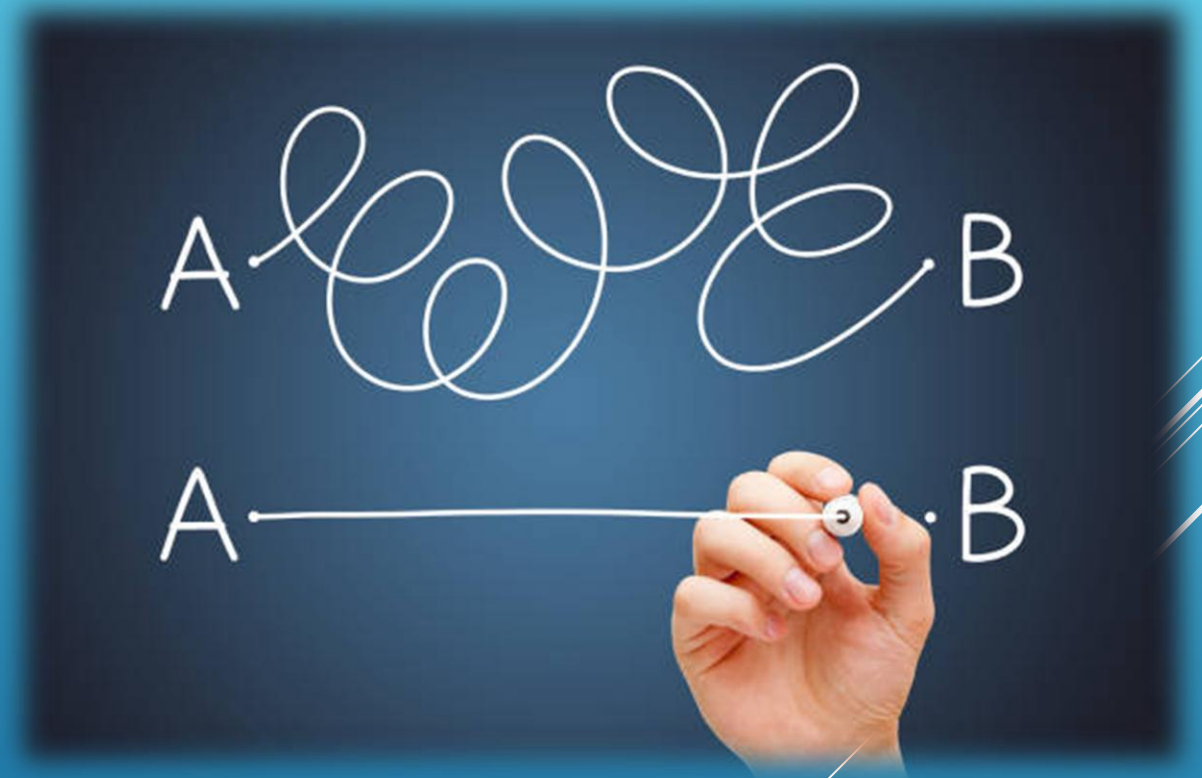
- Equal: 47.4%
- Within 0.1: 89.5%
- Within 0.2: 100%



NEW SYSTEM KEY RESULT

PROCESS SIMPLIFICATION

- ▶ How will it be simpler?
 - ▶ Just count beds and baths
 - ▶ Ignores ancillary fixtures
 - ▶ Predictive equation for rapid evaluation
- ▶ Standardized meter sizing
 - ▶ 5/8": 2.5 ESDs (750 GPD)
 - ▶ 3/4": 3.5 ESDs (1,050 GPD)
 - ▶ 1": 6.0 ESDs (1,800 GPD)
- ▶ Current source fee per ESD
 - ▶ $\$5,789 / 2.5 = \$2,316$ (based on smallest condition)



PROCESS

SINGLE FAMILY RESIDENTIAL



- ▶ Bedroom and bathroom counts
 - ▶ Summarized on plan, confirmed by staff
 - ▶ Fewer headaches
 - ▶ Rooms designed like bedrooms will count as bedrooms
- ▶ Approval Process
 - ▶ Confirm proposal is within total ESDs of meter size
 - ▶ New services will pay full impact fee and be entitled to all ESDs until FY27 budget alignment
 - ▶ 0.5 ESDs will be assumed for outdoor water use
 - ▶ Most existing meters will be able to add an ohana without issue



PROCESS

MULTI FAMILY RESIDENTIAL

- ▶ ESD computations same as single family residential
 - ▶ Outdoor usage separately estimated and included
 - ▶ Standardized meter sizing table
 - ▶ 1" up to 16 ESDs
 - ▶ 1.5" up to 60 ESDs
 - ▶ 2" up to 120 ESDs
 - ▶ 3" up to 240 ESDs
- ▶ Based on International Association of Plumbing and Mechanical Officials (IAPMO) Water Demand Calculator (WDC)
 - ▶ Side note about WDC development for non-residential uses
- ▶ Will allow meter sizing by custom WDC calculations if applicant chooses



PROCESS

MULTI FAMILY RESIDENTIAL

- ▶ Existing MF Meters
 - ▶ Entitled to ESDs either:
 - ▶ Commensurate with current approved use
 - ▶ Equal to FY26 source fee / \$2,316
 - ▶ Whichever is greater
 - ▶ No clawbacks
- ▶ Example ESD allocations:
 - ▶ 1.5": 15
 - ▶ 4": 103
 - ▶ 8": 410
- ▶a lucky example



PROCESS

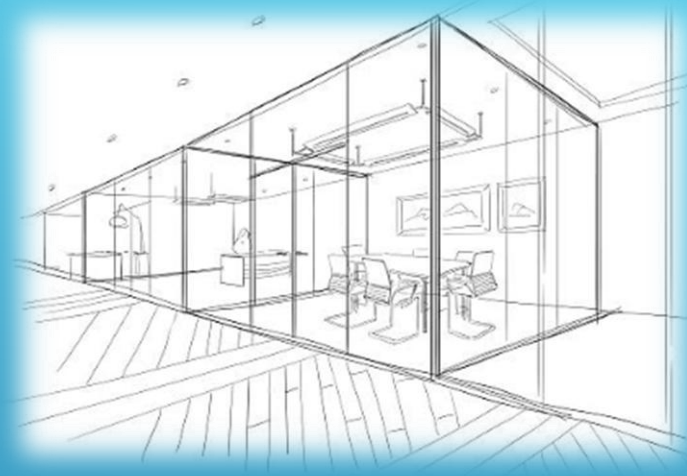
NON-RESIDENTIAL



- ▶ Daily usage estimated by applicant based on:
 - ▶ Consumption guidelines in the Water System Standards
 - ▶ Custom calculations stamped and signed by a licensed professional
 - ▶ Outdoor use included
 - ▶ DWS staff to convert daily usage to ESDs
- ▶ Meter sizing calculations
 - ▶ Custom calculations stamped and signed by a licensed professional
 - ▶ Issue requested meter and collect associated storage and transmission fees.

PROCESS

NON-RESIDENTIAL



- ▶ Existing meters
 - ▶ Entitled to ESDs in the same manner as MF meters
 - ▶ FY26 source fee / \$2,316 = ESDs



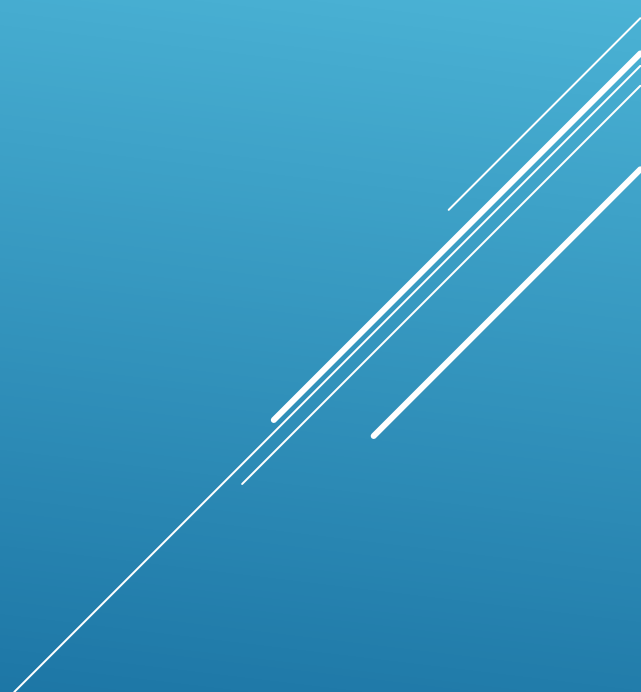
IMPLEMENTATION

HOW THE SHIFT WILL HAPPEN

- ▶ Staff preparation and training
 - ▶ Beta testing with current applications
 - ▶ Happening now
 - ▶ Get the process in place!
 - ▶ There will be hiccups
 - ▶ Separate source fee from meter size
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FY27 BUDGET

SOURCE COMPONENT OF WATER SYSTEM DEVELOPMENT FEE

- ▶ Separate source fee from other impact fees associated with meter size
 - ▶ Change minimum meter size from 5/8" to 3/4"
 - ▶ DWS is analyzing the development fee and structure and will propose changes in the FY27 budget
 - ▶ Fee will be developed by reviewing recent source development cost figures against quantity of ESDs served
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FY27 BUDGET

SOURCE FEE PRELIMINARY ESTIMATE

- ▶ Recent cost to develop well: \$18.07 million
- ▶ Source provided by well: 0.96 MGD
- ▶ ESDs generated by new source: 3,200
- ▶ Resulting source fee: $\$18,076,000 / 3,200 = \$5,648$ per ESD
- ▶ % Increase in per ESD fee: $\$5,648 / \$2,316 = 2.44x$



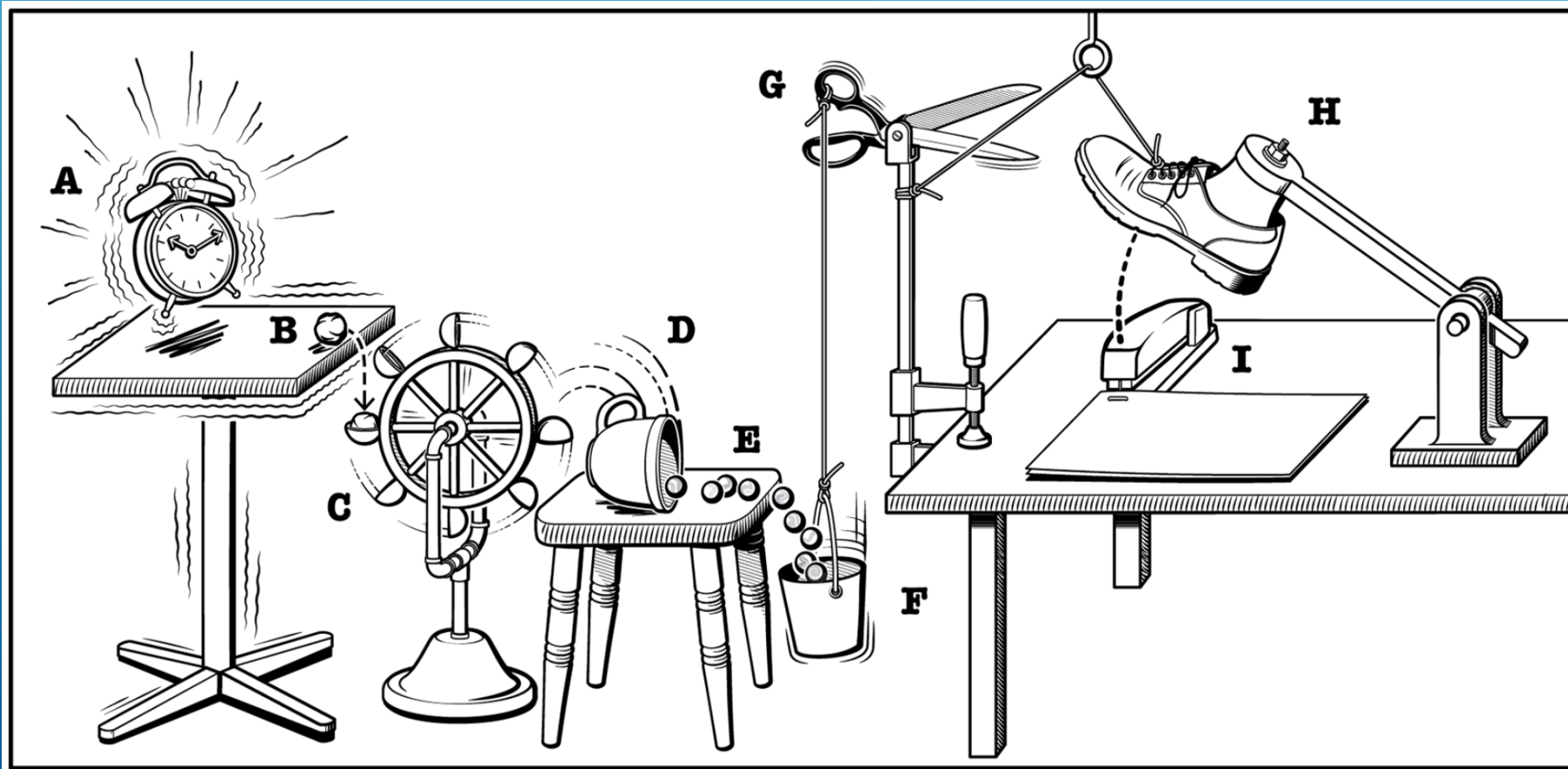
FY27 BUDGET

IMPACT FEE CALCULATION EXAMPLES

- ▶ First house and full build out on $\frac{3}{4}$ " meter:
 - ▶ Current: \$18,884
 - ▶ New: \$18,293 (1.5 ESDs, including 0.5 for irrigation)
 - ▶ New: \$29,590 (Full 3.5 ESDs, including 0.5 for irrigation)
- ▶ 300 MF units on a 3" meter + 3500 GPD irrigation:
 - ▶ Current: \$279,380
 - ▶ New: \$1,566,880 (251.7 ESDs)
- ▶ Commercial (3000 GPD indoor, 600 GPD outdoor, $\frac{3}{4}$ " meter)
 - ▶ Current: \$18,884
 - ▶ New: \$77,605
- ▶ 1" irrigation meter using 9000 GPD:
 - ▶ Current: \$33,356
 - ▶ New: \$186,807

WHY IS THIS A BETTER SYSTEM?

- Large up front effort to result in a simple outcome



WHY IS THIS A BETTER SYSTEM?

- ▶ Simpler and Accurate
 - ▶ Focus on bedrooms and bathrooms
 - ▶ Improved representation of actual use
 - ▶ Custom calculations for non-residential uses
- ▶ Faster
 - ▶ Shifts work from engineers to administrative staff
 - ▶ Decreases total work to be performed
- ▶ Correction to impact fee



MAHALO NUI
QUESTIONS?

