

2024

WEF/AWWA
**The Utility
Management
Conference**

Using Data Analysis to Improve Household Water Conservation

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Water Finance Assistance



This Session

- Explain why a utility would want to promote conservation
- Define necessary and unnecessary household water use
- Describe how to assess and address unnecessary use
- Introduce an interesting case study

If utilities make money
selling water...

Why would a utility **want** to
promote **conservation**?

Why Utilities Want to Promote Conservation

- Water is precious and limited and therefore should be used prudently
- Facing supply shortages due to drought
- Reaching its treatment or storage capacity
- Reaching the limits of its water rights
- Growing customer base

To promote conservation, we need to distinguish between **necessary** and **unnecessary** water usage

The Most Necessary Water Use



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**Water Environment
Federation**
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**American Water Works
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40 to 60

gallons per person, per day

We use water in other ways
that are **unnecessary**

Outdoor Water Use



Leaks



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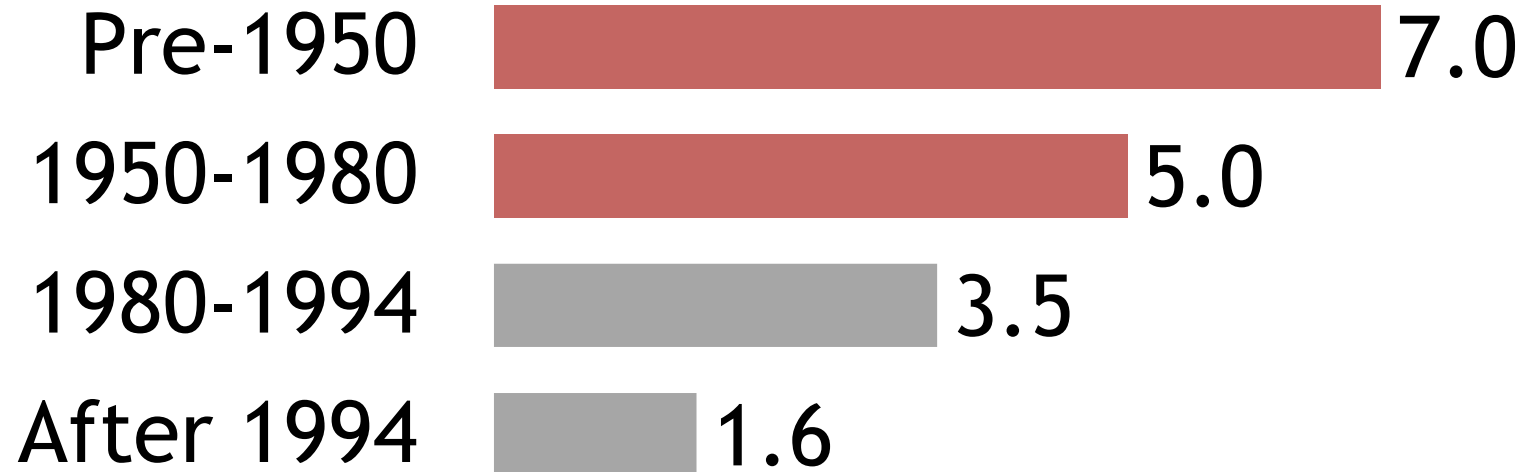
**Water Environment
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Association**

Outdated Fixtures & Appliances

Toilets

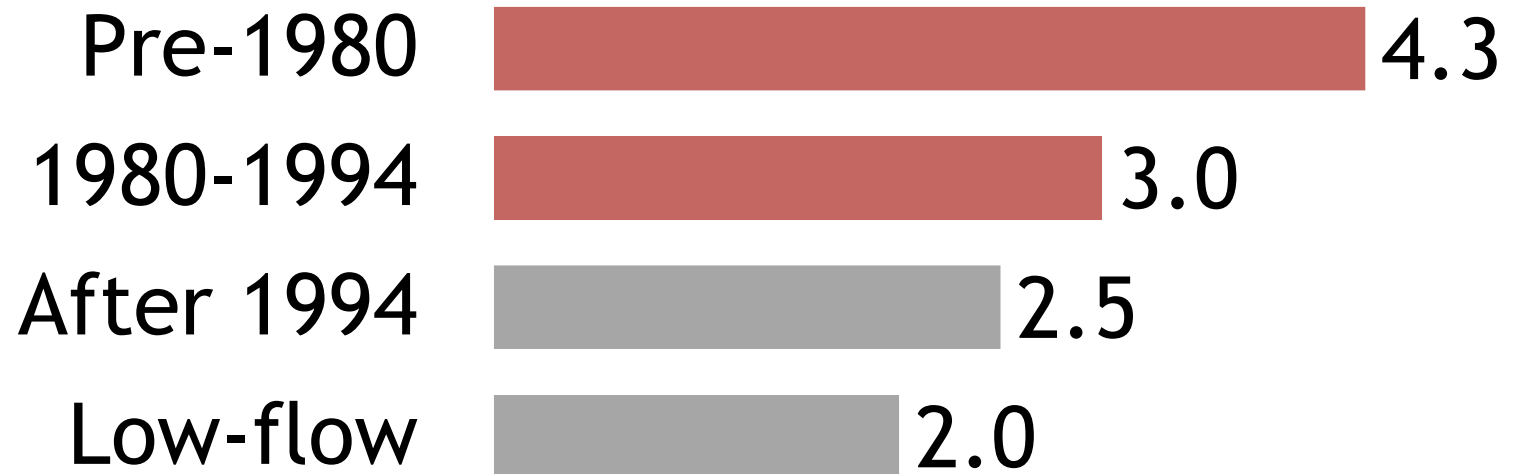
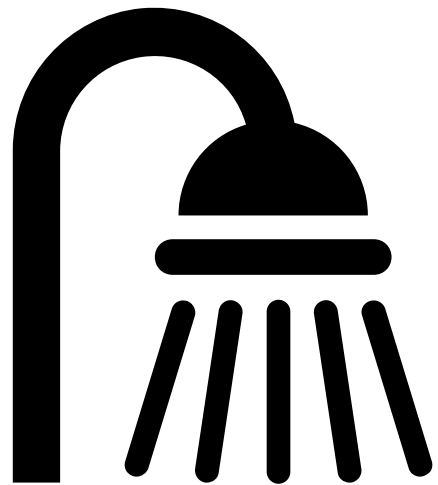
Gallons per flush:



Source: <https://extension.psu.edu/water-conservation-how-much-water-and-money-can-you-save>

Outdated Fixtures & Appliances

Showerheads Gallons per minute:



Source: <https://extension.psu.edu/water-conservation-how-much-water-and-money-can-you-save>

To promote **conservation**,
utilities should target users
with **unnecessary** water
consumption

3 Step Process to Promoting Conservation

- 1 Identify if there is unnecessary water use *in general*
- 2 Identify *which* type(s) of unnecessary water use exist
- 3 Tailor programs to those types

Total Usage is **NOT** a Good Metric



Compare household usage to
the **number of people** in the
household

Number of People per Household

- Ideally, we would like to know the exact number of people in each household to compare to that household's water use, but we typically **don't have this information**
- Census Table S2501

Is There Unnecessary Water Use?

1 person $\leq 1,800$ gallons/mo.

2 persons $1,801$ to $3,600$ gallons/mo.

3 persons $3,601$ to $4,800$ gallons/mo.

4+ persons $> 4,800$ gallons/mo.

Different Metrics for Each Unnecessary Type

- Outdoor water use
- Customer-Side Leaks
- Outdated fixtures and appliances

To Assess Outdoor Water Use

- Outdoor water use is often seasonal
- Look for overall usage per month to see if there are any obvious patterns

Addressing Outdoor Water Use

- Water use restrictions may or may not help
- Incentives for low-water landscaping (xeriscaping)
- Sprinkler optimization program
- Pool covers to prevent evaporation

To Assess Customer-Side Leaks

- For big leaks, look for a sudden and significant jump in water usage
- For background leaks, easier to do with AMI meters. Look for consistent usage through the night. AMI system may give you alerts

Addressing Customer-Side Leaks

- Customer notifications
- Kits for small but persistent leaks in toilets and other fixtures
- Subsidized plumbing services for less fortunate households

To Assess Prevalence of Outdated Fixtures

- Data on the fixtures in every house does not exist!
- Use age of housing stock as a proxy—Pre-1980
- Tax assessor data or Census Table DP04

Addressing Outdated Fixtures

- Incentives for low-flow toilets, showerheads, and faucets
- Rebates for low-water use appliances
- Replacements in public housing

Case Study

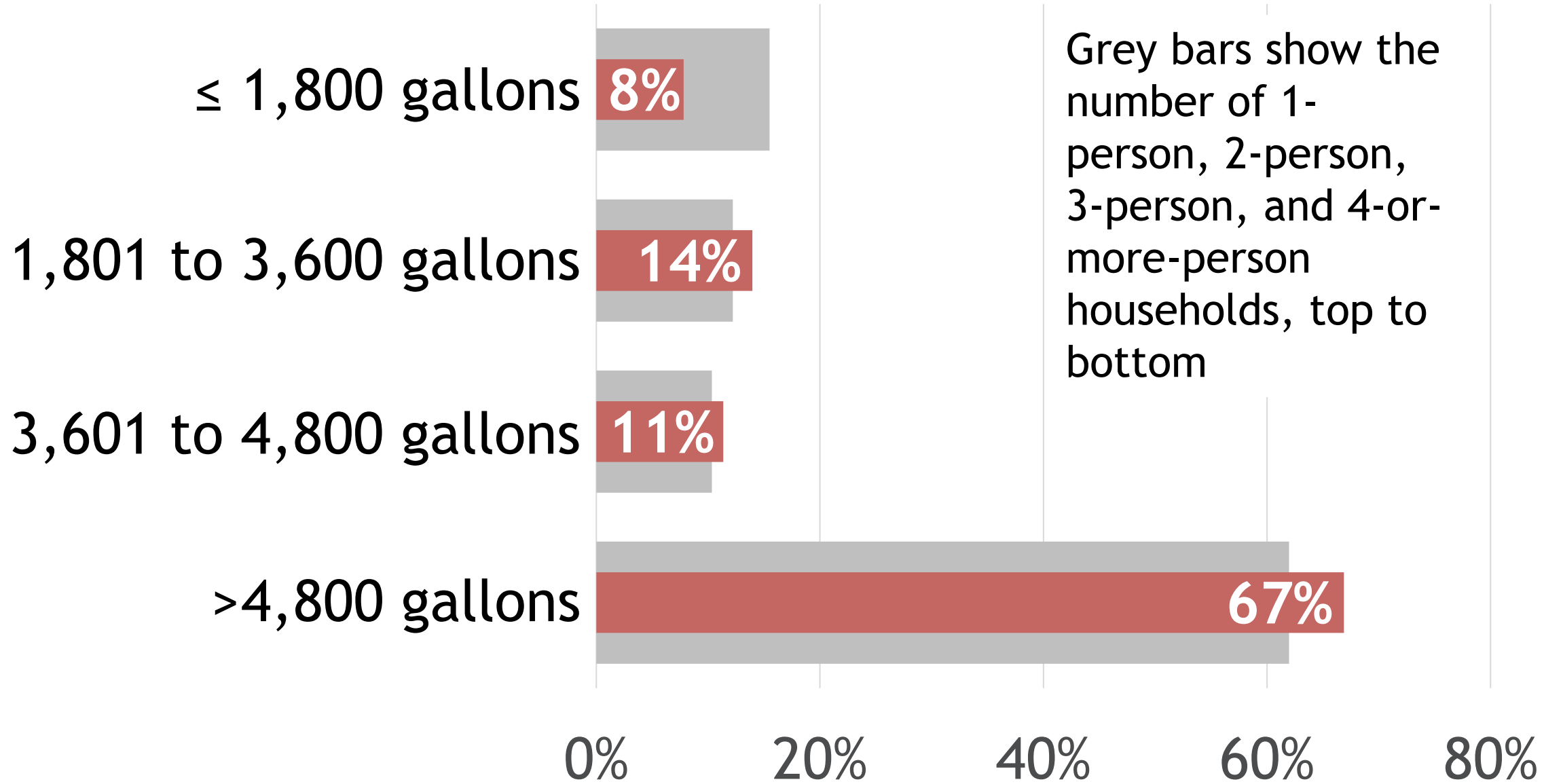
Case Study Utility

- 381 service connections
- 1,800 people served
- Low-income community

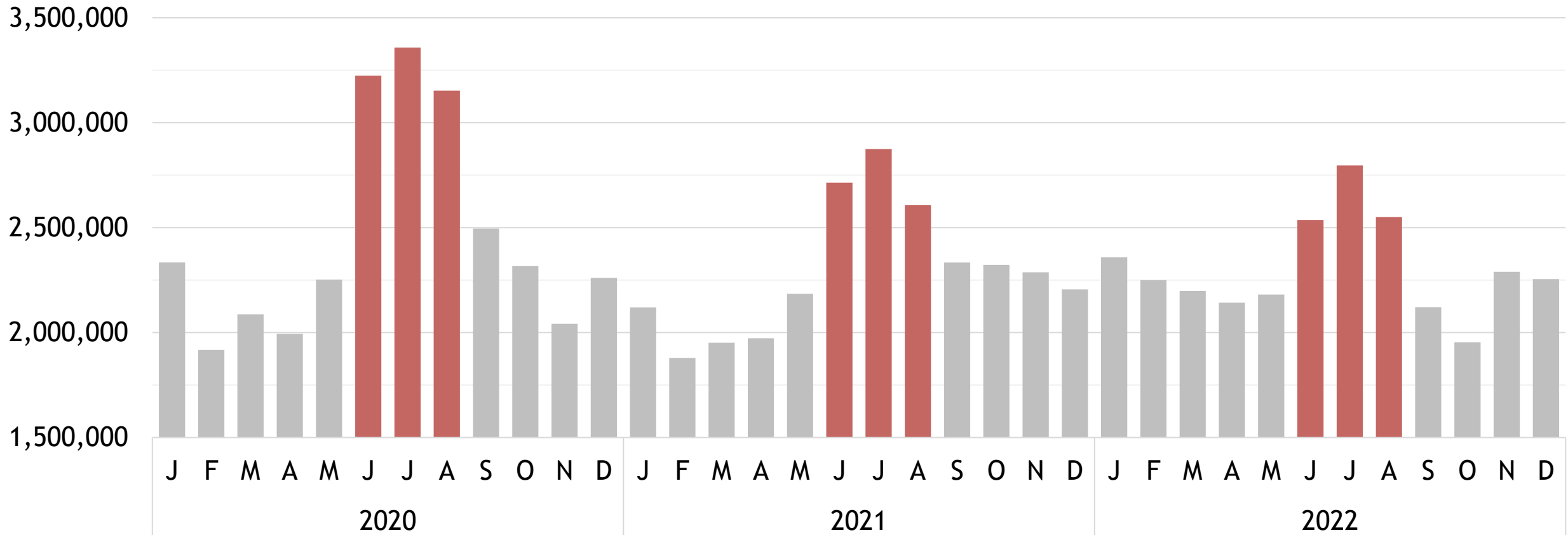
Conservation Incentives

- Persistent drought limiting water supply
- Expected rate changes that will

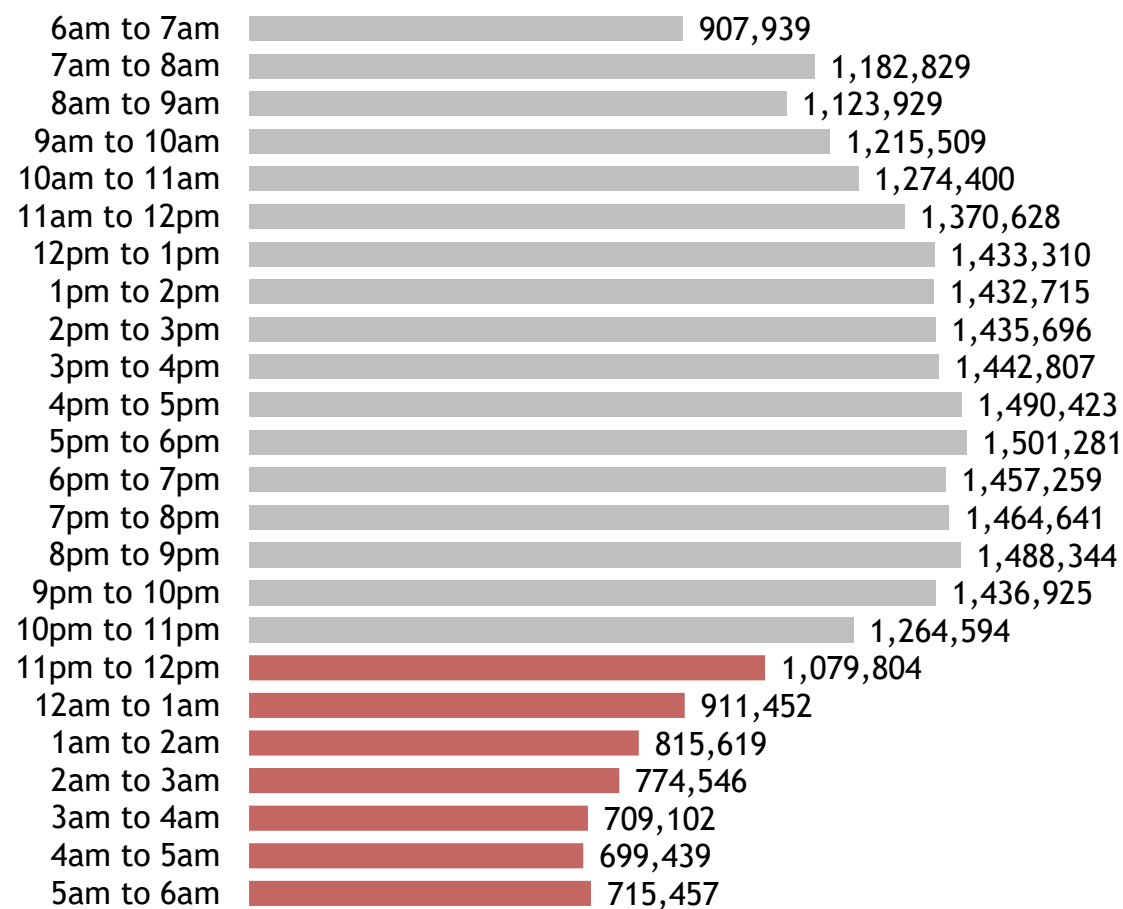
Does the utility have
unnecessary water use?



Assessing Outdoor Water Use



Assessing Customer-Side Leaks

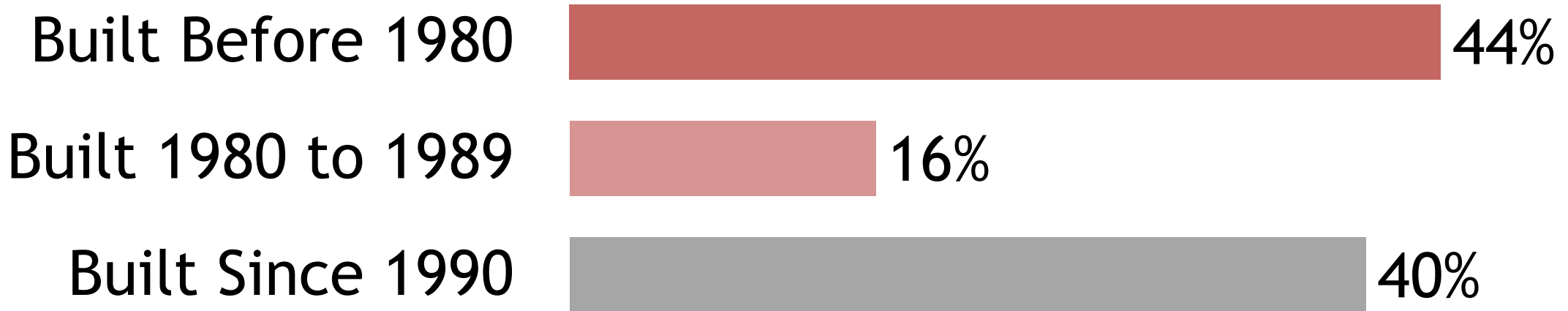


20%

of annual residential water usage occurred overnight

Assessing Outdated Fixtures

Housing Stock:



Thank You!



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