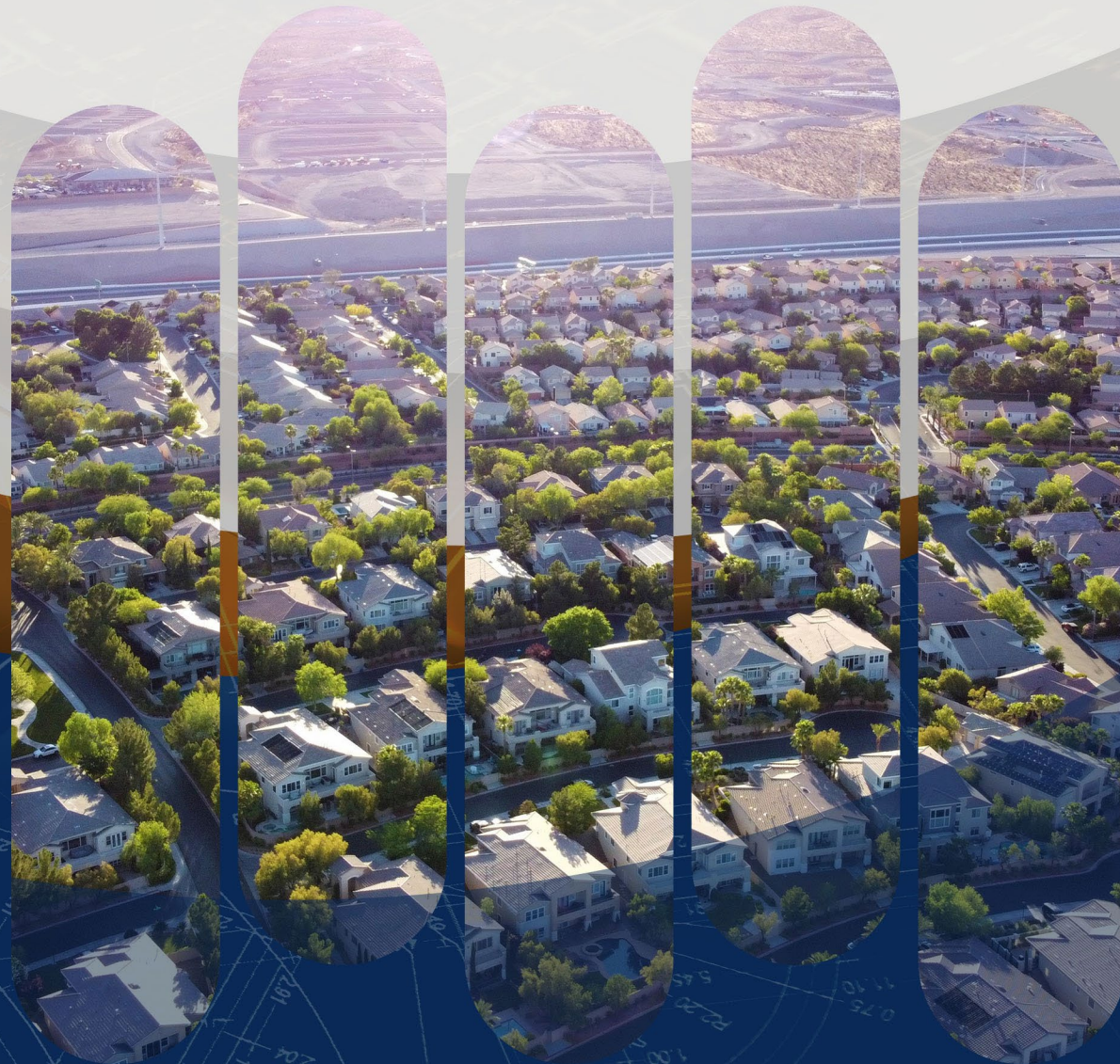




# SOUTHERN NEVADA RESIDENTIAL WATER USE ANALYSIS

JUNE 14, 2022



June 14, 2022

Mr. Nat Hodgson  
Chief Executive Officer  
Southern Nevada Home Builders Association  
4175 S. Riley St., Suite 100  
Las Vegas, NV 89147

**RE: Southern Nevada Residential Water Use Analysis**

Dear Mr. Hodgson:

In accordance with your request, Applied Analysis ("AA") is pleased to submit this analysis relating to residential water use in Southern Nevada. More specifically, AA was retained by the Southern Nevada Home Builders Association (the "SNHBA") to consider the water use trends for single family residential homes in Southern Nevada. To achieve this end, AA used a stratified random sample to select and analyze water use data from single family residential homes built in four different decades in Southern Nevada. Results of the analysis allow for the comparison of monthly and annual average water use trends across homes built in 1989, 1999, 2009 and 2019. The salient findings of our analysis are included in this report.

This report was designed by AA in response to your request. However, we make no representations as to the adequacy of these procedures for all purposes. Generally speaking, our findings and estimates are as of the date of this letter and utilize the most recent data available. This information was collected from various third parties, including the Las Vegas Valley Water District ("LVVWD"), the City of North Las Vegas, the City of Henderson, Boulder City and the Virgin Valley Water District ("VVWD"). The data were assembled by AA. While we have no reason to doubt its accuracy, the information collected was not subjected to any auditing or review procedures by AA; therefore, we can offer no representations or assurances as to its completeness. This is an executive summary. It is intended to provide an overview of the analyses conducted and a summary of our salient findings. AA will retain additional working papers relevant to this study. If you reproduce this report, it must be done so in its entirety. We welcome the opportunity to discuss this report with you at any time. Should you have any questions, please contact Brian Gordon at (702) 967-3333.

Sincerely,



Applied Analysis



# Primary Research Objective

“

**How has water use among  
residential properties in  
Southern Nevada evolved  
over time?**

”

# Research Approach and Methodology

1



## Sample Selection

To evaluate how water use among residential properties has evolved over time, AA randomly selected 100 homes built in Southern Nevada in four distinct decades. This sample set focused on homes built in 1989, 1999, 2009 and 2019. The years selected ensure a full year of water use in the most recent calendar year (2021).

2



## Identify Water Provider

The next step was to determine water service provider to the homes that were randomly selected. A majority of the homes sampled from Southern Nevada are serviced by the Las Vegas Valley Water District while some are serviced by either the City of North Las Vegas, Virgin Valley Water District, the City of Henderson or Boulder City public utilities departments.

3



## Request Water Use Data

After identifying the appropriate utility service entity for each of the selected properties in the data set, AA requested monthly billed water use data for 2021 from each of the water utility providers. These data were reviewed, cleaned and aggregated by construction year to allow for comparative analysis between construction period and jurisdictions.

4



## Analyze Water Use Data

Lastly, AA utilized the aggregated billed water use data from 2021 to analyze monthly and annual water use trends for each of the property age groups. This also included an analysis of the seasonal differences in monthly water use. The results of the analyses follow.

# Findings in Summary

## Newer Homes Utilize Less Water Than Older Homes

On average, newer homes used less water than older homes based on overall water consumption measured in 2021. Newly built homes (2019) used 95,800 gallons of water annually, compared to 151,700 gallons for older homes (1989). This amounts to a savings of 55,900 gallons per year.

Newer homes were much more efficient in their water use in 2021 compared to older properties. Newly built homes used approximately 38.3 gallons per square foot compared to 75.9 gallons per square foot for older homes, a reduction of almost 50 percent.

## Consumptive Versus Non-Consumptive Water Use Is An Important Consideration

Water use varied the most in the summer months. Newer homes use approximately 48.3 percent of their annual total in the months of May through September. In contrast, those same months accounted for 56.7 percent of the annual total for older homes.

On average, newer homes saved approximately 39,100 gallons in summer months (May through September) compared to older homes during the same period. Specifically, newer homes utilized 46,300 gallons in the summer months compared to older homes that utilized 85,400 gallons during the same period.



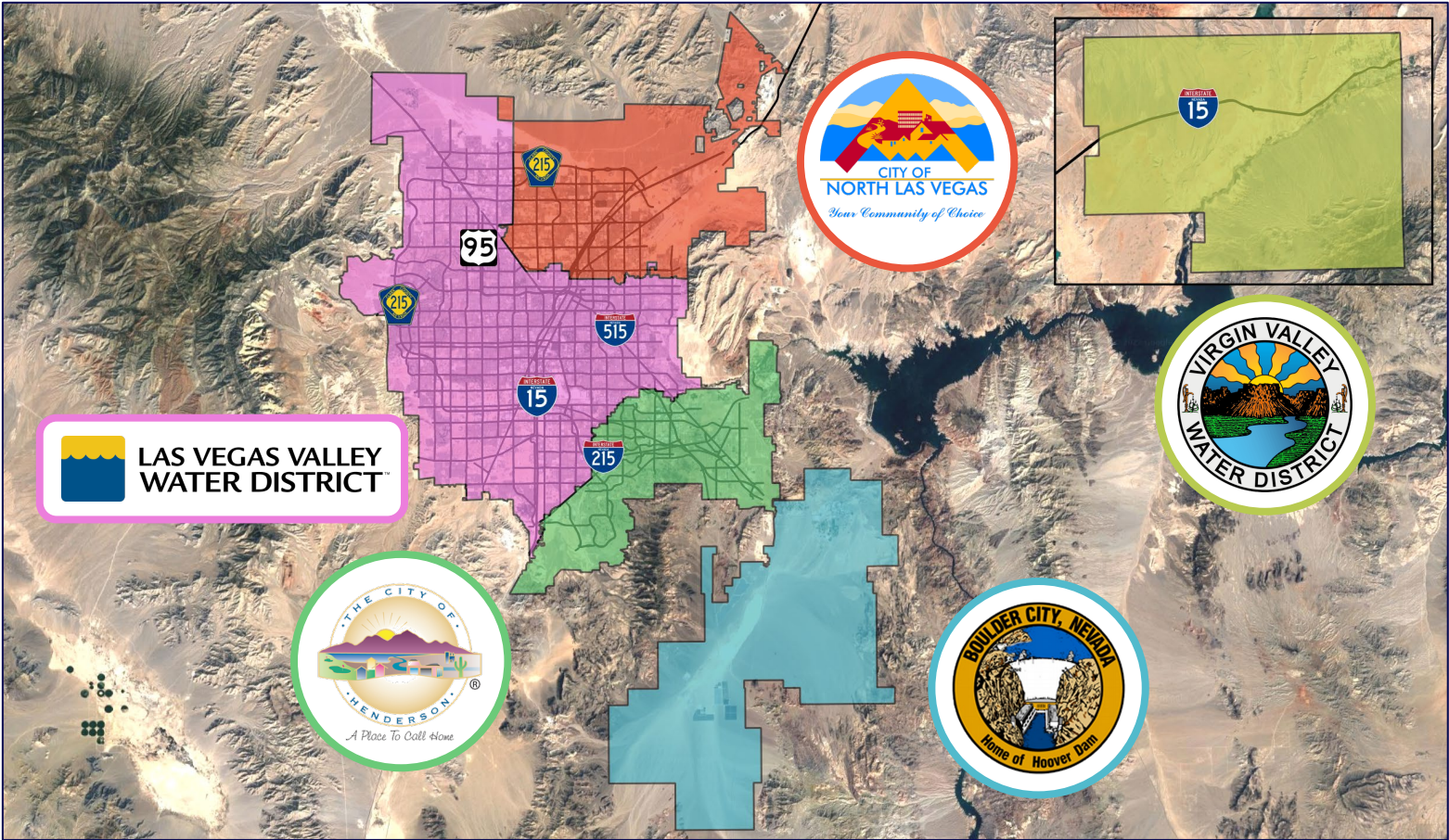
# Overview of Residential Water Use Data Collection and Methodology





# Sample Selection

## Water Use Data Obtained By Utility Provider



Data Requested

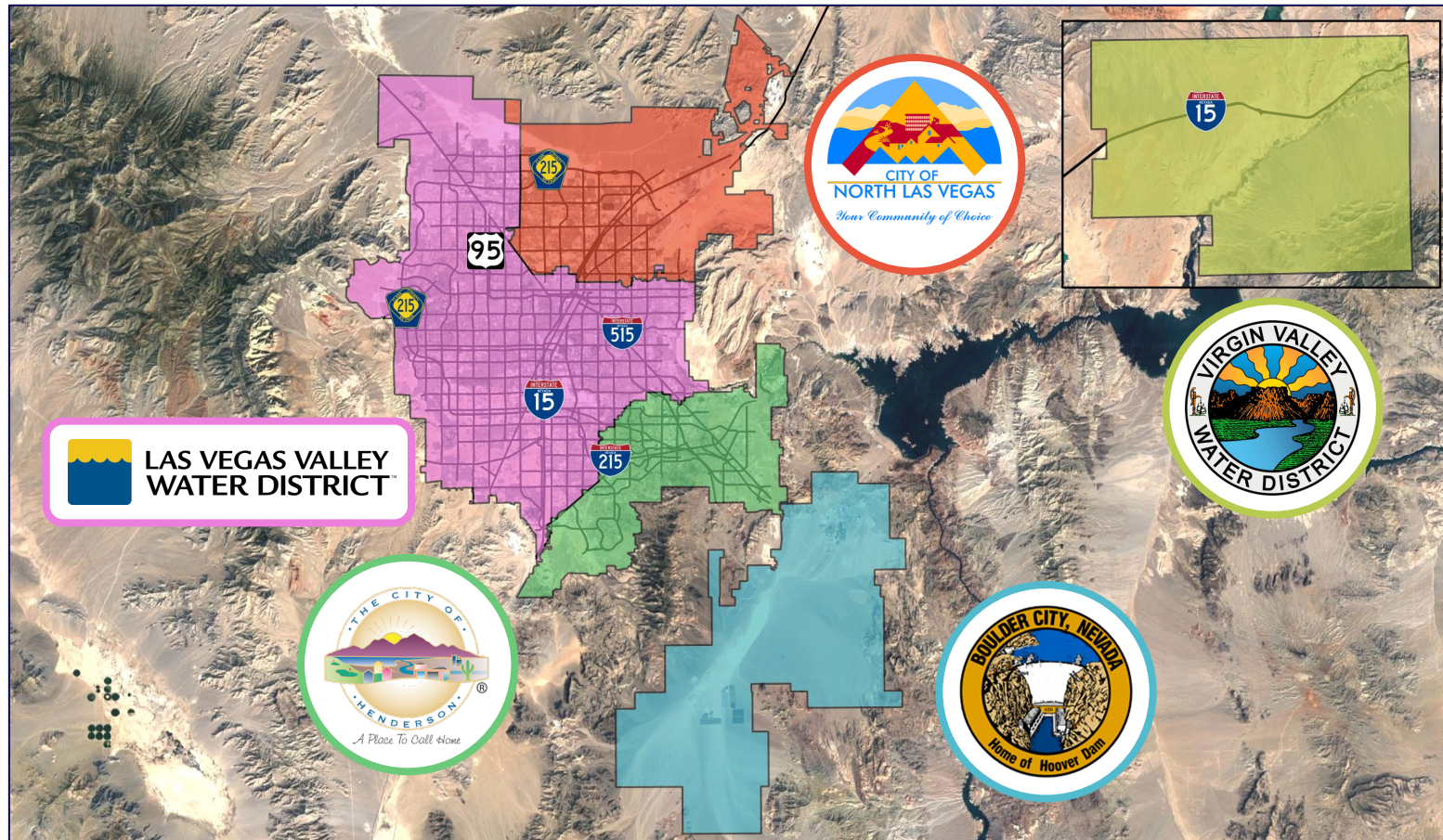
Utility Provider	Data Requested	Share
Boulder City	2	0.5%
Henderson	83	20.8%
North Las Vegas	49	12.3%
Las Vegas Valley Water District	256	64.0%
Virgin Valley Water District	10	2.5%
Total	400	100%

Source: Comprehensive Annual Financial Report, Fiscal Years 2020-2021, Las Vegas Valley Water District. Note: Service areas are approximated.



# Sample Selection

## Water Use Data Obtained By Utility Provider



### Data Collected

Utility Provider	Data Collected	Rate
Boulder City	2	100.0%
Henderson	80	96.4%
North Las Vegas	46	93.9%
Las Vegas Valley Water District	241	98.0%
Virgin Valley Water District	10	100.0%
<b>Total</b>	<b>379</b>	<b>94.8%</b>

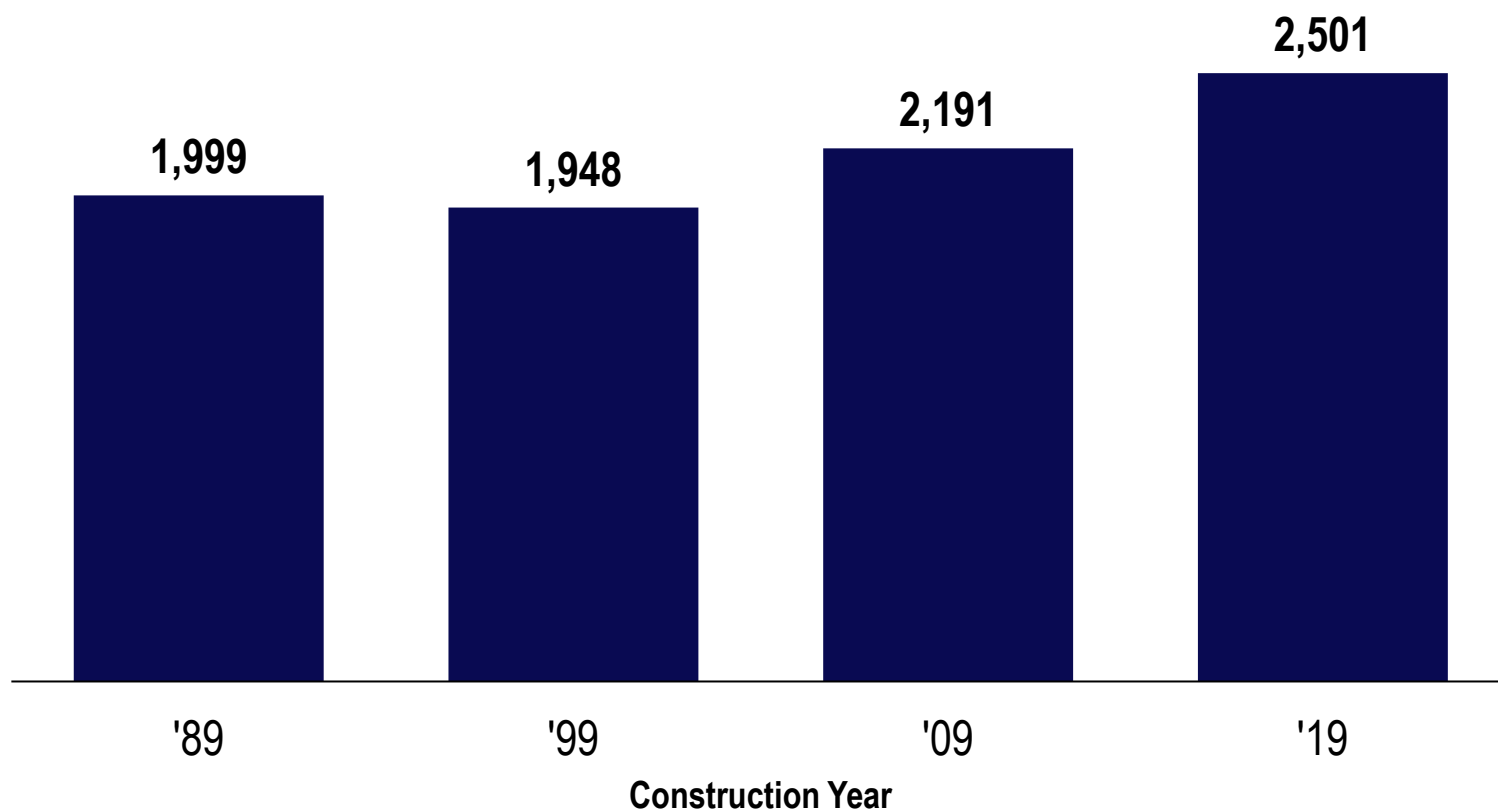
*Note: Data represent addresses with 12 months of water usage in 2021. There were 10 properties sampled for which the corresponding water utility service could not readily be determined because they either served by an entity other than the one in which the map dictates or they use a well.*

Source: Comprehensive Annual Financial Report, Fiscal Years 2020-2021, Las Vegas Valley Water District. Note: Service areas are approximated.



# Sample Selection

## Average Home Size (in Square Feet)



- Homes that were built in either 2009 or 2019 were larger than homes built in 1989.
- At 2,191 square feet, homes built in 2009 were about 10 percent larger on average than those from 1989.
- At 2,501 square feet, homes from 2019 were 25 percent larger than those built in 1989.

*Note: Average square footage by construction year only includes those addresses for which 12 months of water use data were provided. Homes sampled for this analysis were limited to a maximum size of one acre.*

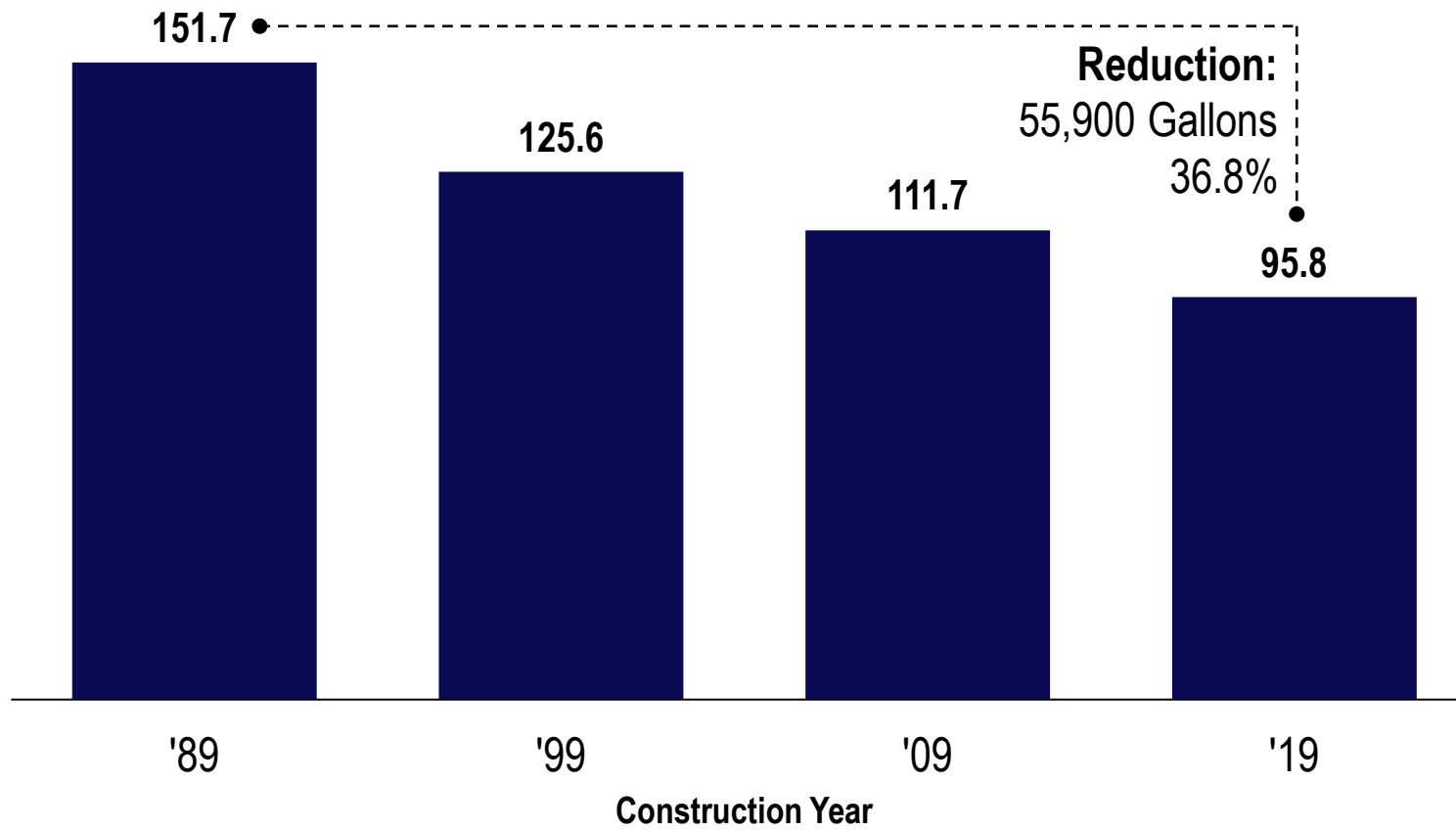
# Summary of Residential Water Use by Construction Year





# Summary of Annual Residential Water Use in 2021

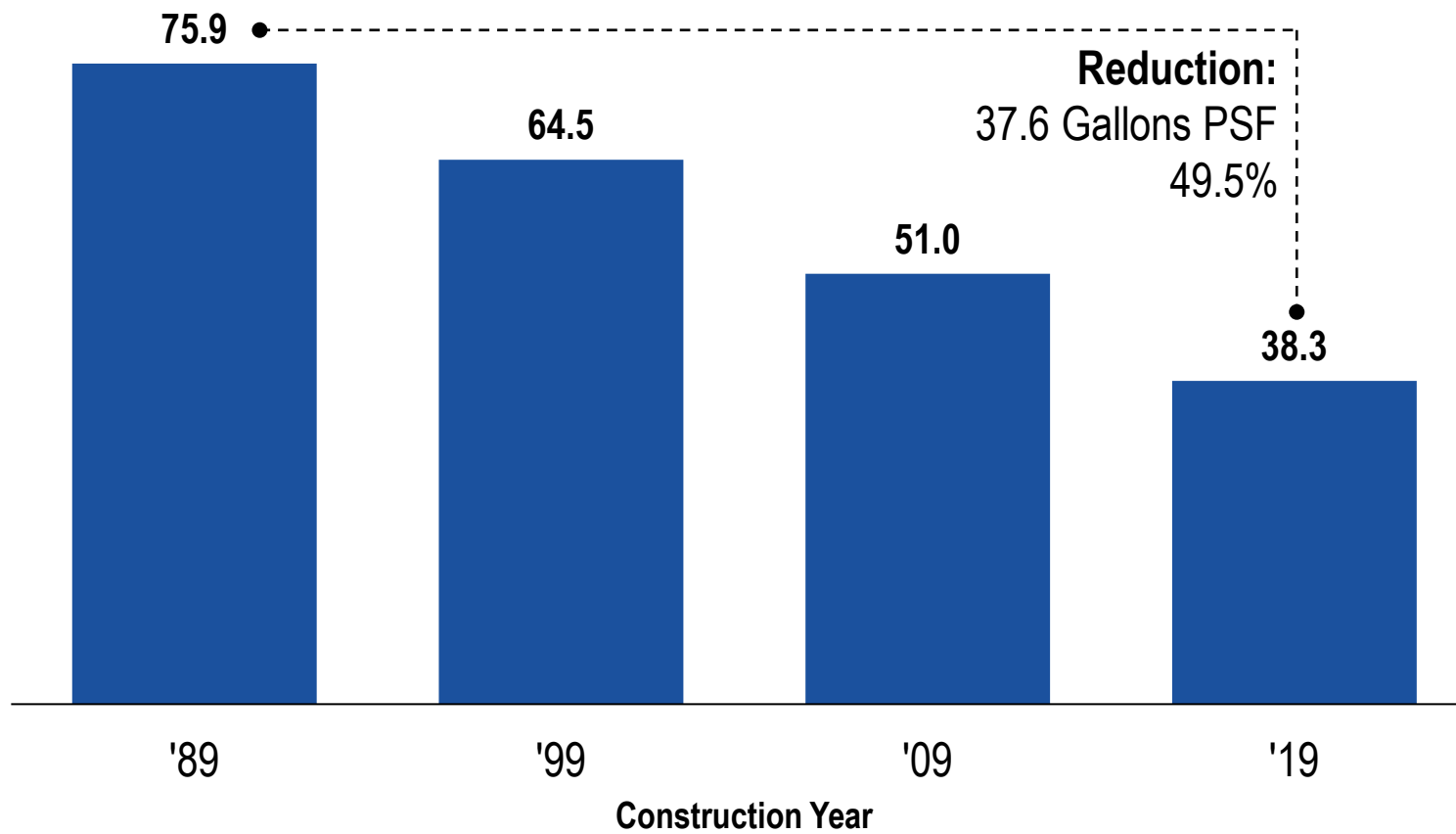
## Annual Water Use By Construction Year (in 1,000 Gallons)



- On average, homes built in 1989 used 151,700 gallons of water in 2021.
- Homes built in 1999 used just over 125,600 gallons in 2021, while homes built in 2009 used 111,700 gallons during the same timeframe.
- The newest homes used only 95,800 gallons of water in 2021. Compared to homes built in 1989, the average annual water use for newer homes (2019) translated into annual water use savings of 55,900 gallons (a decline of 36.8 percent for homes built in 2019).

# Summary of Annual Residential Water Use in 2021

## Annual Water Use per Square Foot (SF) By Construction Year

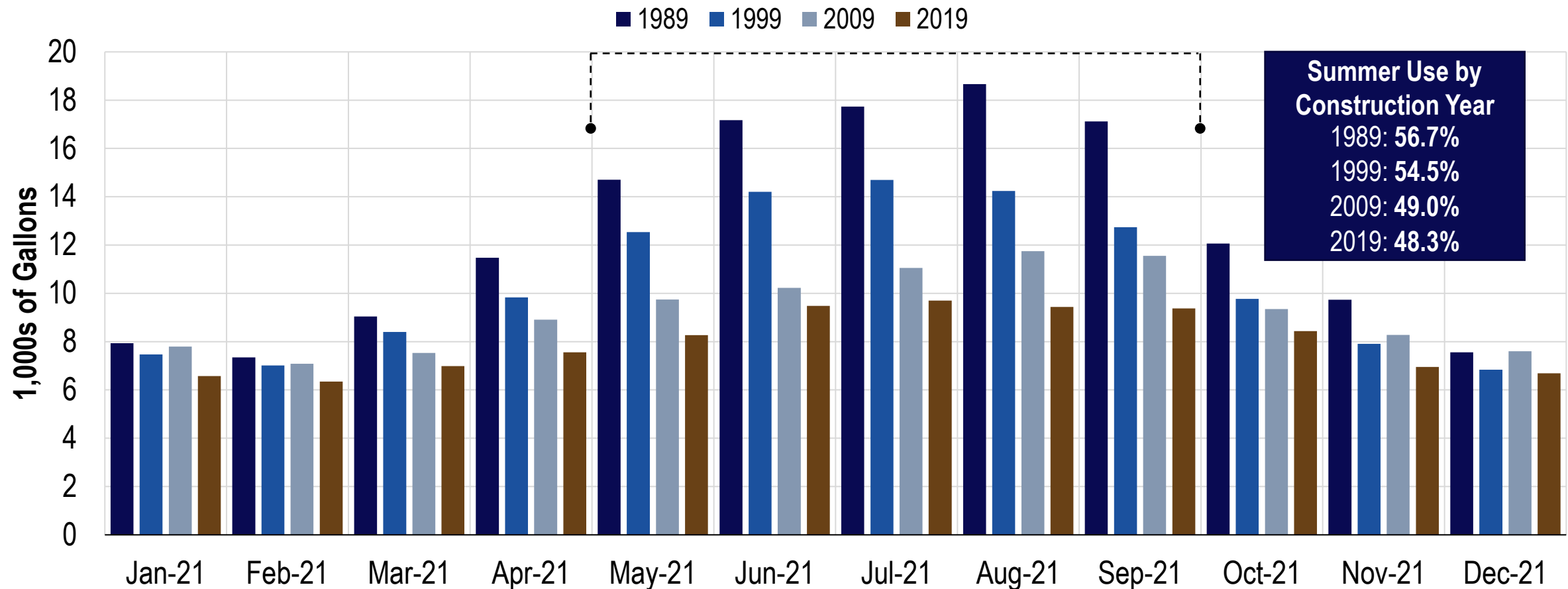


- On average, homes built in 1989 used 75.9 gallons per square foot during 2021.
- The newest homes (built in 2019) used about 38.3 gallons per square foot.
- Homes built in 1989 use approximately two times the amount of water of newly construction homes, equating to a savings of 37.6 gallons per square foot annually.



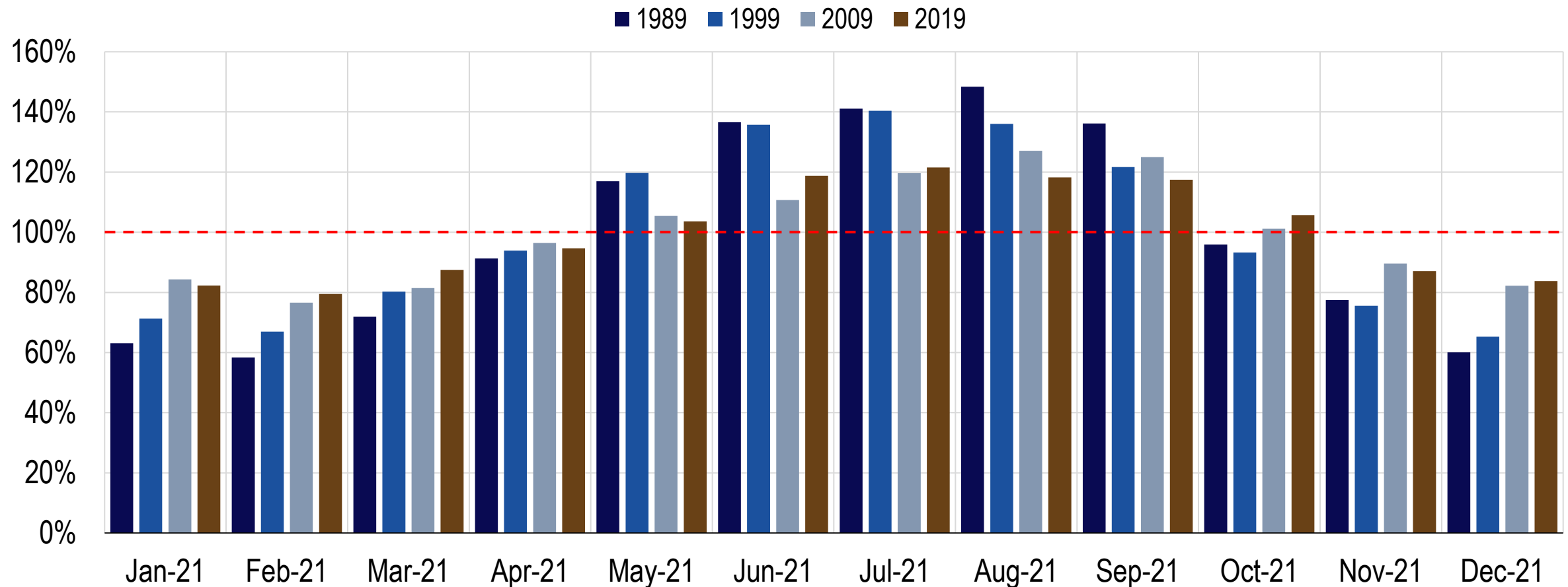
# Seasonality of Water Use in 2021

## By Month and Year of Construction (Average)



# Seasonality of Water Use in 2021

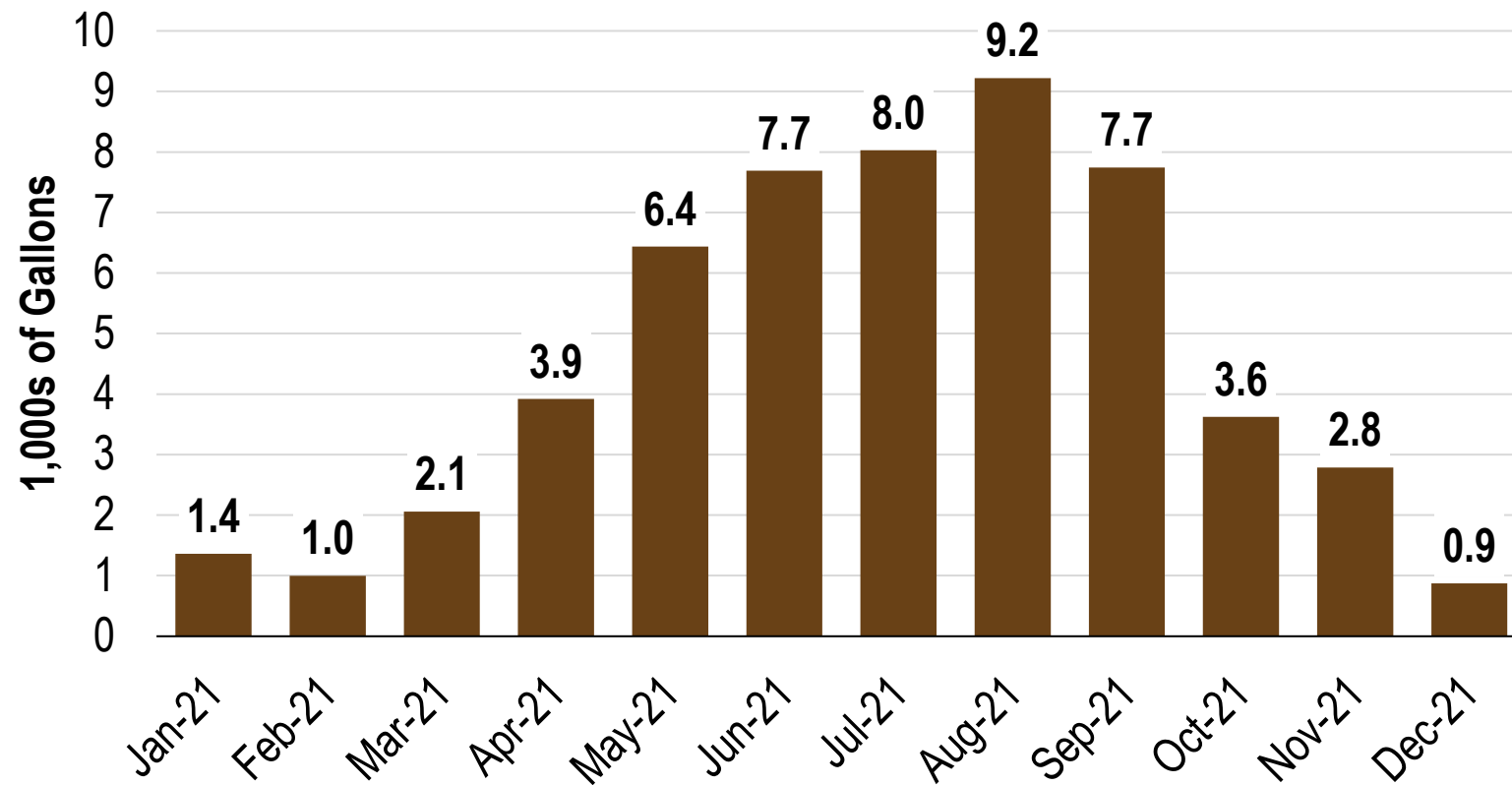
Monthly Use as Share of Average (100 Percent = Monthly Average)





# Monthly Water Use in 2021

## Differential: Homes Built in 2019 Versus 1989



- On average, homes built in 2019 used substantially less water each month than homes built in 1989.
- Based on the monthly distribution of water use, it is clear the majority of excessive water use is occurring in the May to September timeframe (months of more extreme heat conditions).

# Data Limitations, Methodology and Notes





# Data Limitations, Methodology and Notes

Data used in the analyses included in this report were requested from the water utility entity for each of the sampled residential properties. These data were provided by various third-party sources. While AA has no reason to doubt the accuracy of the water use data provided, we have not audited the data and can make no assurances relative to the accuracy of the data or use for all purposes.

Note, there were 10 properties out of the entire sampled population for which the corresponding water utility service could not readily be determined. After talking with the appropriate water utility entity, it was determined that these properties were either served by an entity other than the one in which the service area map dictates or they are served by a well. Because the water service for these parcels was unknown, AA was unable to collect water use data to include in the analyses. The omission of these properties did not appear to impact the overall conclusions of the analysis.

AA attempted to collect monthly billed water use for all residential properties sampled for this analysis. In some instances, data were provided by a water utility provider by single month (e.g., January 2021). However, not all water billing cycles necessarily represent a single month, rather the billed use date falls on or near the middle of the month. For continuity and comparison purposes, AA attempted to assign monthly billed water data to a single month. For this reason, some monthly water use data reported by the water utility servicer (e.g., a thirty-day period of billed water use) may include several days from a month other than the one represented. Where appropriate, AA used a general approach to assign the billed water use for a month to the most appropriate month.



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