



Appendix M Fact Sheet

Uniform Plumbing Code (UPC) Appendix M is a peer-reviewed alternative pipe sizing methodology for premise plumbing that was developed in response to the increased prevalence of high-efficiency water fixtures in the U.S, and it can be applied to single- and multi-family dwellings. It is the first major update to plumbing sizing requirements since the 1940's "Hunter's Curve" that dictated the use of oversized pipes, and the update is significant given that water flows are lower today than they were 80 years ago. **This alternative approach will be available for statewide use in California on a voluntary basis effective July 1, 2024.**

California water utilities and other stakeholders stand to experience a variety of benefits from utilizing UPC Appendix M, including:

Water Savings

Who Benefits: Water Utilities and their Customers

- Smaller pipes are more compatible with modern fixtures, which can help save water for utilities and their customers.
- Smaller pipes can use smaller meters, which are better at detecting leaks, potentially saving water for both utilities and customers.

Energy Savings

Who Benefits: Water Utilities and their Customers

- For every decrease in pipe size, less energy is required for water circulation pumps and water heaters to transfer and heat water throughout a building, leading to energy savings for both utilities and consumers.

Cost Savings

Who Benefits: Water Utilities and their Customers, Home builders

- Utilities can meet consumer demand with less water, which allows utilities to reduce short-term costs since they need to pump, treat, and distribute less water.
- Customers will see reduced energy bills, as smaller pipes require less energy for water heating and transportation.
- Homebuilders can see cost savings, as smaller pipes require less money to install.

Decarbonization

Who Benefits: Manufacturers, Home Builders, the State of California

- By shrinking pipe size requirements, the manufacturers can reduce their carbon footprint. Smaller pipes mean less resources and energy are needed per pipe, lowering the carbon

footprint of each new pipe produced.

- This additional decarbonization can help the State of California meet its climate change goals.

Public Health Positive Externalities

Who Benefits: Everyone

- Smaller pipes have the potential to improve water quality, as smaller pipes reduce water age and the potential for pathogen growth, stay cleaner longer, and need less disinfectant.
- Cleaner water for the end user can contribute to an improvement in overall public health, as fewer people will be at risk for contracting illness through water borne pathogens.

Additional References

- 2021 UPC, Appendix M “Peak Water Demand Calculator”
<http://epubs.iapmo.org/2021/UPC/#p=453> <https://www.uniformcodes.org/water-demand-calculator>
- 2017 Study on Peak Water Demand by S. Buchberger et al. (basis for Water Demand Calculator)
<https://www.iapmo.org/media/3857/peak-water-demand-study-executive-summary.pdf>
- 2020 Study on Water Demand Calculator by Stantec (assessment of cost savings from using Water Demand Calculator) <https://www.iapmo.org/group/update/stantec-wdc-savings-study>
https://www.iapmo.org/media/25276/water_demand_calculator_report_summary.pdf

Examples of Adoption of UPC Appendix M

Multiple states have already adopted UPC Appendix M into their codes and standards. Below is a list of successful adoptions and how it fits into different state codes and standards.

- Adoption of UPC Appendix M into 2021 **Oregon** Plumbing Specialty Code
<https://www.oregon.gov/bcd/codes-stand/code-adoption/Pages/2020-opsc-adoption.aspx>
- Adoption of UPC Appendix M into 2018 **Nevada** Plumbing Code
<https://up.codes/viewer/nevada/upc-2018/chapter/M/peak-water-demand-calculator#M>
- Adoption of UPC Appendix M into 2018 **North Dakota** Plumbing Code
<https://casetext.com/regulation/north-dakota-administrative-code/title-62-state-board-of-plumbing/article-62-031-plumbing-installation-standards/chapter-62-031-01-administration/section--62031-01-01-effective-412020conformance-with-the-north-dakota-plumbing-code>