



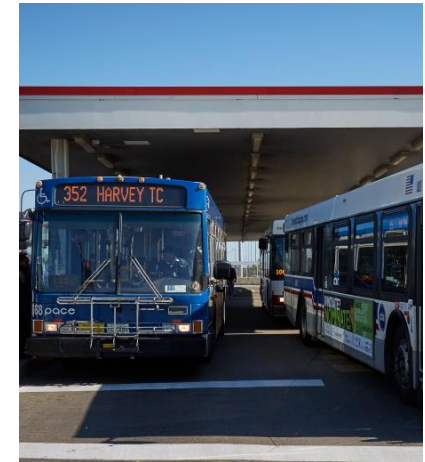
Chicago Metropolitan  
Agency for Planning



# NWPA Water Supply Sustainability Plan: Residential retrofits strategy

September 26, 2023

Technical Advisory Committee Meeting











# Residential retrofits strategy

Overview and assumptions

# Residential retrofits: Overview

Replacement of residential toilets, showerheads, and faucets with more water-efficient devices (US EPA WaterSense labeled products)

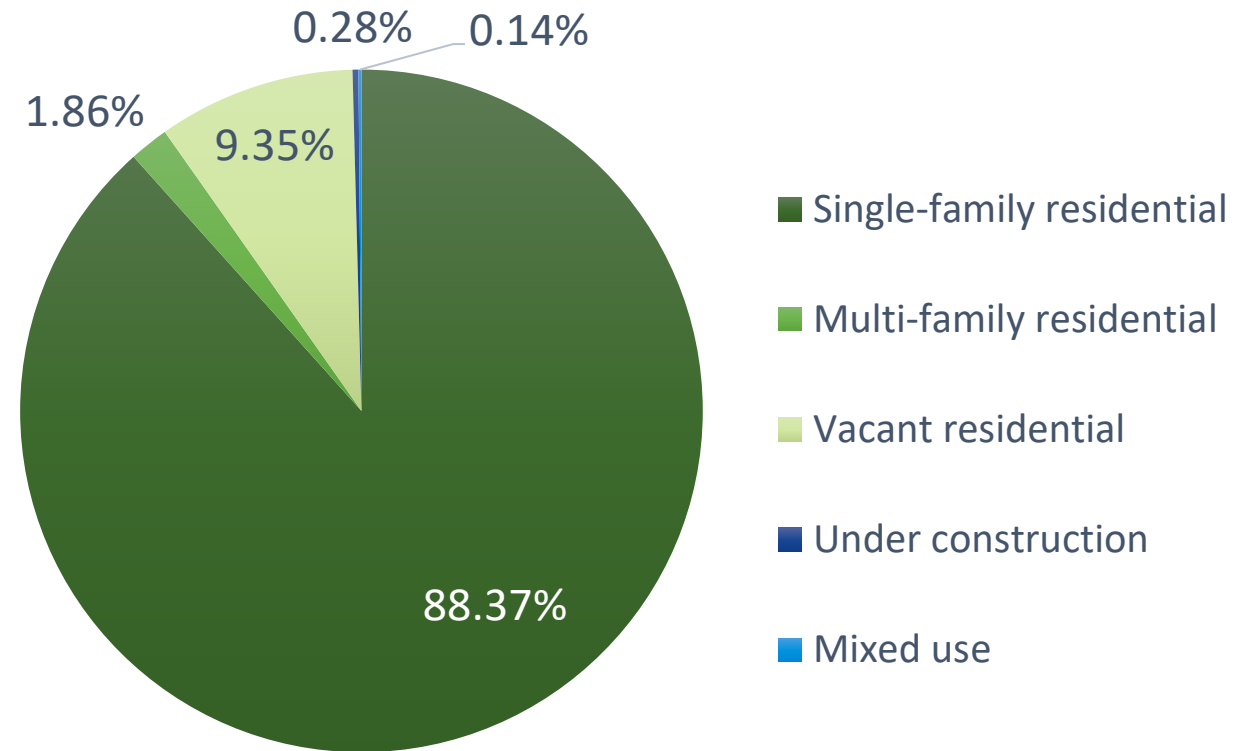
							
Toilet <b>24%</b> 32.6 gphd	Faucet <b>20%</b> 27.0 gphd	Shower <b>20%</b> 26.9 gphd	Clothes washer <b>16%</b> 22.0 gphd	Leak <b>13%</b> 17.8 gphd	Bath <b>3%</b> 4.4 gphd	Other* <b>3%</b> 4.0 gphd	Dishwasher <b>2%</b> 2.2 gphd

\* The "Other" category includes evaporative cooling, humidification, water softening, and other uncategorized indoor uses.

# Residential retrofits: Target audience

NWPA single-family homes

Residential land uses in NWPA region



# Residential retrofits: Overview

Assumes replacement devices will have at least the WaterSense efficiency standards.

Devices	1992 Energy Act	2006 WaterSense
Bathroom faucet (gpm)	2.2	1.5
Kitchen faucet (gpm)	2.2	N/A
Toilets (gpf)	1.6	1.28
Showerheads (gpm)	2.5	2

# Residential retrofits: Baseline water use

**Baseline water use data:** The Illinois Water Inventory Program (IWIP)  
2018 water use data

**Target geography:** NWPA municipalities served by a public water  
supply utility<sup>1</sup>

# Residential retrofits: Baseline water use

Assumes residential and non-residential use is split 75-25%

County	Municipal PWS Total Use, MGD	Residential Use, MGD (75%)	Non-residential Use, MGD (25%)
DeKalb	TBD	TBD	TBD
Kane	50.5	37.9	12.6
Kendall	5.0	3.7	1.2
Lake	51.1	38.3	12.8
McHenry	19.9	14.9	5.0
<b>NWPA region total</b>	<b>126.5</b>	<b>94.9</b>	<b>31.6</b>

# Residential retrofits: Baseline water use

Assumes indoor and outdoor residential use is split 90-10%

County	Total residential Use, MGD	Total indoor residential use, MGD (90%)
DeKalb	TBD	TBD
Kane	37.9	34.1
Kendall	3.7	3.4
Lake	38.3	34.5
McHenry	14.9	13.4
<b>NWPA region total</b>	<b>94.9</b>	<b>85.4</b>



# Residential retrofits: Baseline water use

Assumes toilets account for 24%, showerheads account for 19%, and faucets account for 19% of indoor water use\*

County	Total indoor use, MGD	Toilet, MGD	Showerhead, MGD	Faucet, MGD
DeKalb	TBD	TBD	TBD	TBD
Kane	34.1	8.2	6.5	6.5
Kendall	3.4	0.8	0.6	0.6
Lake	34.5	8.3	6.6	6.6
McHenry	13.4	3.2	2.5	2.5
<b>NWPA region total</b>	<b>85.4</b>	<b>20.5</b>	<b>16.2</b>	<b>16.2</b>

\*Source: Residential End Uses of Water, Version 2 (Water Research Foundation, 2016)

# Residential retrofits strategy

Estimating potential water savings

# Residential retrofits: Preliminary water savings estimates

*Water Savings* = 20% x 53 MGD = **10.6 MGD**

WR is from US EPA WaterSense - On average, WaterSense-labeled fixtures use 20% less water than the current federal water-efficiency (EPAct) requirements.

-> Represents 8% of NWPA regional 126 MGD

# Residential retrofits: Preliminary estimates

g = gallons	Baseline Water Use (EPAct)	Retrofit Water Use (WaterSense)	Daily Device use per person (Vickers, 2001)	Daily baseline Water Use per person (gpcd)	Daily baseline Water Use per household	Estimated water savings per person (gpcd)	Estimated water savings per household
Toilets (gpf)	1.6	1.28	5.1	17.85	45.34	<b>1.63</b>	4.15
Showerheads (gpm)	2.5	2.0	5.3	13.25	33.66	<b>2.65</b>	6.73
Faucets (gpm)	2.2	1.5	8.1	17.82	45.26	<b>5.67</b>	14.40

Putting this into GPCD for context, the NWPAs region's 2020 average forecasted GPCD is 72, a combined water savings of 9.95 gpcd is 62 gpcd.

# Residential retrofits strategy

Opportunities and barriers to  
implementation

# Discussion questions

How can the NWPA achieve the estimated water savings?

- What types of incentives (e.g., device-replacement rebate programs, policies, education, etc.) would be most appealing or favorable to NWPA communities?

What are the potential barriers to implementation?

What type of framing or additional information is needed to help us build the case for retrofitting existing devices?



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# Questions?

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