Drinking Water Infrastructure Needs Survey and Assessment

7th Report to Congress

Office of Water
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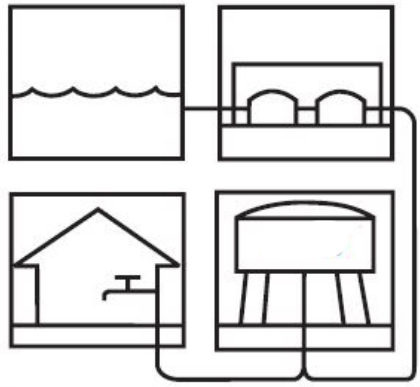
DRINKING WATER INFRASTRUCTURE NEEDS SURVEY AND ASSESSMENT

7TH REPORT TO CONGRESS



EXHIBITS

EXECUTIVE SUMMARY

The United States Environmental Protection Agency's (EPA) Drinking Water Infrastructure Needs Survey and Assessment (DWINSA) is used to determine the financial needs of the nation's drinking water infrastructure over the next twenty years. It also guides EPA's distribution of annual funding to states through the Drinking Water State Revolving Fund (DWSRF), including the unprecedented funding provided by the Infrastructure Investment and Jobs Act (P.L. 117-58), also known as the Bipartisan Infrastructure Law.

The 7th DWINSA includes a State survey and a Tribal survey. The State survey includes the U.S. territories, the District of Columbia, and Puerto Rico and shows a twenty-year capital improvement need of $625 billion. Of that $625 billion, $620.4 billion is for states and Puerto Rico, $1.2 billion is for U.S. territories, and $3.4 billion is for the District of Columbia. The Tribal survey shows a need of $4.1 billion, of which $3.2 billion is for American Indian systems and $0.9 billion is for Alaska Native Villages. This $629.1 billion total estimate represents DWSRF-eligible infrastructure projects necessary, from January 1, 2021, through December 31, 2040, for water systems to continue to provide safe drinking water to the public. The findings are based on data collected in calendar year 2021.

The seventh survey and assessment relied primarily on a statistical survey of 3,629 public water systems in all 50 states, Puerto Rico, the District of Columbia, and U.S. territories as well as 198 American Indian water systems and 97 Alaska Native Village water systems for 3,924 systems total. These public water systems consisted of small community water systems (CWS), medium CWS, large CWS, and not-for-profit non-community water systems (NPNCWS). Out of the 3,924 public water systems surveyed, 3,820 responded, which is a 97% response rate. This response rate provides a high degree of confidence in the statistical precision of the assessment's findings. The 7th DWINSA is the largest and broadest scope effort since its inception in 1995, including new data on lead service lines (LSLs), operator workforce concerns, and pipe and storage tank construction materials related to the Safe Drinking Water Act's (SDWA) American Iron and Steel (AIS) provisions.

Section 1 Traditional State Infrastructure Needs

Section 1.1 Background

The SDWA requires that EPA examine the needs for infrastructure improvements and maintenance at public water systems in the United States. To accomplish this, EPA is required to conduct a survey and assessment every four years. Results from previous surveys can be found here: https://www.epa.gov/dwsrf. The 7th DWINSA includes a State survey and a Tribal survey. The State survey includes the U.S. territories, the District of Columbia, and Puerto Rico. The Tribal survey includes American Indian systems and Alaska Native Villages.

EPA, states, and water systems collected data for the 7th DWINSA in calendar year 2021. This data represents the DWSRF-eligible infrastructure projects that are necessary over the 20-year period of January 1, 2021, through December 31, 2040, for water systems to continue to provide safe drinking water to the public. These projects include infrastructure needs that are eligible for, but not necessarily financed by, the DWSRF, including the installation of new drinking water infrastructure and the rehabilitation, expansion, or replacement of existing infrastructure. The findings of the State survey of traditional 20-year infrastructure needs are reported in this section; the findings of the Tribal survey are reported in Section 5.

The SDWA mandates that EPA use the DWINSA to develop a formula to distribute DWSRF capitalization grants to states. By law, each state, the District of Columbia, and Puerto Rico are guaranteed a minimum allotment of 1% of the total amount available to states and the U.S. territories share 1.5% of the total amount available to states. For each DWINSA, EPA uses a standardized methodology to develop a new allocation formula based on each state's 20-year infrastructure need compared to the national need and accounting for the required 1% minimum allocation for each state. There are minor changes in the allotment percentages in the allocation formula developed from the 7th DWINSA compared to the previous. Starting in FY23, this allotment formula will be used to distribute the DWSRF Base Appropriations, the Bipartisan Infrastructure Law General Supplemental, and the Bipartisan Infrastructure Law Emerging Contaminants funds. As described further below, EPA used information collected in the 7th DWINSA on service line materials to develop a separate allocation formula to distribute the DWSRF Bipartisan Infrastructure Law Lead Service Line Replacement (LSLR) fund for FY23.

The Assessment was developed in consultation with a workgroup consisting of state and EPA regional coordinators. The workgroup met several times by conference call and in person to discuss and to receive feedback on the Assessment's policies and processes. In addition, in compliance with the Paperwork Reduction Act (44 U.S.C. §3501 et seq.), the survey design and instrument were reviewed and approved by the Office of Management and Budget (OMB). The Information Collection Request for the survey can be accessed in the Federal Register (86 FR 6542; February 5, 2020).

Section 1.2 Methodology

The 7th DWINSA conducted a statistical survey of 3,629 public water systems in all 50 states, Puerto Rico, the District of Columbia, and the U.S. territories. Exhibit 1.1 shows the total number of DWSRF-eligible systems and the number of systems surveyed. These public water systems included large community

water systems (CWS), medium CWS, small CWS, and not-for-profit non-community water systems (NPNCWS). Due to the burden of participating, small CWS are not included in every survey. Small CWS were last surveyed in the 4th DWINSA. The 7thDWINSA is the largest and broadest scope effort since its inception in 1995 and includes data related to lead service lines (LSLs), operator workforce concerns, and pipe and storage tank construction materials related to SDWA's American Iron and Steel (AIS) provisions.

Out of the 3,629 state public water systems surveyed, 3,526 responded, which is a 97% response rate, well above the 90% goal. This response rate goal was established to provide a high degree of confidence in the statistical precision of the assessment's findings. For the State survey, EPA surveyed all large CWS, a random sample of medium CWS in each state, a national random sample of small CWS and a national sample of NPNCWS. Large and medium CWS either filled out the survey themselves or with state assistance. EPA's contractor assisted small CWS and NPNCWS. States which are likely to only receive the 1% minimum DWSRF allotment may choose to not conduct the survey for medium CWS, and if so, are known as partial participating states. Large and small CWS are still surveyed in partial participating states. Exhibit 1.1 shows the achieved number of responses by water system size for the State survey.

Exhibit 1.1: DWSRF-Eligible State Water Systems Surveyed

Size of System	Total Number of Systems	Number of Surveyed Systems	Sampling Rate	Number of Survey Responses	% Survey Responses
Small Community Water Systems (serving 3,300 and fewer people)	~40,000	606	1.60%	602	99.3%
Medium Community Water Systems (serving 3,301 to 100,000 people)	~9,000	2,181	22.70%	2,091	95.9%
Large Community Water Systems (serving over 100,000 people)	708	708	100%	705	99.6%
Not-for-Profit Noncommunity Water Systems	~26,000	134	0.50%	128	95.5%
Total				**3,526**	**97.6%**

Basic statistical and survey methodologies used for this assessment are the same as those used in previous assessments. Water systems surveyed by the DWINSA submit cost estimates for capital improvement projects that the water system plans to complete over the next 20 years (for this survey, January 1, 2021, through December 31, 2040). For a project to be included, the water system must

document that they are committed to completing the project, and that it is feasible and necessary. One way to show commitment is for the project to be listed in a water system's capital improvement plan. To show the project is necessary and feasible a water system might submit a preliminary engineering report. Cost estimates reflect comprehensive infrastructure costs like engineering and design, purchase of raw materials and equipment, and construction labor. Project costs, which can either be actual submitted costs or modeled based on project category, are totaled for each water system and then used to extrapolate the total need for the state.

The 20-year national infrastructure need for the State survey is calculated for each individual state and territory using the reported needs of large CWS, the weighted needs of medium CWS and by applying the small CWS national need to each state's small CWS inventory. The medium CWS need for partial participating states was estimated using data from full participating states and the inventory of medium CWS in the partial participating states. Use of this method allowed EPA to meet its precision target for each full participating state as well as at the national level.

State extrapolated needs are then totaled with the results of the American Indian and Alaska Native Village surveys to get the national need. Additional information on methodology can be found in the 6th DWINSA Report to Congress.

Section 1.3 Survey Credibility

EPA has been working closely with water systems and states for over 25 years to conduct the DWINSA. The survey and its methodology are widely accepted and often cited in various literature and studies. The DWINSA collects actual project and asset data from a stratified random statistical sample of water systems, which minimizes bias and uncertainty in the survey and results. Rigorous water system project documentation is required based on a weight of evidence approach to demonstrate that a project is necessary, feasible, and has commitment. Consequently, the survey is credible, defensible, and statistically significant.

Section 1.4 State Survey Results

The 20-year national infrastructure need for states (including territories, Puerto Rico, and the District of Columbia) estimated by the 7th DWINSA is $625 billion. This is a 32% increase over the 6th DWINSA ($472.6 billion, in January 2015 dollars). Accounting for inflation, this is a 14% increase in need over the adjusted 6th DWINSA ($546.6 billion, in January 2021 dollars). The breakout of the need by project category is presented in Exhibit 1.2. The distribution across categories is similar to the 6th DWINSA, although the quantity of need has increased. Exhibit 1.3 shows the breakout of the need based on water system size and type. The U.S. territory needs, reported as part of the total 20-year state need, total approximately $1.15 billion, of which $519.3 million is needed for distribution and transmission, $232.3 million for treatment, $266.7 million for storage, $70.6 million for source, and $62.7 for other needs. Additional information on U.S. state and U.S. territory needs, including a breakout by territory, can be found in Exhibit 1.4, Exhibit 1.5 and Appendix B.

Exhibit 1.2: Total 20-year State Need by Infrastructure Project Category (in billions; January 2021 dollars)

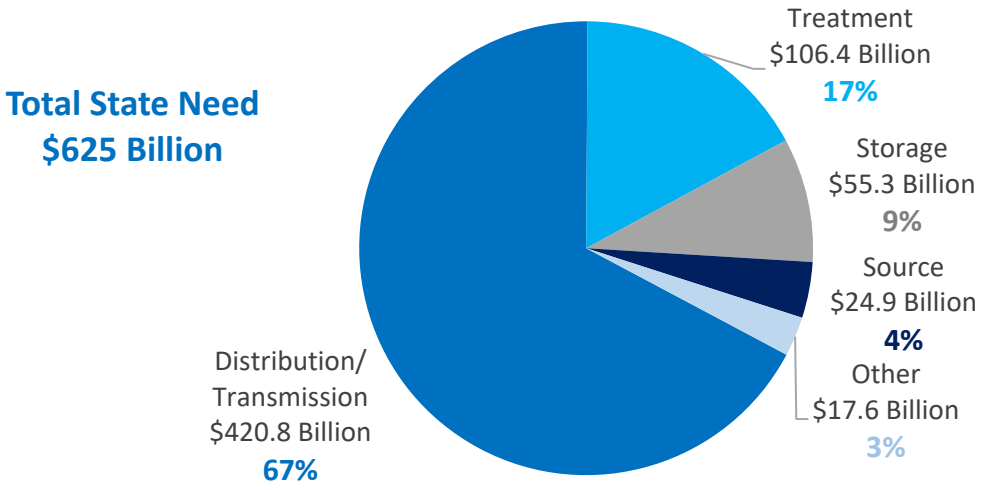


Exhibit 1.3: Total 20-year State Need by System Size/Type (in billions; January 2021 dollars)

System Size/Type	Estimated Need	Percent of Need (%)
Small Community Water Systems (serving 3,300 and fewer people)	$100.1	16%
Medium Community Water Systems (serving 3,301 to 100,000 people)	$273.1	44%
Large Community Water Systems (serving over 100,000 people)	$235.2	37%
Not-for-Profit Noncommunity Water Systems	$16.6	3%
Total State Need	**$625.0**	**100%**

Exhibit 1.4: State 20-year Need Reported by Project Category (in millions; January 2021 dollars)

State	Distribution/ Transmission	Treatment	Storage	Source	Other	Total
Alabama	$9,241.7	$1,486.3	$948.2	$182.5	$319.2	$12,178.0
Alaska*	$729.4	$291.1	$201.9	$87.7	$52.9	$1,363.0
Arizona	$7,455.6	$2,175.3	$1,161.4	$699.0	$557.4	$12,048.7
Arkansas	$5,626.8	$956.4	$695.6	$152.3	$252.7	$7,683.8
California	$55,742.3	$13,549.9	$9,238.6	$3,571.1	$1,413.3	$83,515.2
Colorado	$7,502.3	$2,877.6	$1,022.9	$290.6	$374.4	$12,067.8
Connecticut	$3,017.6	$1,066.1	$445.4	$184.0	$197.0	$4,910.1
Delaware*	$1,193.4	$301.4	$176.4	$77.8	$60.8	$1,809.9
District of Columbia	$3,316.4	n/a	$45.5	n/a	$0.0	$3,361.9
Florida	$17,615.2	$5,135.6	$1,778.1	$1,454.8	$765.9	$26,749.6
Georgia	$13,966.4	$3,299.9	$1,263.1	$552.3	$573.6	$19,655.2
Hawaii*	$1,442.8	$454.8	$252.2	$109.1	$54.5	$2,313.4
Idaho*	$1,905.8	$552.5	$313.0	$188.4	$114.1	$3,073.8
Illinois	$14,101.7	$4,280.5	$2,019.5	$972.0	$837.2	$22,210.8
Indiana	$8,161.4	$1,691.0	$872.5	$601.2	$457.7	$11,783.8
Iowa	$6,924.3	$1,373.1	$716.1	$860.2	$231.0	$10,104.7
Kansas	$4,607.9	$1,495.0	$503.2	$280.0	$149.1	$7,035.1
Kentucky	$6,020.7	$974.1	$651.0	$90.3	$106.7	$7,842.9
Louisiana	$6,130.8	$1,513.2	$694.7	$307.8	$364.6	$9,011.1
Maine*	$1,236.6	$355.7	$206.6	$93.9	$68.3	$1,961.1
Maryland	$12,780.4	$1,041.5	$480.9	$271.0	$71.1	$14,644.9
Massachusetts	$10,205.1	$2,880.1	$1,143.9	$440.0	$523.7	$15,192.8
Michigan	$11,696.1	$2,246.2	$1,110.9	$751.7	$452.9	$16,257.7
Minnesota	$6,017.2	$2,122.2	$1,043.4	$593.7	$401.0	$10,177.5
Mississippi	$4,925.5	$1,962.4	$650.0	$366.1	$215.0	$8,118.9
Missouri	$7,890.2	$1,562.9	$1,025.7	$372.0	$238.6	$11,089.4
Montana*	$1,342.6	$490.3	$264.6	$137.8	$90.6	$2,326.0
Nebraska*	$2,296.6	$403.0	$268.0	$169.0	$100.8	$3,237.4
Nevada	$3,926.2	$997.3	$1,220.3	$208.2	$63.0	$6,414.9
New Hampshire*	$1,452.6	$481.7	$279.7	$149.9	$96.2	$2,460.2
New Jersey	$8,261.5	$2,230.6	$1,087.5	$361.2	$312.0	$12,252.8
New Mexico*	$2,101.0	$547.5	$327.0	$171.8	$162.6	$3,309.8
New York	$24,472.1	$5,415.4	$3,237.9	$1,101.6	$920.6	$35,147.7
North Carolina	$14,028.7	$3,215.0	$1,372.1	$826.0	$563.2	$20,004.9
North Dakota*	$1,326.8	$343.9	$197.4	$1,229.7	$70.3	$3,168.0
Ohio	$10,819.6	$2,767.8	$1,308.8	$652.9	$522.7	$16,071.8
Oklahoma	$6,331.9	$1,724.7	$739.8	$606.6	$306.0	$9,708.9
Oregon	$5,678.3	$2,170.7	$1,349.7	$509.4	$402.3	$10,110.5

State	Distribution/ Transmission	Treatment	Storage	Source	Other	Total
Pennsylvania	$15,844.1	$4,710.0	$2,197.1	$691.2	$858.8	$24,301.1
Puerto Rico	$2,197.3	$822.9	$425.2	$120.6	$103.8	$3,669.8
Rhode Island*	$1,264.6	$347.2	$126.7	$47.4	$40.6	$1,826.5
South Carolina	$5,531.3	$1,246.3	$644.4	$415.3	$262.0	$8,099.4
South Dakota*	$1,361.5	$362.8	$240.1	$121.1	$81.9	$2,167.4
Tennessee	$9,054.7	$1,401.0	$871.9	$154.7	$44.5	$11,526.8
Texas	$41,372.6	$11,466.1	$4,828.6	$1,596.1	$1,989.8	$61,253.1
Utah*	$3,286.3	$1,146.2	$460.9	$192.8	$149.6	$5,235.7
Vermont*	$1,096.7	$325.4	$197.0	$93.9	$66.3	$1,779.3
Virginia	$6,147.5	$1,761.0	$927.8	$250.2	$295.6	$9,382.2
Washington	$10,105.9	$2,685.9	$2,152.3	$647.1	$731.3	$16,322.5
West Virginia*	$3,008.7	$804.5	$455.8	$158.3	$138.0	$4,565.3
Wisconsin	$7,494.8	$2,321.9	$1,068.2	$604.5	$266.3	$11,755.7
Wyoming*	$987.7	$291.5	$169.1	$76.1	$56.4	$1,580.8
Subtotal	**$420,245.3**	**$106,125.2**	**$55,078.3**	**$24,842.6**	**$17,548.0**	**$623,839.4**
American Samoa	$86.1	$62.4	$44.2	$19.4	$3.9	$215.9
Guam	$132.1	$63.3	$127.6	$29.9	$33.2	$386.1
Northern Mariana Islands	$207.0	$91.4	$50.1	$14.0	$17.5	$380.0
Virgin Islands	$94.1	$15.3	$44.7	$7.3	$8.1	$169.5
Subtotal	$519.3	$232.3	$266.7	$70.6	$62.7	$1,151.6
Total	**$420,765**	**$106,357**	**$55,345**	**$24,913**	**$17,611**	**$624,991**

*Partial participating states are those states which are likely to only receive the 1% minimum DWSRF allotment and therefore, by choice, do not conduct the survey for medium water systems. Large and small water systems are surveyed in these states. Medium system needs in these states are estimated based on average medium system needs nationally, by stratum, derived from data from full participating states. The medium system and total needs of partial participating states is estimated but do not meet the data quality objectives for the survey.

Note: Numbers may not total due to rounding.

Exhibit 1.5: State 20-year Need by System Size (in millions; January 2021 dollars)

State	Large	Medium	Small	NPNCWS	Total
Alabama	$2,564.3	$8,709.8	$894	$9.9	$12,178
Alaska	$155.1	*	$509.9	$245.7	$910.7
Arizona	$6,973.7	$3,619.3	$1,328.1	$127.5	$12,048.7
Arkansas	$736.9	$5,054.5	$1,881.6	$10.7	$7,683.8
California	$41,926.3	$34,325.9	$5,545.8	$1,717.1	$83,515.2
Colorado	$4,710	$5,501	$1,718.6	$138.2	$12,067.8
Connecticut	$2,000.1	$1,780.8	$799.7	$329.5	$4,910.1
Delaware	$405	*	$424	$35	$864
District of Columbia	$3,361.9	**	**	**	$3,361.9
Florida	$12,409.6	$10,668.2	$2,821.1	$850.6	$26,749.6
Georgia	$10,268.9	$6,599.3	$2,677.7	$109.3	$19,655.2
Hawaii	$993.7	*	$272	$1.4	$1,267.1
Idaho	$361.3	*	$1,179.4	$180.8	$1,721.6
Illinois	$4,973.1	$11,824.3	$4,937.8	$475.6	$22,210.8
Indiana	$3,587.8	$5,611.9	$1,937.2	$646.9	$11,783.8
Iowa	$1,083.1	$6,312	$2,560.5	$149	$10,104.7
Kansas	$1,940.1	$2,737	$2,332	$25.9	$7,035.1
Kentucky	$1,543.8	$5,679	$614.4	$5.7	$7,842.9
Louisiana	$1,813.1	$4,727.7	$2,435.8	$34.5	$9,011.1
Maine	$137.6	*	$703.9	$172.4	$1,013.9
Maryland	$12,042.2	$1,319.3	$881.9	$401.5	$14,644.9
Massachusetts	$3,572.2	$10,803.6	$654	$163	$15,192.8
Michigan	$5,358.8	$6,572.7	$2,813	$1,513.2	$16,257.7
Minnesota	$1,171.4	$5,355	$2,379.4	$1,271.8	$10,177.5
Mississippi	$387.4	$4,345.4	$3,362.9	$23.2	$8,118.9
Missouri	$2,822.5	$4,908.6	$3,170.3	$188	$11,089.4
Montana	$221.2	*	$1,120.8	$211.8	$1,553.8
Nebraska	$769.8	*	$1,361.5	$104.7	$2,235.9
Nevada	$5,032.3	$938.5	$388.6	$55.5	$6,414.9
New Hampshire	$41.6	*	$1,056.1	$265.3	$1,363
New Jersey	$5,941.4	$4,741.3	$1,089.4	$480.6	$12,252.8
New Mexico	$516.8	*	$1,002.2	$97.7	$1,616.7
New York	$22,279.2	$6,971.9	$5,444.1	$452.5	$35,147.7
North Carolina	$6,521.8	$9,613.4	$2,916.7	$953.1	$20,004.9
North Dakota	$1,297.1	*	$641.1	$12.9	$1,951.1
Ohio	$6,179.4	$6,580.7	$2,657	$654.7	$16,071.8
Oklahoma	$2,866	$4,404.6	$2,372.7	$65.6	$9,708.9
Oregon	$2,915.5	$5,141.8	$1,708.6	$344.6	$10,110.5
Pennsylvania	$10,218.1	$9,199.3	$4,084	$799.7	$24,301.1

State	Large	Medium	Small	NPNCWS	Total
Puerto Rico	$1,274.2	$1,599	$796.5	**	$3,669.8
Rhode Island	$837.3	*	$124.9	$66.8	$1,029
South Carolina	$2,747.5	$4,336.2	$961.9	$53.7	$8,099.4
South Dakota	$167.1	*	$814.1	$18.7	$999.9
Tennessee	$2,522.2	$8,127.5	$841.8	$35.3	$11,526.8
Texas	$23,091.6	$28,152.9	$9,760.6	$248	$61,253.1
Utah	$888.2	*	$949.1	$61.1	$1,898.4
Vermont	**	*	$771.5	$117.2	$888.7
Virginia	$3,802.3	$3,307.5	$1,991.9	$280.6	$9,382.2
Washington	$4,357.9	$7,774.1	$3,843.9	$346.6	$16,322.5
West Virginia	$127.9	*	$1,398.1	$65.3	$1,591.3
Wisconsin	$2,862.8	$4,582.5	$2,403	$1,907.4	$11,755.7
Wyoming	**	*	$558.1	$71.7	$629.8
Subtotal	**$234,779**	**$272,569**	**$99,893**	**$16,598**	**$623,839**
American Samoa	**	$165.2	$50.7	**	$215.9
Guam	$386.1	**	**	**	$386.1
North Mariana Is.	**	$291.5	$88.5	**	$380
Virgin Islands	**	$98.1	$71.3	**	$169.5
Subtotal	$386.1	$554.8	$210.5	$0	$1,151.5
Total	**$235,165**	**$273,124**	**$100,104**	**$16,598**	**$624,991**

*The total medium system needs for partial participating states is $20,642,700,000. This is represented cumulatively in the "Subtotal" and not by state. Partial participating states are those states which are likely to only receive the 1% minimum DWSRF allotment and therefore, by choice, do not conduct the survey for medium water systems. Large and small water systems are surveyed in these states.
**Indicates there are no water systems at all in these categories.
Note: Numbers may not total due to rounding.

Exhibits 1.6 through 1.8 present the 7th DWINSA results for states compared to previous assessments. Note that the assessments differed in scope (small CWS, American Indian and Alaskan Native Village systems and NPNCWs were not included in data collection every survey cycle, but where data was not collected the total need for the state was calculated using previously collected data for those categories, converted that Assessment's year). Exhibit 1.6 shows each DWINSA total state and U.S. territory need in "current year" dollars (in other words, dollars from the year of the specific Assessment) and expressed in January 2021 dollars. It shows the percentage change in the inflation-adjusted need from the previous assessment's total need. This means the percentage change shown accounts for inflation and reflects the real change in need.

Exhibit 1.6: Total State and U.S. Territory 20-year National Need Compared to Previous DWINSA Findings (dollars in billions)

	1995	1999	2003	2007	2011	2015	2021
Total National Need (as listed in Assessment Year's Report to Congress in Current Year Dollars)	$137.1	$148.7	$274.3	$331.9	$380.9	$468.8	$625.0
Cost adjustment factor to January 2021 dollars (based on Construction Cost Index)	114%	94%	77%	48%	30%	17%	--
Total National Need in 2021 Dollars	**$292.8**	**$288.2**	**$484.6**	**$489.7**	**$495.5**	**$546.6**	**$625.0**
Percent Increase from Previous Assessment	--	-1.6%	68.2%	1.0%	1.2%	10.3%	14.3%

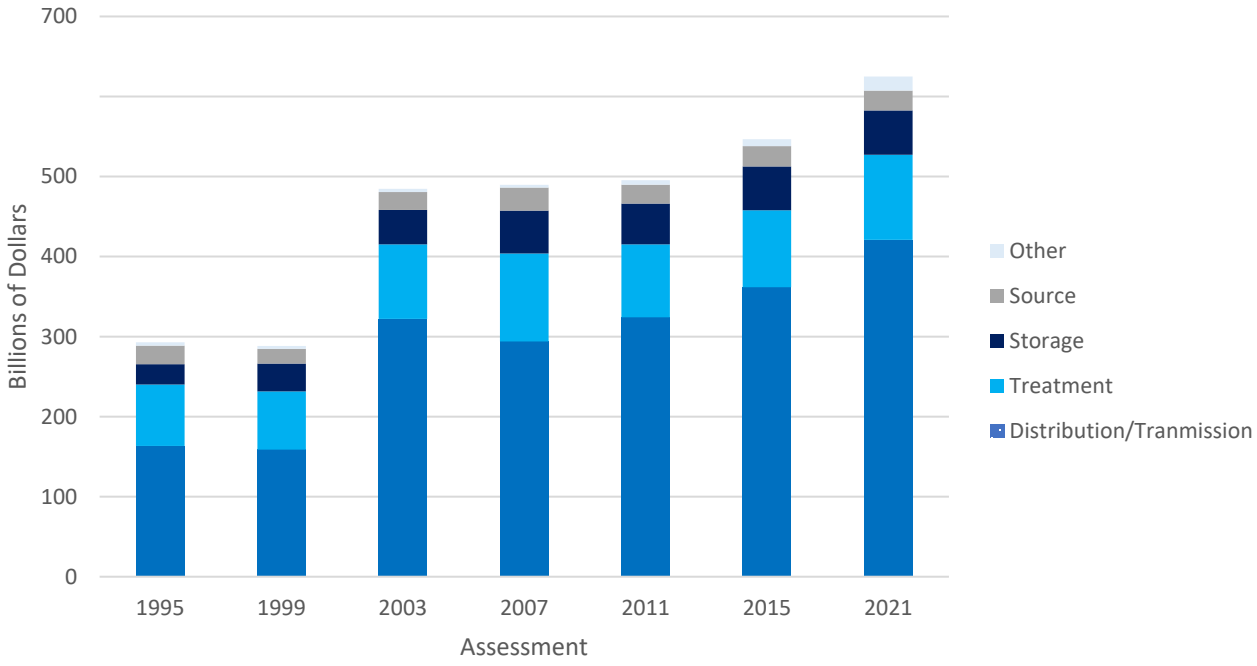
The 1999 through 2015 National Need each included the estimated capital cost of proposed or recently promulgated regulations taken from the regulations' Economic Analyses. The 1995 and 2021 National Need do not include any proposed or recently promulgated regulations.

Exhibit 1.7: Total 20-Year State and U.S. Territory Need by System Size/Type (in billions; January 2021 dollars)

System Type	1995	1999	2003	2007	2011	2015	2021
Small CWSs (serving 3,300 or fewer people)	$79.5	$60.4	$60.4	$87.7	$83.9	$86.8	$100.1
Medium CWSs (serving 3,301 to 100,000 people)				$214.0	$210.5	$245.6	$273.1
Large CWSs (serving more than 100,000 people)				$171.7	$188.7	$203.3	$235.2
Combined Medium/Large CWSs*	$213.4	$203.8	$399.1				
Not-for-Profit Noncommunity Systems		$6.0	$6.0	$6.0	$6.0	$6.0	$16.6
Total Need	**$292.9**	**$270.1**	**$465.4**	**$479.4**	**$489.1**	**$541.7**	**$625.0**

Note: Numbers may not total due to rounding. Total Need presented in Exhibit 1.7 does not include estimated capital costs of proposed or recently promulgated regulations, which were included in the 1999 through 2015 reported Total National Need.

Exhibit 1.8: Total State 20-year Need by Project Category for Each Assessment (in billions; January 2021 dollars)



Section 2 State and U.S. Territory Lead Service Line Counts

Section 2.1 Service Line Questionnaire

America's Water Infrastructure Act (AWIA) of 2018 amended Section 1452(h) of SDWA to mandate that EPA evaluate and include the cost to replace lead service lines (LSLs) in future drinking water infrastructure needs surveys. EPA collected service line material information to support this evaluation for the first time in 2021, as a part of the 7th DWINSA.

In accordance with Section 1452(h)(2) of SDWA, all public water systems participating in the 7th DWINSA were asked to provide information on the number of service lines in their system (whether owned by the system, the customer, or jointly owned by both the system and the customer) and their knowledge of the construction materials of the service lines and service line connectors (see Exhibit 2.1). This includes medium CWS in partial participating states which were not surveyed for 20-year infrastructure needs. These systems were sent an abbreviated version of the DWINSA questionnaire which contained only the operator workforce and service line questions. Exhibit 2.1 also shows how the responses for each row were categorized by service line material. If a system reported any LSLs or connectors, EPA included those service lines in the lead content category. EPA included service lines that systems reported as galvanized pipe previously downstream of lead source (including lead pipes, lead connectors and/or any unknown source of lead) in the lead category as well. Galvanized service lines that have never been downstream of a source of lead are reported as standalone galvanized. Service lines known to not be lead are categorized as no lead. Service lines for which the system did not know the material or did not report a material are included in the undiscovered (including unknown and nonreported) category.

Exhibit 2.2 shows an example completed questionnaire. Like participation in the full needs survey, the service line questionnaire was optional; however, 75% of water systems in the State survey provided responses.

EPA recognizes that states and communities continue to make progress on identifying LSLs. To account for this rapidly developing data, states will be provided a one-time opportunity to adjust their reported service line data in Fall 2023. The updated service line information will be first used in distribution of DWSRF BIL LSLR funding to states in 2024.

Exhibit 2.1: Questions on Service Line Questionnaire

Type of Service Line	Category of Service Line Materials
Row 1. Service lines that contain any lead pipe	**Lead Content**
Row 2. Service lines that do not contain any lead pipe but have lead connectors (such as goosenecks or pigtails).	
Row 3a. Service lines that contain galvanized pipe and were previously downstream from a lead pipe that was removed from the service line.	
Row 3b. Service lines that contain galvanized pipe and were previously downstream from a lead connector that was removed from the service line.	
Row 3c. Service lines that contain galvanized pipe and were previously downstream from an unknown source of lead that was removed from the service line.	
Row 3d. Service lines that contain galvanized pipe that have never been downstream from any lead pipe or lead connector in the service line.	**Standalone Galvanized**
Row 4a. Service lines that do not contain any lead pipe or galvanized pipe and that do not have lead connectors.	**No Lead**
Row 4b. Service lines for which the material makeup of the service line and of the connector are not known. (Unknown SLs)	**Undiscovered Material**
Inserted Row 5 for Analysis – Service lines that system did not disclose knowledge of material make-up (Not Reported SLs)	

Exhibit 2.2: Example Completed Lead Service Line Supplemental Questionnaire

LEAD SERVICE LINE TABLE			
For each category, include those service lines *for which it is known or there is reason to believe* the service line likely fits the description. Please record the number of service lines that fit the description of each row and column and count each service line only once.			
	Number of Service Lines that are Solely System-Owned	**Number of Service Lines that are Solely Customer-Owned**	**Number of Service Lines for which the System and Customer Share Ownership**
Service Lines That Contain Lead Pipe			
Row 1. Service lines that contain any lead pipe.	0	0	100
Service Lines That Contain Lead Connectors			
Row 2. Service lines that do not contain any lead pipe but have lead connectors (such as goosenecks or pigtails).	0	0	0
Service Lines That Contain Galvanized Pipe			
Row 3a. Service lines that contain galvanized pipe and were previously downstream from a lead pipe that was removed from the service line.	0	0	0
Row 3b. Service lines that contain galvanized pipe and were previously downstream from a lead connector that was removed from the service line.	0	0	0
Row 3c. Service lines that contain galvanized pipe and were previously downstream from an unknown source of lead that was removed from the service line.	0	0	0
Row 3d. Service lines that contain galvanized pipe that have never been downstream from any lead pipe or lead connector in the service line.	0	0	200
Other Service Lines and Service Lines of Unknown Materials			
Row 4a. Service lines that do not contain any lead pipe or galvanized pipe and that do not have lead connectors.	0	0	500
Row 4b. Service lines for which the material makeup of the service line and of the connector are not known.	0	0	200
Total Number of Service Lines by Column	0	0	1,000

Exhibit 2.3 shows the number of surveyed systems that responded for each category of service line material. A system may have responded with information on more than one type of service line. Some or all of the 725 systems that reported one or more services lines with lead content may also have reported some lines were known to not have lead content and some were of unknown material. Category 5 in Exhibit 2.3 captures the systems that did not respond to the questions on service line inventory. To date, this is the best available data collected and assessed on service line materials in the U.S.

Exhibit 2.3: Number of Surveyed Systems that Responded to the State Service Line Supplemental Questionnaire (National Summary)

Type of Service Line (Material)	Number of System Responses
1. Systems that reported any lead content in any of their service lines or connectors	725
2. Systems that did not know the material of some or all their service lines	843
3. Systems that reported some standalone galvanized service lines	127
4. Systems that reported that they had no lead content	920
5. Not reported	898

Note: A system may have reported data for more than one category (e.g., reported they have lead content in some service lines (Row 1) and known no lead content in other service lines (Row 4). The system would be included as responding in both rows.

Section 2.2 Lead Service Line Estimate Methodology

The same 3,629 water systems participating in the primary state DWINSA were surveyed using the 7th DWINSA service line questionnaire, which collected information on the number of service lines by material type. Medium CWS selected for the survey in partial participating states were asked to respond to the service line questionnaire even though they did not report 20-year infrastructure needs. To develop estimated counts of service lines, system level data is extrapolated at the state and national level using similar methodology as for the primary DWINSA. A description of this approach is included in Appendix A. Responses from the DWINSA service line questionnaire were used to estimate the number of service lines of each material type. As shown in Exhibit 2.3, EPA categorized these material types as known lead, standalone galvanized, no lead, and undiscovered (including unknown and nonreported).

The Lead and Copper Rule Revisions (LCRR) require water systems to identify and make public an initial inventory of the locations of LSLs by October 16, 2024. In 2022, EPA issued the document *Guidance for Developing and Maintaining a Service Line Inventory* (found here: https://www.epa.gov/ground-water-and-drinking-water/revised-lead-and-copper-rule) to support this effort. Until water systems have complete inventories, the number of reported undiscovered (including unknown and nonreported) service lines that are actually lead is unknown. Therefore, for each state, EPA applied the ratio of the number of known LSLs to the total service lines of all known material types to project how many undiscovered (including unknown and nonreported) service lines might be lead. This same projection was done for the standalone galvanized service lines. The DWINSA estimated service line material based on survey response is shown in Exhibit 2.4 for each state and U.S. territory. Appendix B includes

information for each state on the number of service lines by category estimated from survey responses and the number projected for the state using the state ratios.

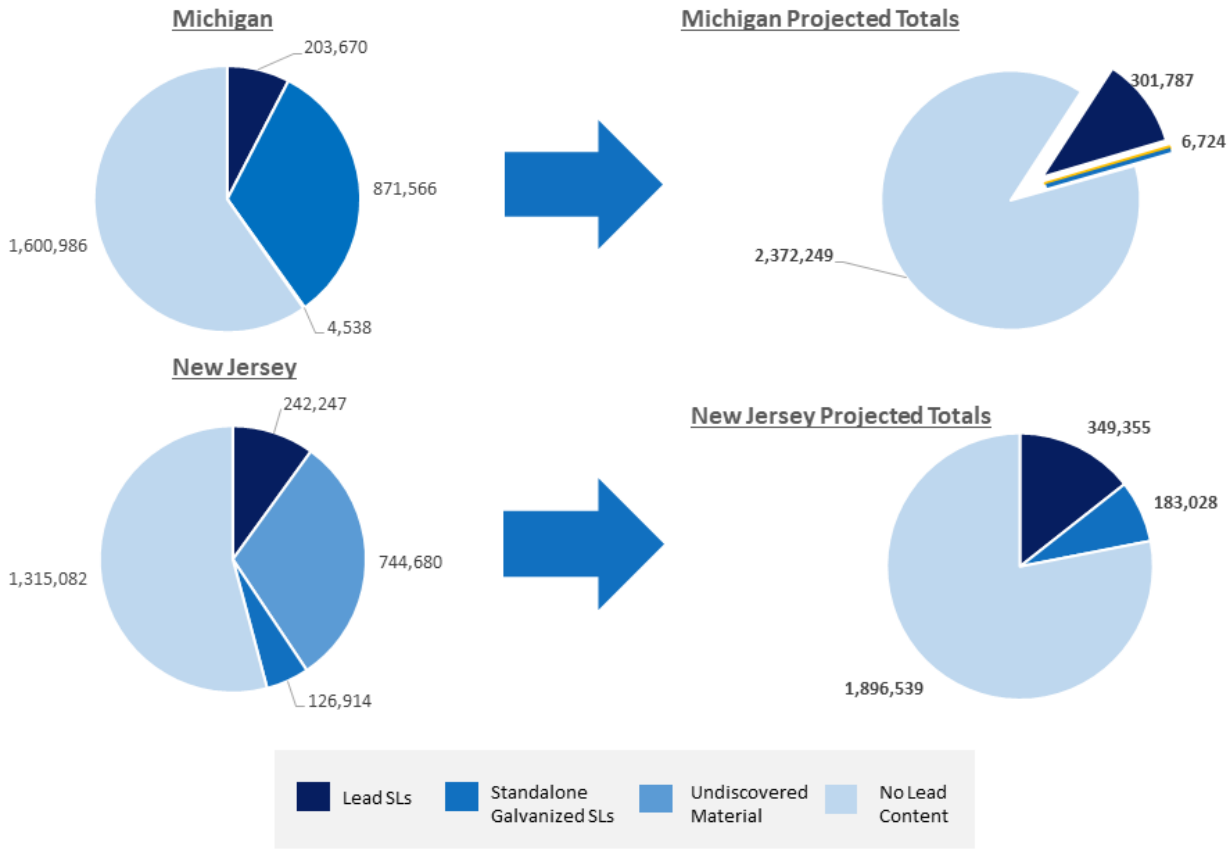
Examples of this methodology for two states are shown in Exhibit 2.5. A state-specific ratio was developed to derive the total projected count of LSLs in each state. These state numbers were then totaled to calculate the total national LSL number. This is illustrated in Exhibit 2.5, where Michigan's 871,566 service lines of undiscovered (including unknown and nonreported) material are projected to be either lead, standalone galvanized, or not lead pipe based on state-specific ratios and are added to the totals for those materials from the survey's estimates. If a state reported all unknown materials or did not respond to the survey, for medium CWS, EPA applied a national ratio derived from the states with reported data. For small CWS, a national ratio was applied to the number of connections reported in small CWS in each state. Appendix A provides a more detailed step-by-step description of the methodology used to develop service line estimates.

Exhibit 2.4: Estimated Service Line Material Based on Survey Response

	Service Line Material				
State/Territory	Lead Content	Unknown Material	Standalone Galvanized	No Lead Content	Not Reported
Alabama	54,838	397,891	34,613	1,029,411	351,025
Alaska	520	41,528	1,351	38,488	30,981
Arizona	8,310	381,240	29,092	1,473,006	185,676
Arkansas	77,248	102,889	21,654	449,384	568,005
California	12,984	215,308	199,929	9,085,439	136,974
Colorado	86,831	135,639	2,291	1,201,973	237,207
Connecticut	17,604	532,699	297	68,482	100,153
Delaware	17,952	53,998	8,322	101,362	120,377
District of Columbia	23,952	16,072	714	99,262	0
Florida	792,534	956,068	791,911	2,939,425	1,137,447
Georgia	32,786	742,610	36,059	2,253,691	192,310
Hawaii	5,715	58,986	5,109	153,278	52,248
Idaho	33,451	70,269	29,823	264,679	86,383
Illinois	690,280	757,795	28,141	1,754,954	507,117
Indiana	174,647	602,747	3,368	1,054,922	37,923
Iowa	64,230	270,987	8,086	667,634	100,024
Kansas	8,385	832,983	2,096	151,310	49,246
Kentucky	20,713	265,507	2,313	802,881	511,796
Louisiana	140,244	267,811	11,005	739,979	537,606
Maine	13,420	56,521	13,616	174,274	13,037
Maryland	8,099	20,196	1,712	155,938	1,270,475
Massachusetts	86,736	413,494	26,754	1,233,738	57,932
Michigan	203,670	569,384	4,538	1,600,986	302,182
Minnesota	81,993	518,229	1,686	750,761	40,263

State/Territory	Lead Content	Unknown Material	Standalone Galvanized	No Lead Content	Not Reported
Mississippi	4,035	358,522	5,055	434,959	418,706
Missouri	130,044	219,620	10,836	1,124,278	481,476
Montana	5,274	118,333	9,479	86,462	51,467
Nebraska	38,796	126,560	1,831	394,418	35,302
Nevada	5,331	173,212	15,118	446,382	152,271
New Hampshire	11,643	43,192	1,605	202,159	15,544
New Jersey	242,247	574,955	126,914	1,315,082	169,725
New Mexico	8,460	159,641	3,127	332,997	125,171
New York	201,075	936,794	8,041	1,240,706	1,175,258
North Carolina	272,078	640,448	59,669	1,986,416	191,370
North Dakota	14,624	18,709	515	114,075	85,692
Ohio	369,077	657,490	12,895	1,409,102	1,167,069
Oklahoma	12,250	735,471	2,621	573,712	53,850
Oregon	1,316	165,812	6,003	428,382	567,257
Pennsylvania	257,315	1,123,477	21,792	1,123,770	1,228,363
Puerto Rico	30,689	309,050	26,821	801,757	273, 322
Rhode Island	17,204	166,988	63	51,809	68,075
South Carolina	50,350	786,265	11,670	779,545	180,279
South Dakota	3,554	21,710	687	243,057	19,157
Tennessee	79,769	1,976,379	20,719	478,840	213,813
Texas	378,873	1,284,408	10,482	7,206,494	4,103,903
Utah	9,017	243,215	9,454	540,448	83,793
Vermont	3,317	13,773	2,852	98,420	47,577
Virginia	64,360	408,853	26,385	657,562	1,027,314
Washington	11,893	1,113,290	97,278	1,261,166	54,647
West Virginia	6,906	408,507	3,221	215,470	27,682
Wisconsin	256,363	157,160	11,938	873,704	219,939
Wyoming	6,405	35,280	2,813	99,065	33,544
Subtotal	5,149,407	20,784,452	1,732,567	52,765,494	18,486,209
American Samoa	11	180	11	9,665	221
Guam	0	0	0	0	44,736
Northern Mariana Is.	8	151	8	1,623	11,201
Virgin Islands	35,002	54	1	264	66
Subtotal	35,021	385	20	11,552	56,224
Total	5,184,428	20,784,837	1,732,587	52,777,046	18,542,433

Exhibit 2.5 Estimated Known Service Line Materials Applied to State's Undiscovered



Section 2.3 Lead Service Line Replacement Allotment Formula

In 2021, the Bipartisan Infrastructure Law included a specific DWSRF appropriation of $15 billion for Lead Service Line Replacement (LSLR) and associated activities. In addition to replacement projects, this funding can and should be used for LSL identification, including development of LSL inventories as required by the LCRR. EPA allocated the first year of the Bipartisan Infrastructure Law LSLR funding using a formula based on all categories of infrastructure need.

EPA is using the new results from LSL information collected under the 7th DWINSA to allocate the remaining years of Bipartisan Infrastructure Law LSLR funding. EPA developed a LSL percentage for each state by dividing the states' projected LSLs (as derived using the methodology described in Appendix A) by the total national number of projected LSLs. EPA used the state percentages to develop the LSL-specific allocation formula for distributing the DWSRF Bipartisan Infrastructure Law LSLR funding. As required under Section 1452(a)(1)(D) of SDWA, each state is provided a minimum allotment of 1% of the

total amount available to states and the U.S. territories share 1.5% of the national total based on each territory's share of the territories total.

The new LSL formula will allow states to receive financial assistance commensurate with their need as soon as possible, furthering public health protection nationwide. Any remaining imbalance in allotments is expected to be addressed through the normal DWSRF reallotment process established under SDWA. Funds not distributed to eligible LSLR DWSRF projects by the end of the second fiscal year after apportionment are reallotted; this process is outlined in Section 1452(a)(1)(E) of SDWA and the deadline cannot be shortened or extended by EPA. The new LSL formula will reduce the need for reallotments as well as the administrative burden on states and EPA that is created when allocated funding outweighs the need of water systems in that state or vice versa.

EPA recognizes that states and communities continue to make progress on identifying LSLs. To account for this rapidly developing data, states will be provided a one-time opportunity to adjust their reported service line data in fall 2023. The anticipated updated information would be first used in distribution of DWSRF BIL LSLR funding to states in 2024.

Section 2.4 Lead Service Line Results

Based on the findings from the 7th DWINSA, the total projected number of LSLs in the United States is 9.2 million for the states, U.S. territories, Puerto Rico, and the District of Columbia (see Exhibit 2.6). The estimated cost to replace these LSLs ranges from approximately $50 billion to $80 billion (2021 dollars). This is derived from service line replacement cost information collected as part of the 7th DWINSA for both full and partial lead service line replacement. The low estimate (25th percentile or 25% of LSLR cost data is below this value) is $5,328/LSL and the high estimate (75th percentile or 25% of LSLR cost data is above this value) is $9,015/LSL. There are also an estimated 2.8 million standalone galvanized service lines that have never been downstream of lead. Currently, some states require that galvanized pipe be identified, and some states require that it be removed.

Exhibit 2.6: National Projected Service Lines by Material

Service Line Material	Projected Count *
Lead Content	9,223,745
Stand-Alone Galvanized	2,800,839
No-Lead Content	87,929,975
National Total Service Lines	99,949,560

**Projected Count includes known lines and unknown and unreported lines projected to be in one of these three categories.*

The 7th DWINSA provides the best available national and state-level projections of service line materials and counts. Exhibit 2.7 shows the distribution of LSLs across the nation and Exhibit 2.8 shows projected LSLs by state and territories. Exhibit 2.9 shows the number of service lines by type of material and system size.

Exhibit 2.7: Projected Number of Lead Services Lines by State and Territory

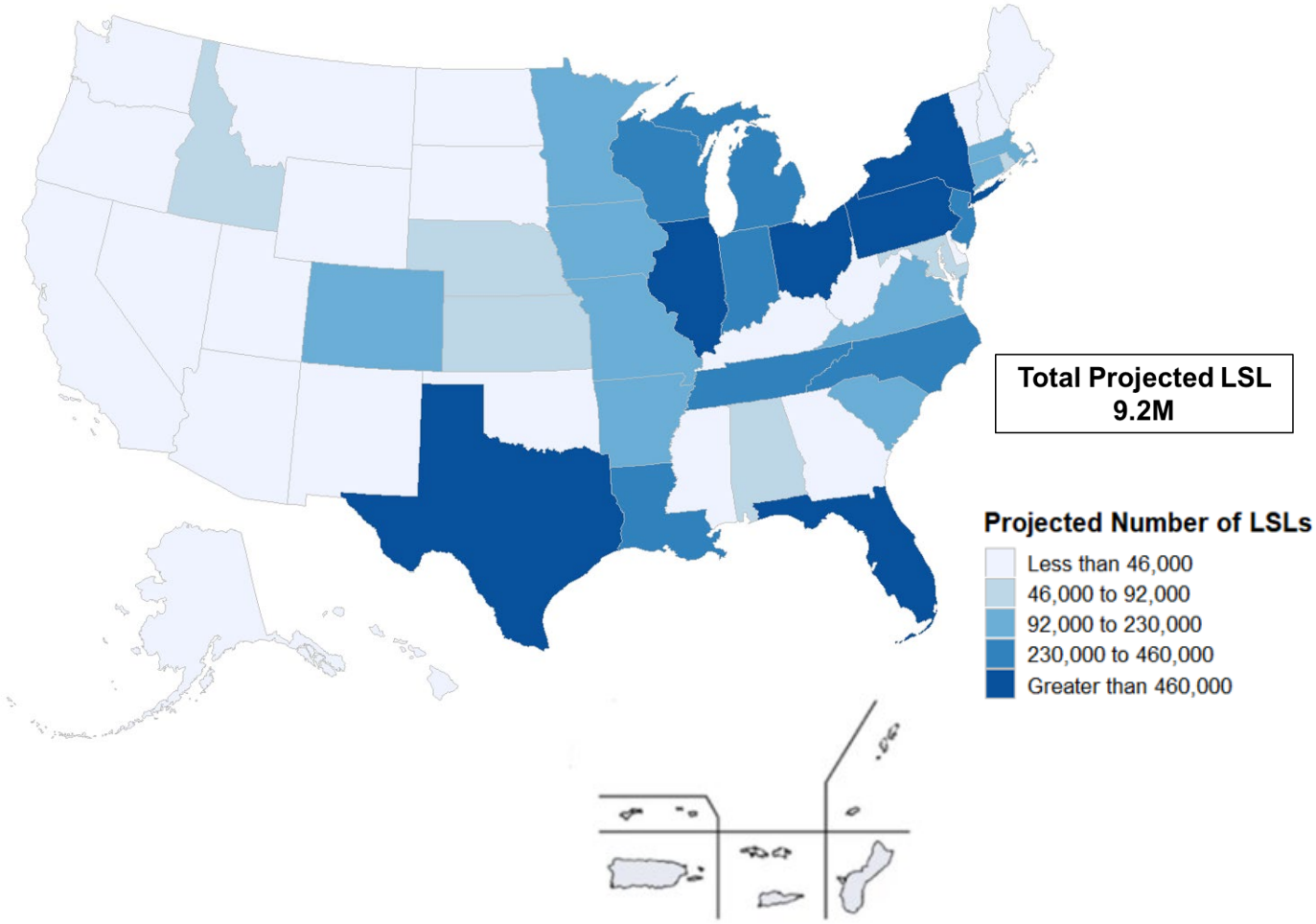


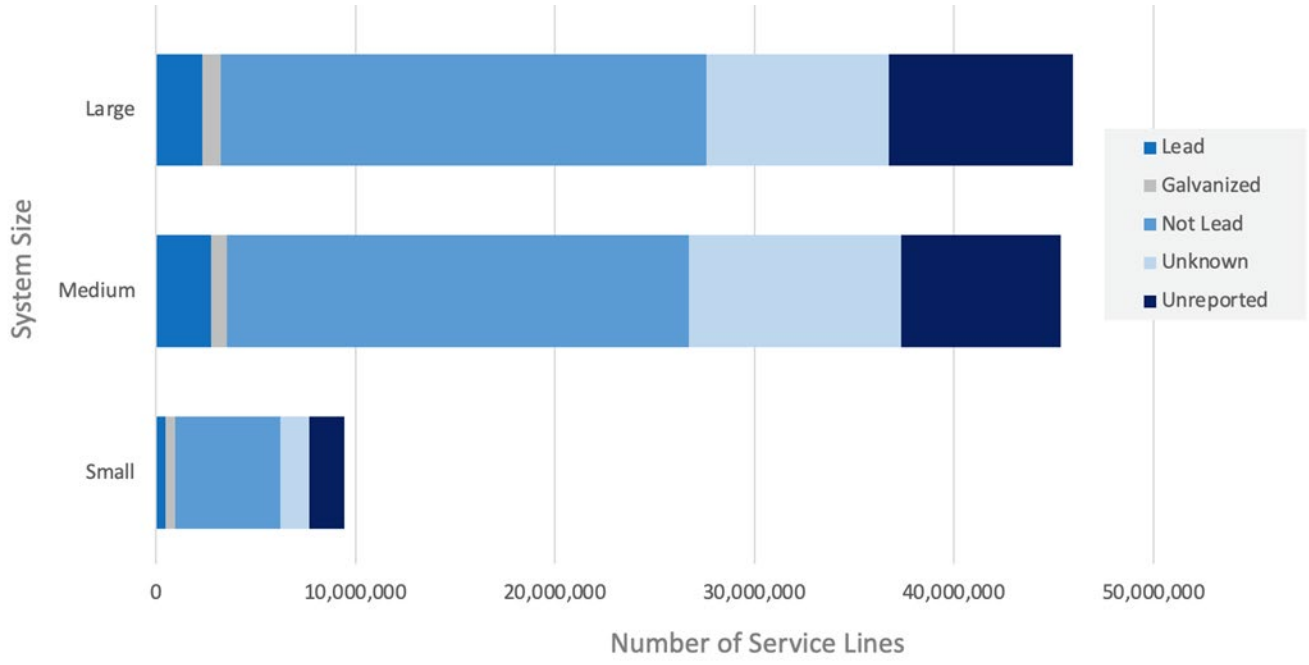
Exhibit 2.8: Total Projected Lead Services Lines by State

State	Projected LSL	
	Number	% of Total
Alabama	91,544	1.00%
Alaska	1,454	0.02%
Arizona	11,429	0.12%
Arkansas	171,771	1.87%
California	13,476	0.15%
Colorado	111,907	1.22%
Connecticut	146,574	1.60%
Delaware	42,479	0.46%
District of Columbia	27,058	0.29%
Florida	1,159,300	12.62%
Georgia	45,985	0.50%
Hawaii	9,589	0.10%
Idaho	49,434	0.54%
Illinois	1,043,294	11.35%
Indiana	265,400	2.89%
Iowa	96,436	1.05%
Kansas	54,107	0.59%
Kentucky	40,207	0.44%
Louisiana	266,984	2.91%
Maine	18,057	0.20%
Maryland	71,166	0.77%
Massachusetts	117,090	1.27%
Michigan	301,790	3.28%
Minnesota	136,873	1.49%
Mississippi	11,098	0.12%
Missouri	202,112	2.20%
Montana	14,125	0.15%
Nebraska	53,230	0.58%
Nevada	9,048	0.10%
New Hampshire	14,819	0.16%
New Jersey	349,357	3.80%
New Mexico	15,453	0.17%
New York	494,007	5.38%
North Carolina	369,715	4.02%
North Dakota	26,443	0.29%
Ohio	745,061	8.11%
Oklahoma	28,679	0.31%
Oregon	3,530	0.04%

State	Projected LSL	
	Number	% of Total
Pennsylvania	688,697	7.50%
Puerto Rico	51,490	0.56%
Rhode Island	75,749	0.82%
South Carolina	108,177	1.18%
South Dakota	4,141	0.05%
Tennessee	381,342	4.15%
Texas	647,640	7.05%
Utah	14,293	0.16%
Vermont	5,263	0.06%
Virginia	187,883	2.04%
Washington	22,030	0.24%
West Virginia	20,259	0.22%
Wisconsin	341,023	3.71%
Wyoming	10,477	0.11%
State Subtotal	**9,188545**	**100%**
Territories	35,202	0.38%
Total	**9,223,745**	

Note: Numbers may not total due to rounding.

Exhibit 2.9: Number of State Service Lines by Material Type and System Size



Section 3 Workforce Survey Response

Section 3.1 Background

As in many technical sectors, the drinking water industry is predicting large-scale retirements and consequently a potential workforce shortage. EPA, states, and drinking water industry associations and organizations are working to promote the water sector as a good source of employment and career opportunities. These efforts are intended to help ensure that there are enough trained and qualified water professionals to meet current and future needs.

For the first time, the 7th DWINSA collected responses to operator workforce questions, which provides a unique opportunity to estimate projected water sector workforce shortfalls over the next five to ten years and quantify the reasons for anticipated shortfalls. This data includes responses from all surveyed systems in the states, U.S. territories, Puerto Rico, the District of Columbia, and American Indian and Alaska Native Village water systems. Of the 3,924 systems surveyed, 3,818 responded to the operator workforce questions, for an overall response rate of 97.3%. Of the systems that received the state survey, 97.16% responded, and 98.98% of American Indian and Alaskan Native Village systems responded to the operator workforce questions.

Section 3.2 Operator Workforce Responses

The following exhibits show the results of the responses to the operator workforce questions. These graphics show that workforce issues are universal across water systems of all sizes. A significant percentage of responding systems of each size reported that hiring difficulties will increase over the next five to ten years and identified lack of interest and lack of candidates as the top reasons. Small water systems cited the inability to hire full-time employees and offer benefits as more significant reasons than larger water systems.

Exhibit 3.1: Current Workforce Hiring for Responding Water Systems

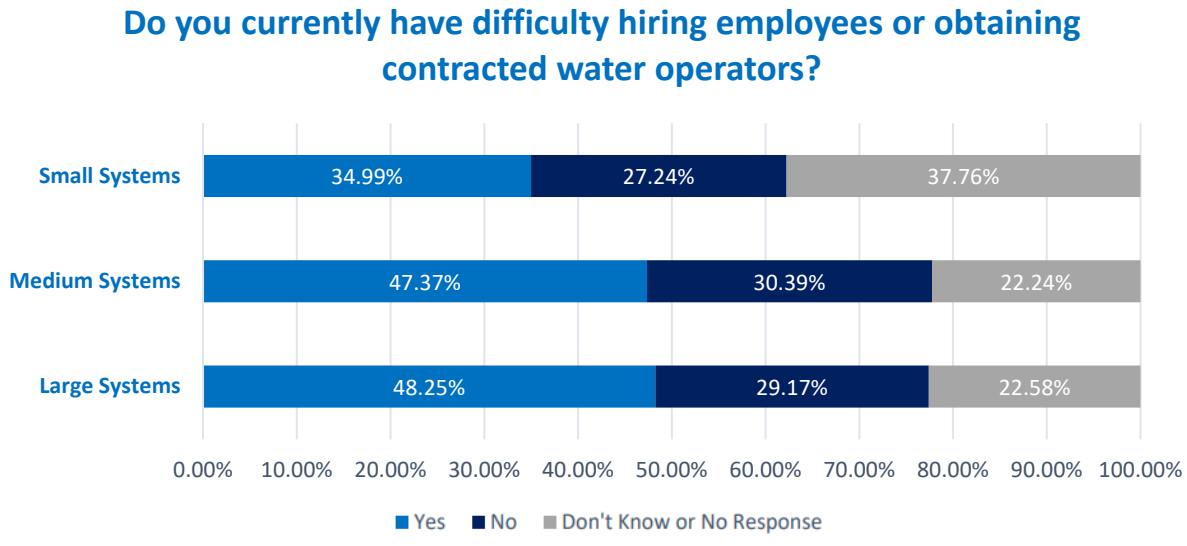


Exhibit 3.2: Hiring Next 5 Years for Responding Water Systems

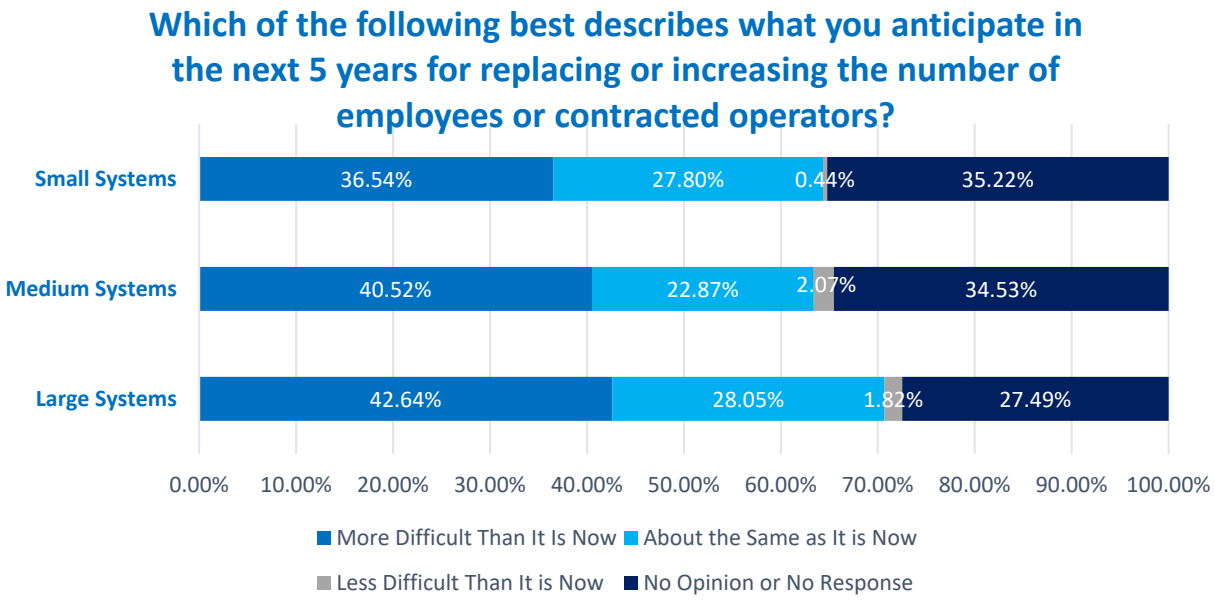
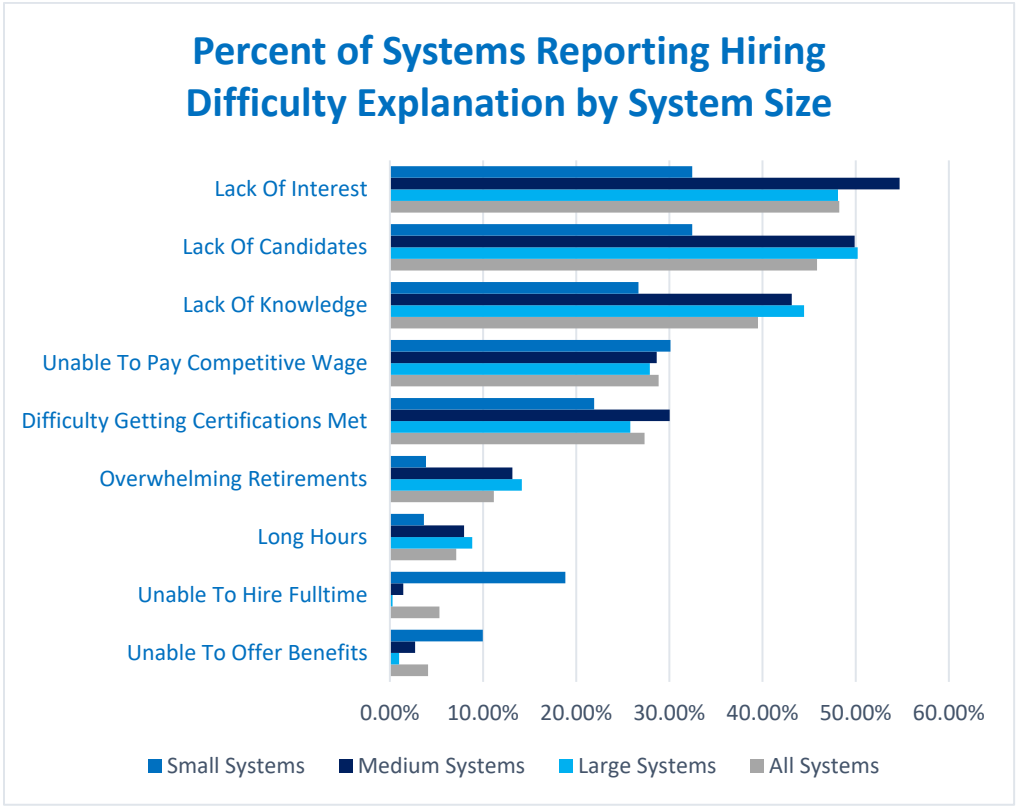


Exhibit 3.3: Hiring Challenges by System Size for Responding Water Systems



Section 4 Iron and Steel Construction Materials

Section 4.1 Background

Questions on pipe and storage tank construction materials were included in the 7th DWINSA to provide information on materials used for specific types of infrastructure that are often, but not always, comprised of primarily iron or steel and thus subject to the American Iron and Steel (AIS) requirements under SDWA section 1452(a)(4). The responses to these questions and the data from the 7th DWINSA will aid EPA in management and oversight of the AIS requirements. The questions were provided to all small CWS, medium CWS in full participating states and large CWS in states and the U.S. territories. American Indian and Alaska Native Village were not asked about the material of their pipes and tanks as they are not subject to AIS requirements. Medium CWS in partial participating states were not asked these pipe and tank materials questions because they were not asked to report their 20-year infrastructure needs.

The types of infrastructure for which materials information was requested include raw water transmission, finished water transmission, distribution mains, elevated finished water storage, and ground-level finished water storage. The construction materials questions were formatted as inventory tables and focused on identifying the material used for the following project types:

Transmission and Distribution Mains

Existing material (cast iron, ductile iron, plastic, unknown, etc.)

Materials of pipe typically used for replacement

Materials typically used for new pipe installation and existing policies for the type of pipe to be installed (e.g., mains <6" are HDPE and >6" are ductile iron)

Elevated and Ground Storage Tanks

Existing material (bolted or welded steel, glass fused to steel, fiberglass, concrete, composite)

Materials typically used for tank replacement

Materials typically used for new storage tanks

The exhibits in this section show the information provided by survey respondents for the iron and steel construction materials questions. For replacement of existing materials, the exhibits are based on the reported number of existing tanks or the reported pipe length of the surveyed systems. For new materials (tank or pipe), the figures are based on the number of systems offering each response. Overall, 72% of systems responded to pipe material questions and 87% of systems responded to tank material questions. These results have not been adjusted for the statistical weights of each system in the survey.

Section 4.2 Storage Tank Materials Responses

These exhibits show that storage tank material for future tank construction is generally the same composition as the existing tank materials. Understandably, there are significant differences between the types of materials for elevated tanks versus ground level tanks. While the most common material for both elevated tanks and ground level tanks in responding systems is steel, ground level tanks are

concrete one-third of the time. In addition, the material is consistent whether for replacement of a tank or construction of a new tank.

Note that the "other" category includes responses such as but not limited to, "no future elevated storage tanks planned, elevated storage tank not used, unlikely to construct elevated storage tank," etc.

Exhibit 4.1: Likely Tank Replacement Material (Elevated) for Responding Water Systems

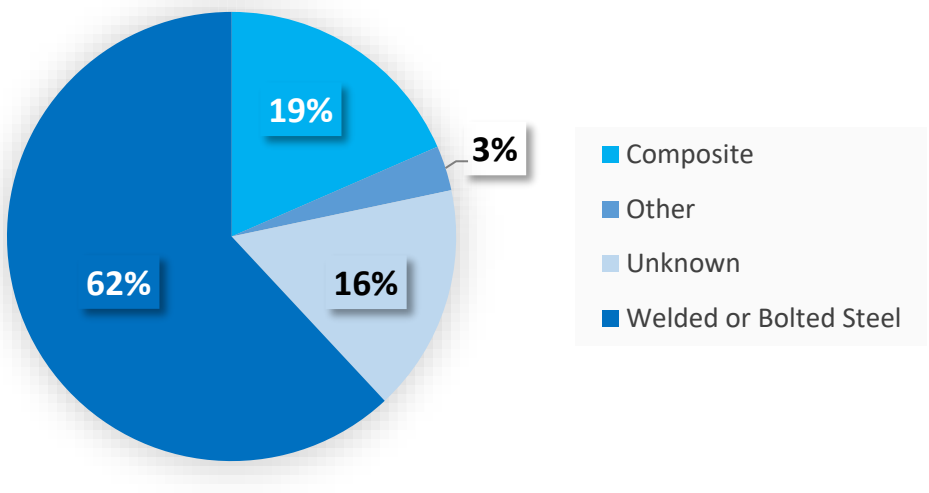


Exhibit 4.2: Likely Tank Replacement Material (Ground) for Responding Water Systems

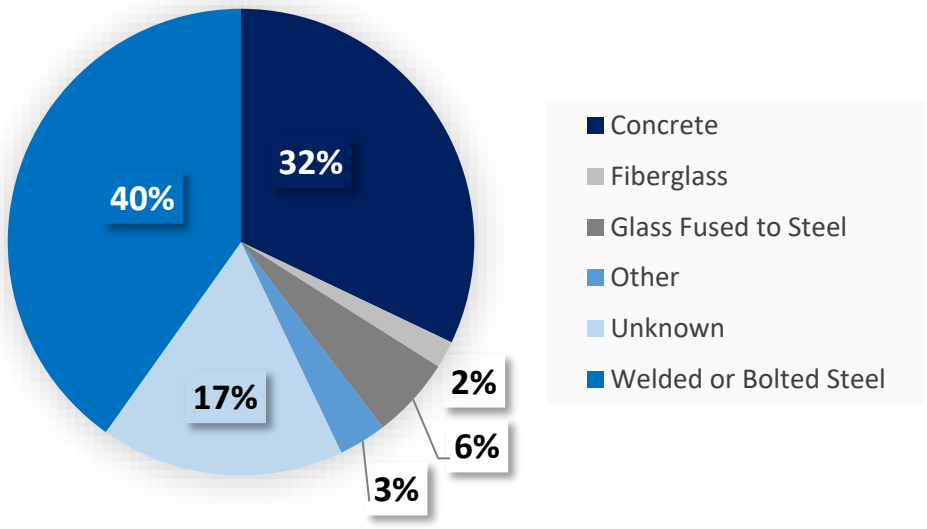


Exhibit 4.3: Likely Material for New Tanks (Elevated) for Responding Water Systems

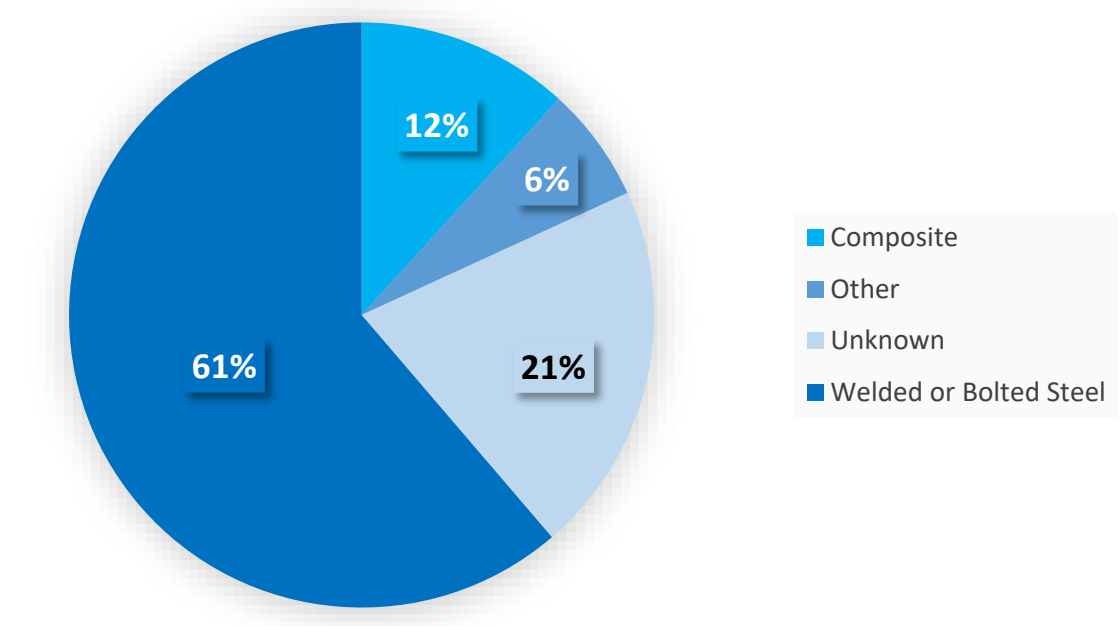
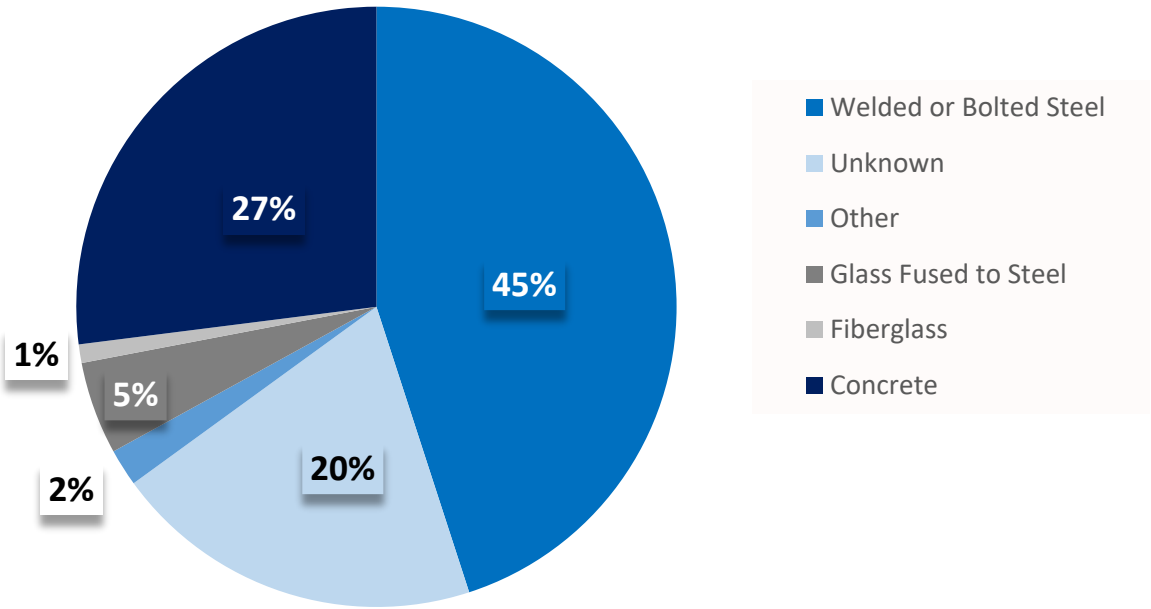


Exhibit 4.4: Likely Material for New Tanks (Ground) for Responding Water Systems



Section 4.3 Pipe Materials Responses

The following exhibits show that cast iron and asbestos cement pipe materials are reported as relatively infrequently used for pipe replacement or new construction. Asbestos cement is reported as replaced primarily with plastic pipe, while cast iron pipe is reported as replaced with ductile iron or plastic pipe. Based on the reported material of existing pipe, approximately one-third of existing pipe is plastic in the surveyed systems. Additionally, based on reported material for replacement of existing pipe, systems in the survey will replace 54% of existing pipe length with plastic pipe and replace 34% of existing pipe with ductile iron pipe. Similarly, 47% of systems stated that plastic is the most likely material for new pipe projects, while 34% stated that ductile iron is the most likely material for new pipe projects. These data report surveyed-system responses and have not been extrapolated to represent national data. Respondents did not indicate the pipe length of new pipe projects (as that length is presently unknown); data for new project questions is shown by percentage of respondents.

Note that the "other" category includes, but is not limited to, cement mortar lined pipe, reinforced concrete cylinder pipe (RCCP), and a combination of material types such as HDPE and cement mortar lined pipe.

Exhibit 4.5: Existing Pipe Material by Percent of Length of Pipe for Responding Water Systems

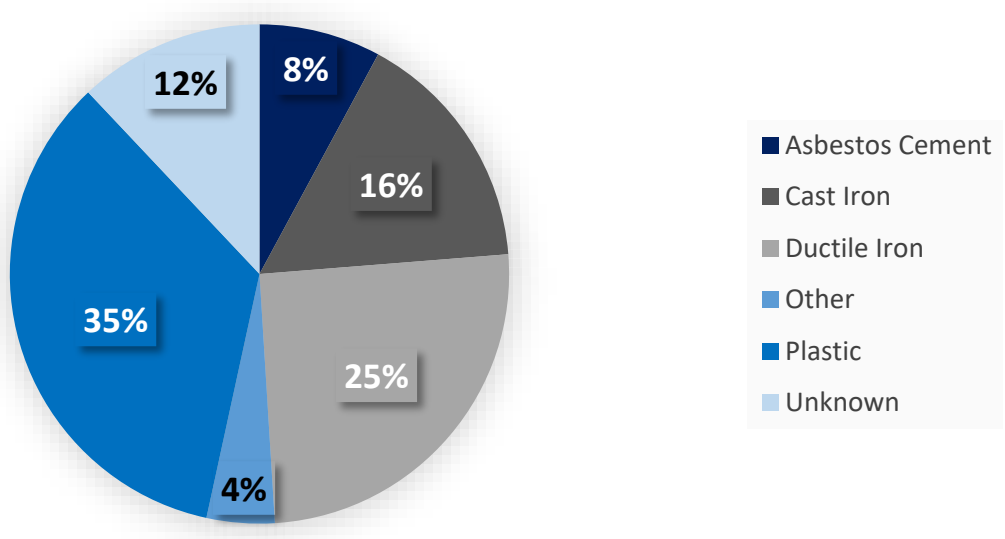


Exhibit 4.6: Replacement Material for Existing Pipe and Existing Material by Percent of Length of Pipe for Responding Water Systems

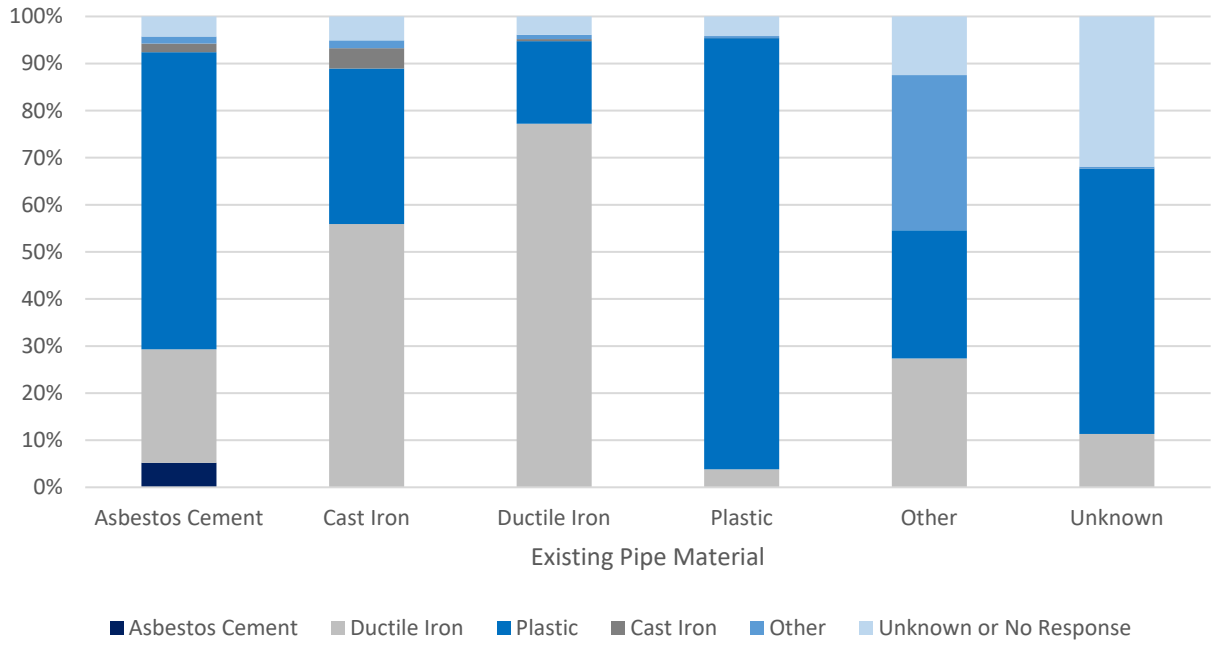


Exhibit 4.7: Likely Replacement Material for Existing Pipe by Percent of Length of Pipe for Responding Water Systems

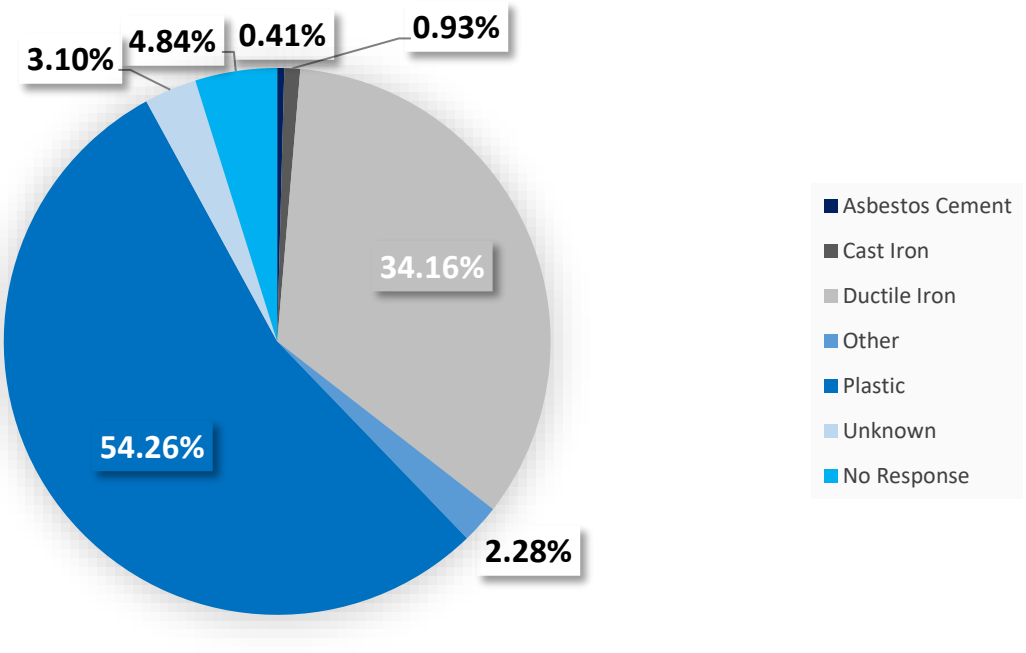
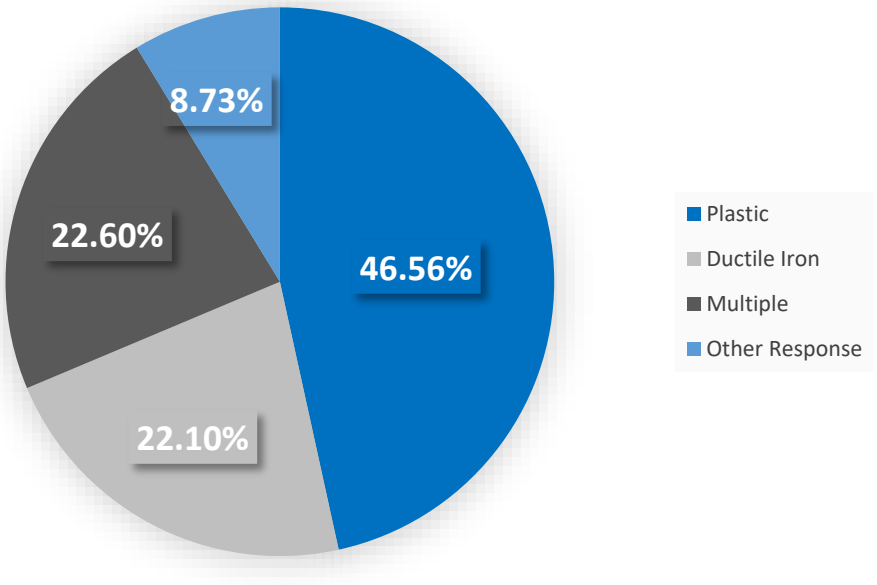


Exhibit 4.8: Likely Material Type for New Pipe Projects by Percent of Responding Water Systems



Section 5 Tribal Water System Traditional Infrastructure Needs

Section 5.1 Background

The 7th Drinking Water Infrastructure Needs Survey and Assessment estimates that the capital investment needs of water systems serving American Indian and Alaska Native Village water systems totals $4.1 billion over the next 20 years. This is the first time Tribal water systems have been surveyed since the 5th DWINSA in 2011.

The Tribal need is compounded by high average per-household costs compared to most non-Native water systems due to unique circumstances that many of these water systems face. Tribal public water systems are almost all small – serving 3,300 or fewer people. They are often located in remote rural areas, some in areas with permafrost, and the communities served may have households that lack piped access to the public water supply. These conditions present special challenges for providing safe drinking water.

Bureau of Reclamation Projects for American Indian Water Systems

The Bureau of Reclamation is responsible for several large projects that impact water systems serving American Indian and other communities. These include the Navajo Gallup Water Supply Project, Rocky Boy's/North Central Montana Rural Water System, and the Mni Wiconi Project (Oglala Sioux Rural Water Supply System Project), among others. These are costly projects that are usually completed in phases over many years. The water they provide may have several uses, including community water supplies, irrigation, and power. Under acts of the U.S. Congress, various public laws specify federal funding obligations including water rights settlements; annual funding is specified in the Bureau's budget requests.

The American Indian need documented in this DWINSA does not include the costs of the Bureau of Reclamation water projects that are underway or planned for the next 20 years. However, these projects and their costs are noteworthy because they address significant drinking water infrastructure needs. Water supplied by Bureau of Reclamation projects compensates for reduced ground water availability, replaces poor quality sources, and brings piped water to regions where it was not previously available. If operations and maintenance responsibilities are transferred to tribes, considerable infrastructure needs would have to be included in future DWINSA efforts. As these projects are completed, responsibility for future repair and replacement of the infrastructure may shift to American Indian utilities; if and when that should occur, future DWINSA efforts will capture these needs.

Section 5.2 Assessment Results

The 7th DWINSA Tribal survey is based on distinct and statistically designed surveys of American Indian water systems and Alaska Native Village water systems. These surveys were designed and implemented as distinct efforts due to differences associated with their water systems' geographic locations and infrastructure. Of the 925 American Indian water systems, 198 were included in the survey and all 198 responded; of the 154 Alaska Native Village water systems, 97 were included in the survey and 96 responded. These combine to over 99% response rate for the Tribal survey.

Data was submitted for the surveys by Tribal water systems in coordination with the Navajo Nation, EPA Regions, Village Safe Water, and Indian Health Service (IHS) Areas. Exhibit 5.1 presents the American Indian and Alaska Native Village water system need by EPA Region and by type of need. American Indian System needs are presented by the EPA Region in which they are located and for the Navajo Nation. Alaska Native Village water system needs are presented separately and are not included in EPA Region 10, although they are located in that region. Exhibit 5.2 presents the need estimated by the four DWINSAs completed to date in which data were collected for American Indian and Alaska Native Village water systems.

Exhibit 5.1: 20-Year Need for American Indian and Alaska Native Village Systems by EPA Region and Type of Need (in millions; January 2021 dollars)

	Transmission and Distribution	Source	Treatment	Storage	Other	Total Need
Region 1	$3.2	$3.6	$2.0	$0.5	$0.2	$9.5
Region 2	$26.5	$2.2	$2.8	$1.3	$0.7	$33.5
Region 3	$0.4	$0.2	$0.3	$0.1	$0.1	$1.0
Region 4	$43.7	$17.2	$16.1	$7.2	$4.4	$88.5
Region 5	$121.7	$37.3	$41.7	$20.5	$9.3	$230.4
Region 6	$129.4	$42.1	$46.8	$22.2	$10.7	$251.2
Region 7	$19.1	$6.4	$6.5	$3.4	$1.5	$36.9
Region 8	$456.3	$90.0	$93.8	$35.1	$21.0	$696.1
Region 9	$422.7	$167.2	$183.4	$79.1	$58.2	$910.6
Region 10[1]	$135.4	$50.7	$54.6	$26.7	$11.3	$278.7
Navajo Nation[2]	$431.0	$56.5	$118.7	$48.2	$13.9	$668.4
Alaska Native Village Systems	$422.8	$197.3	$140.1	$83.5	$23.7	$867.5
Total	$2,212.1	$670.9	$706.8	$327.8	$154.9	$4,072.5

Note: Numbers may not total due to rounding.

1. Needs for Alaska Native Village water systems are not included in the EPA Region 10 total.
2. Navajo water systems are in EPA Regions 6, 8, and 9, but for purposes of this report all Navajo water system needs are reported in Navajo Nation.

Exhibit 5.2: American Indian and Alaska Native Village 20-year Need Reported by Survey Year (in millions; January 2021 dollars)

EPA Region	1995 Results (1st DWINSA)	1999 Results (2nd DWINSA)	2011 Results (5th DWINSA)	2021 Results (7th DWINSA)
Region 1	$0.6	$7.6	$6.8	$9.5
Region 2	$3.8	$11.6	$32.8	$33.5
Region 3[1]	$0.0	$0.0	$0.0	$1.0
Region 4	$33.3	$34.5	$59.0	$88.5
Region 5	$88.0	$304.8	$239.7	$230.4
Region 6	$73.7	$294.4	$229.7	$251.2
Region 7	$12.2	$27.7	$43.5	$36.9
Region 8	$204.0	$258.4	$568.8	$696.1
Region 9	$684.6	$1,063.6	$731.4	$910.6
Region 10[2]	$97.2	$229.2	$249.3	$278.7
Navajo Nation[3]	$0.0	$0.0	$1,345.5	$668.4
American Indian Subtotal	**$1,197.5**	**$2,232.0**	**$3,506.6**	**$3,205.0**
Alaska Native Village Systems	$1,649.1	$2,068.0	$771.9	$867.5
American Indian and Alaska Native Village Total	**$2,846.6**	**$4,300.0**	**$4,278.5**	**$4,072.5**

Note: Numbers may not total due to rounding.

1. There were no American Indian water systems in EPA Region 3 for the 1995, 1999 and 2011 surveys.
2. Needs for Alaska Native Village water systems are not included in the EPA Region 10 total.
3. Navajo water systems are in EPA Regions 6, 8, and 9, but for purposes of this report all Navajo water system needs are reported in Navajo Nation. Navajo Nation water system needs were included in EPA Region 9 for the 1995 and 1999 Assessments.

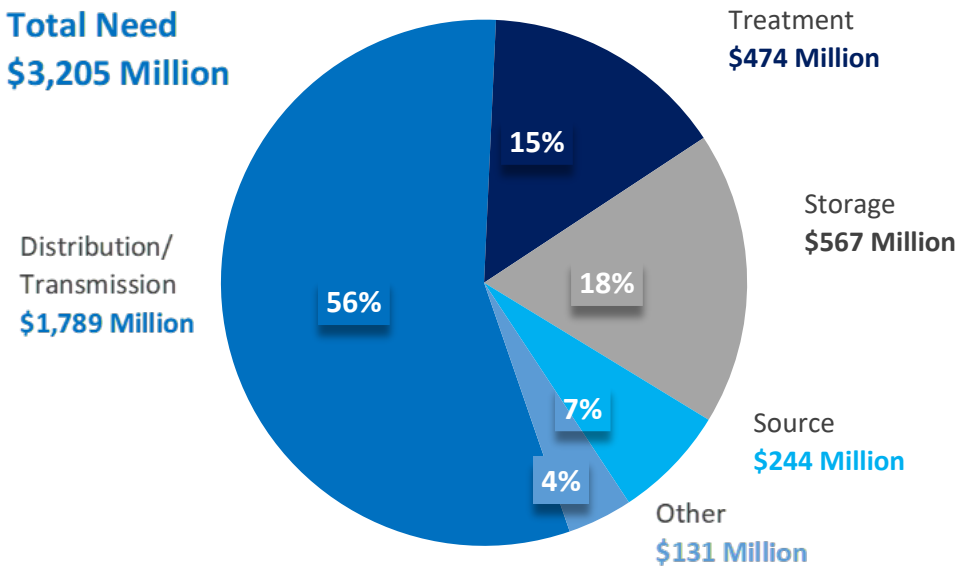
The decrease in the Alaska Native Village Need from the 2nd DWINSA to 5th DWINSA is due to a change in criteria for increased project-specific documentation of project feasibility. The decreased American Indian water system need from the 5th DWINSA to the 7th DWINSA is primarily attributable to exclusion of projects funded by the Bureau of Reclamation that were included in the 5th Assessment, and significant completion of the Navajo-Gallup Water Supply Project between the 5th and 7th Assessments.

American Indian Water System Needs

The total 20-year need for American Indian water systems is estimated to be $3.2 billion, a decrease of $301 million from the 5th DWINSA estimate of $3.5 billion.

Exhibit 5.3 shows the total American Indian water system need by project type. As would be expected for these systems, transmission and distribution is the largest category of need, representing 56 percent of the total need. This high percentage reflects the significant infrastructure and logistical challenges associated with American Indian water systems that must serve widely dispersed populations in remote locations or transmit piped water long distances from their source to the consumers.

Exhibit 5.3: Total 20-year Need by Project Type for American Indian Water Systems (in millions, January 2021 dollars)

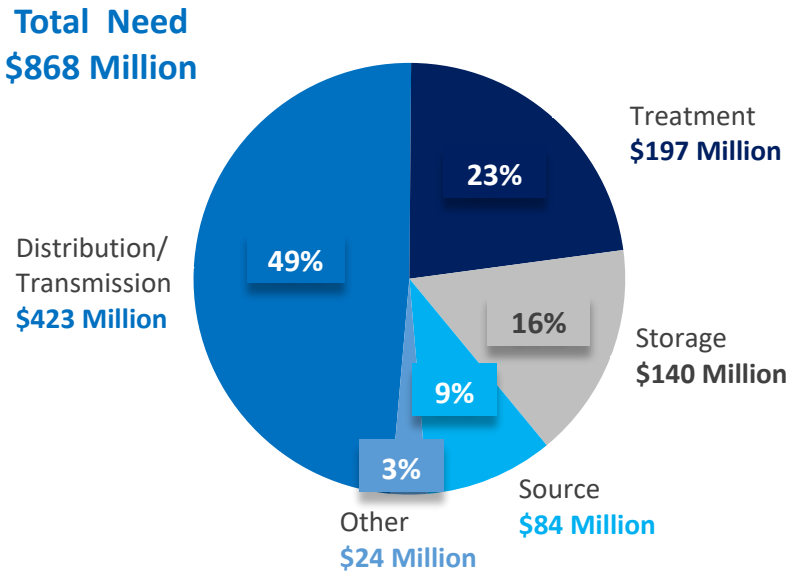


Alaska Native Village Water System Needs

The total 20-year need for Alaska Native Village water systems is estimated to be $868 million, a $95.6 million increase from the 5th DWINSA estimate of $772 million. This difference is attributable in part to investments needed to improve access to safe drinking water in Villages where piped water is not provided to homes.

Exhibit 5.4 shows the total Alaska Native Village water system need by project type. The need for Alaska Native Village water systems differs from more typical community water systems and American Indian water systems in that costs for piping in Alaska Native Village water systems make up less than half the need, with storage and treatment comprising a greater percentage of the total. These smaller communities with homes in close proximity typically have lower relative need for piping. However, the cost per foot of pipe is high due to shipping costs to these remote locations and the specialized piping necessary to prevent water from freezing under arctic conditions. Alaska Native Villages face higher treatment and storage costs than American Indian systems and typical systems in the lower 48-states because of their remote or arctic conditions that require they obtain and treat water sufficient for several months of use during a short period of time when warmer conditions enable those water system operations.

Exhibit 5.4: Total 20-year Need by Project Type for Alaska Native Village Water Systems (in millions, January 2021 dollars)



Appendix A Process for Developing Service Line Count Estimates

The 7th Drinking Water Infrastructure Needs Survey and Assessment (DWINSA) collected information about the investment needs of public water systems. The 7th DWINSA also collected supplemental information from systems about the number of service lines by material composition. A sample of drinking water systems were selected to participate in the 7th DWINSA that included all large systems (those serving more than 100,000 people), a random sample of medium systems (those serving 3,301 to 100,000 people) for each state, and a national random sample of small systems (those serving 3,300 or fewer people). EPA used the information provided by the responding systems to project the number of lead service lines in each state and territory.

Step 1. Categorize the service lines reported by surveyed systems by material composition.

EPA used the supplemental data about service lines to categorize the service lines by material. Systems provided the following information:

1. The number of service lines that contain any lead pipe.
2. The number of service lines that do not contain any lead pipe but contain lead connectors.
3. The number of service lines that contain galvanized pipe and were previously downstream of a lead pipe that was removed from the service line.
4. The number of service lines that contain galvanized pipe and were previously downstream of a lead connector that was removed from the service line.
5. The number of service lines that contain galvanized pipe and were previously downstream of an unknown source of lead that was removed from the service line.
6. The number of service lines that contain galvanized pipe and were never downstream of a lead pipe or lead connector in the service line.
7. The number of service lines that do not contain any lead pipe or galvanized pipe and that do not have lead connectors.
8. The number of service lines for which the material makeup of the service line and the connector are not known.

The DWINSA Sample Weights

The 7th DWINSA relies on a random sample of water systems to estimate the number of LSLs in each state and in the nation. Within each state, medium and large water systems are divided into several categories based on each system's water source and the size of the population served. The DWINSA includes all large systems and a sample of medium systems. A random sample of medium systems is selected from each category of systems in each state. In addition, a random sample of small systems is selected from each category of systems nationally. To estimate state totals for medium and large systems using the sample, each system is assigned a weight that is equal to the number of systems in the category divided by the number of systems sampled from that category. For example, if the survey included a sample of three systems from a category that consists of 12 systems, each of the three systems from that category would receive a weight of 4 (12 ÷ 3 = 4).

For purposes of the allotment of the BIL LSLR SRF fund, EPA considers service lines to be eligible if they contain any lead pipe or connectors or are galvanized pipe previously downstream of any lead sources. Therefore, service lines reported under items 1 through 5 above were categorized as lead service lines.

Some surveyed systems did not respond to the supplemental service line questions. For those systems, EPA used their reported number of connections as an estimate of their number of service lines. EPA categorized those service lines as "unreported." EPA used the following five material type categories:

1. Lead service lines
2. Standalone galvanized service lines
3. Lead-free and galvanized-free service lines
4. Unknown service lines
5. Unreported service lines

Step 2. Estimate the proportion of service lines in medium and large systems by material type in each state.

EPA used the sample data developed in Step 1 to estimate the proportion of service lines in medium and large systems in each state that are in each of the five material type categories. EPA weighted the sample data by each responding system's sampling weight, including the systems that did not respond to the supplemental service line questions. EPA weights the estimates to ensure the proportions are representative of all the medium and large systems in each state. (See the text box for an explanation of how EPA determines each system's sampling weight.) Table 1 shows the estimated proportions for a sample state. A similar set of proportions was estimated for each state.

Table 1. Proportion of Service Lines in Each Material Type Category in Medium and Large Systems in an Example State

Service Line Material	Proportion of Service Lines in Each Category
1. Lead Service Lines	0.025
2. Standalone Galvanized Service Lines	0.047
3. Lead- and Galvanized-Free Service Lines	0.184
4. Unknown Service Lines	0.560
5. Unreported Service Lines	0.184
Total	1.000

Step 3. Estimate the proportion of service lines in small systems by material type in the nation.

EPA used data from the national sample of small systems in Step 1 to estimate the proportion of service lines in those systems that are in each of the five material type categories. EPA contractors visited the small systems in person to help them respond to the survey. All the small systems responded to the supplemental questions, although many responded as "unknown." Table 2 shows the proportion of service lines in each material category for small systems nationally.

Table 2. Proportion of Service Lines in Each Material Type Category in Small Systems in the United States	
Service Line Material	**Proportion of Service Lines in Each Category**
1. Lead Service Lines	0.009
2. Standalone Galvanized Service Lines	0.009
3. Lead- and Galvanized-Free Service Lines	0.613
4. Unknown Service Lines	0.369
5. Unreported Service Lines	0.000
Total	1.000

Step 4. Use the proportions estimated in Steps 2 and 3 and data on the number of connections per state to estimate the number of service lines in each state by type of material.

To estimate the total number of service lines of each material type in each state, EPA multiplied the proportions estimated in Steps 2 and 3 by the total number of connections in each state. EPA took the number of connections from the federal version of the 2019 Safe Drinking Water Information System (SDWIS Fed), which provides estimates of the number of connections for every system in the country. For medium and large systems, EPA multiplies the proportions estimated in Step 2 by the number of connections in medium and large systems in each state. For small systems, EPA multiplies the proportions estimated in Step 3 by the number of connections among small systems in the state. For example, if a state has 186,000 service lines among medium and large systems and using the example state proportion of lead service lines from Table 1, the total number of lead service lines among medium and large systems would be 4,650:

$$186{,}000 \times 0.025 = 4{,}650$$

If the same state has 85,000 service lines among small systems and using the national proportion of lead service lines from Table 2, the total number of lead service lines among small systems would be 765:

$$85{,}000 \times 0.009 = 765$$

The total number of lead service lines in the state in small, medium, and large systems would be:

$$4{,}650 + 765 = 5{,}415$$

This calculation is repeated for each material type category. Table 3 shows the result for the example state.

Table 3. Estimated Number of Service Lines by Material Type in an Example State	
Service Line Material	**Estimated Number of Service Lines in Each Category**
1. Lead Service Lines	5,415
2. Standalone Galvanized Service Lines	9,507
3. Lead- and Galvanized-Free Service Lines	86,329
4. Unknown Service Lines	135,525
5. Unreported Service Lines	34,224
Total	271,000

Step 5. Estimate the number of service lines in each state whose material type is unknown that are projected to be lead, standalone galvanized, or lead-free and galvanized-free.

The unreported lines and the lines for which the material makeup is unknown likely include some number of lead service lines. To project the total number of lead service lines in each state, including unknown and unreported service lines that might be lead, EPA assumed that the proportion of unknown and unreported service lines that are lead is the same as the proportion of known service lines that are lead. For the example state the proportion of known service lines that are lead is 0.053:

$$5{,}415 \div (5{,}415 + 9{,}057 + 86{,}329) = 0.053$$

The estimated number of unknown and unreported service lines that are projected to be lead is 9,078:

$$0.053 \text{ X } (135{,}525 + 34{,}224) = 9{,}078$$

(Due to rounding, the totals do not match.) The total number of projected lead service lines is then equal to the estimated number of known lead service lines plus the estimated number of unknown and unreported lines that are projected to be lead, or 14,493:

$$5{,}415 + 9{,}078 = 14{,}493$$

Appendix B State-by-State Findings Charts

Appendix B presents State survey findings for each state and U.S. Territory.

The top two pie charts show the findings for total need by water system size and by project category, representing the DWSRF-eligible infrastructure projects that are necessary over the 20-year period of January 1, 2021, through December 31, 2040.

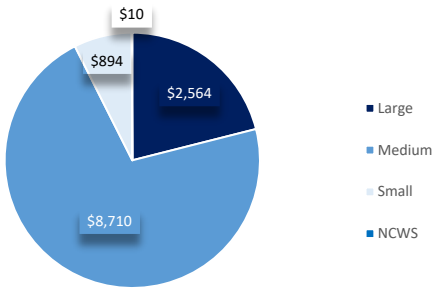
The middle bar chart and table present the estimated number of service lines by material and by water system size, and the pie chart in the lower left presents the total estimated number by material. EPA used survey response sample data to estimate the proportion of service lines in each state that are in each of the five material type categories (including unknown and not reported).

The pie chart in the lower right shows the projected service lines findings for lead, galvanized, and all other materials are the total number of service lines in each state that fit these three categories, including unknown and unreported service lines that might be lead. These findings are projected from the estimated findings based on the proportion of known service lines that are lead or galvanized to the number of lines of known material.

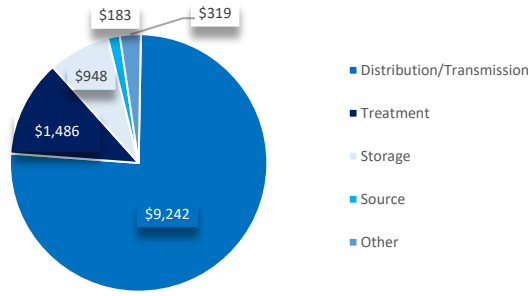
See Appendix A for a detailed step-by-step description of the methodology used to develop service line estimates.

Alabama

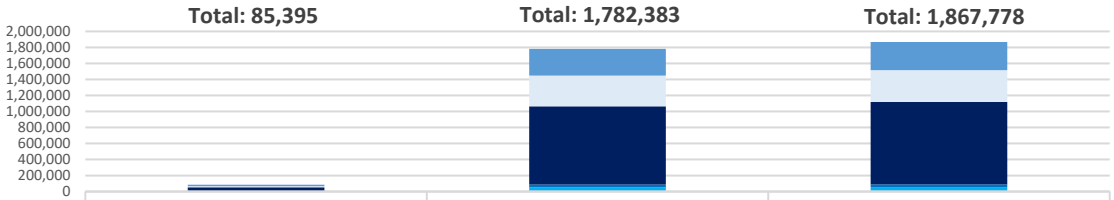
Alabama Total Need by System Size (in millions; January 2021 dollars)



Alabama Total Need by Project Category (in millions; January 2021 dollars)



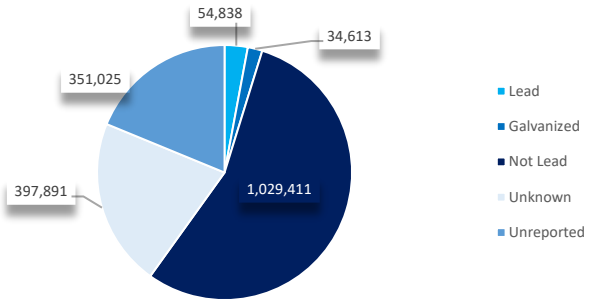
Alabama Estimated Service Lines by System Size



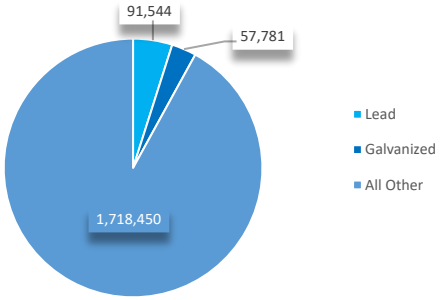
	Small Systems	Medium and Large Systems	All Systems
Unreported	17,374	333,651	351,025
Unknown	14,173	383,718	397,891
Not Lead	52,351	977,060	1,029,411
Galvanized	745	33,868	34,613
Lead	752	54,086	54,838

Lead Galvanized Not Lead Unknown Unreported

Alabama Service Lines - Estimated from Survey Responses

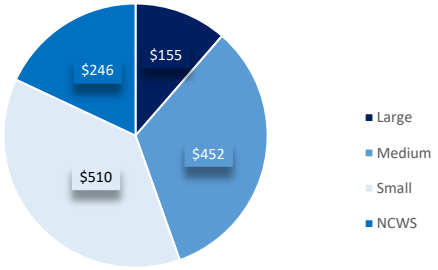


Alabama Projected Service Lines

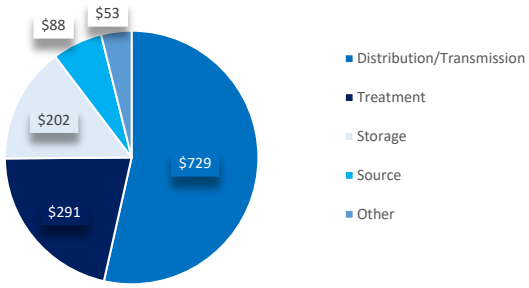


Alaska

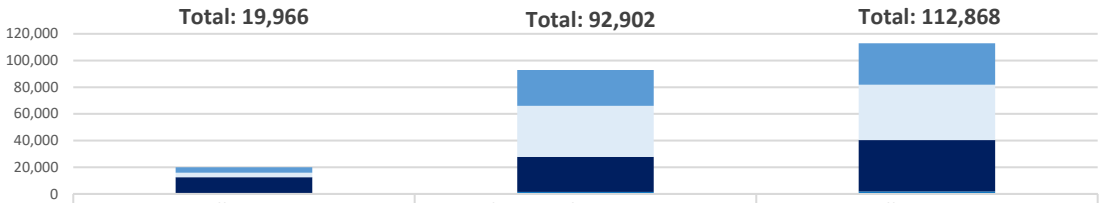
Alaska Total Need by System Size (in millions; January 2021 dollars)



Alaska Total Need by Project Category (in millions; January 2021 dollars)



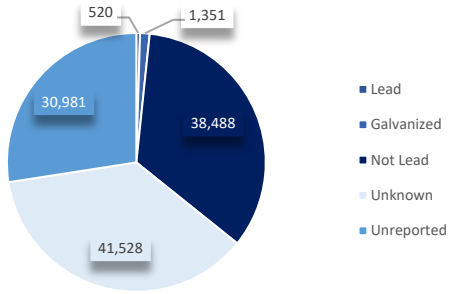
Alaska Estimated Service Lines by System Size



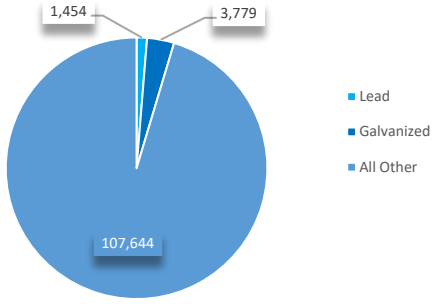
	Small Systems	Medium and Large Systems	All Systems
Unreported	4,060	26,921	30,981
Unknown	3,310	38,218	41,528
Not Lead	12,267	26,221	38,488
Galvanized	164	1,187	1,351
Lead	165	355	520

Lead Galvanized Not Lead Unknown Unreported

Alaska Service Lines - Estimated from Survey Responses

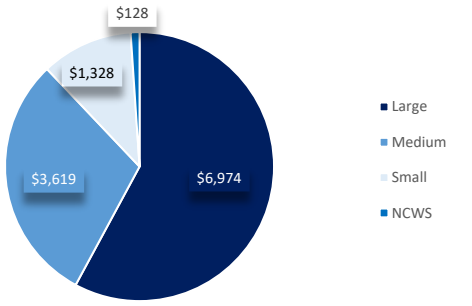


Alaska Projected Service Lines

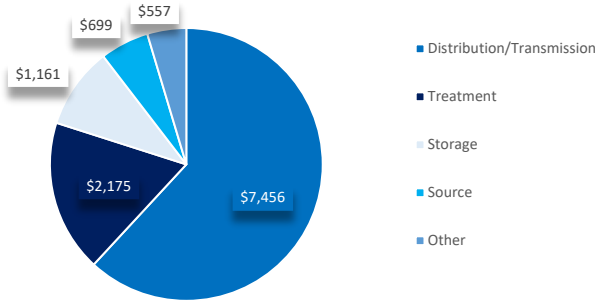


Arizona

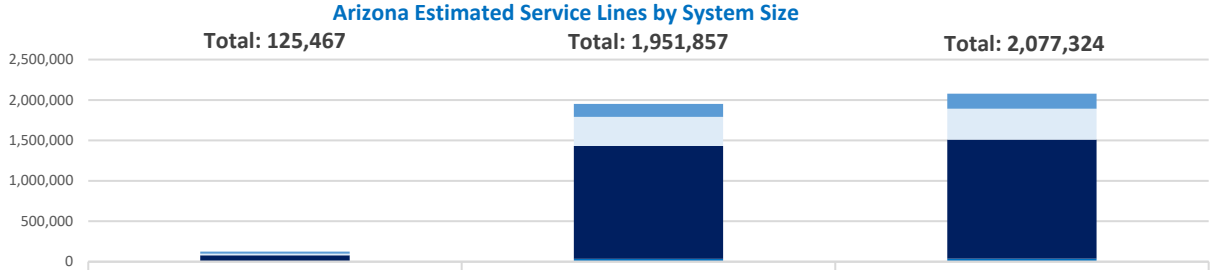
Arizona Total Need by System Size (in millions; January 2021 dollars)



Arizona Total Need by Project Category (in millions; January 2021 dollars)



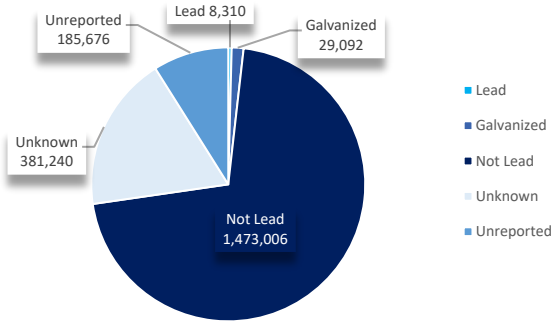
Arizona Estimated Service Lines by System Size



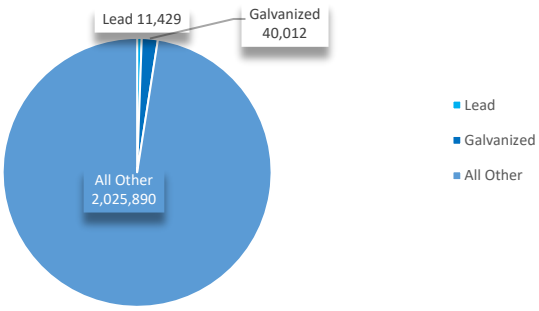
	Small Systems	Medium and Large Systems	All Systems
Unreported	25,539	160,137	185,676
Unknown	20,827	360,413	381,240
Not Lead	76,957	1,396,049	1,473,006
Galvanized	1,062	28,030	29,092
Lead	1,082	7,228	8,310

Lead Galvanized Not Lead Unknown Unreported

Arizona Service Lines - Estimated from Survey Responses

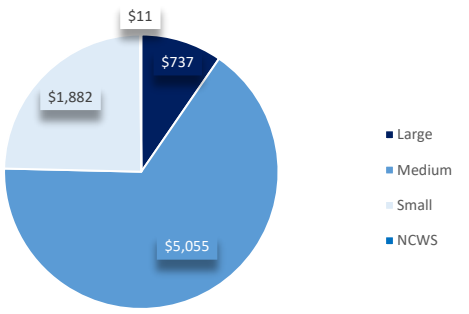


Arizona Projected Service Lines

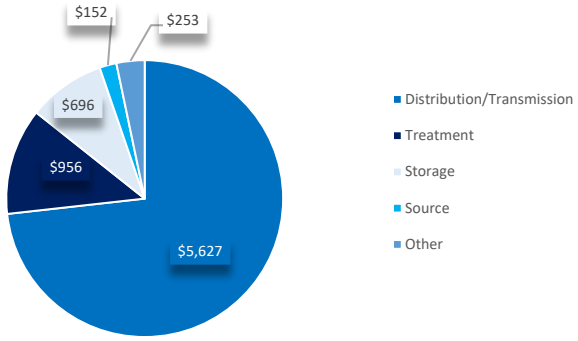


Arkansas

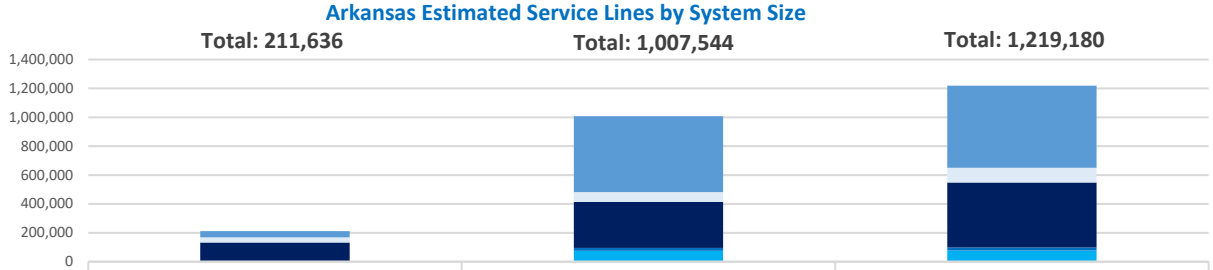
Arkansas Total Need by System Size (in millions; January 2021 dollars)



Arkansas Total Need by Project Category (in millions; January 2021 dollars)



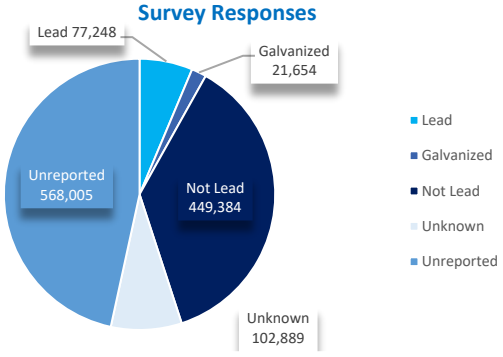
Arkansas Estimated Service Lines by System Size



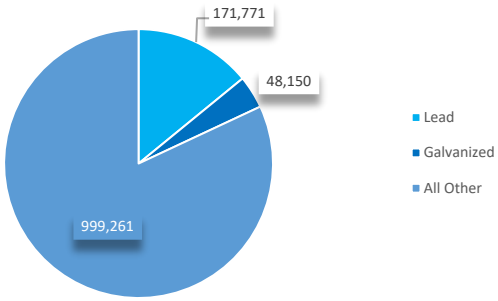
	Small Systems	Medium and Large Systems	All Systems
Unreported	43,081	524,924	568,005
Unknown	35,111	67,778	102,889
Not Lead	129,744	319,640	449,384
Galvanized	1,834	19,820	21,654
Lead	1,866	75,382	77,248

Lead Galvanized Not Lead Unknown Unreported

Arkansas Service Lines - Estimated from Survey Responses

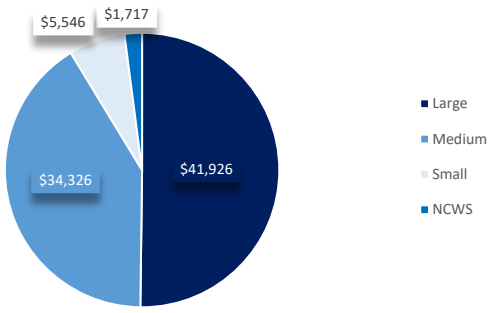


Arkansas Projected Service Lines

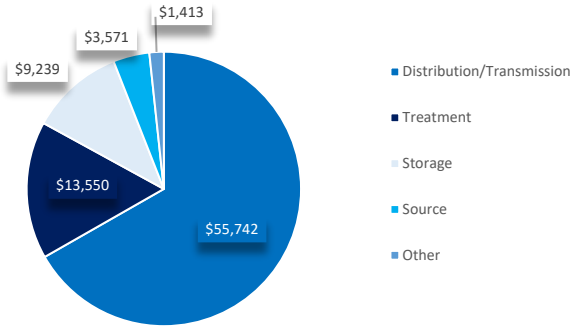


California

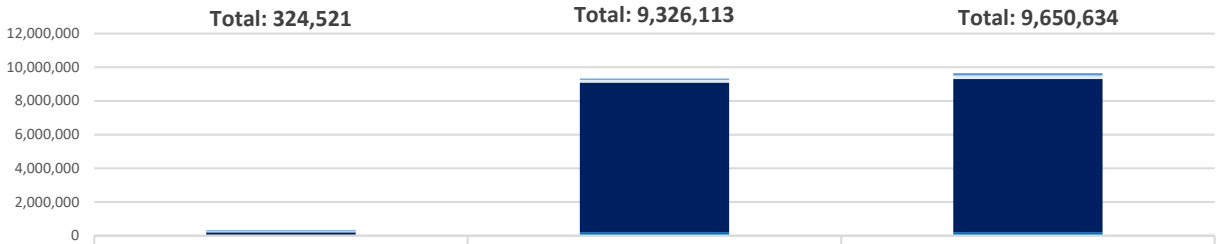
California Total Need by System Size (in millions; January 2021 dollars)



California Total Need by Project Category (in millions; January 2021 dollars)



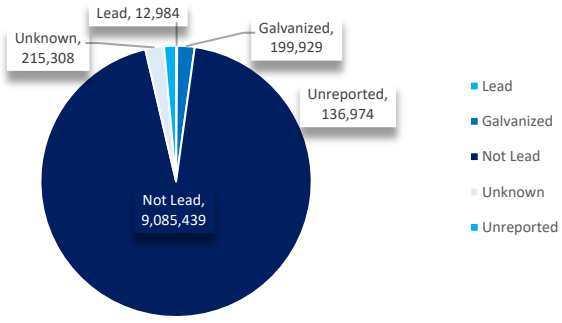
California Estimated Service Lines by System Size



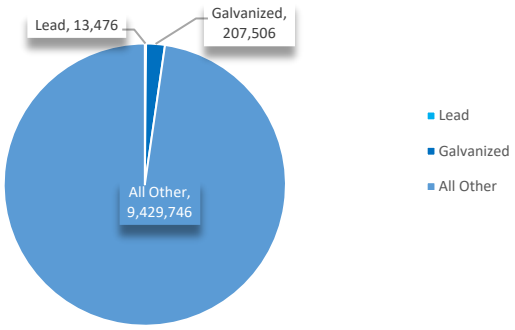
	Small Systems	Medium and Large Systems	All Systems
Unreported	66,109	70,865	136,974
Unknown	53,833	161,475	215,308
Not Lead	199,214	8,886,225	9,085,439
Galvanized	2,663	197,266	199,929
Lead	2,702	10,282	12,984

Lead Galvanized Not Lead Unknown Unreported

California Service Lines - Estimated from Survey Responses

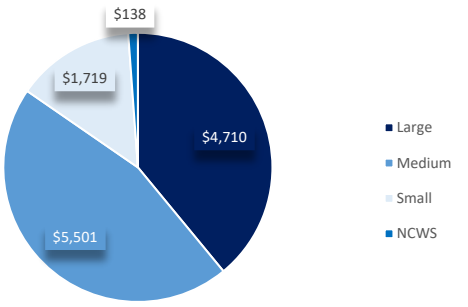


California Projected Service Lines

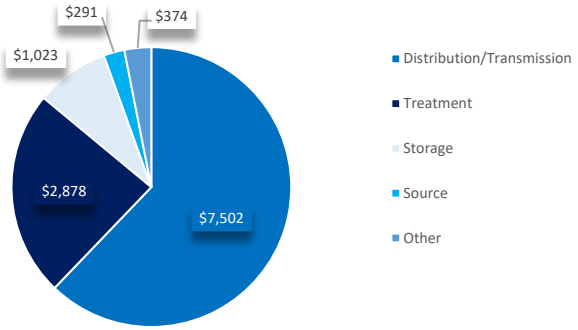


Colorado

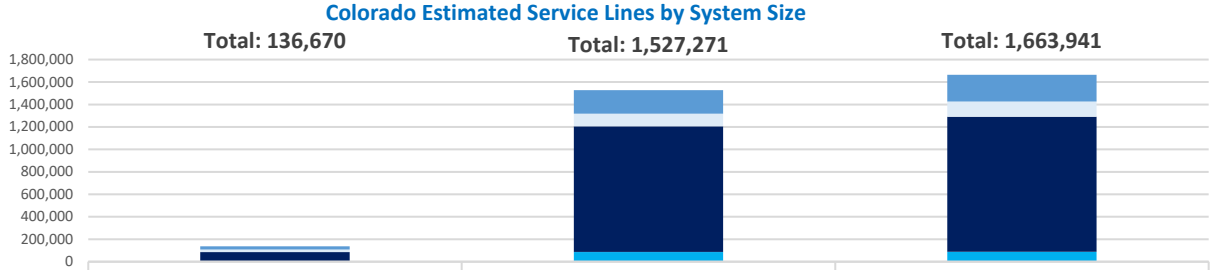
Colorado Total Need by System Size (in millions; January 2021 dollars)



Colorado Total Need by Project Category (in millions; January 2021 dollars)



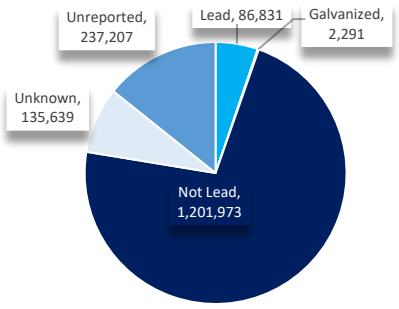
Colorado Estimated Service Lines by System Size



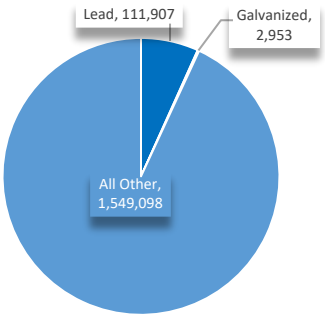
	Small Systems	Medium and Large Systems	All Systems
Unreported	27,810	209,397	237,207
Unknown	22,689	112,950	135,639
Not Lead	83,852	1,118,121	1,201,973
Galvanized	1,152	1,139	2,291
Lead	1,167	85,664	86,831

Lead Galvanized Not Lead Unknown Unreported

Colorado Service Lines - Estimated from Survey Responses

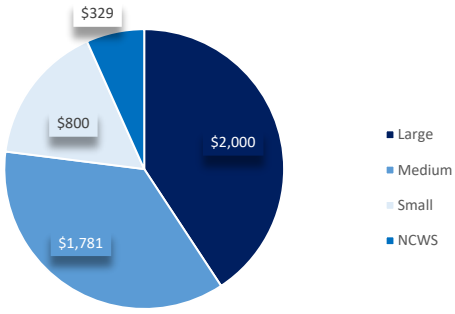


Colorado Projected Service Lines

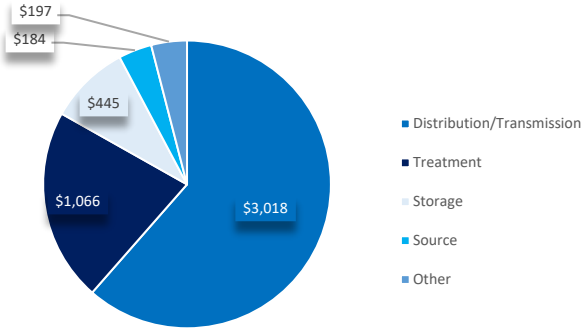


Connecticut

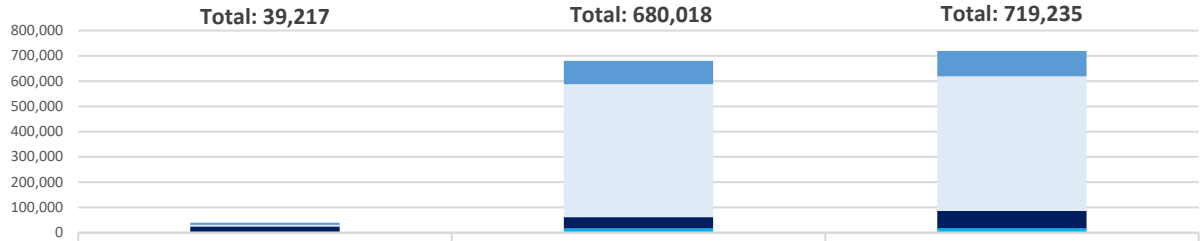
Connecticut Total Need by System Size (in millions; January 2021 dollars)



Connecticut Total Need by Project Category (in millions; January 2021 dollars)



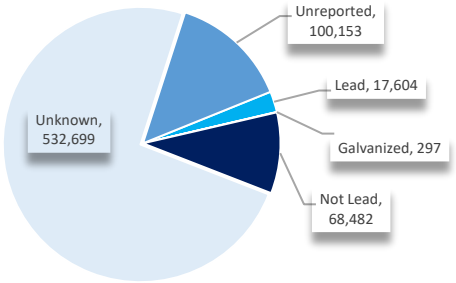
Connecticut Estimated Service Lines by System Size



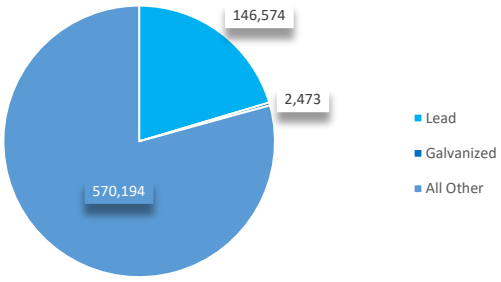
	Small Systems	Medium and Large Systems	All Systems
Unreported	7,996	92,157	100,153
Unknown	6,510	526,189	532,699
Not Lead	24,110	44,372	68,482
Galvanized	297	0	297
Lead	304	17,300	17,604

Lead Galvanized Not Lead Unknown Unreported

Connecticut Service Lines - Estimated from Survey Responses

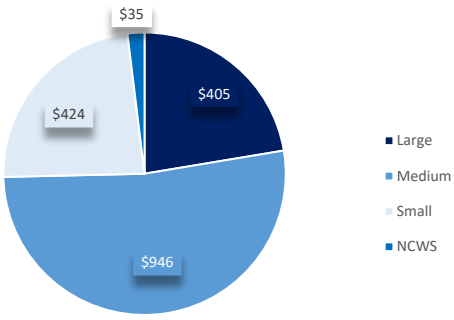


Connecticut Projected Service Lines

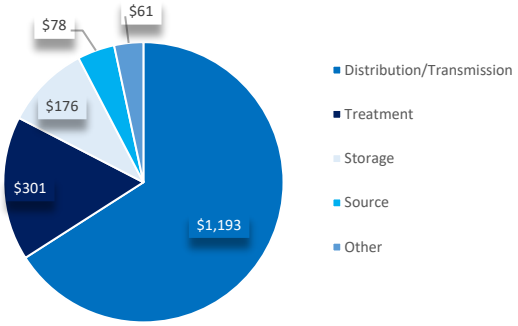


Delaware

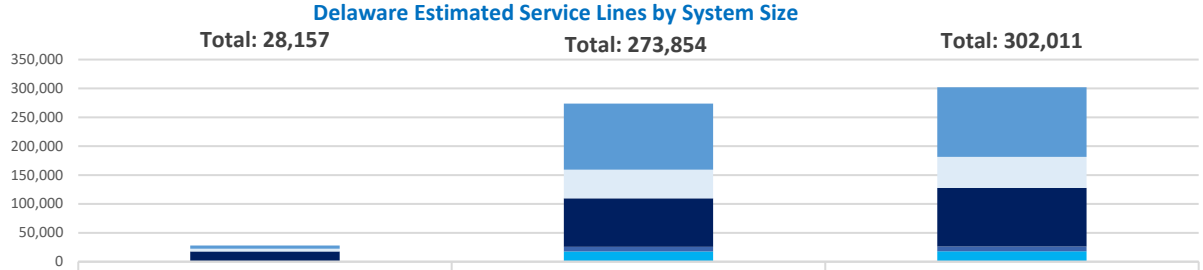
Delaware Total Need by System Size (in millions; January 2021 dollars)



Delaware Total Need by Project Category (in millions; January 2021 dollars)



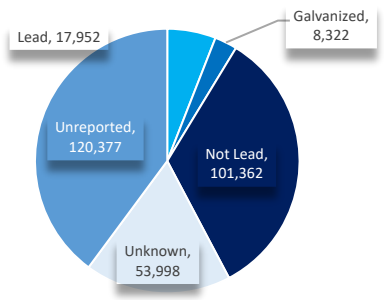
Delaware Estimated Service Lines by System Size



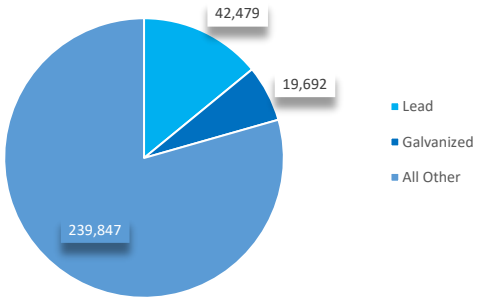
	Small Systems	Medium and Large Systems	All Systems
Unreported	5,734	114,643	120,377
Unknown	4,674	49,324	53,998
Not Lead	17,278	84,084	101,362
Galvanized	232	8,090	8,322
Lead	239	17,713	17,952

Lead Galvanized Not Lead Unknown Unreported

Delaware Service Lines - Estimated from Survey Responses

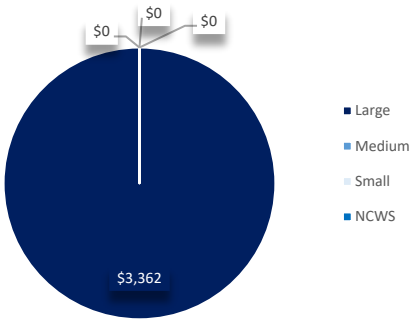


Delaware Projected Service Lines

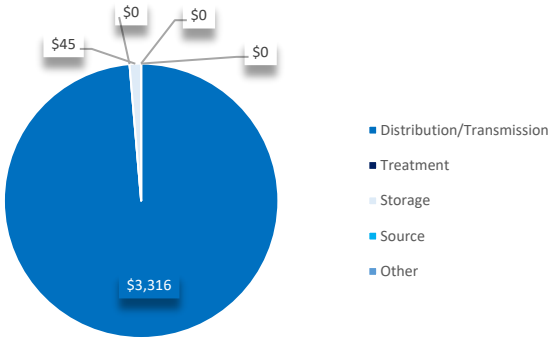


District of Columbia

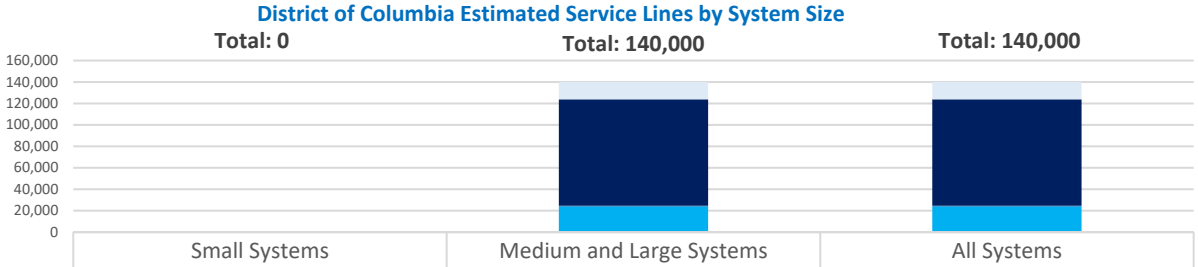
District of Columbia Total Need by System Size (in millions; January 2021 dollars)



District of Columbia Total Need by Project Category (in millions; January 2021 dollars)



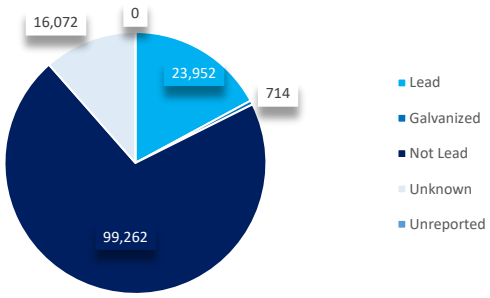
District of Columbia Estimated Service Lines by System Size



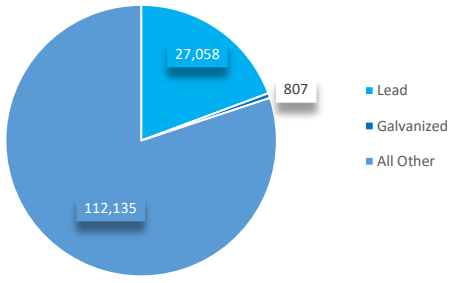
	Small Systems	Medium and Large Systems	All Systems
Unreported	0	0	0
Unknown	0	16,072	16,072
Not Lead	0	99,262	99,262
Galvanized	0	714	714
Lead	0	23,952	23,952

Lead Galvanized Not Lead Unknown Unreported

District of Columbia Service Lines - Estimated from Survey Responses

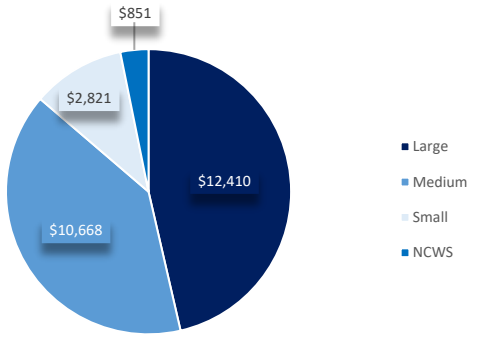


District of Columbia Projected Service Lines

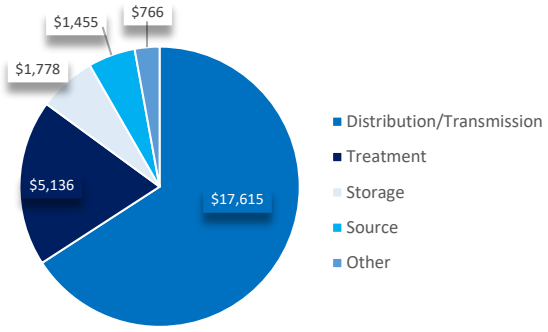


Florida

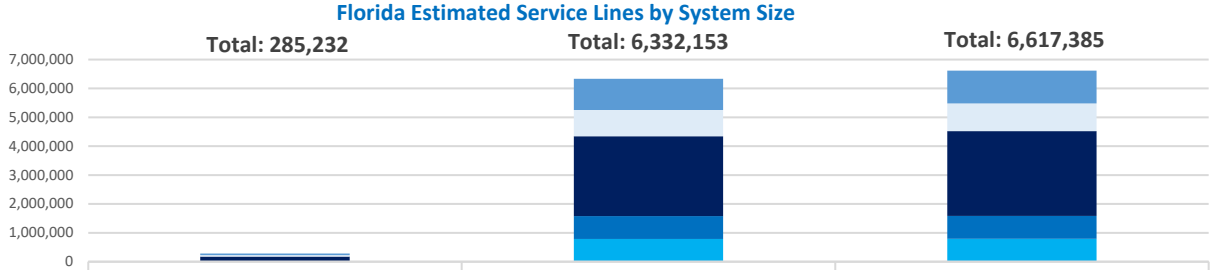
Florida Total Need by System Size (in millions; January 2021 dollars)



Florida Total Need by Project Category (in millions; January 2021 dollars)



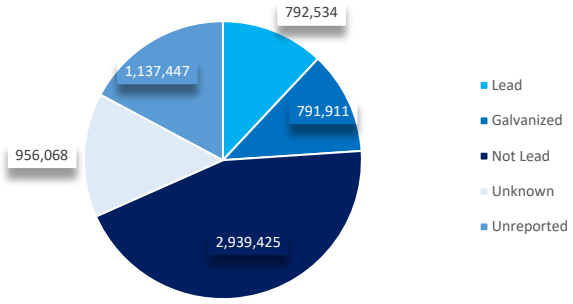
Florida Estimated Service Lines by System Size



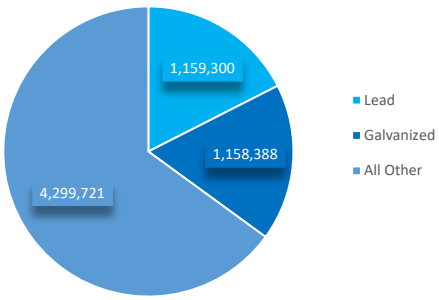
	Small Systems	Medium and Large Systems	All Systems
Unreported	58,050	1,079,397	1,137,447
Unknown	47,329	908,739	956,068
Not Lead	174,905	2,764,520	2,939,425
Galvanized	2,458	789,453	791,911
Lead	2,490	790,044	792,534

Lead Galvanized Not Lead Unknown Unreported

Florida Service Lines - Estimated from Survey Responses

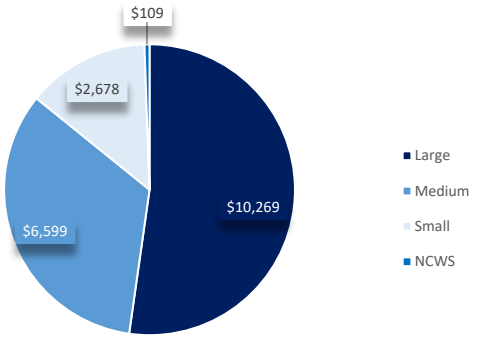


Florida Projected Service Lines

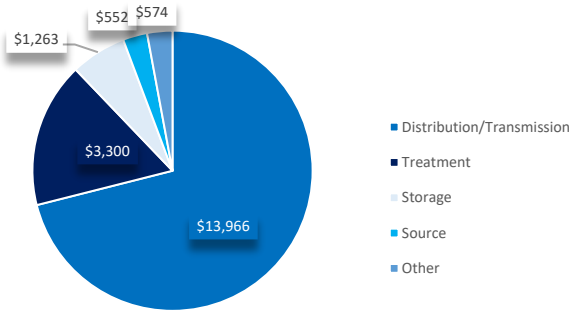


Georgia

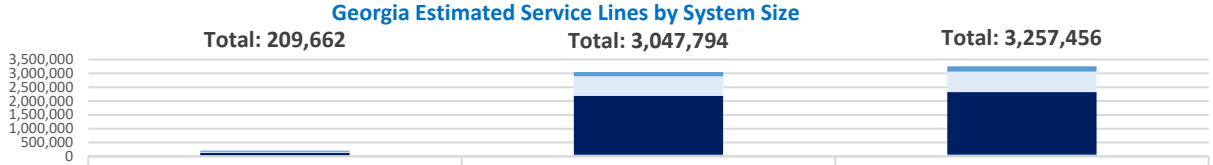
Georgia Total Need by System Size (in millions; January 2021 dollars)



Georgia Total Need by Project Category (in millions; January 2021 dollars)



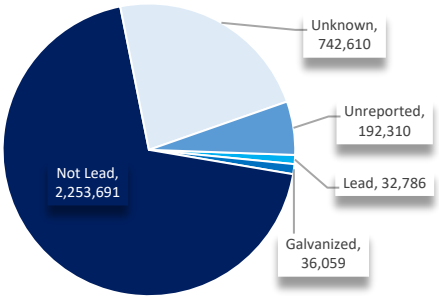
Georgia Estimated Service Lines by System Size



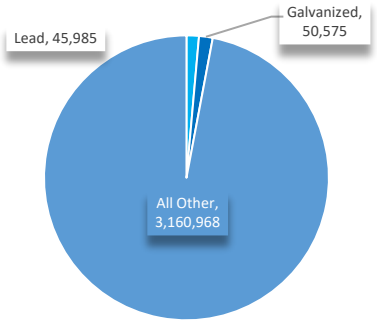
	Small Systems	Medium and Large Systems	All Systems
Unreported	42,702	149,608	192,310
Unknown	34,790	707,820	742,610
Not Lead	128,699	2,124,992	2,253,691
Galvanized	1,724	34,335	36,059
Lead	1,747	31,039	32,786

Lead Galvanized Not Lead Unknown Unreported

Georgia Service Lines - Estimated from Survey Responses

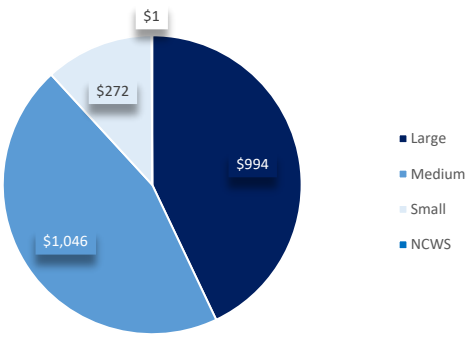


Georgia Projected Service Lines

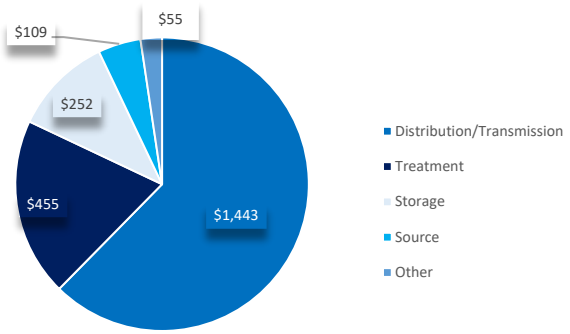


Hawaii

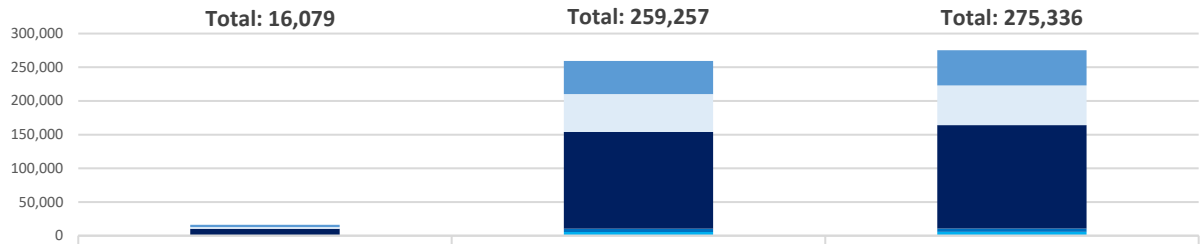
Hawaii Total Need by System Size (in millions; January 2021 dollars)



Hawaii Total Need by Project Category (in millions; January 2021 dollars)



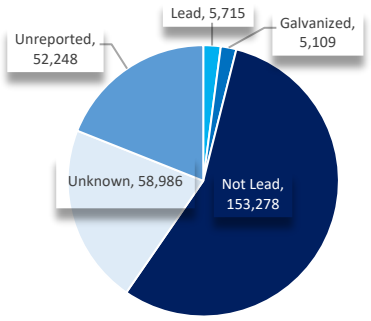
Hawaii Estimated Service Lines by System Size



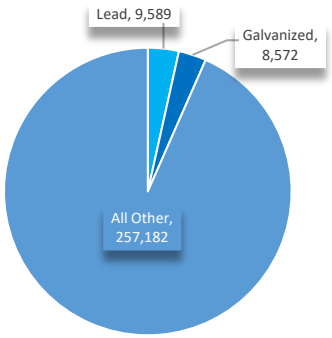
	Small Systems	Medium and Large Systems	Large Systems
Unreported	3,273	48,975	52,248
Unknown	2,667	56,319	58,986
Not Lead	9,865	143,413	153,278
Galvanized	137	4,972	5,109
Lead	137	5,578	5,715

Lead Galvanized Not Lead Unknown Unreported

Hawaii Service Lines - Estimated from Survey Responses

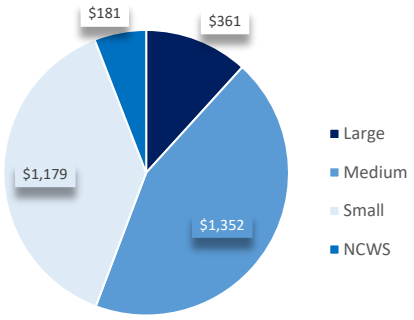


Hawaii Projected Service Lines

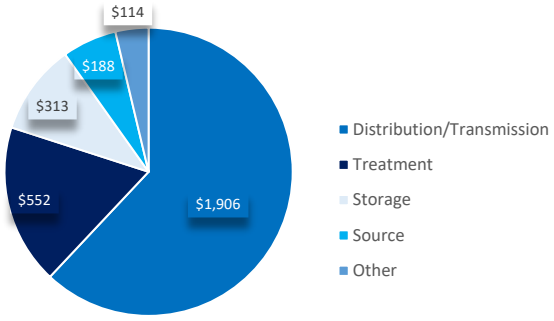


Idaho

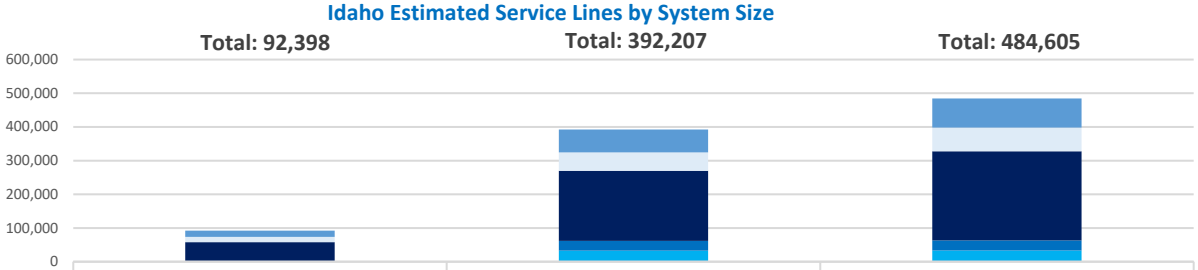
Idaho Total Need by System Size (in millions; January 2021 dollars)



Idaho Total Need by Project Category (in millions; January 2021 dollars)



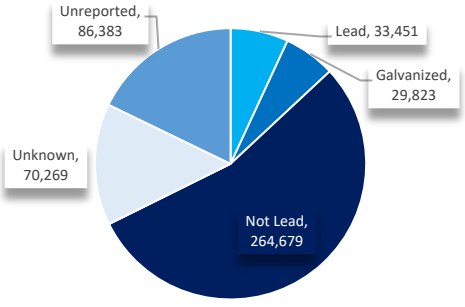
Idaho Estimated Service Lines by System Size



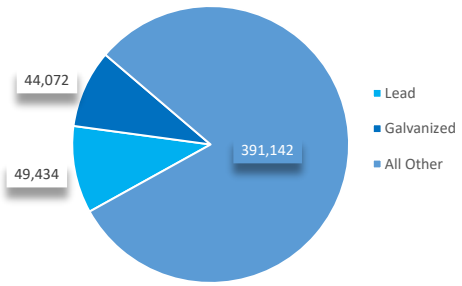
	Small Systems	Medium and Large Systems	All Systems
Unreported	18,825	67,558	86,383
Unknown	15,333	54,936	70,269
Not Lead	56,753	207,926	264,679
Galvanized	738	29,085	29,823
Lead	749	32,702	33,451

Lead Galvanized Not Lead Unknown Unreported

Idaho Service Lines - Estimated from Survey Responses

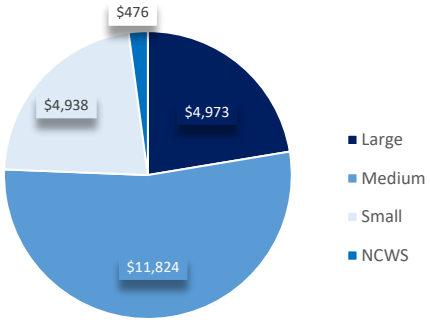


Idaho Projected Service Lines

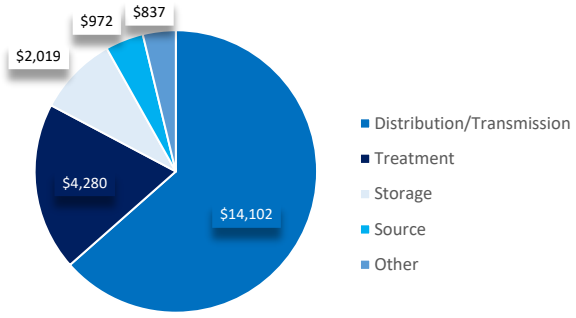


Illinois

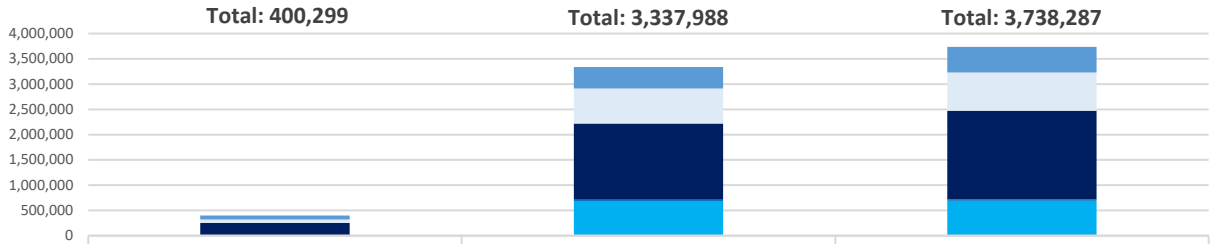
Illinois Total Need by System Size (in millions; January 2021 dollars)



Illinois Total Need by Project Category (in millions; January 2021 dollars)



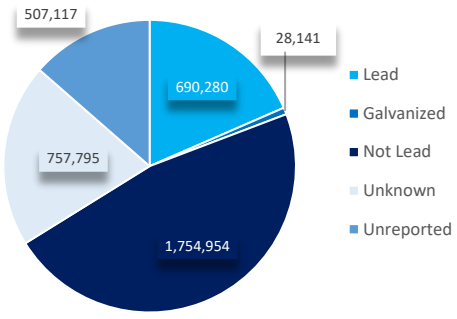
Illinois Estimated Service Lines by System Size



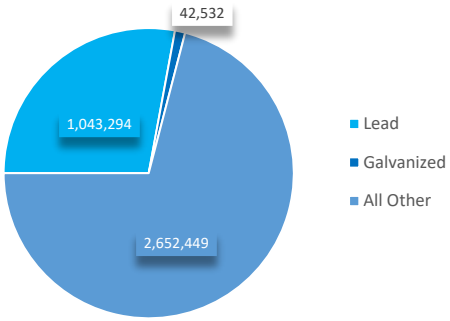
	Small Systems	Medium and Large Systems	All Systems
Unreported	81,483	425,634	507,117
Unknown	66,419	691,376	757,795
Not Lead	245,423	1,509,531	1,754,954
Galvanized	3,457	24,684	28,141
Lead	3,517	686,763	690,280

Lead Galvanized Not Lead Unknown Unreported

Illinois Service Lines - Estimated from Survey Responses

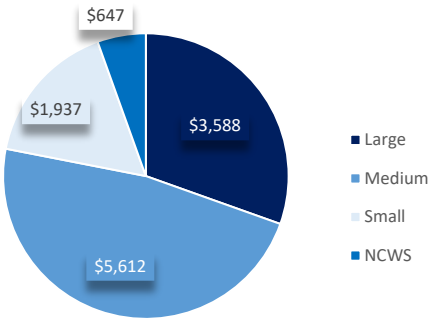


Illinois Projected Service Lines

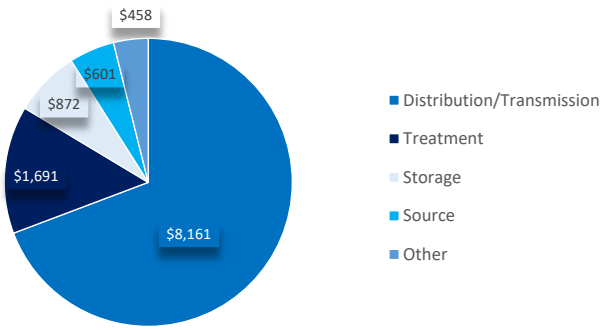


Indiana

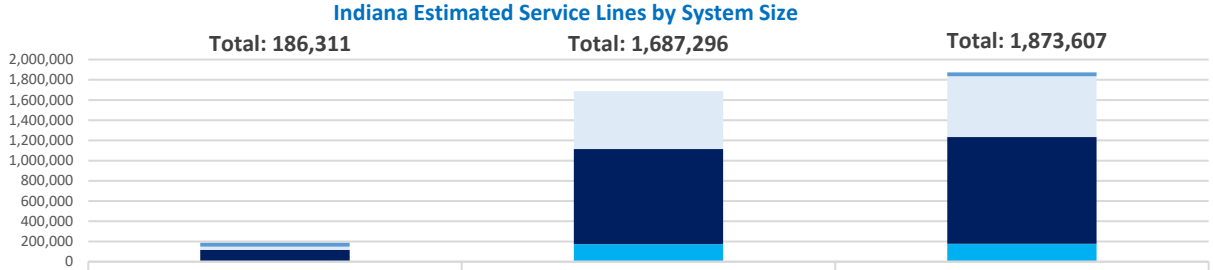
Indiana Total Need by System Size (in millions; January 2021 dollars)



Indiana Total Need by Project Category (in millions; January 2021 dollars)



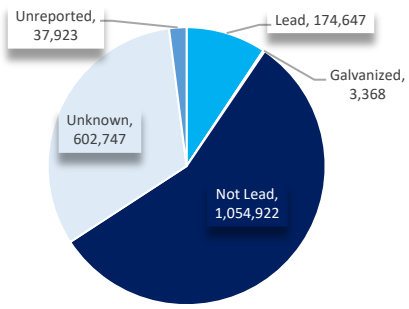
Indiana Estimated Service Lines by System Size



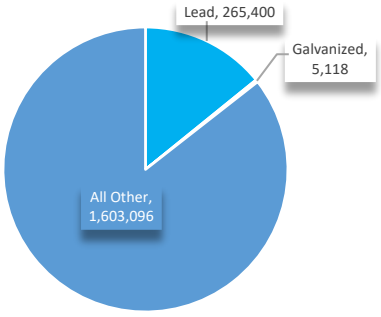
	Small Systems	Medium and Large Systems	All Systems
Unreported	37,923	0	37,923
Unknown	30,914	571,833	602,747
Not Lead	114,255	940,667	1,054,922
Galvanized	1,595	1,773	3,368
Lead	1,624	173,023	174,647

Lead Galvanized Not Lead Unknown Unreported

Indiana Service Lines - Estimated from Survey Responses

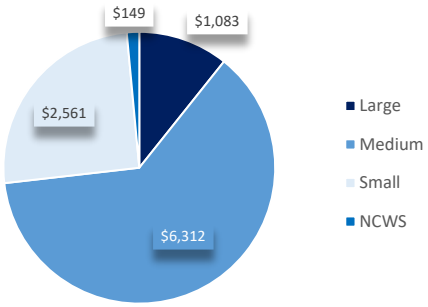


Indiana Projected Service Lines

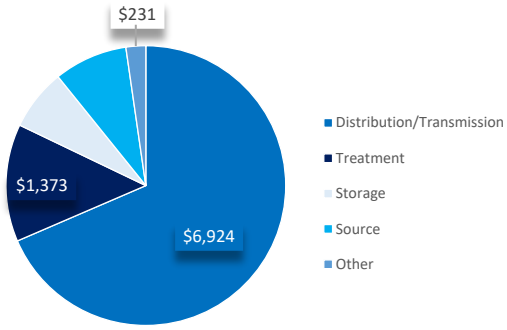


Iowa

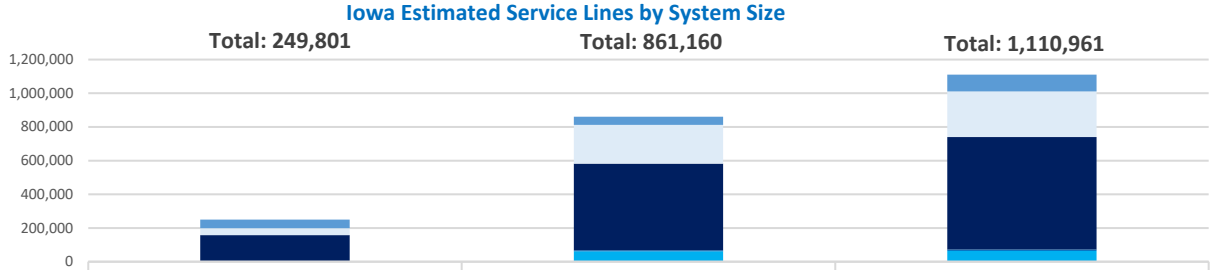
Iowa Total Need by System Size (in millions; January 2021 dollars)



Iowa Total Need by Project Category (in millions; January 2021 dollars)



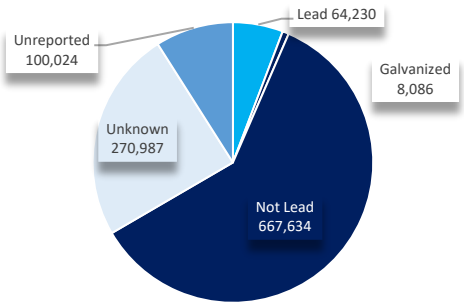
Iowa Estimated Service Lines by System Size



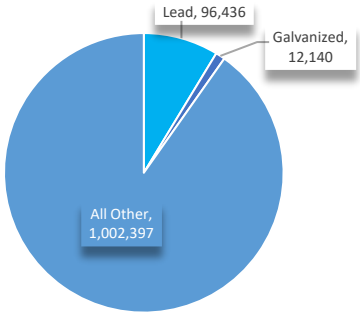
	Small Systems	Medium and Large Systems	All Systems
Unreported	50,831	49,193	100,024
Unknown	41,463	229,524	270,987
Not Lead	153,174	514,460	667,634
Galvanized	2,152	5,934	8,086
Lead	2,181	62,049	64,230

Lead Galvanized Not Lead Unknown Unreported

Iowa Service Lines - Estimated from Survey Responses

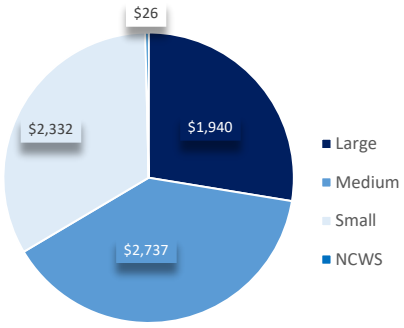


Iowa Projected Service Lines

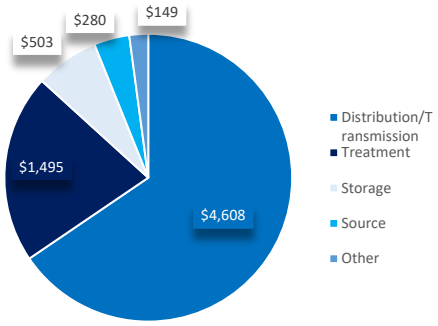


Kansas

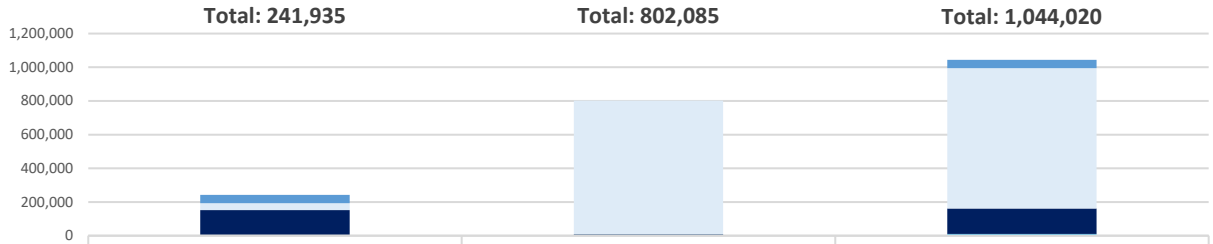
Kansas Total Need by System Size (in millions; January 2021 dollars)



Kansas Total Need by Project Category (in millions; January 2021 dollars)



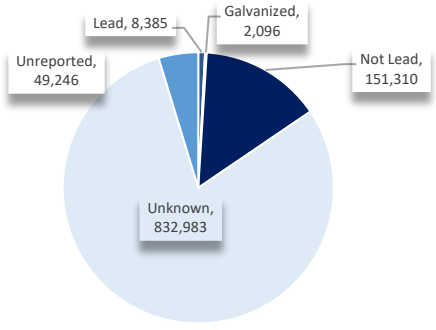
Kansas Estimated Service Lines by System Size



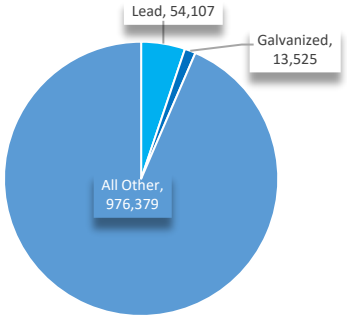
	Small Systems	Medium and Large Systems	All Systems
Unreported	49,246	0	49,246
Unknown	40,136	792,847	832,983
Not Lead	148,329	2,981	151,310
Galvanized	2,096	0	2,096
Lead	2,128	6,257	8,385

Lead Galvanized Not Lead Unknown Unreported

Kansas Service Lines - Estimated from Survey Responses

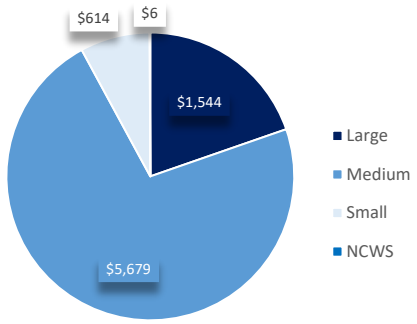


Kansas Projected Service Lines

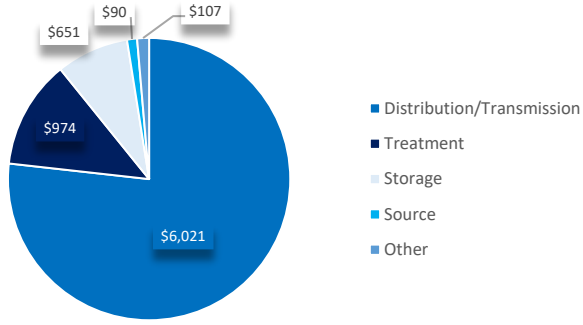


Kentucky

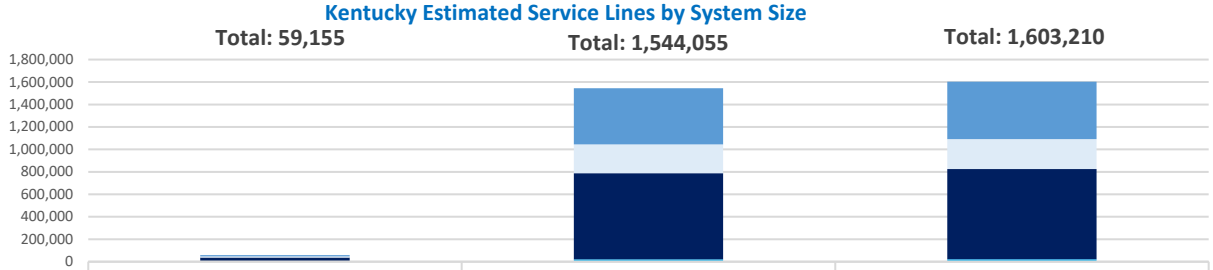
Kentucky Total Need by System Size (in millions; January 2021 dollars)



Kentucky Total Need by Project Category (in millions; January 2021 dollars)



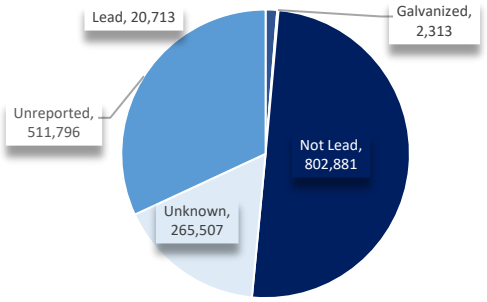
Kentucky Estimated Service Lines by System Size



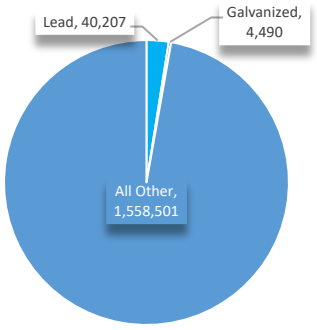
	Small Systems	Medium and Large Systems	All Systems
Unreported	12,041	499,755	511,796
Unknown	9,815	255,692	265,507
Not Lead	36,275	766,606	802,881
Galvanized	509	1,804	2,313
Lead	515	20,198	20,713

Lead Galvanized Not Lead Unknown Unreported

Kentucky Service Lines - Estimated from Survey Responses

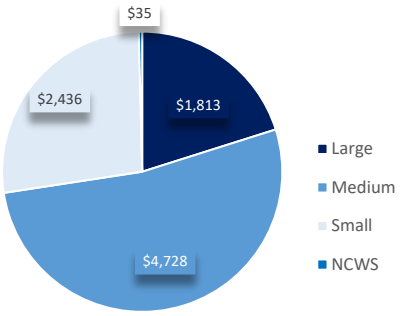


Kentucky Projected Service Lines

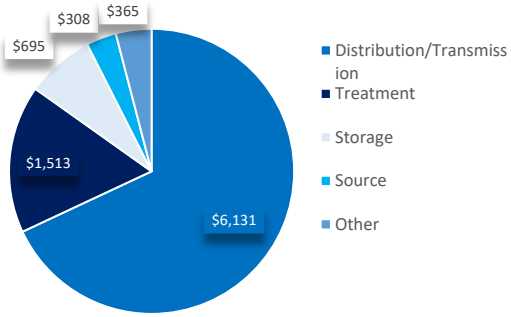


Louisiana

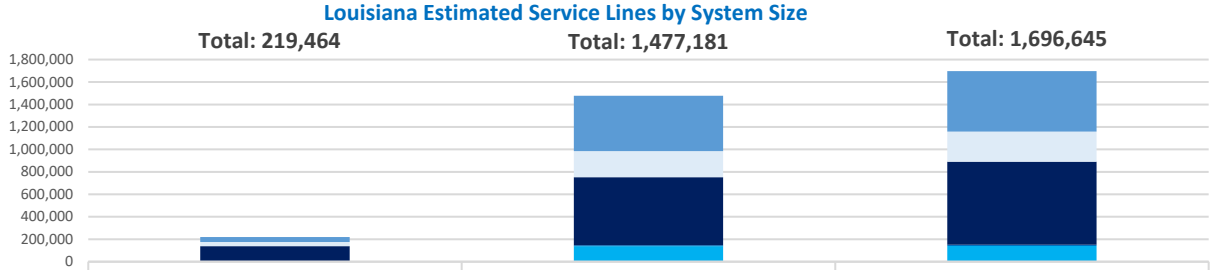
Louisiana Total Need by System Size (in millions; January 2021 dollars)



Louisiana Total Need by Project Category (in millions; January 2021 dollars)



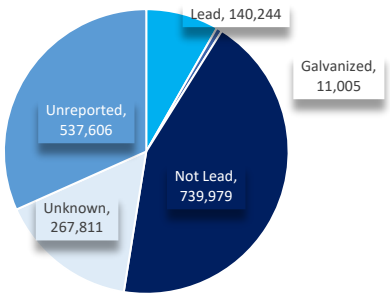
Louisiana Estimated Service Lines by System Size



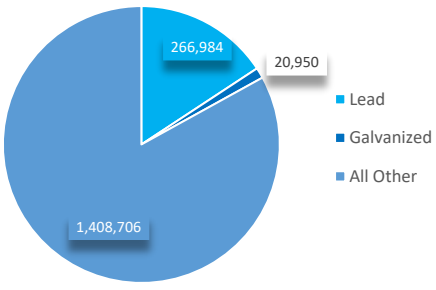
	Small Systems	Medium and Large Systems	All Systems
Unreported	44,665	492,941	537,606
Unknown	36,413	231,398	267,811
Not Lead	134,579	605,400	739,979
Galvanized	1,886	9,119	11,005
Lead	1,921	138,323	140,244

Lead Galvanized Not Lead Unknown Unreported

Louisiana Service Lines - Estimated from Survey Responses

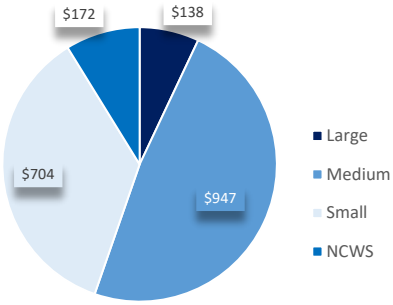


Louisiana Projected Service Lines

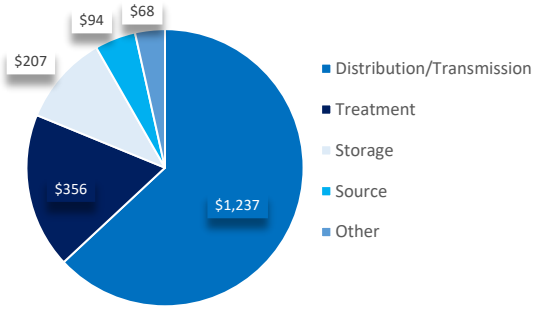


Maine

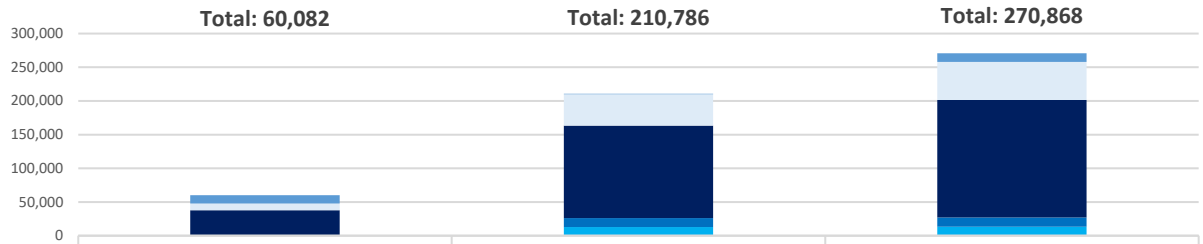
Maine Total Need by System Size (in millions; January 2021 dollars)



Maine Total Need by Project Category (in millions; January 2021 dollars)



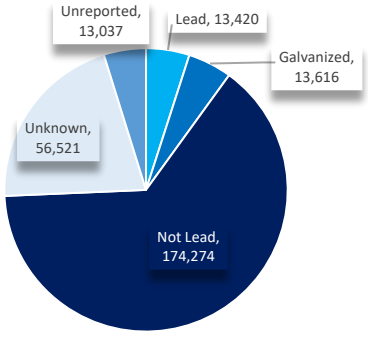
Maine Estimated Service Lines by System Size



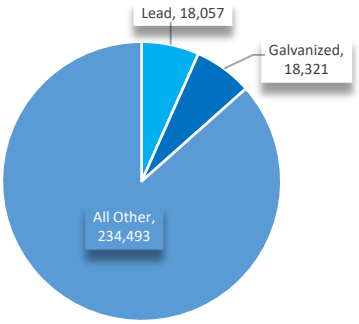
	Small Systems	Medium and Large Systems	All Systems
Unreported	12,235	802	13,037
Unknown	9,974	46,547	56,521
Not Lead	36,886	137,388	174,274
Galvanized	487	13,129	13,616
Lead	500	12,920	13,420

Lead Galvanized Not Lead Unknown Unreported

Maine Service Lines - Estimated from Survey Responses

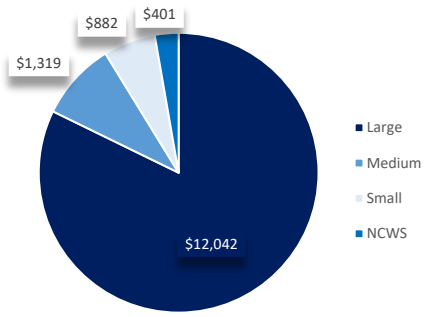


Maine Projected Service Lines

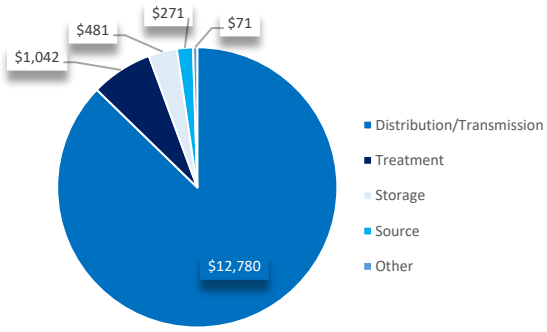


Maryland

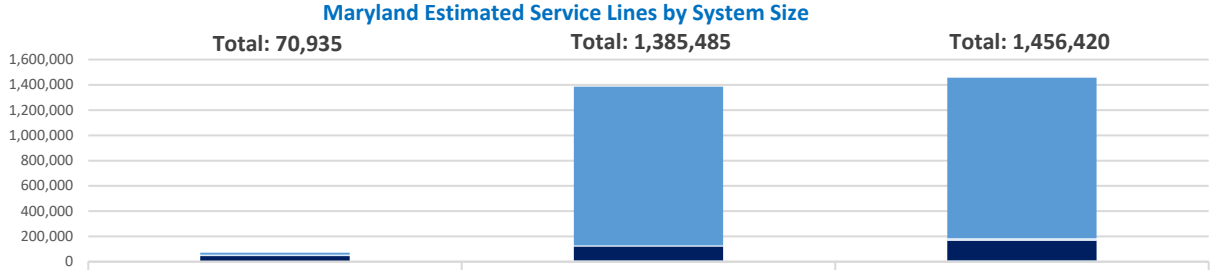
Maryland Total Need by System Size (in millions; January 2021 dollars)



Maryland Total Need by Project Category (in millions; January 2021 dollars)



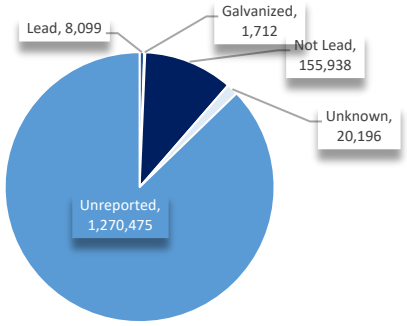
Maryland Estimated Service Lines by System Size



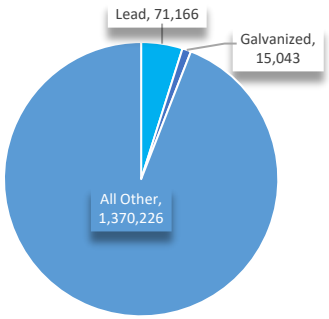
	Small Systems	Medium and Large Systems	All Systems
Unreported	14,440	1,256,035	1,270,475
Unknown	11,775	8,421	20,196
Not Lead	43,537	112,401	155,938
Galvanized	586	1,126	1,712
Lead	597	7,502	8,099

Lead Galvanized Not Lead Unknown Unreported

Maryland Service Lines - Estimated from Survey Responses

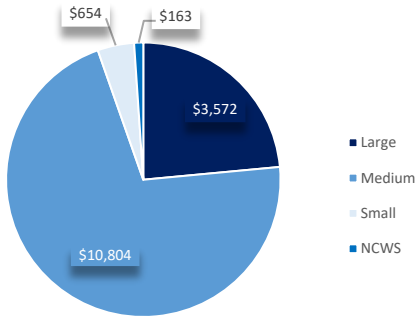


Maryland Projected Service Lines

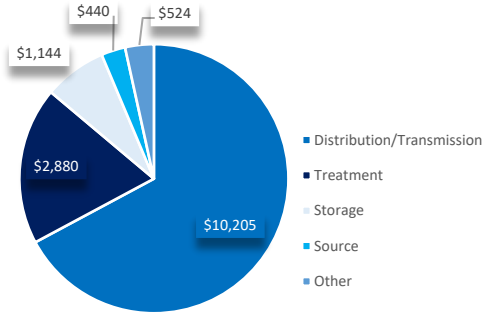


Massachusetts

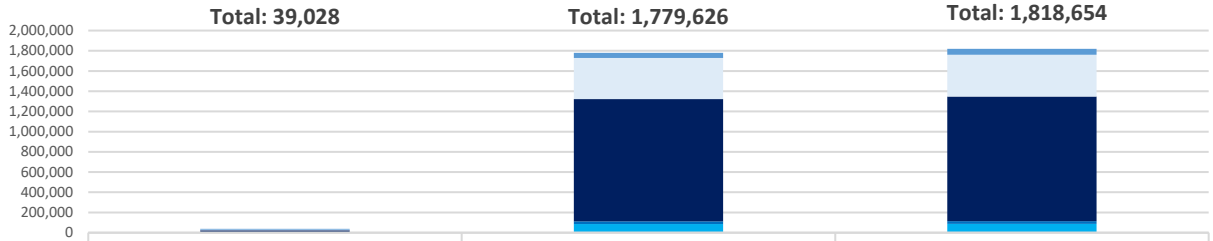
Massachusetts Total Need by System Size (in millions; January 2021 dollars)



Massachusetts Total Need by Project Category (in millions; January 2021 dollars)



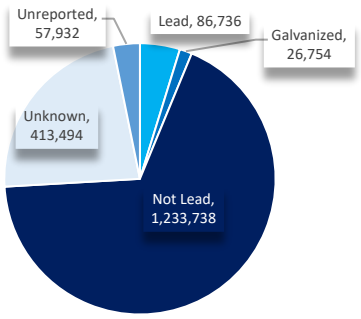
Massachusetts Estimated Service Lines by System Size



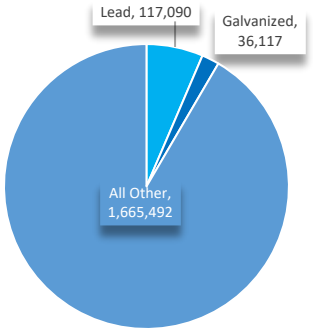
	Small Systems	Medium and Large Systems	All Systems
Unreported	7,945	49,987	57,932
Unknown	6,461	407,033	413,494
Not Lead	23,959	1,209,779	1,233,738
Galvanized	328	26,426	26,754
Lead	335	86,401	86,736

Lead Galvanized Not Lead Unknown Unreported

Massachusetts Service Lines - Estimated from Survey Responses

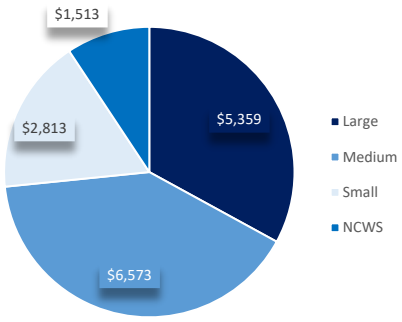


Massachusetts Projected Service Lines

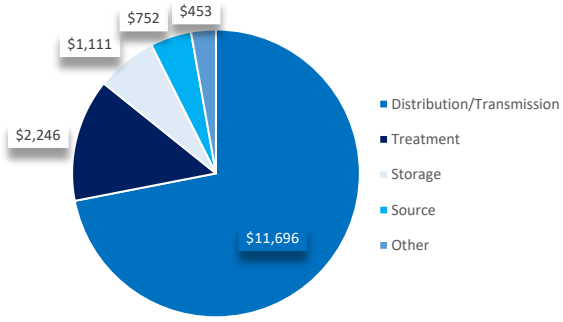


Michigan

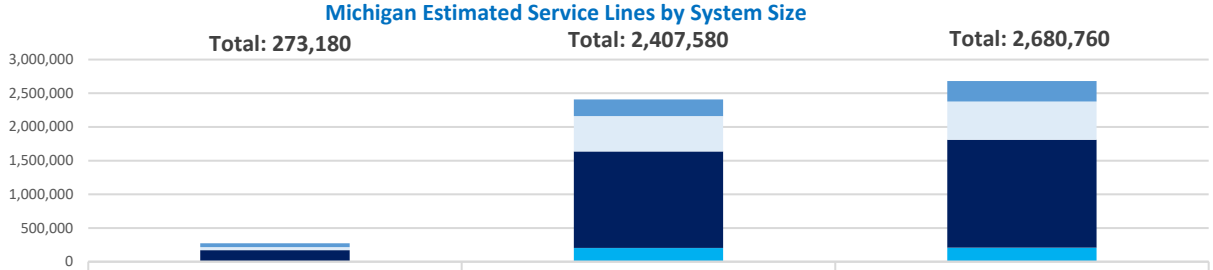
Michigan Total Need by System Size (in millions; January 2021 dollars)



Michigan Total Need by Project Category (in millions; January 2021 dollars)



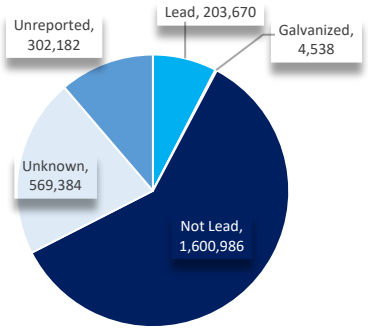
Michigan Estimated Service Lines by System Size



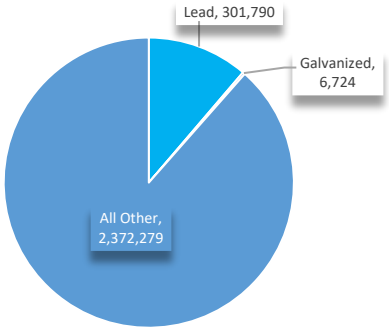
	Small Systems	Medium and Large Systems	All Systems
Unreported	55,602	246,580	302,182
Unknown	45,318	524,066	569,384
Not Lead	167,570	1,433,416	1,600,986
Galvanized	2,331	2,207	4,538
Lead	2,359	201,311	203,670

Lead Galvanized Not Lead Unknown Unreported

Michigan Service Lines - Estimated from Survey Responses

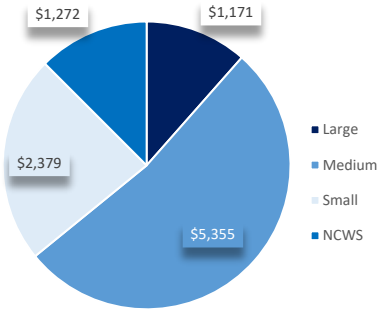


Michigan Projected Service Lines

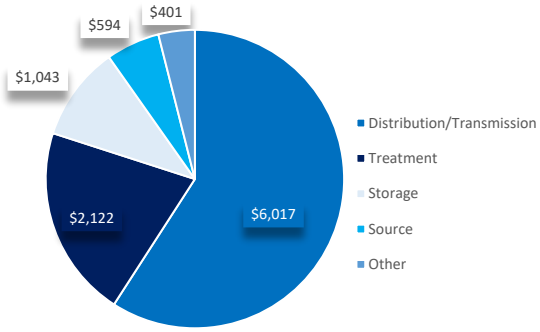


Minnesota

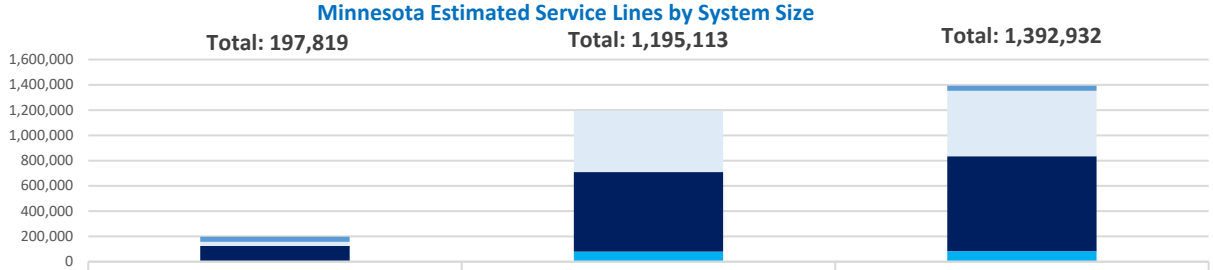
Minnesota Total Need by System Size (in millions; January 2021 dollars)



Minnesota Total Need by Project Category (in millions; January 2021 dollars)



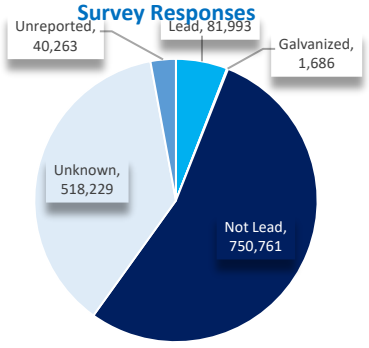
Minnesota Estimated Service Lines by System Size



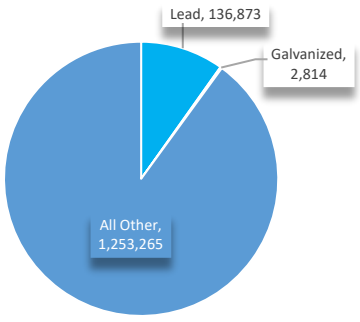
	Small Systems	Medium and Large Systems	All Systems
Unreported	40,263	0	40,263
Unknown	32,825	485,404	518,229
Not Lead	121,331	629,430	750,761
Galvanized	1,686	0	1,686
Lead	1,714	80,279	81,993

Lead Galvanized Not Lead Unknown Unreported

Minnesota Service Lines - Estimated from Survey Responses

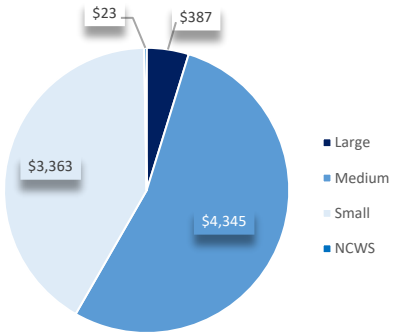


Minnesota Projected Service Lines

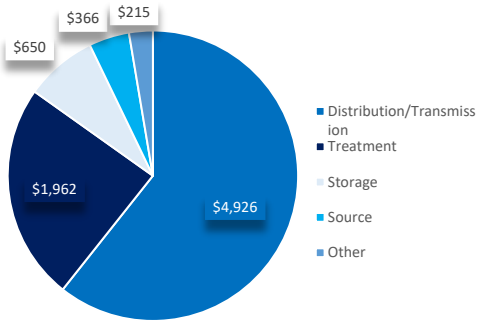


Mississippi

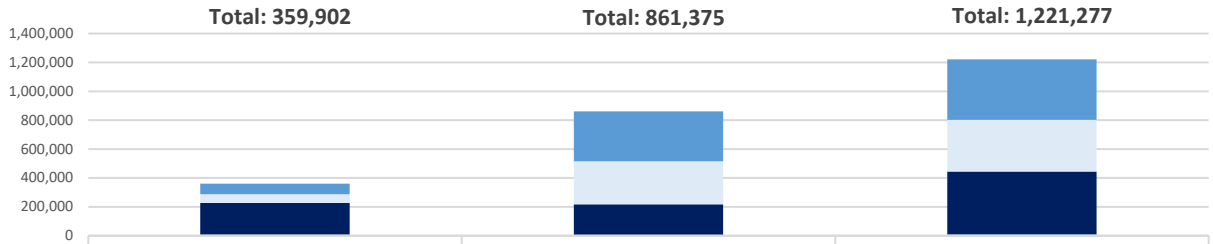
Mississippi Total Need by System Size (in millions; January 2021 dollars)



Mississippi Total Need by Project Category (in millions; January 2021 dollars)



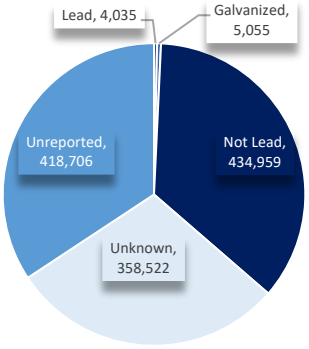
Mississippi Estimated Service Lines by System Size



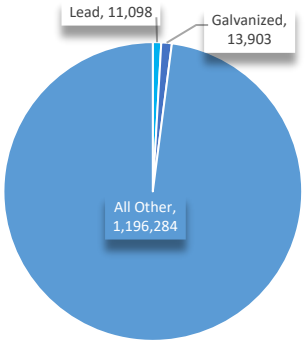
	Small Systems	Medium and Large Systems	All Systems
Unreported	73,235	345,471	418,706
Unknown	59,717	298,805	358,522
Not Lead	220,643	214,316	434,959
Galvanized	3,139	1,916	5,055
Lead	3,168	867	4,035

Lead Galvanized Not Lead Unknown Unreported

Mississippi Service Lines - Estimated from Survey Responses

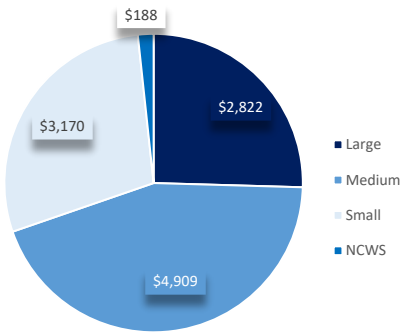


Mississippi Projected Service Lines

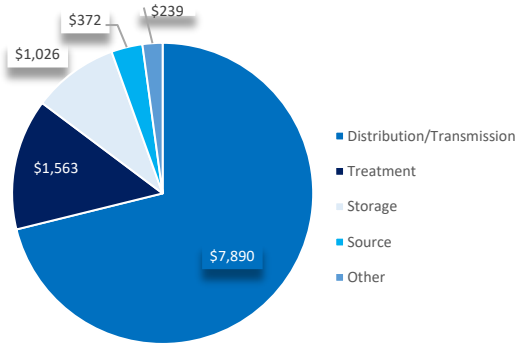


Missouri

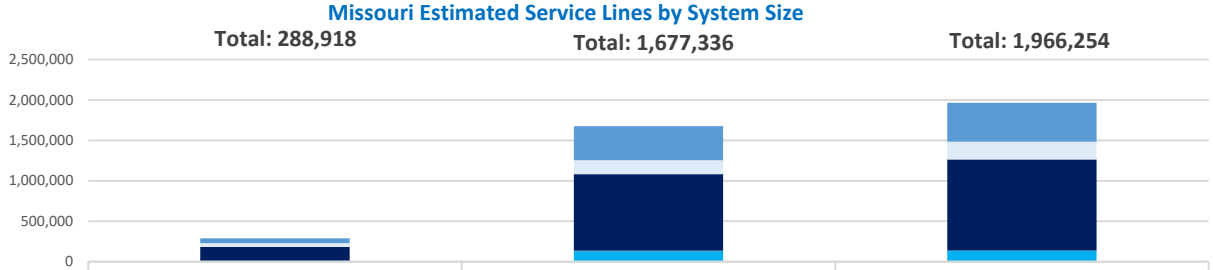
Missouri Total Need by System Size (in millions; January 2021 dollars)



Missouri Total Need by Project Category (in millions; January 2021 dollars)



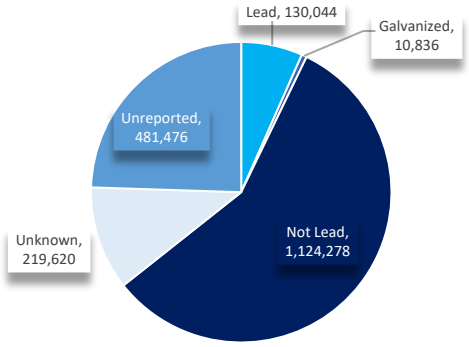
Missouri Estimated Service Lines by System Size



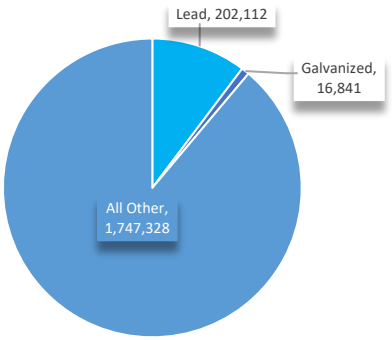
	Small Systems	Medium and Large Systems	All Systems
Unreported	58,789	422,687	481,476
Unknown	47,948	171,672	219,620
Not Lead	177,180	947,098	1,124,278
Galvanized	2,489	8,347	10,836
Lead	2,512	127,532	130,044

Lead Galvanized Not Lead Unknown Unreported

Missouri Service Lines - Estimated from Survey Responses

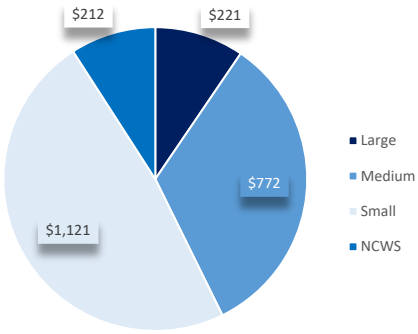


Missouri Projected Service Lines

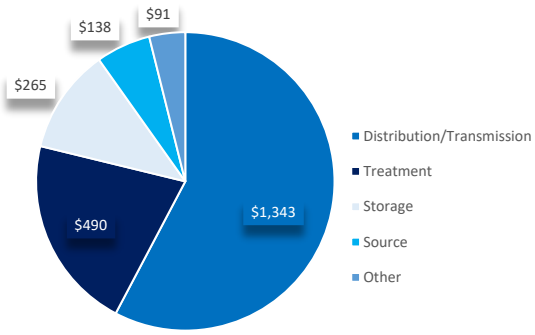


Montana

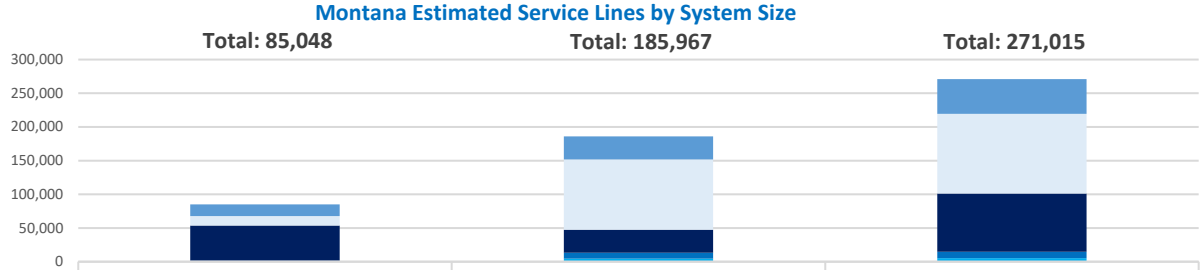
Montana Total Need by System Size (in millions; January 2021 dollars)



Montana Total Need by Project Category (in millions; January 2021 dollars)



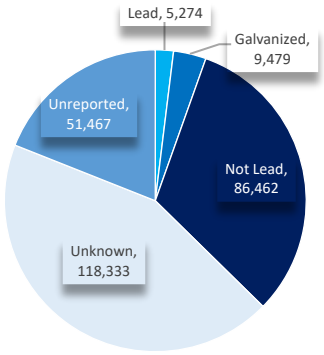
Montana Estimated Service Lines by System Size



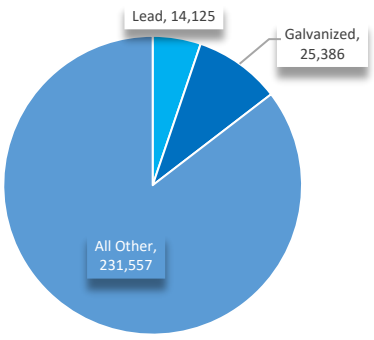
	Small Systems	Medium and Large Systems	All Systems
Unreported	17,322	34,145	51,467
Unknown	14,112	104,221	118,333
Not Lead	52,246	34,216	86,462
Galvanized	678	8,801	9,479
Lead	690	4,584	5,274

Lead Galvanized Not Lead Unknown Unreported

Montana Service Lines - Estimated from Survey Responses

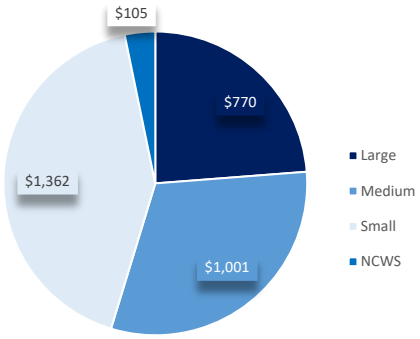


Montana Projected Service Lines

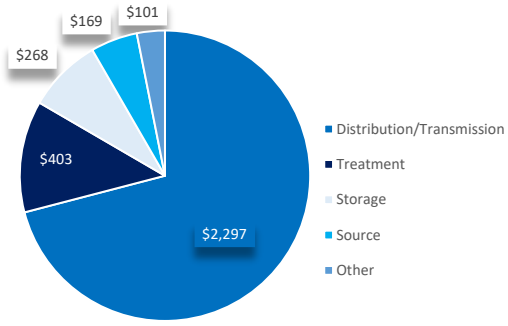


Nebraska

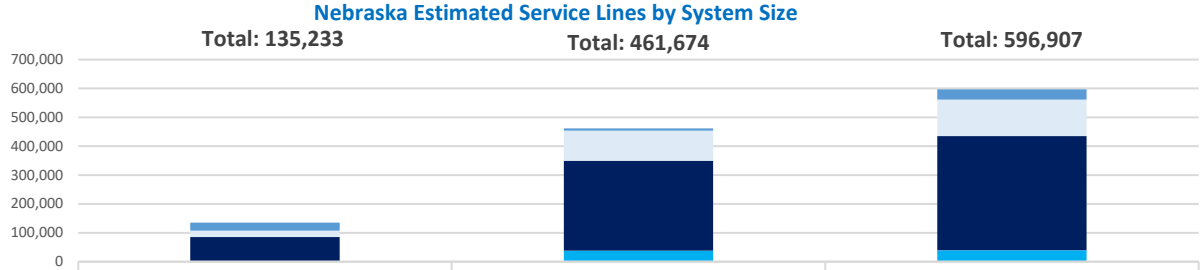
Nebraska Total Need by System Size (in millions; January 2021 dollars)



Nebraska Total Need by Project Category (in millions; January 2021 dollars)



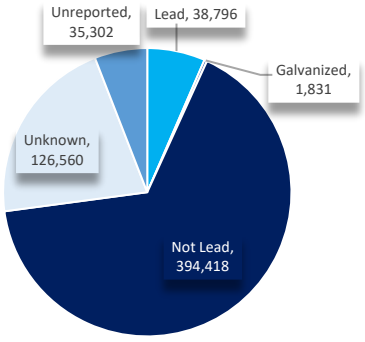
Nebraska Estimated Service Lines by System Size



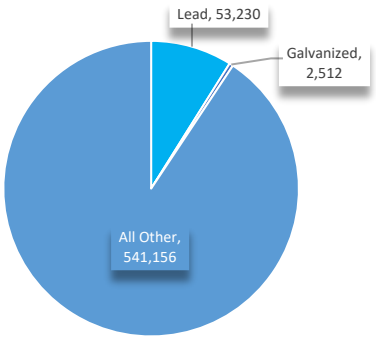
	Small Systems	Medium and Large Systems	All Systems
Unreported	27,517	7,785	35,302
Unknown	22,433	104,127	126,560
Not Lead	82,900	311,518	394,418
Galvanized	1,183	648	1,831
Lead	1,200	37,596	38,796

Lead Galvanized Not Lead Unknown Unreported

Nebraska Service Lines - Estimated from Survey Responses

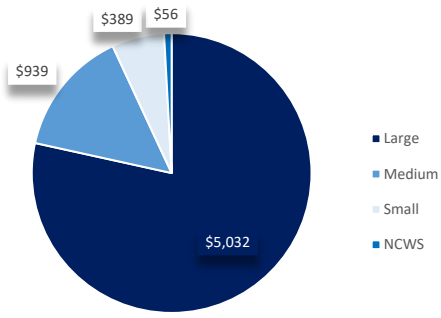


Nebraska Projected Service Lines

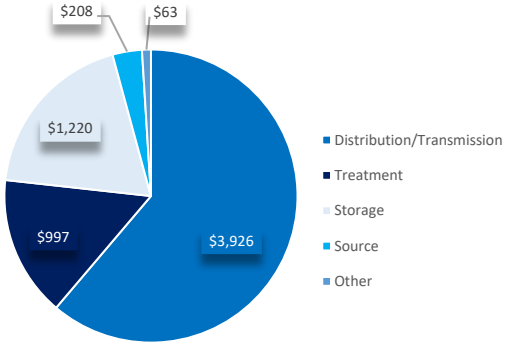


Nevada

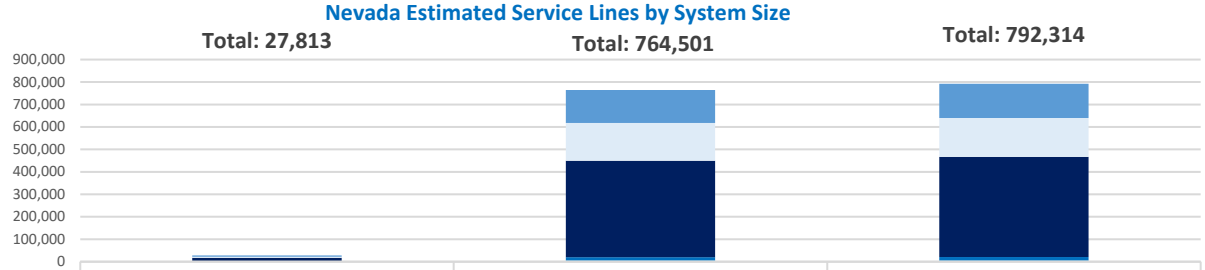
Nevada Total Need by System Size (in millions; January 2021 dollars)



Nevada Total Need by Project Category (in millions; January 2021 dollars)



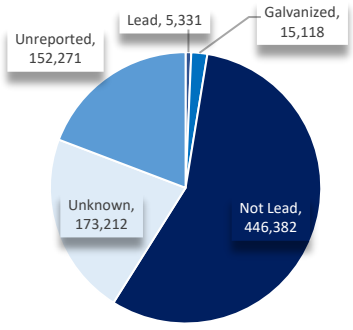
Nevada Estimated Service Lines by System Size



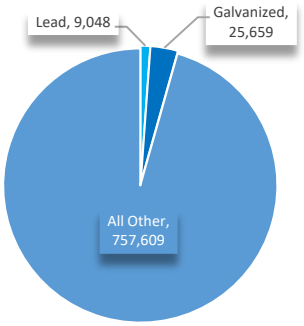
	Small Systems	Medium and Large Systems	All Systems
Unreported	5,663	146,608	152,271
Unknown	4,612	168,600	173,212
Not Lead	17,066	429,316	446,382
Galvanized	234	14,884	15,118
Lead	238	5,093	5,331

Lead Galvanized Not Lead Unknown Unreported

Nevada Service Lines - Estimated from Survey Responses

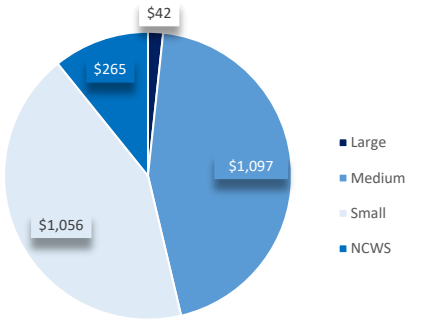


Nevada Projected Service Lines

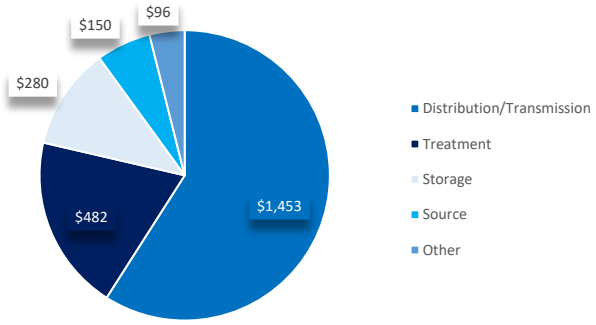


New Hampshire

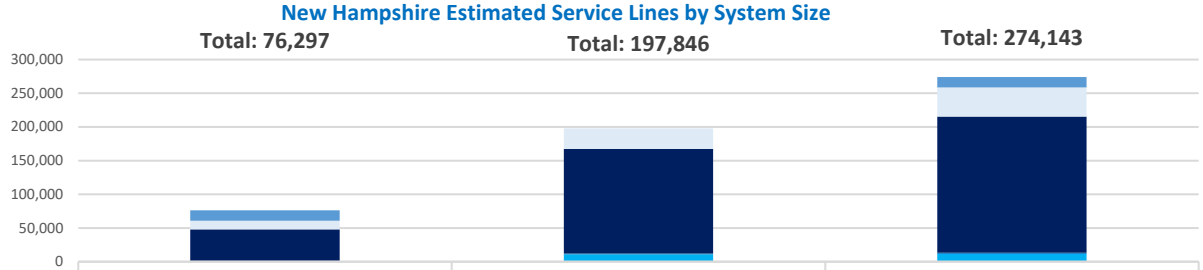
New Hampshire Total Need by System Size (in millions; January 2021 dollars)



New Hampshire Total Need by Project Category (in millions; January 2021 dollars)



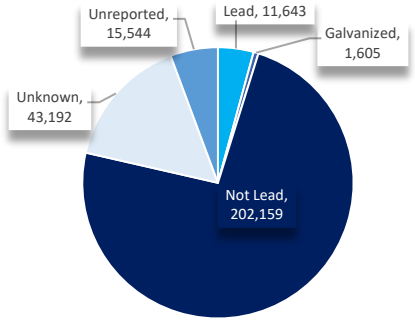
New Hampshire Estimated Service Lines by System Size



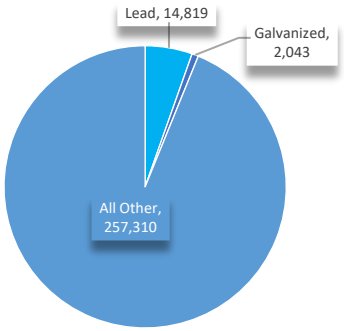
	Small Systems	Medium and Large Systems	All Systems
Unreported	15,544	0	15,544
Unknown	12,683	30,509	43,192
Not Lead	46,878	155,281	202,159
Galvanized	592	1,013	1,605
Lead	600	11,043	11,643

Lead Galvanized Not Lead Unknown Unreported

New Hampshire Service Lines - Estimated from Survey Responses

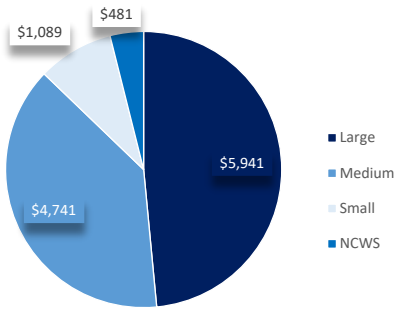


New Hampshire Projected Service Lines

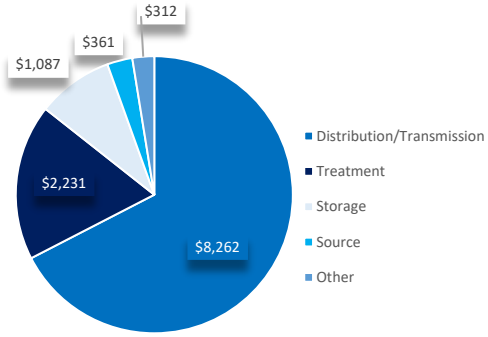


New Jersey

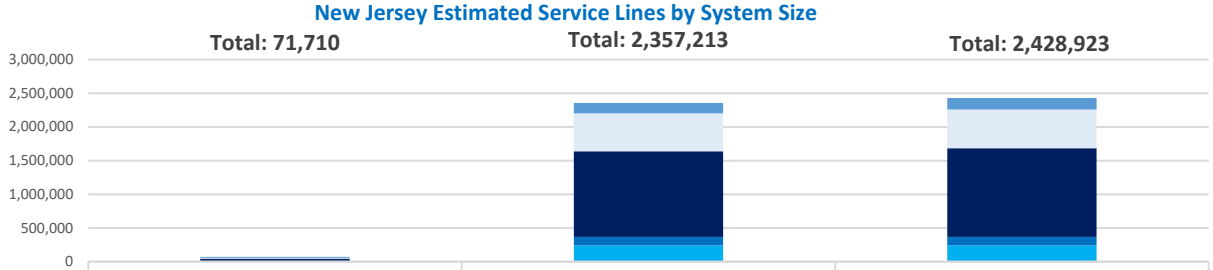
New Jersey Total Need by System Size (in millions; January 2021 dollars)



New Jersey Total Need by Project Category (in millions; January 2021 dollars)



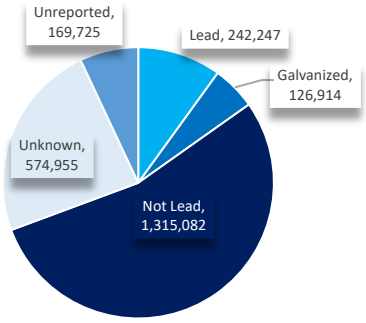
New Jersey Estimated Service Lines by System Size



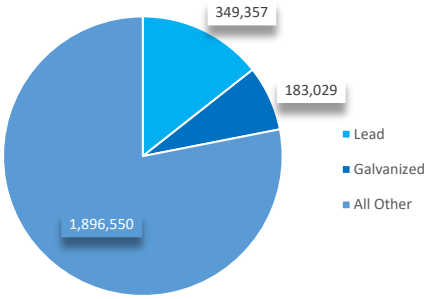
	Small Systems	Medium and Large Systems	All Systems
Unreported	14,599	155,126	169,725
Unknown	11,895	563,060	574,955
Not Lead	43,989	1,271,093	1,315,082
Galvanized	607	126,307	126,914
Lead	620	241,627	242,247

Lead Galvanized Not Lead Unknown Unreported

New Jersey Service Lines - Estimated from Survey Responses

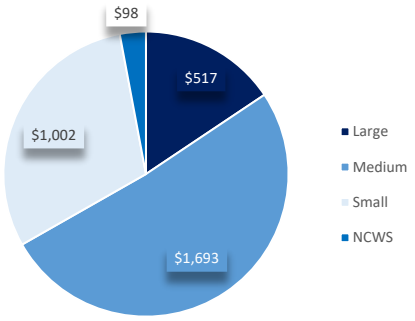


New Jersey Projected Service Lines

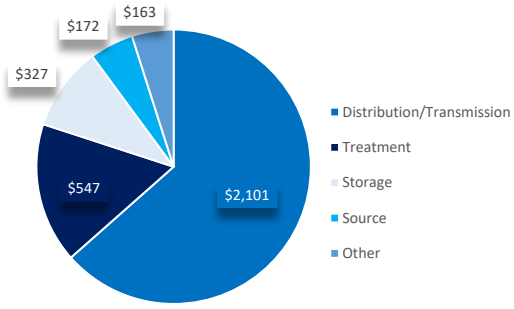


New Mexico

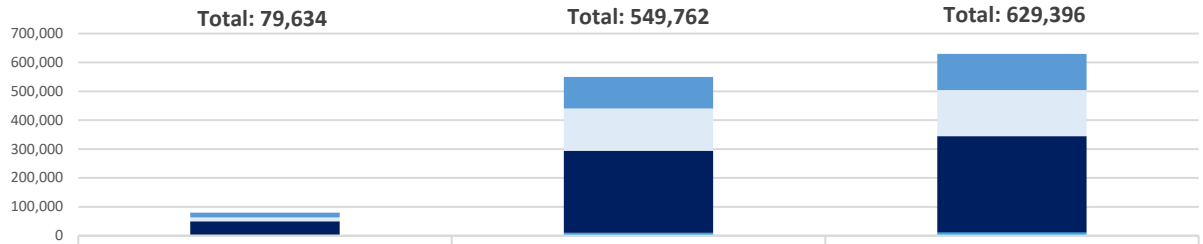
New Mexico Total Need by System Size (in millions; January 2021 dollars)



New Mexico Total Need by Project Category (in millions; January 2021 dollars)



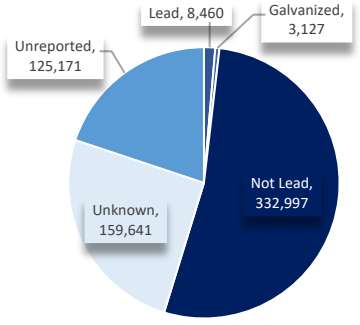
New Mexico Estimated Service Lines by System Size



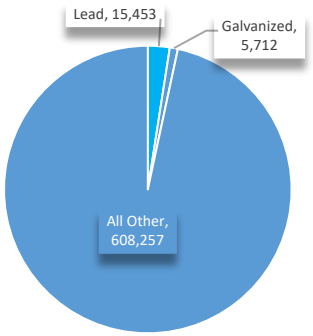
	Small Systems	Medium and Large Systems	All Systems
Unreported	16,215	108956	125,171
Unknown	13,212	146,429	159,641
Not Lead	48,866	284,131	332,997
Galvanized	666	2,461	3,127
Lead	675	7,785	8,460

Lead Galvanized Not Lead Unknown Unreported

New Mexico Service Lines - Estimated from Survey Responses

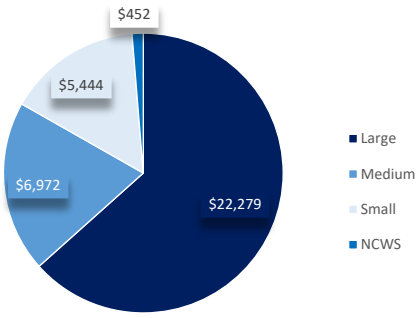


New Mexico Projected Service Lines

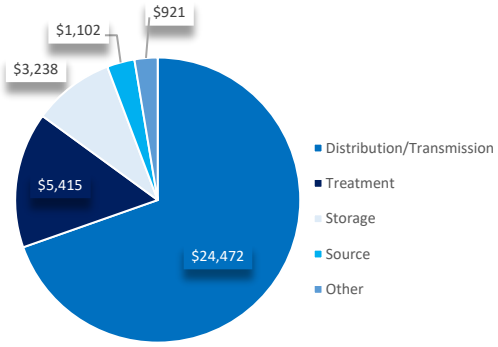


New York

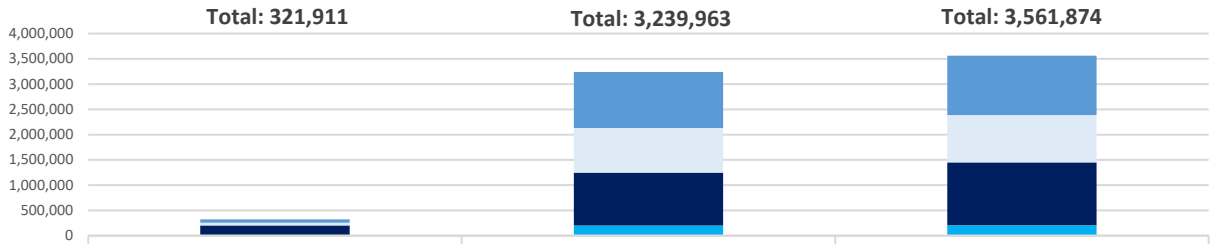
New York Total Need by System Size (in millions; January 2021 dollars)



New York Total Need by Project Category (in millions; January 2021 dollars)



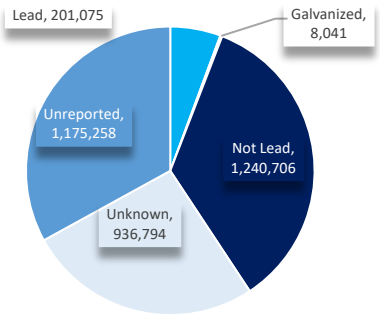
New York Estimated Service Lines by System Size



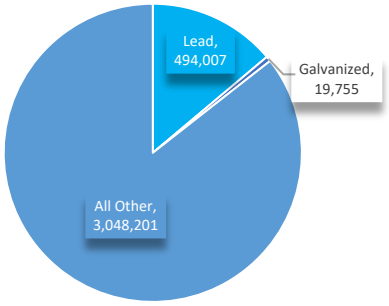
	Small Systems	Medium and Large Systems	All Systems
Unreported	65,545	1,109,713	1,175,258
Unknown	53,419	883,375	936,794
Not Lead	197,582	1,043,124	1,240,706
Galvanized	2,661	5,380	8,041
Lead	2,704	198,371	201,075

Lead Galvanized Not Lead Unknown Unreported

New York Service Lines - Estimated from Survey Responses

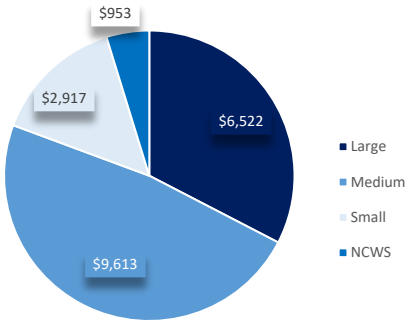


New York Projected Service Lines

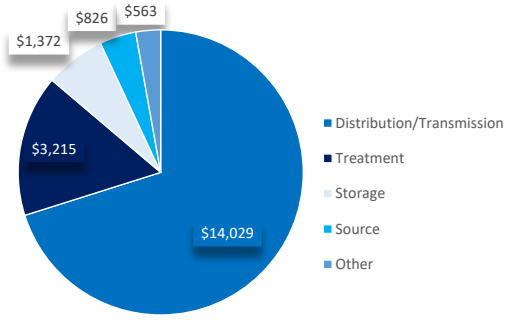


North Carolina

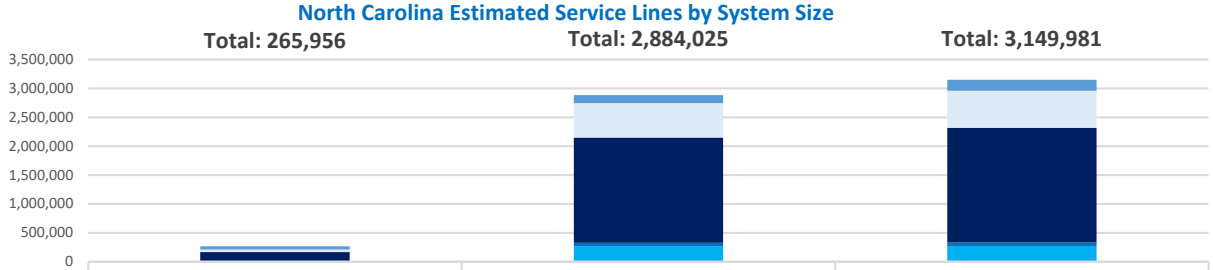
North Carolina Total Need by System Size (in millions; January 2021 dollars)



North Carolina Total Need by Project Category (in millions; January 2021 dollars)



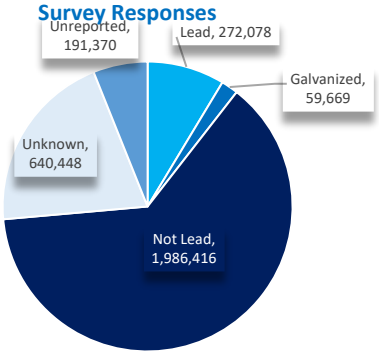
North Carolina Estimated Service Lines by System Size



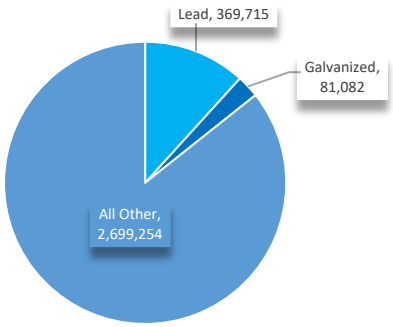
	Small Systems	Medium and Large Systems	All Systems
Unreported	54,183	137,187	191,370
Unknown	44,145	596,303	640,448
Not Lead	163,256	1,823,160	1,986,416
Galvanized	2,168	57,501	59,669
Lead	2,204	269,874	272,078

Lead Galvanized Not Lead Unknown Unreported

North Carolina Service Lines - Estimated from Survey Responses

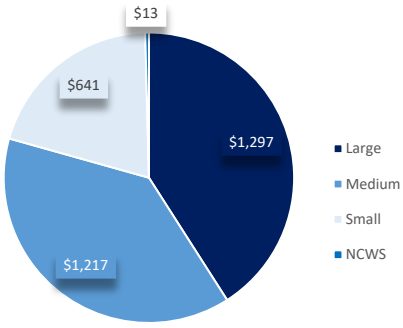


North Carolina Projected Service Lines

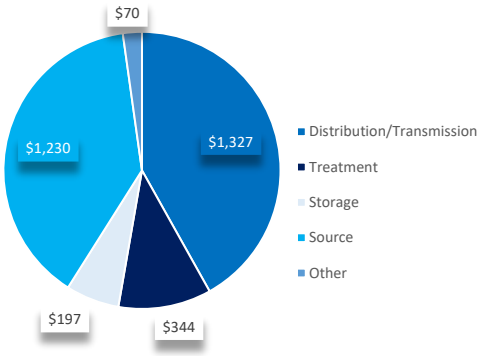


North Dakota

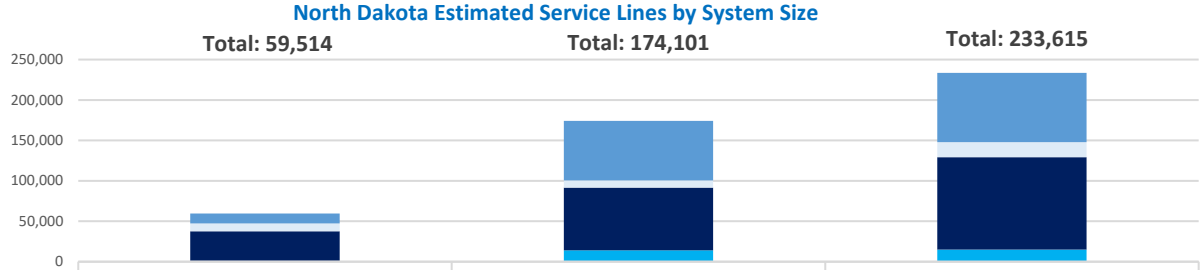
North Dakota Total Need by System Size (in millions; January 2021 dollars)



North Dakota Total Need by Project Category (in millions; January 2021 dollars)



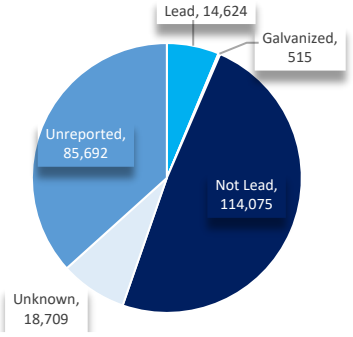
North Dakota Estimated Service Lines by System Size



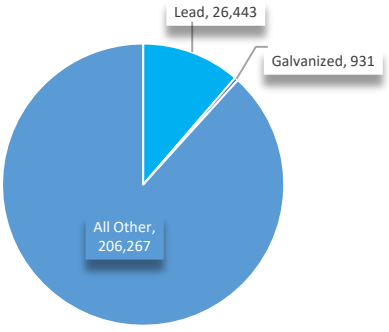
	Small Systems	Medium and Large Systems	All Systems
Unreported	12,106	73,586	85,692
Unknown	9,871	8,838	18,709
Not Lead	36,501	77,574	114,075
Galvanized	515	0	515
Lead	521	14,103	14,624

Lead Galvanized Not Lead Unknown Unreported

North Dakota Service Lines - Estimated from Survey Responses

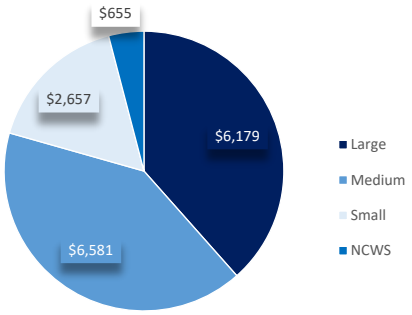


North Dakota Projected Service Lines

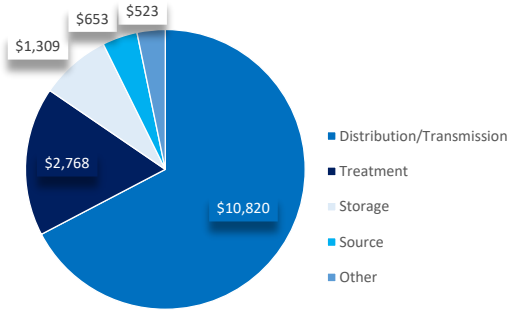


Ohio

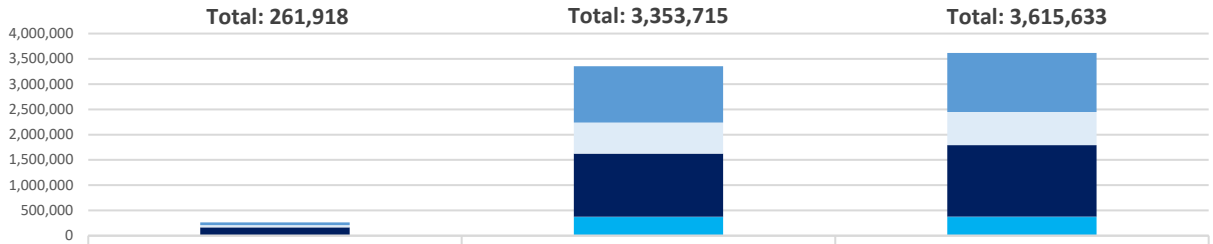
Ohio Total Need by System Size (in millions; January 2021 dollars)



Ohio Total Need by Project Category (in millions; January 2021 dollars)



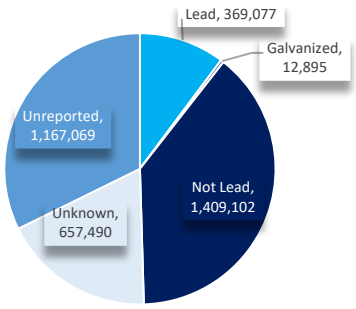
Ohio Estimated Service Lines by System Size



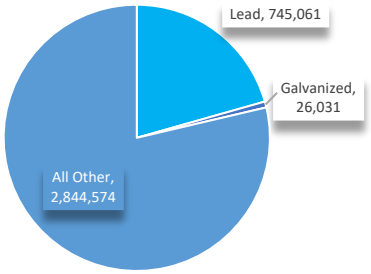
	Small Systems	Medium and Large Systems	All Systems
Unreported	53,314	1,113,755	1,167,069
Unknown	43,444	614,046	657,490
Not Lead	160,625	1,248,477	1,409,102
Galvanized	2,252	10,643	12,895
Lead	2,283	366,794	369,077

Lead Galvanized Not Lead Unknown Unreported

Ohio Service Lines - Estimated from Survey Responses

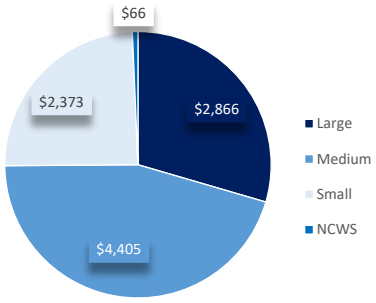


Ohio Projected Service Lines

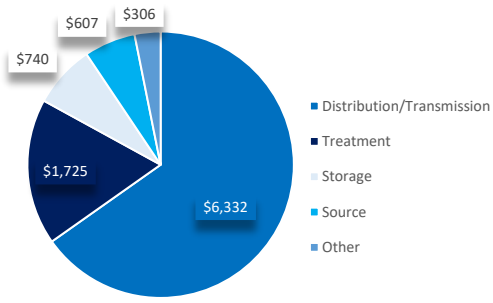


Oklahoma

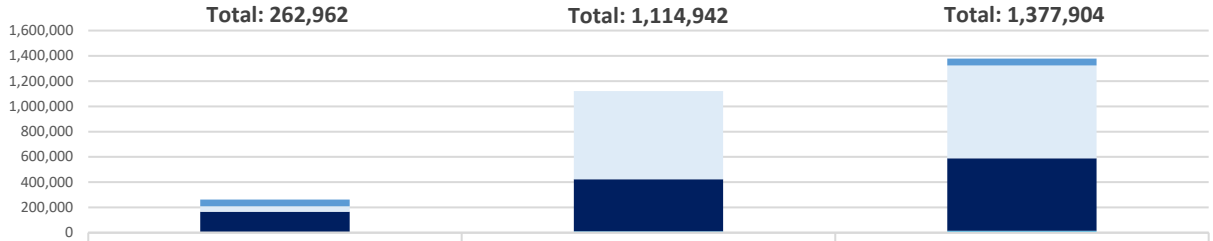
Oklahoma Total Need by System Size (in millions; January 2021 dollars)



Oklahoma Total Need by Project Category (in millions; January 2021 dollars)



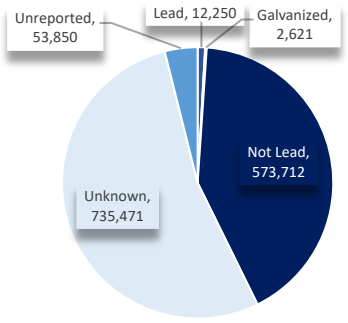
Oklahoma Estimated Service Lines by System Size



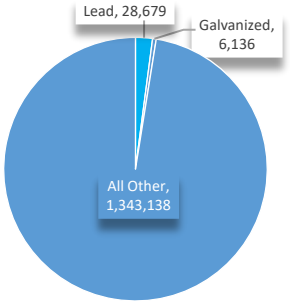
	Small Systems	Medium and Large Systems	All Systems
Unreported	53,512	338	53,850
Unknown	43,617	691,854	735,471
Not Lead	161,208	412,504	573,712
Galvanized	2,294	327	2,621
Lead	2,331	9,919	12,250

Lead Galvanized Not Lead Unknown Unreported

Oklahoma Service Lines - Estimated from Survey Responses

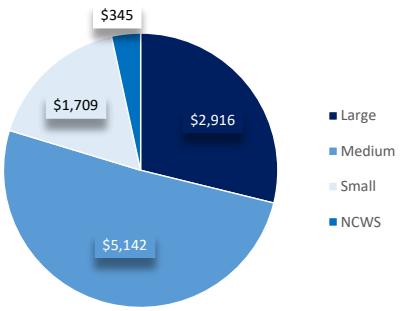


Oklahoma Projected Service Lines

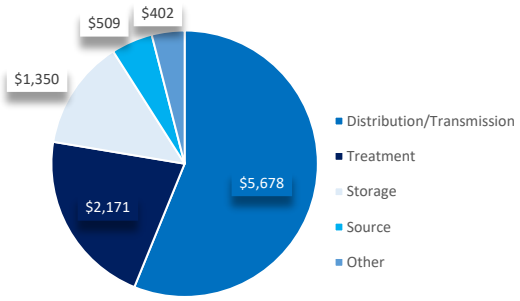


Oregon

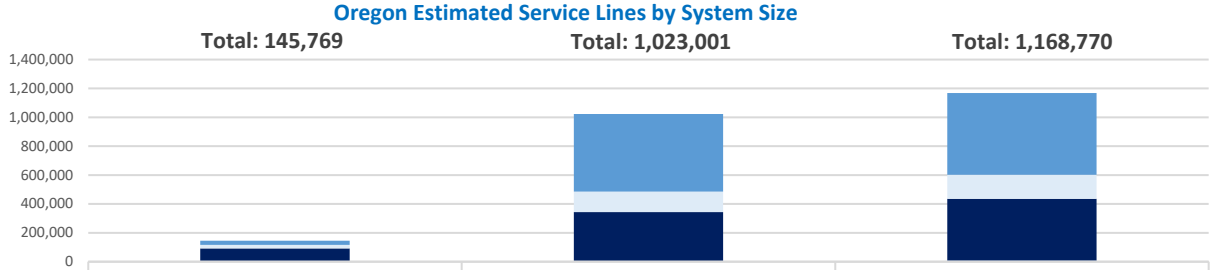
Oregon Total Need by System Size (in millions; January 2021 dollars)



Oregon Total Need by Project Category (in millions; January 2021 dollars)



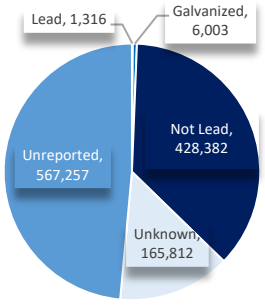
Oregon Estimated Service Lines by System Size



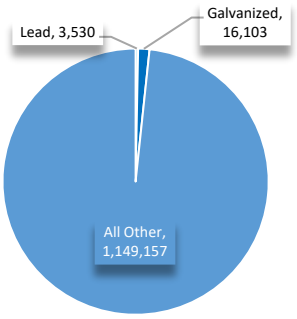
	Small Systems	Medium and Large Systems	All Systems
Unreported	29,698	537,559	567,257
Unknown	24,180	141,632	165,812
Not Lead	89,456	338,926	428,382
Galvanized	1,209	4,794	6,003
Lead	1,226	90	1,316

Lead Galvanized Not Lead Unknown Unreported

Oregon Service Lines - Estimated from Survey Responses

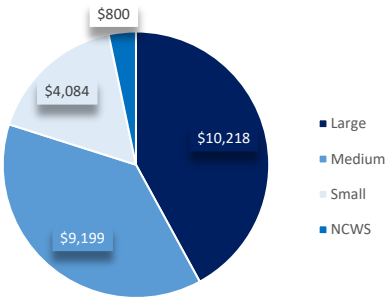


Oregon Projected Service Lines

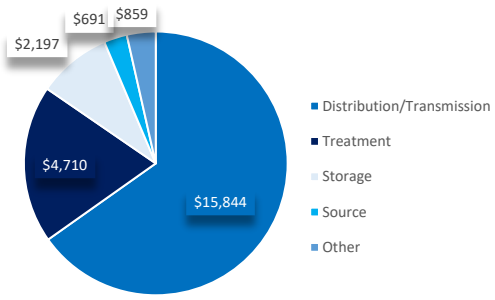


Pennsylvania

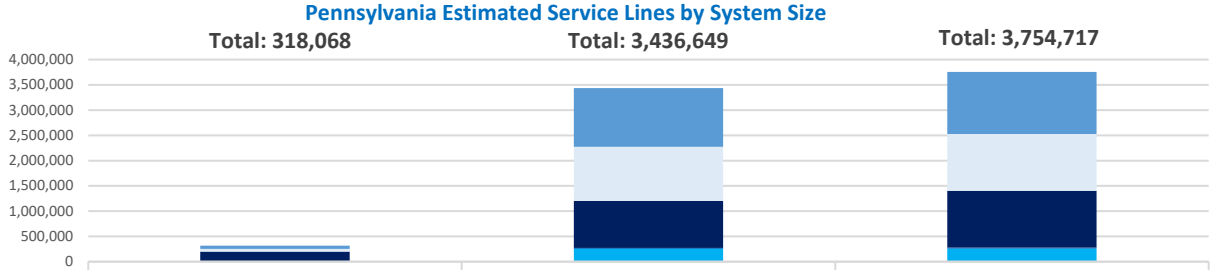
Pennsylvania Total Need by System Size (in millions; January 2021 dollars)



Pennsylvania Total Need by Project Category (in millions; January 2021 dollars)



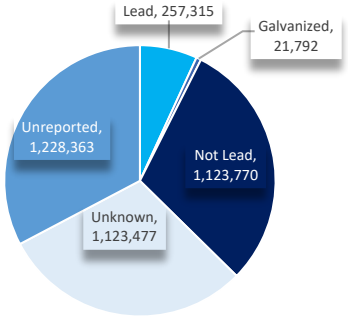
Pennsylvania Estimated Service Lines by System Size



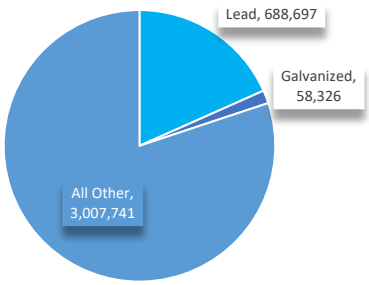
	Small Systems	Medium and Large Systems	All Systems
Unreported	64,766	1,163,597	1,228,363
Unknown	52,772	1,070,705	1,123,477
Not Lead	195,173	928,597	1,123,770
Galvanized	2,662	19,130	21,792
Lead	2,695	254,620	257,315

Lead Galvanized Not Lead Unknown Unreported

Pennsylvania Service Lines - Estimated from Survey Responses

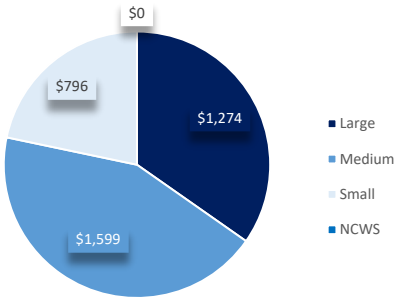


Pennsylvania Projected Service Lines

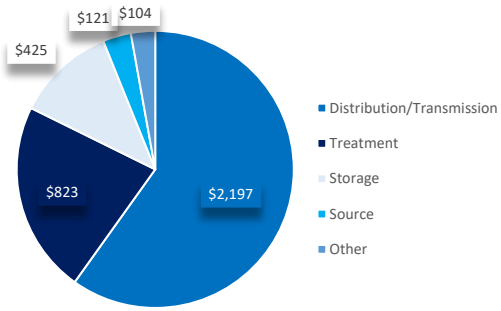


Puerto Rico

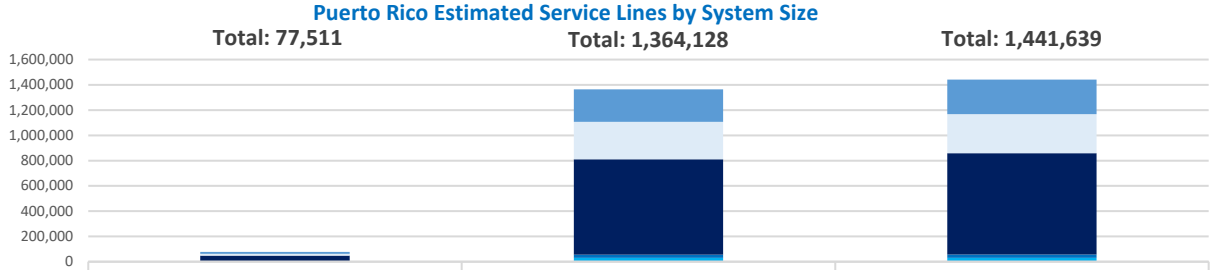
Puerto Rico Total Need by System Size (in millions; January 2021 dollars)



Puerto Rico Total Need by Project Category (in millions; January 2021 dollars)



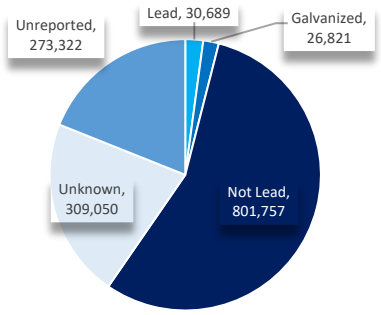
Puerto Rico Estimated Service Lines by System Size



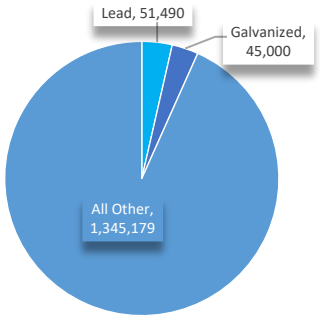
	Small Systems	Medium and Large Systems	All Systems
Unreported	15,762	257,560	273,322
Unknown	12,856	296,194	309,050
Not Lead	47,532	754,225	801,757
Galvanized	676	26,145	26,821
Lead	685	30,004	30,689

Lead Galvanized Not Lead Unknown Unreported

Puerto Rico Service Lines - Estimated from Survey Responses

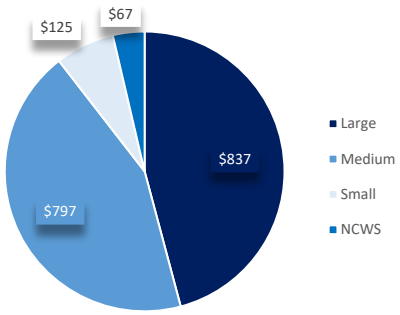


Puerto Rico Projected Service Lines

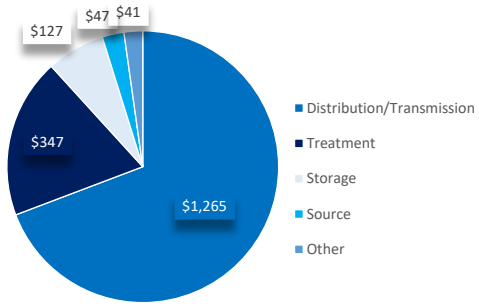


Rhode Island

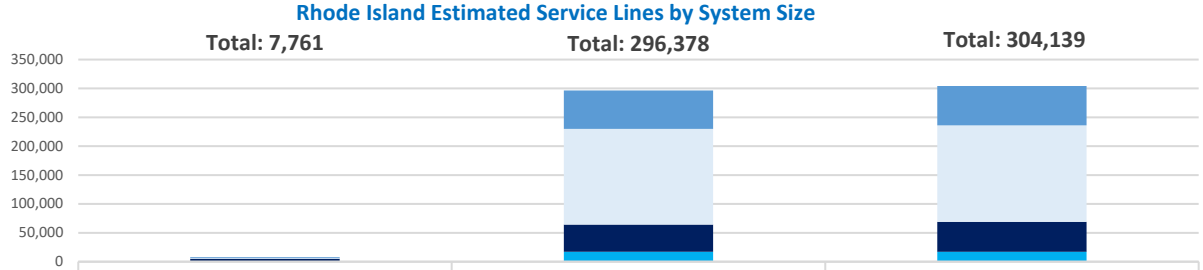
Rhode Island Total Need by System Size (in millions; January 2021 dollars)



Rhode Island Total Need by Project Category (in millions; January 2021 dollars)



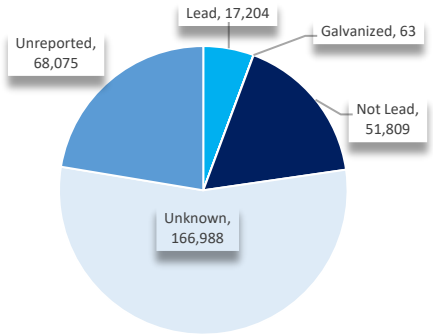
Rhode Island Estimated Service Lines by System Size



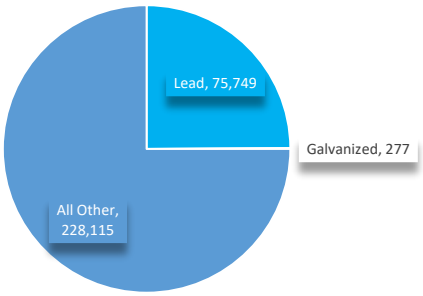
	Small Systems	Medium and Large Systems	All Systems
Unreported	1,579	66,496	68,075
Unknown	1,288	165,700	166,988
Not Lead	4,766	47,043	51,809
Galvanized	63	0	63
Lead	65	17,139	17,204

Lead Galvanized Not Lead Unknown Unreported

Rhode Island Service Lines - Estimated from Survey Responses

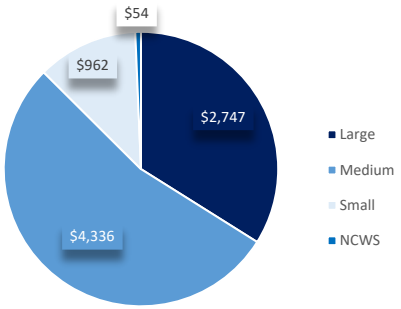


Rhode Island Projected Service Lines

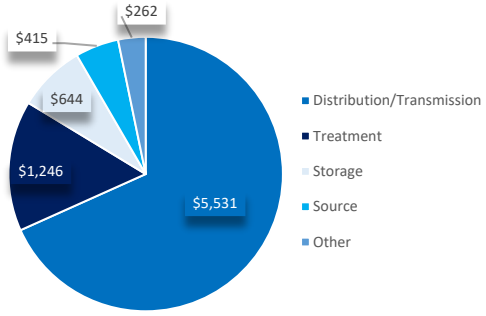


South Carolina

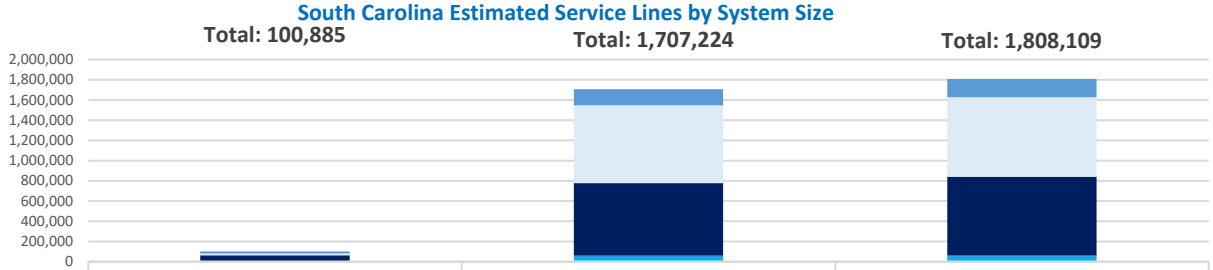
South Carolina Total Need by System Size (in millions; January 2021 dollars)



South Carolina Total Need by Project Category (in millions; January 2021 dollars)



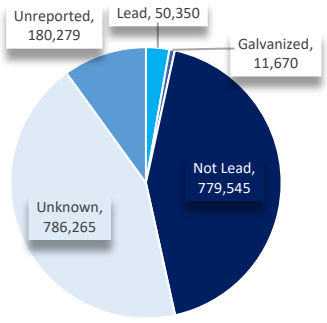
South Carolina Estimated Service Lines by System Size



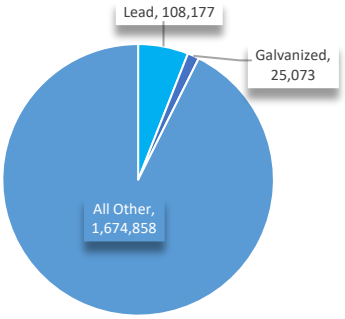
	Small Systems	Medium and Large Systems	All Systems
Unreported	20,543	159,736	180,279
Unknown	16,739	769,526	786,265
Not Lead	61,868	717,677	779,545
Galvanized	864	10,806	11,670
Lead	871	49,479	50,350

Lead Galvanized Not Lead Unknown Unreported

South Carolina Service Lines - Estimated from Survey Responses

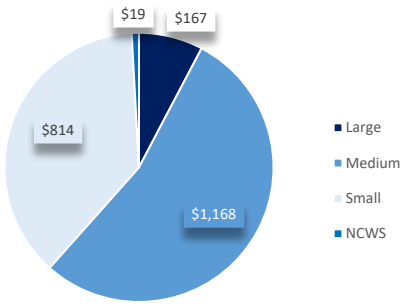


South Carolina Projected Service Lines

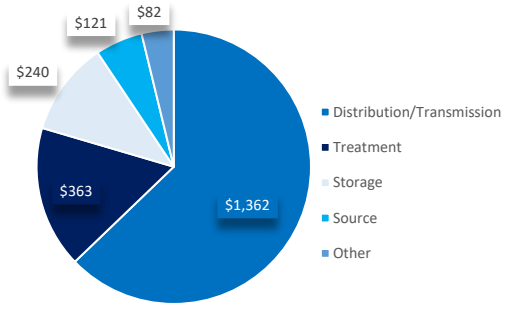


South Dakota

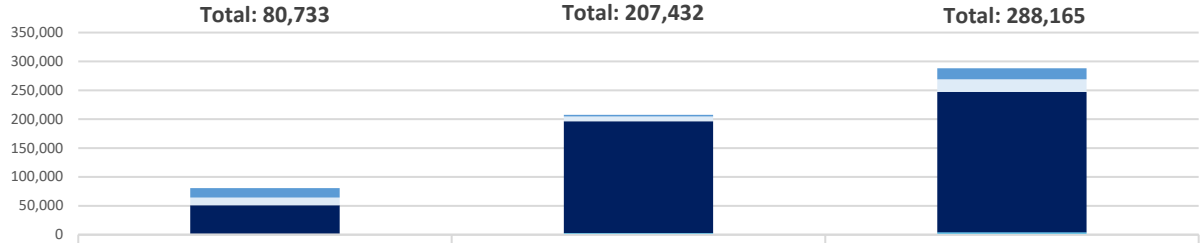
South Dakota Total Need by System Size (in millions; January 2021 dollars)



South Dakota Total Need by Project Category (in millions; January 2021 dollars)



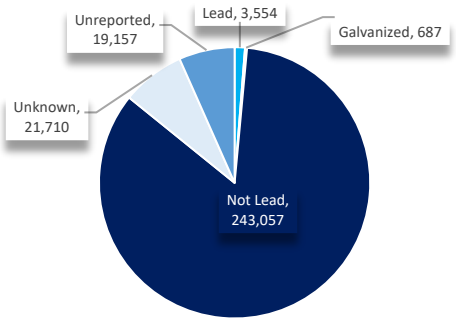
South Dakota Estimated Service Lines by System Size



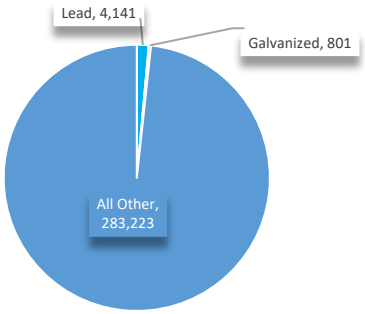
	Small Systems	Medium and Large Systems	All Systems
Unreported	16,429	2,728	19,157
Unknown	13,406	8,304	21,710
Not Lead	49,519	193,538	243,057
Galvanized	684	3	687
Lead	695	2,859	3,554

Lead Galvanized Not Lead Unknown Unreported

South Dakota Service Lines - Estimated from Survey Responses

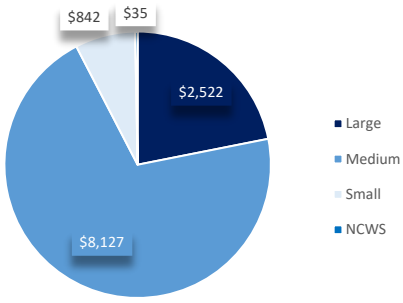


South Dakota Projected Service Lines

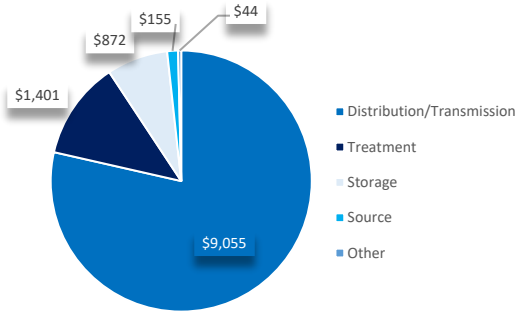


Tennessee

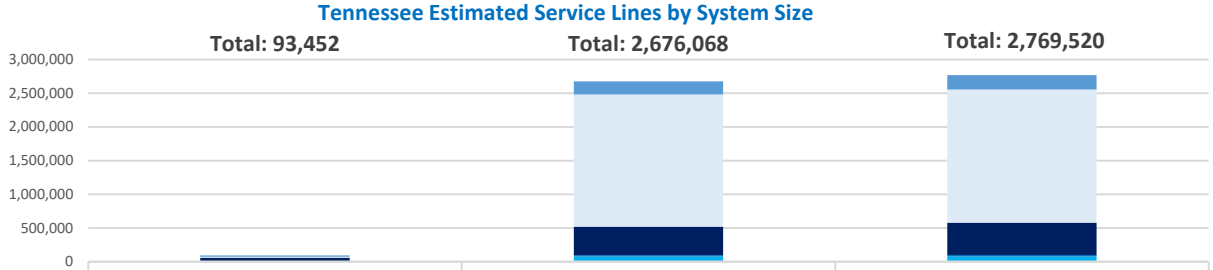
Tennessee Total Need by System Size (in millions; January 2021 dollars)



Tennessee Total Need by Project Category (in millions; January 2021 dollars)



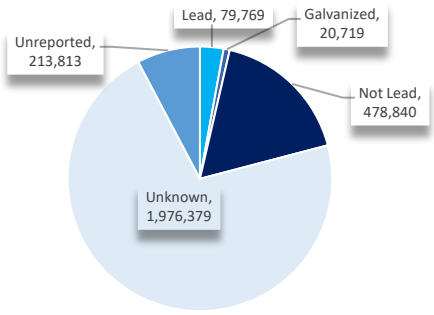
Tennessee Estimated Service Lines by System Size



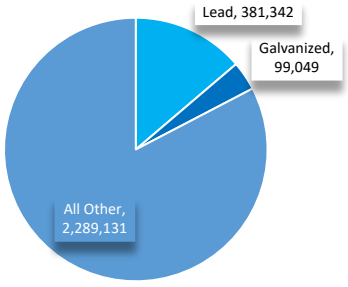
	Small Systems	Medium and Large Systems	All Systems
Unreported	19,012	194,801	213,813
Unknown	15,511	1,960,868	1,976,379
Not Lead	57,299	421,541	478,840
Galvanized	810	19,909	20,719
Lead	820	78,949	79,769

Lead Galvanized Not Lead Unknown Unreported

Tennessee Service Lines - Estimated from Survey Responses

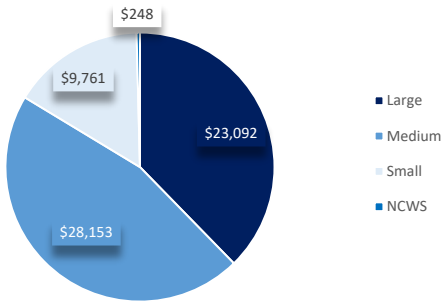


Tennessee Projected Service Lines

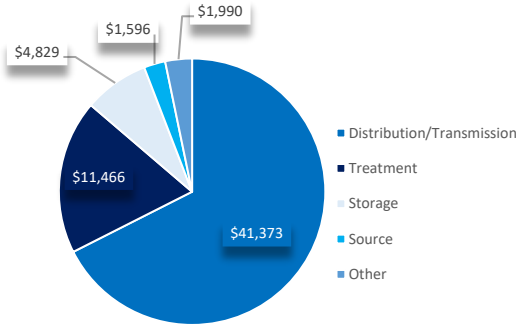


Texas

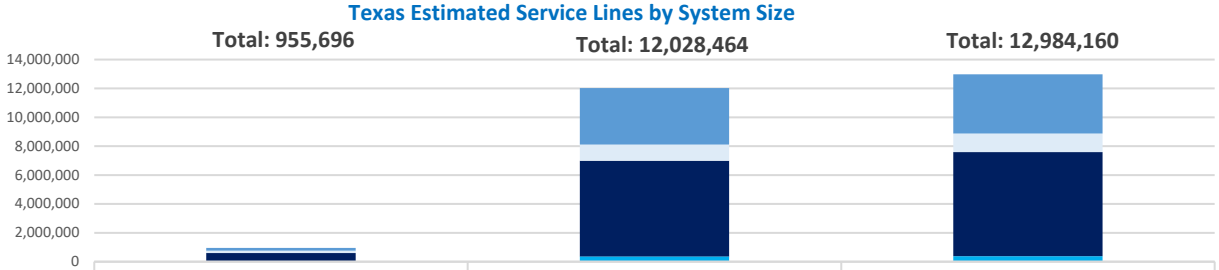
Texas Total Need by System Size (in millions; January 2021 dollars)



Texas Total Need by Project Category (in millions; January 2021 dollars)



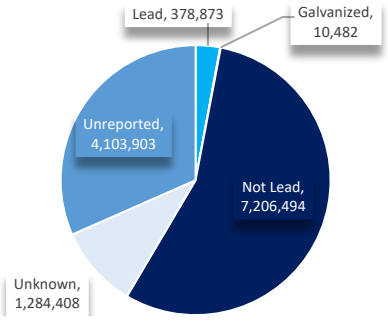
Texas Estimated Service Lines by System Size



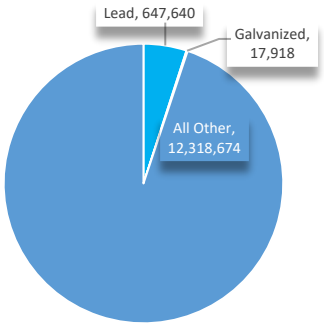
	Small Systems	Medium and Large Systems	All Systems
Unreported	194,529	3,909,374	4,103,903
Unknown	158,584	1,125,824	1,284,408
Not Lead	586,091	6,620,403	7,206,494
Galvanized	8,195	2,287	10,482
Lead	8,297	370,576	378,873

Lead Galvanized Not Lead Unknown Unreported

Texas Service Lines - Estimated from Survey Responses

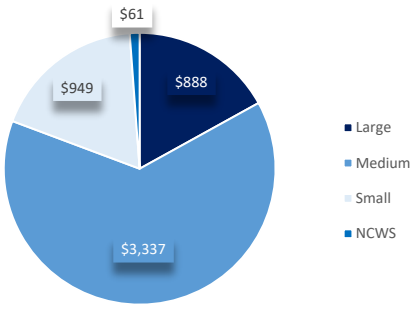


Texas Projected Service Lines

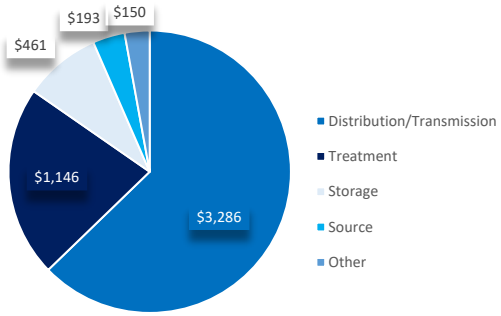


Utah

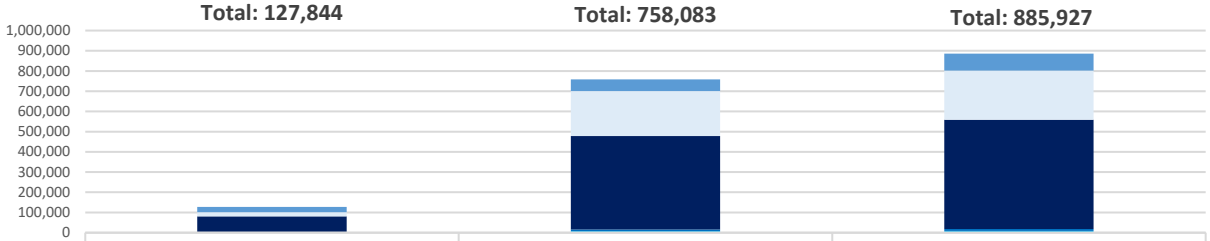
Utah Total Need by System Size (in millions; January 2021 dollars)



Utah Total Need by Project Category (in millions; January 2021 dollars)



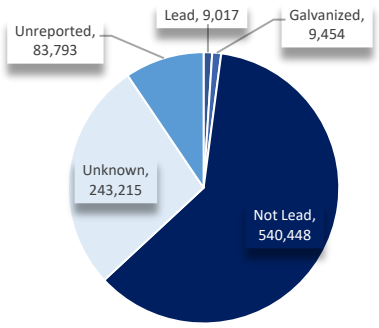
Utah Estimated Service Lines by System Size



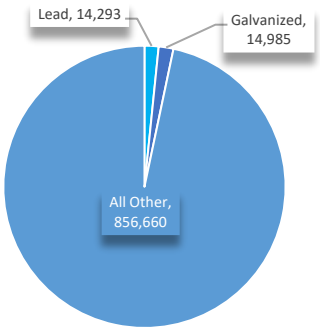
	Small Systems	Medium and Large Systems	All Systems
Unreported	26,022	57,771	83,793
Unknown	21,200	222,015	243,215
Not Lead	78,392	462,056	540,448
Galvanized	1,110	8,344	9,454
Lead	1,120	7,897	9,017

Lead Galvanized Not Lead Unknown Unreported

Utah Service Lines - Estimated from Survey Responses

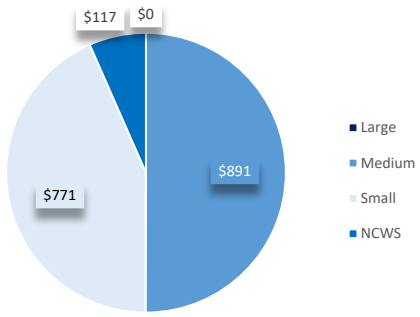


Utah Projected Service Lines

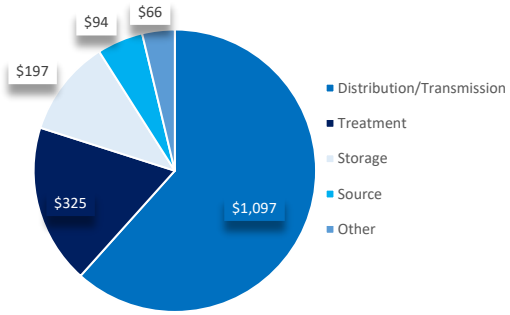


Vermont

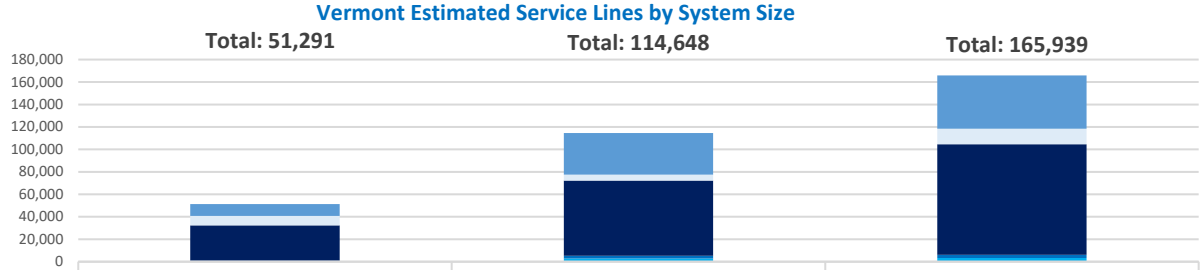
Vermont Total Need by System Size (in millions; January 2021 dollars)



Vermont Total Need by Project Category (in millions; January 2021 dollars)



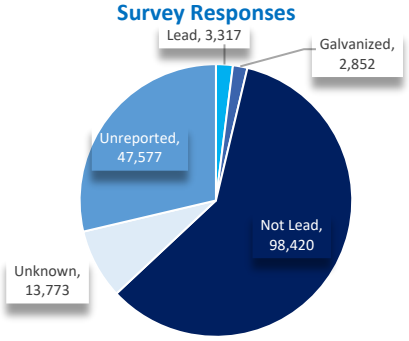
Vermont Estimated Service Lines by System Size



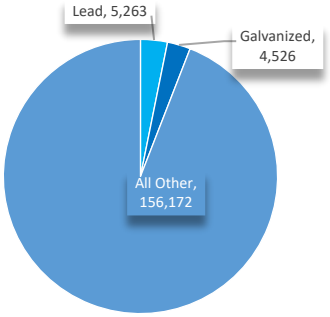
	Small Systems	Medium and Large Systems	All Systems
Unreported	10,449	37,128	47,577
Unknown	8,507	5,266	13,773
Not Lead	31,501	66,919	98,420
Galvanized	414	2,438	2,852
Lead	420	2,897	3,317

Lead Galvanized Not Lead Unknown Unreported

Vermont Service Lines - Estimated from Survey Responses

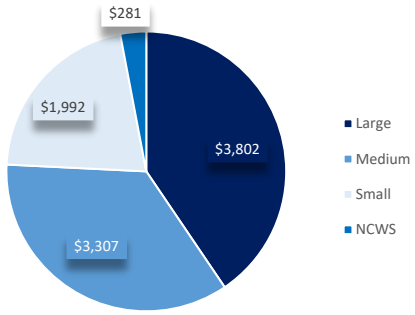


Vermont Projected Service Lines

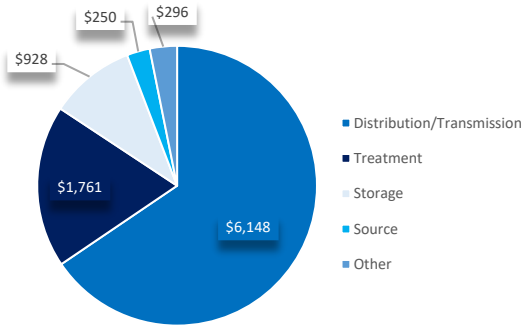


Virginia

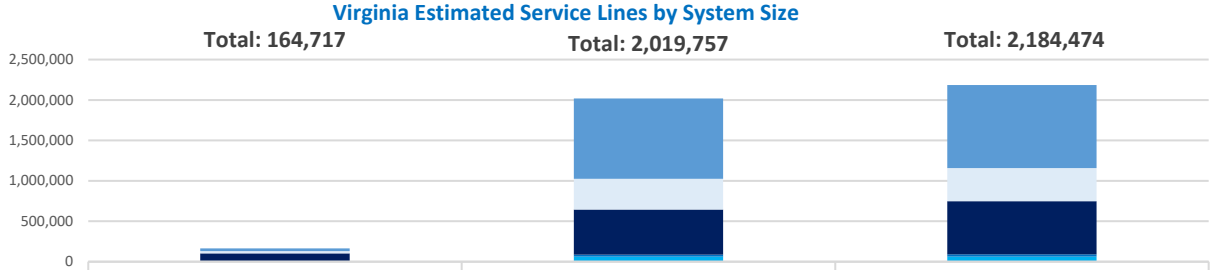
Virginia Total Need by System Size (in millions; January 2021 dollars)



Virginia Total Need by Project Category (in millions; January 2021 dollars)



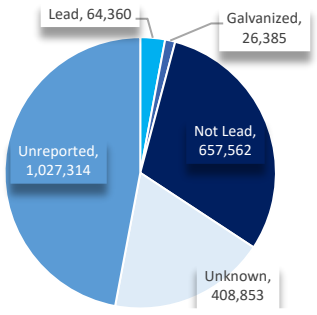
Virginia Estimated Service Lines by System Size



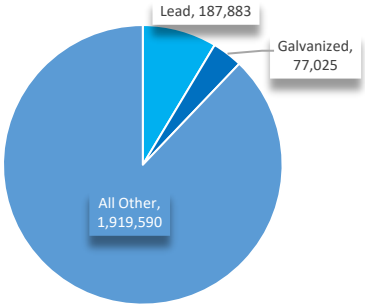
	Small Systems	Medium and Large Systems	All Systems
Unreported	33,546	993,768	1,027,314
Unknown	27,344	381,509	408,853
Not Lead	101,069	556,493	657,562
Galvanized	1,373	25,012	26,385
Lead	1,385	62,975	64,360

Lead Galvanized Not Lead Unknown Unreported

Virginia Service Lines - Estimated from Survey Responses

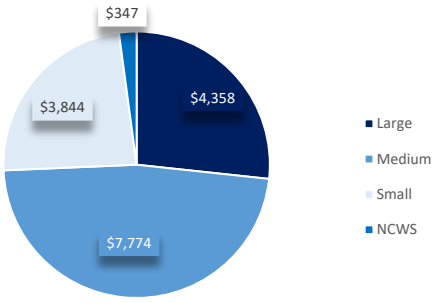


Virginia Projected Service Lines

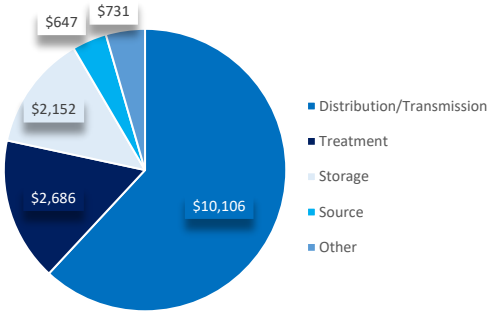


Washington

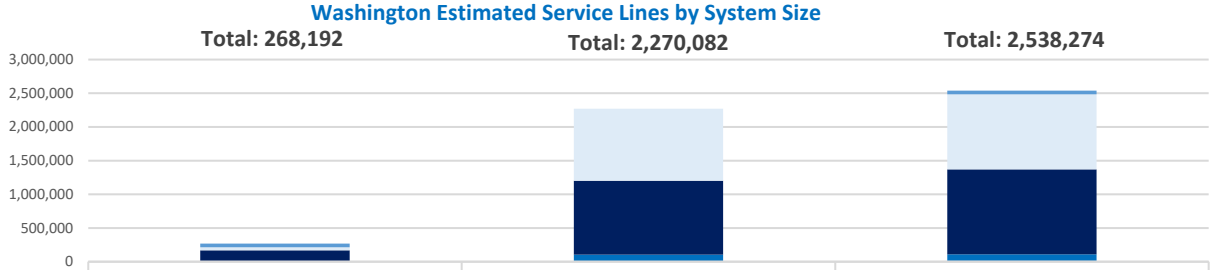
Washington Total Need by System Size (in millions; January 2021 dollars)



Washington Total Need by Project Category (in millions; January 2021 dollars)



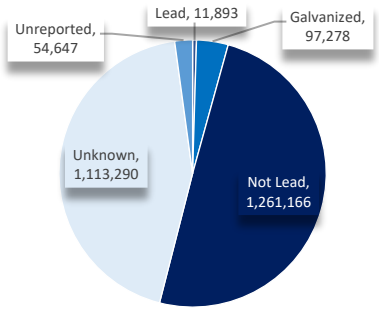
Washington Estimated Service Lines by System Size



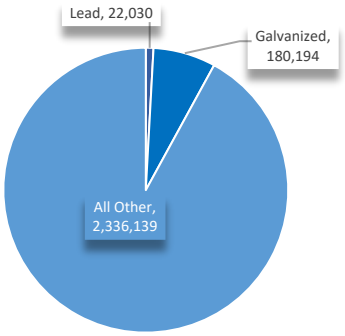
	Small Systems	Medium and Large Systems	All Systems
Unreported	54,647	0	54,647
Unknown	44,506	1,068,784	1,113,290
Not Lead	164,684	1,096,482	1,261,166
Galvanized	2,161	95,117	97,278
Lead	2,194	9,699	11,893

Lead Galvanized Not Lead Unknown Unreported

Washington Service Lines - Estimated from Survey Responses

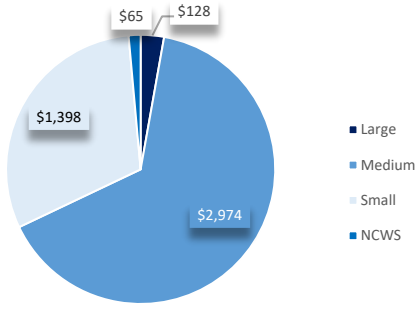


Washington Projected Service Lines

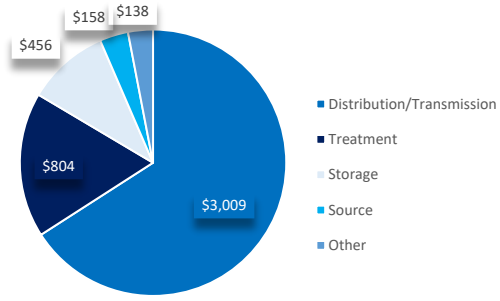


West Virginia

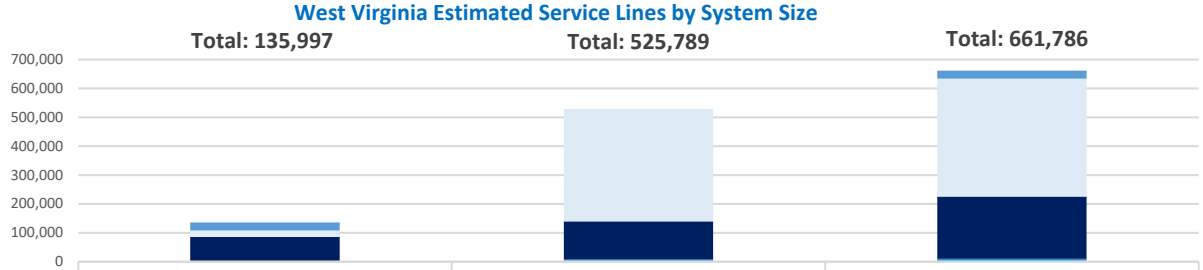
West Virginia Total Need by System Size (in millions; January 2021 dollars)



West Virginia Total Need by Project Category (in millions; January 2021 dollars)



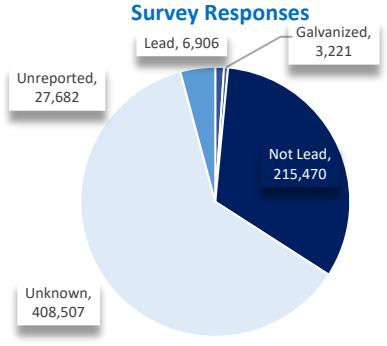
West Virginia Estimated Service Lines by System Size



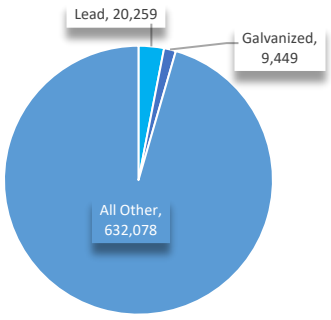
	Small Systems	Medium and Large Systems	All Systems
Unreported	27,679	3	27,682
Unknown	22,573	385,934	408,507
Not Lead	83,377	132,093	215,470
Galvanized	1,177	2,044	3,221
Lead	1,191	5,715	6,906

Lead Galvanized Not Lead Unknown Unreported

West Virginia Service Lines - Estimated from Survey Responses

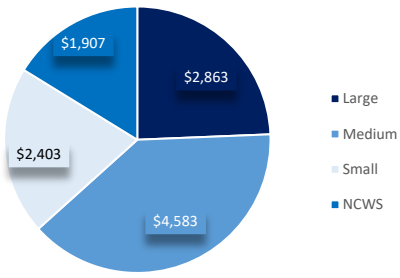


West Virginia Projected Service Lines

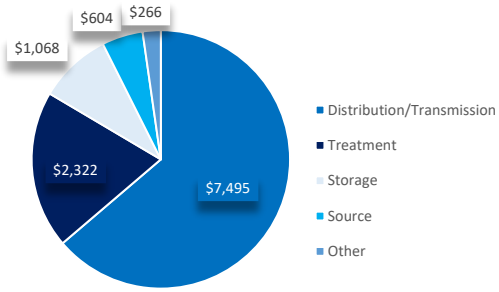


Wisconsin

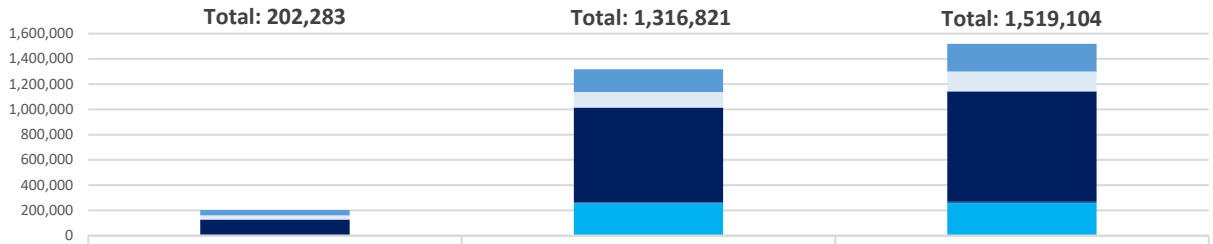
Wisconsin Total Need by System Size (in millions; January 2021 dollars)



Wisconsin Total Need by Project Category (in millions; January 2021 dollars)



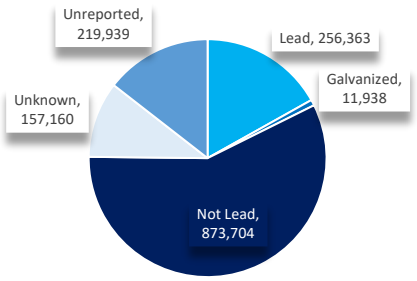
Wisconsin Estimated Service Lines by System Size



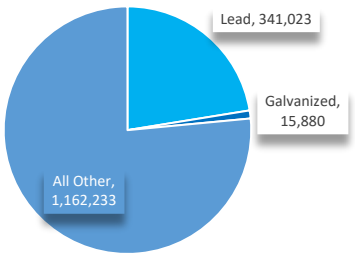
	Small Systems	Medium and Large Systems	All Systems
Unreported	41,188	178,751	219,939
Unknown	33,566	123,594	157,160
Not Lead	124,096	749,608	873,704
Galvanized	1,701	10,237	11,938
Lead	1,732	254,631	256,363

Lead Galvanized Not Lead Unknown Unreported

Wisconsin Service Lines - Estimated from Survey Responses

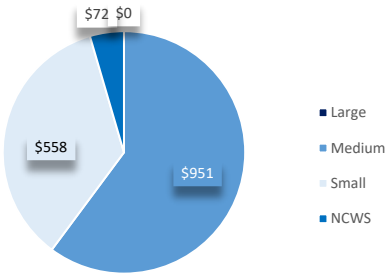


Wisconsin Projected Service Lines

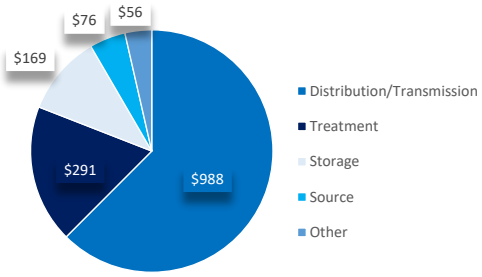


Wyoming

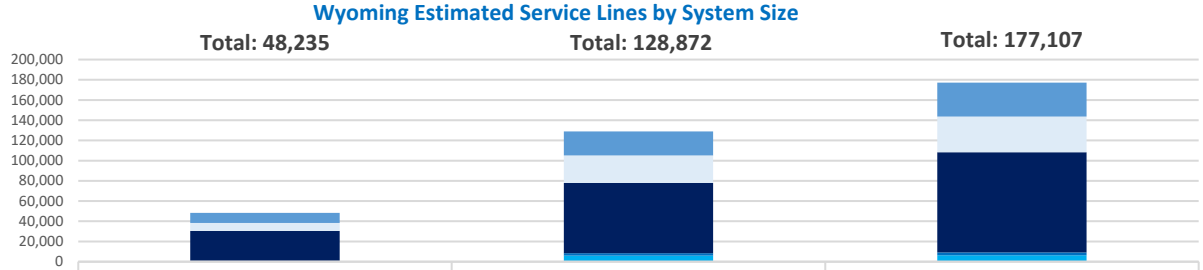
Wyoming Total Need by System Size (in millions; January 2021 dollars)



Wyoming Total Need by Project Category (in millions; January 2021 dollars)



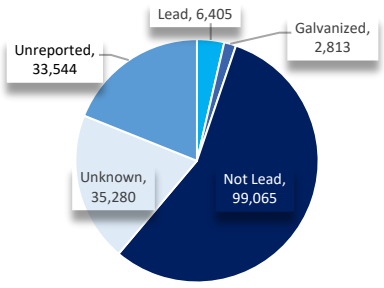
Wyoming Estimated Service Lines by System Size



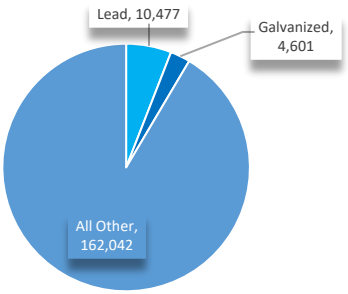
	Small Systems	Medium and Large Systems	All Systems
Unreported	9,822	23,722	33,544
Unknown	8,001	27,279	35,280
Not Lead	29,598	69,467	99,065
Galvanized	404	2,409	2,813
Lead	410	5,995	6,405

Lead Galvanized Not Lead Unknown Unreported

Wyoming Service Lines - Estimated from Survey Responses

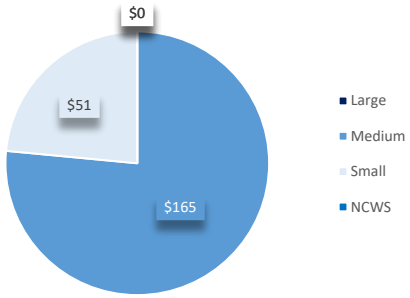


Wyoming Projected Service Lines

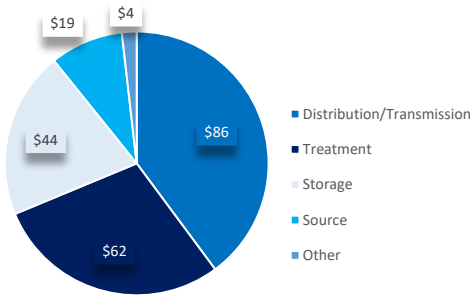


American Samoa

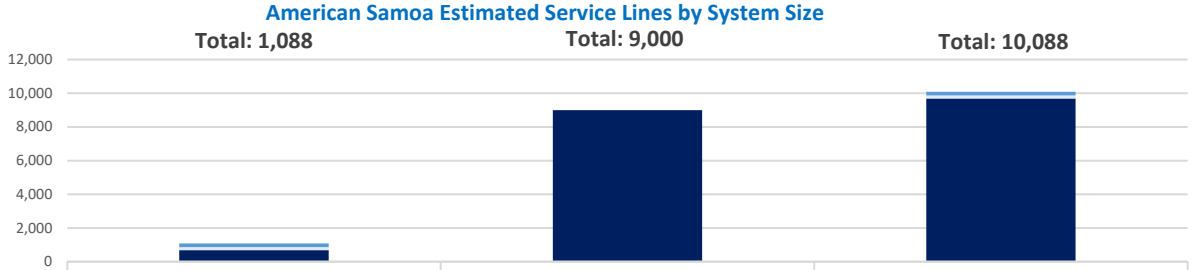
American Samoa Total Need by System Size (in millions; January 2021 dollars



American Samoa Total Need by Project Category (in millions; January 2021 dollars)



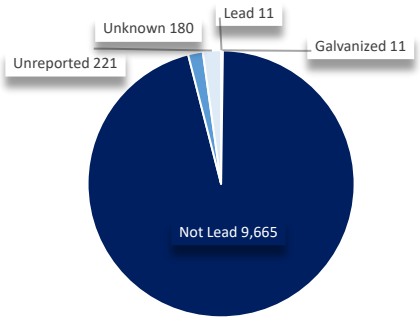
American Samoa Estimated Service Lines by System Size



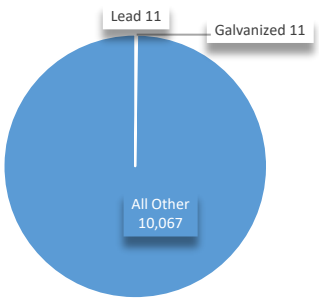
	Small Systems	Medium and Large Systems	All Systems
Unreported	221	0	221
Unknown	180	0	180
Not Lead	665	9,000	9,665
Galvanized	11	0	11
Lead	11	0	11

Lead Galvanized Not Lead Unknown Unreported

American Samoa Service Lines - Estimated from Survey Responses

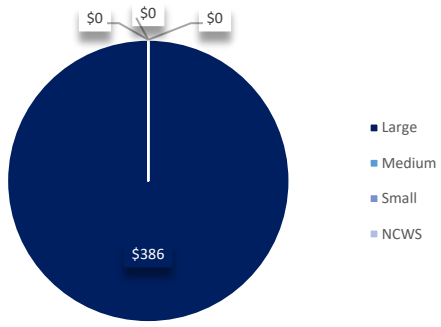


American Samoa Projected Service Lines

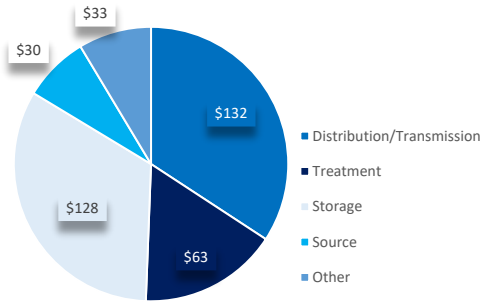


Guam

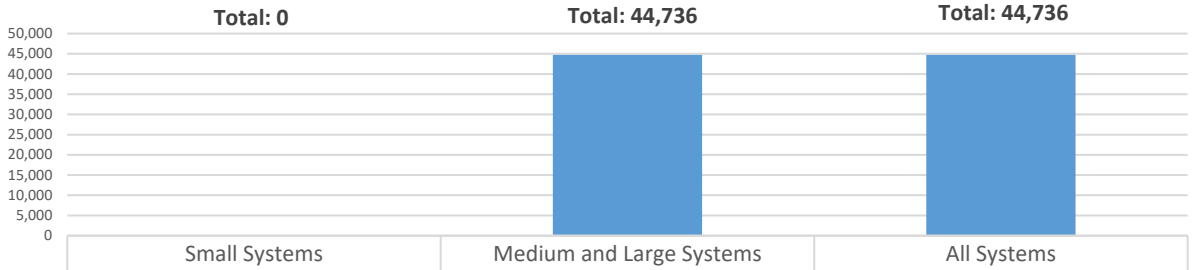
Guam Total Need by System Size (in millions; January 2021 dollars



Guam Total Need by Project Category (in millions; January 2021 dollars)



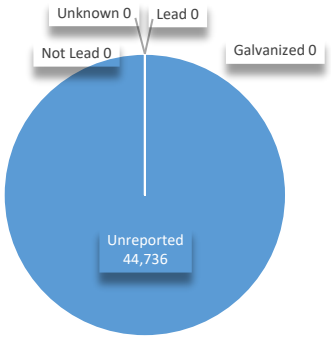
Guam Estimated Service Lines by System Size



	Small Systems	Medium and Large Systems	All Systems
Unreported	0	44,736	44,736
Unknown	0	0	0
Not Lead	0	0	0
Galvanized	0	0	0
Lead	0	0	0

Lead Galvanized Not Lead Unknown Unreported

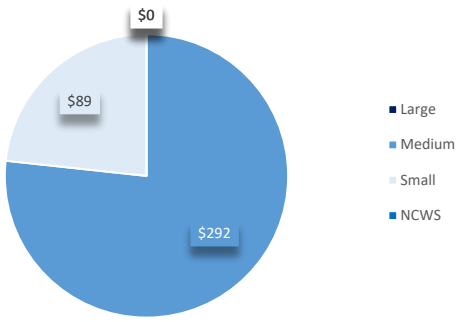
Guam Service Lines - Estimated from Survey Responses



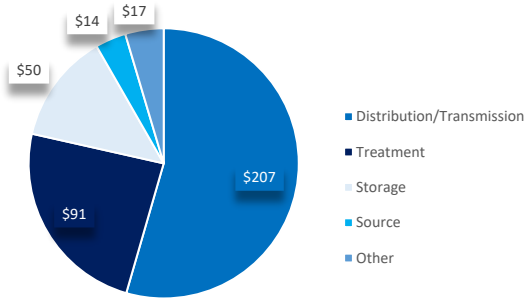
EPA projected no lead or galvanized lines because all service lines were unreported material for one large system in Guam.

Northern Mariana Islands

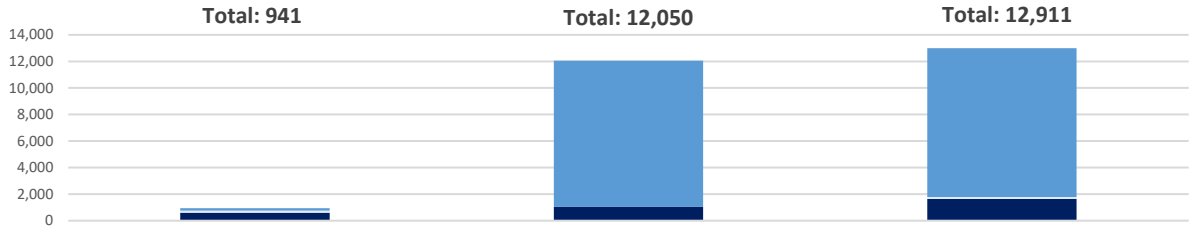
Northern Mariana Islands Total Need by System Size (in millions; January 2021 dollars



Northern Mariana Islands Total Need by Project Category (in millions; January 2021 dollars)



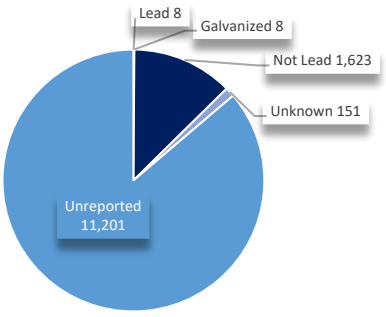
Northern Mariana Islands Estimated Service Lines by System Size



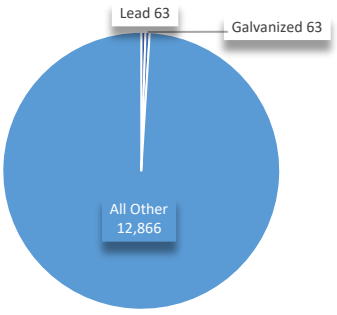
	Small Systems	Medium and Large Systems	All Systems
Unreported	185	11,016	11,201
Unknown	151	0	151
Not Lead	589	1,034	1,623
Galvanized	8	0	8
Lead	8	0	8

Lead Galvanized Not Lead Unknown Unreported

Northern Mariana Islands- Estimated from Survey Responses

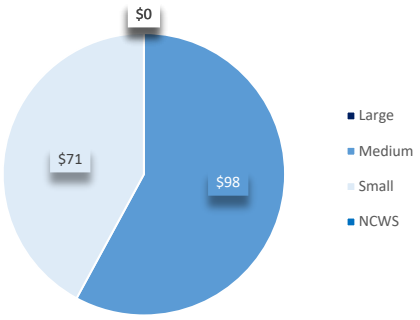


Northern Mariana Islands Projected Service Lines

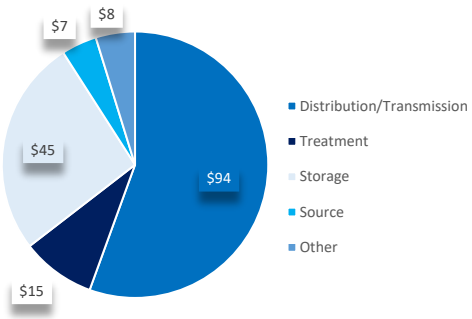


Virgin Islands

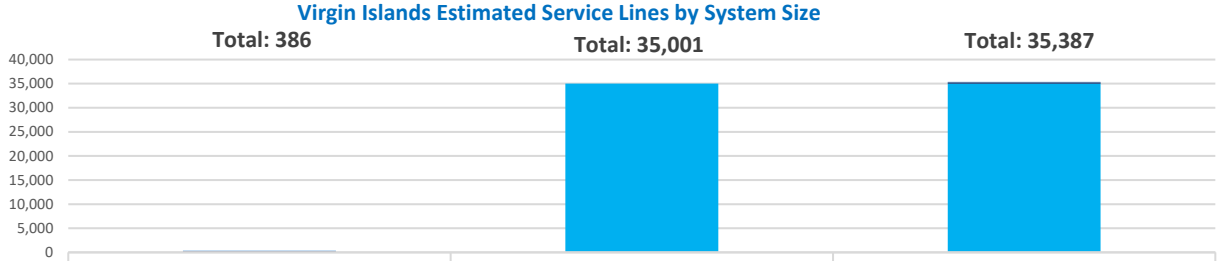
Virgin Islands Total Need by System Size (in millions; January 2021 dollars)



Virgin Islands Total Need by Project Category (in millions; January 2021 dollars)



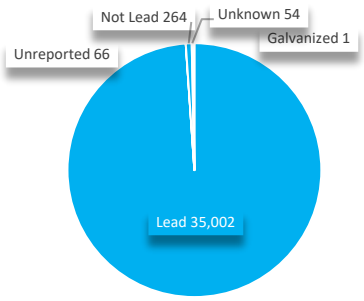
Virgin Islands Estimated Service Lines by System Size



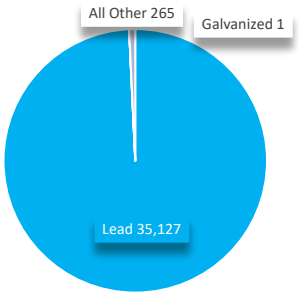
	Small Systems	Medium and Large Systems	All Systems
Unreported	66	0	66
Unknown	54	0	54
Not Lead	264	0	264
Galvanized	1	0	1
Lead	1	35,001	35,002

Lead Galvanized Not Lead Unknown Unreported

Virgin Islands Service Lines - Estimated from Survey Responses



Virgin Islands Projected Service Lines

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