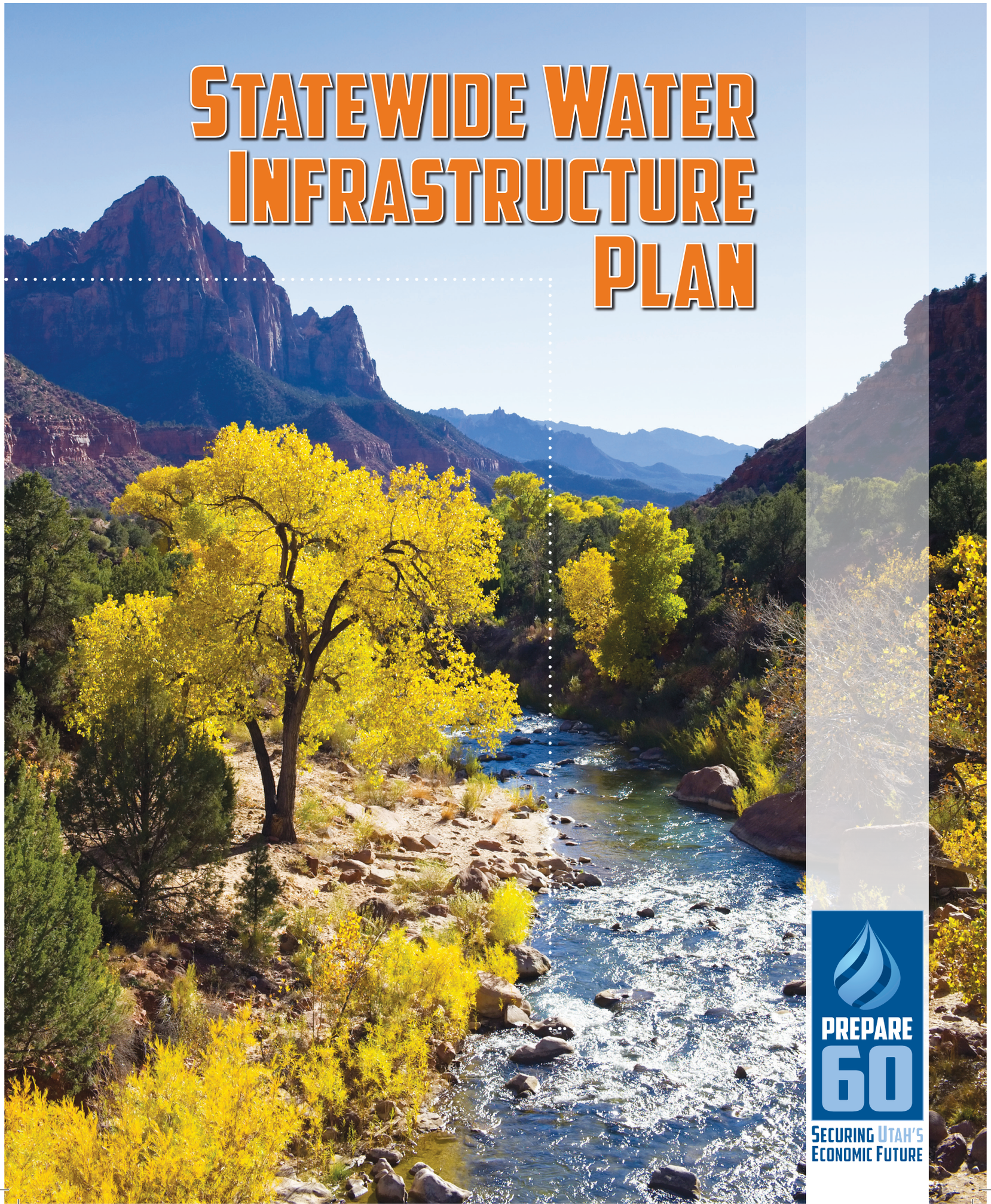
Statewide Water Infrastructure Plan



PREPARE 60

Securing Utah's Economic Future

BACKWASH RETURN
SECONDARY FILTRA
BACKWASH RETURN
N. NOLAND

Statewide Water Infrastructure Plan

Prepared by:

Utah Division of Water Resources
Central Utah Water Conservancy District
Jordan Valley Water Conservancy District
Washington County Water Conservancy District
Weber Basin Water Conservancy District
Bear River Water Conservancy District
Bear River Association of Governments
Cache County Water Department

PREPARE 60
SECURING UTAH'S ECONOMIC FUTURE

TABLE OF CONTENTS

Explanation of the Document . . . . . Page 2
Origin of Data . . . . . Page 3
Statewide Water Infrastructure Plan . . . . . Page 4
Cost Summary . . . . . Page 5
Bear River Basin Water Plan . . . . . Page 6
Cedar/Beaver Basin Water Plan . . . . . Page 7
Jordan River Basin Water Plan . . . . . Page 8
Kanab Creek/Virgin River Basin Water Plan . . . . . Page 9
Southeast Colorado River Basin Water Plan . . . . . Page 10
Sevier River Basin Water Plan . . . . . Page 11
Uintah Basin Water Plan . . . . . Page 12
Utah Lake Basin Water Plan . . . . . Page 13
Weber River Basin Water Plan . . . . . Page 14
West Colorado River Basin Water Plan . . . . . Page 15
West Desert Basin Water Plan . . . . . Page 16

Explanation of the Document

In 2013, Governor Herbert met with water managers to discuss logistics of supplying water to the six million people who are projected to live in Utah by 2060. The Governor was interested in quantifying the state's future water needs and infrastructure requirements so as to not have economic viability impeded by water scarcity. He requested a "road map" of Utah's municipal water supply and infrastructure needs in order to properly plan a path on which the water needs of our increasing population will be met. After hundreds of hours of research, the Utah Division of Water Resources and the major Water Conservancy Districts compiled this Statewide Water Infrastructure Plan. The first iteration of the document was delivered to Governor Herbert in October 2013.

This effort is considering only municipal and industrial water needs for Utah. It includes estimated infrastructure needs projections for all levels of agencies, including those of cities, counties, districts, and the state. Other water-related needs such as storm and waste water infrastructure and agricultural demands are not quantified in this analysis.

The contributing agencies intend for this to be a dynamic document that is updated periodically as new data is available. Planning, budget, and audit information initially gathered will change, and updated versions will follow.

In order to keep the information as succinct as possible, the document geographically separates the state into major river basins and offers information on one page per basin. Projected values for population, water conservation, per capita use, annual water demand, new supply infrastructure costs, and repair and replacement costs are included for each basin.

Origin of Data

A technical work group was assembled to prepare cost estimates for future water supply projects and repair/replacement projects for each river basin. The Utah Division of Water Resources (DWRe) prepared population projections for each of the river basin planning areas based on data from the Governor's Office of Management and Budget – 2012 Baseline Report. DWRe also prepared water consumption rate (gallons per capita per day) projections for each river basin assuming that conservation goals will be achieved. The entities that developed the cost estimates for the respective river basins are listed below:

Bear River Basin:	Bear River Water Conservancy District, Bear River Association of Governments, and Cache County Water Department
Cedar/Beaver Basin:	DWRe
Jordan River Basin:	Jordan Valley Water Conservancy District
Kanab Creek/Virgin River Basin:	Washington County Water Conservancy District
Sevier River Basin:	Central Utah Water Conservancy District
Southeast Colorado River Basin:	DWRe
Uintah Basin:	Duchesne County Water Conservancy District, Uintah County Water Conservancy District, and Central Utah Water Conservancy District
Utah Lake Basin:	Central Utah Water Conservancy District
Weber River Basin:	Weber Basin Water Conservancy District
West Colorado River Basin:	DWRe
West Desert Basin:	DWRe

DWRe had previously compiled a list of future water supply, waste water, and storm water projects referred to as the "$20 Billion list." Projects identified on the list were submitted in response to survey requests over the last several years by Division of Water Quality, Division of Drinking Water, and DWRe. The surveys were voluntary, and many water supply agencies did not submit any response to the survey so the "$20 Billion list" served only as one of several sources of information. The availability of reliable data upon which to base the cost estimates varied for each river basin, so it was not possible for the technical group to use a completely uniform method for every river basin. A general summary of the methods used is described in the paragraphs below, and the individual river basin summary sheets also contain some additional explanatory notes.

With respect to repair and replacement project costs, representatives of the technical group contacted some of the major water suppliers in their respective river basins to request any master plan information that could be used to develop the estimates. In some cases, master plan information that was available was extrapolated to estimate the needs of the entire river basin. In other cases, information on the financial "book value" of water system infrastructure was gleaned from city and water district comprehensive financial reports published on the Utah State Auditor's website. A percentage of the book value (usually 2%-4%) was calculated to represent the annual repair and replacement cost that would be needed to keep the infrastructure in functional condition.

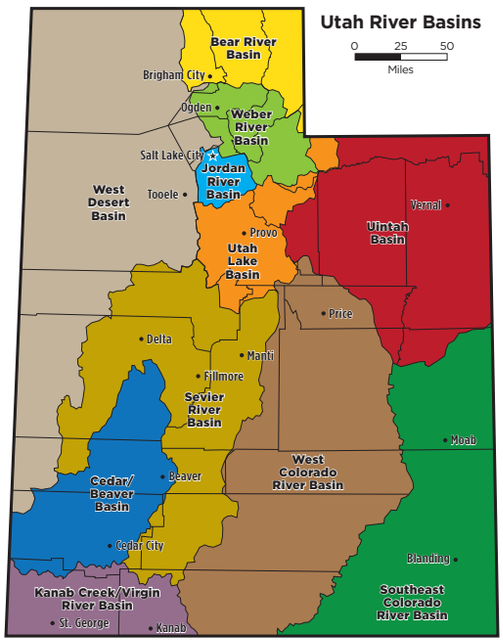
With respect to new water supply project costs, previously-developed estimates for large projects with a defined scope and yield were used for the applicable river basins. However, large new supply projects that have defined scopes and target yields made up only a portion of the gap between the new demands and available supplies. Cost estimates for other, yet to be defined new water supply projects were generally based on an approximate cost of $10,000/acre-foot* for new supply development projects or by extrapolating limited master plan information.

**Central Utah Water Conservancy District has recently developed the first phase of a major new regional water supply project. The total cost of that project including acquisition of water rights, groundwater development, and surface water treatment features is approximately $10,000/acre-foot.*

Statewide Water Infrastructure Plan

To prepare for substantial population growth, several state and municipal water entities prepared a 50-year (2010-2060) plan for all municipal and industrial water in Utah.

PREPARE 60
SECURING UTAH'S ECONOMIC FUTURE



The statewide plan, organized by river basin (at left), lists projected per capita water use, conservation achievements and new water development projects for each decade.

Actions needed for each basin include:

- Water conservation
- Repair and replacement of aging infrastructure
- Agricultural water transfers and water reuse
- Development of new infrastructure and water supplies, both local and regional

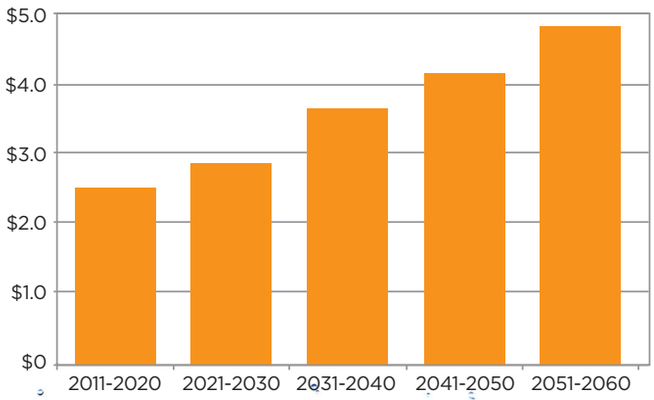
Estimated Statewide Costs:

$33 Billion

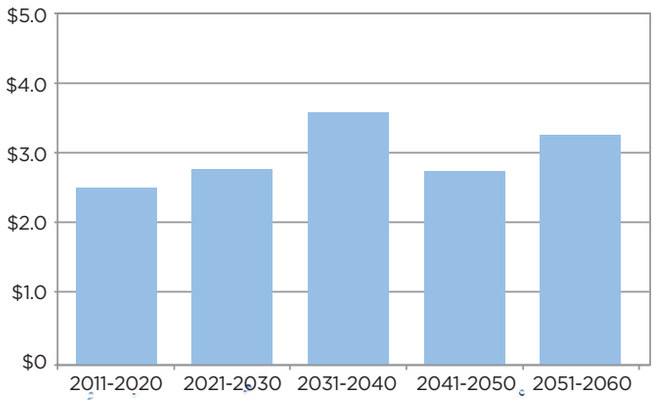
$18 Billion – Repair and replacement of aging infrastructure

$15 Billion – New infrastructure and supplies

Statewide Cost Projections by Decade for Repair and Replacement in Billions of Dollars

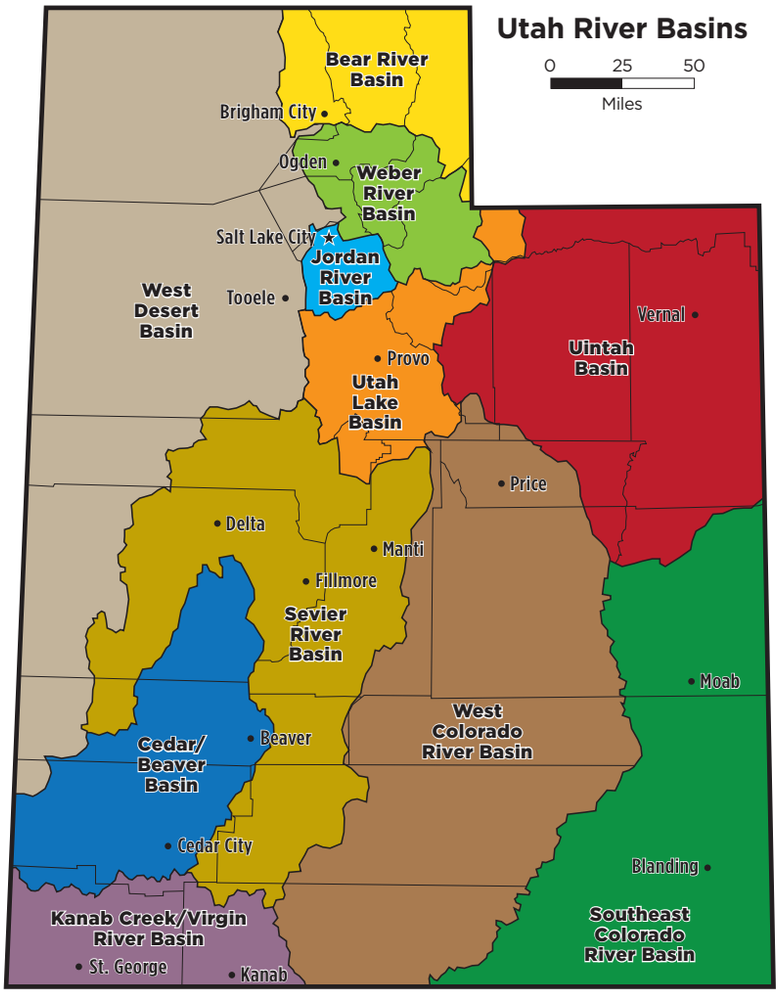


Total Spent on New Supply Capital Projects Statewide in Billions of Dollars



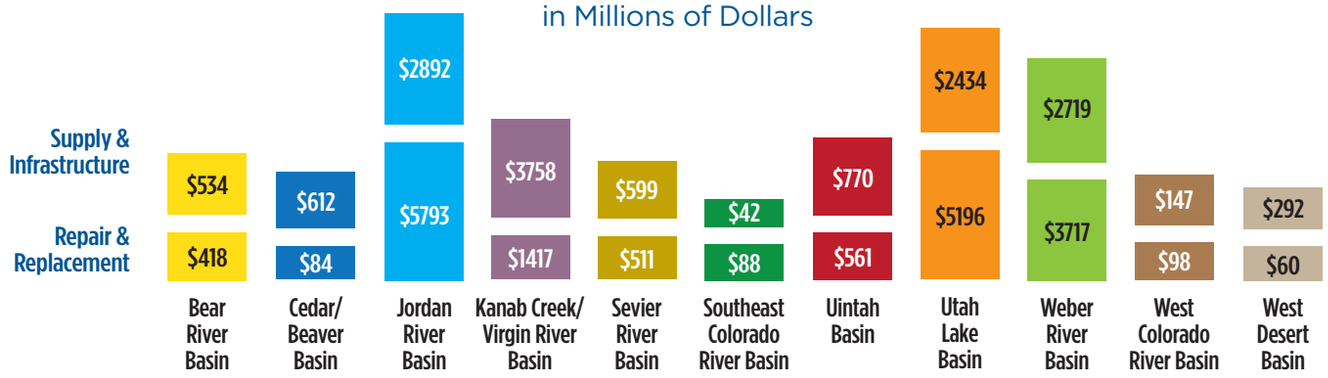
Cost Summary

Below is a summary of anticipated costs, by river basin, for this report. The remainder of this report provides detailed cost breakdowns for each river basin.



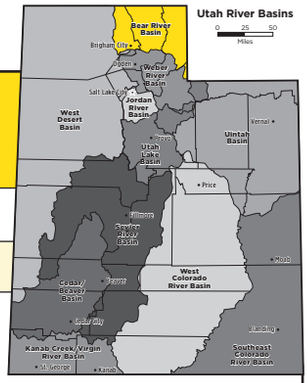
INVESTMENT NEEDED

in Millions of Dollars



Securing the Next Generation's Water = $33 Billion

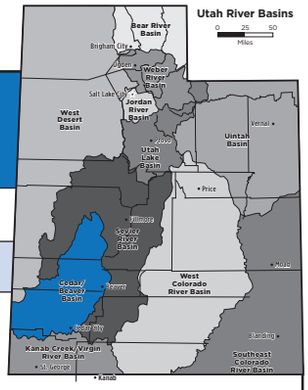
Bear River Basin Water Plan



Decade	Population (ending) [1]	Conservation Goal [2]	Per Capita Use (GPCD) [3]	M&I Water Use (AF/yr) [3]	Additional Water Demand (AF/yr) [4]	Projected Water Project Costs [5] (millions [6])		Actions Needed (by)
						Supply & Infrastructure	Repair & Repacement	
2000[7]	126,420	0%	70 | 205 | 297	10,000 | 29,000 | 42,000	—	—	—	
2001-2010	156,930	4%	61 | 197 | 284	11,000 | 35,000 | 50,000	—	—	—	
2011-2020	188,330	18%	55 | 168 | 242	10,000 | 35,000 | 51,000	1,000	$85.1	$96.8	• Repair and Replacement (cities, counties) • Growth-Related Infrastructure (cities) • Groundwater Development/ Aquifer Storage and Recovery • Waste Water Reuse • Water Rights, Stock Acquisitions & Agricultural Water Conversion • Conservation & Watershed Protection (cities) • New reservoir (ACME Water Company) • Mantua Reservoir Capacity Study (Brigham City) • Perry City Water System • Water System Expansion (South Willard)
2021-2030	222,380	25%	53 | 154 | 222	13,000 | 38,000 | 55,000	4,000	$138.8	$50.8	• Repair and Replacement (cities, counties) • Growth-Related Infrastructure (cities) • Groundwater Development/Aquifer Storage and Recovery • Waste Water Reuse • Water Rights, Stock Acquisitions & Agricultural Water Conversion • Conservation & Watershed Protection (cities) • Tremonton City Corporation – Master Plan
2031-2040	256,370	25%	53 | 154 | 222	15,000 | 44,000 | 63,000	8,000	$145.6	$89.3	• Repair and Replacement (cities, counties) • Growth-Related Infrastructure (cities) • Groundwater Development/Aquifer Storage and Recovery • Waste Water Reuse • Water Rights, Stock Acquisitions & Agricultural Water Conversion • Conservation & Watershed Protection (cities) • Bear River Project-Preconstruction & Option Preservation • Collinston Project Phases 1-4 (BRWCD) • Marble Hills Pipeline (BRWCD) • RDA Project Water Supply Pipeline Phases 1-2 (BRWCD) • Harper Ward, S. Willard and Bothwell System Improvement (BRWCD)
2041-2050	298,410	25%	53 | 154 | 222	18,000 | 51,000 | 74,000	11,000	$81.3	$83.8	• Repair and Replacement (cities, counties) • Growth-Related Infrastructure (cities) • Groundwater Development/Aquifer Storage and Recovery • Waste Water Reuse • Water Rights, Stock Acquisitions & Agricultural Water Conversion • Conservation & Watershed Protection (cities) • Bear River Project
2051-2060	346,660	25%	53 | 154 | 222	20,000 | 60,000 | 86,000	12,000	$83.4	$97.7	• Repair and Replacement (cities, counties) • Growth-Related Infrastructure (cities) • Groundwater Development/Aquifer Storage and Recovery • Waste Water Reuse • Water Rights, Stock Acquisitions & Agricultural Water Conversion • Conservation & Watershed Protection (cities) • Bear River Project
					43,000	**$534.2**	**$418.4**	

1) Population ending data from Governor's Office of Management and Budget
2) Percentage reduction from 2000 per captia use, at end of decade, per state goal of 25% by 2025
3) Gallons per capita per day calculated by DWRe; first number is residential indoor use; second number is residential indoor and outdoor use (inc secondary); third number is residential indoor and outdoor plus commercial, industrial, and institutional (CI&I)
4) The aggregate water supply needed in addition to previous decade to meet demands of the decade for the basin as a whole; conditions may exist where shortages in one area of the basin cannot be met by the surpluses in another
5) Box Elder County costs were derived from financial statements available through the Utah State Auditor's website and growth projections from the Utah Governor's Office of Management and Budget. Projected water project costs for Cache and Rich counties were based on averaged per capita figures derived from existing community data in each county, respectively
6) In 2013 dollars
7) 2000 is the baseline year; 2000 and 2010 data are current approximations for those decades; 2011-2060 data is projected

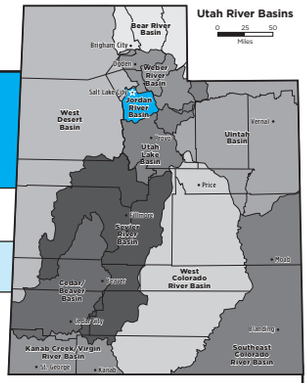
Cedar/Beaver Basin Water Plan



Decade	Population (ending) [1]	Conservation Goal [2]	Per Capita Use (GPCD) [3]	M&I Water Use (AF/yr) [3]	Additional Water Demand (AF/yr) [4]	Projected Water Project Costs [5] (millions [6])		Actions Needed (by)
						Supply & Infrastructure	Repair & Repacement	
2000[7]	26,540	0%	71 | 283 | 404	2,000 | 8,000 | 12,000	—	—	—	
2001-2010	50,130	29%	58 | 200 | 285	3,000 | 11,000 | 16,000	—	—	—	
2011-2020	61,914	31%	55 | 197 | 274	4,000 | 14,000 | 19,000	3,000	$37.6	$14.5	• Repair and Replacement (cities) • Growth-Related Infrastructure (cities) • Conservation & Watershed Protection (cities, UDWR) • Water Rights, Stock Acquisitions (cities)
2021-2030	77,746	32%	53 | 194 | 276	5,000 | 17,000 | 24,000	5,000	$50.0	$17.3	• Repair and Replacement (cities) • Growth-related infrastructure (cities) • Conservation & Watershed Protection (cities, UDWR) • Water Rights, Stock Acquisitions (cities)
2031-2040	94,261	33%	53 | 190 | 265	6,000 | 20,000 | 28,000	4,000	$393.1	$17.4	• Repair and Replacement (cities) • Growth-related infrastructure (cities) • Water Rights, Stock Acquisitions (cities) • Conservation & Watershed Protection (cities, UDWR) • Cedar City Water System Master Plan
2041-2050	113,959	34%	53 | 187 | 266	7,000 | 24,000 | 34,000	6,000	$60.0	$17.3	• Repair and Replacement (cities) • Growth-related infrastructure (cities) • Water Rights, Stock Acquisitions (cities) • Conservation & Watershed Protection (cities, UDWR)
2051-2060	137,121	35%	53 | 184 | 260	8,000 | 28,000 | 40,000	6,000	$71.0	$17.1	• Repair and Replacement (cities) • Water Rights, Stock Acquisitions (cities) • Conservation & Watershed Protection (cities, UDWR) • Growth-related infrastructure (cities)
					24,000	**$611.7**	**$83.6**	

1) Population ending data from Governor's Office of Management and Budget
2) Percentage reduction from 2000 per captia use, at end of decade, per state goal of 25% by 2025
3) Gallons per capita per day calculated by DWRe; first number is residential indoor use; second number is residential indoor and outdoor use (inc secondary); third number is residential indoor and outdoor plus commercial, industrial, and institutional (CI&I)
4) The aggregate water supply needed in addition to previous decade to meet demands of the decade for the basin as a whole; conditions may exist where shortages in one area of the basin cannot be met by the surpluses in another
5) From list compiled by UDWR, State Auditor reports, 2011-2020 are numbers based on city/county data; funding increased by same percentage as population growth after 2020
6) In 2013 dollars
7) 2000 is the baseline year; 2000 and 2010 data are current approximations for those decades; 2011-2060 data is projected

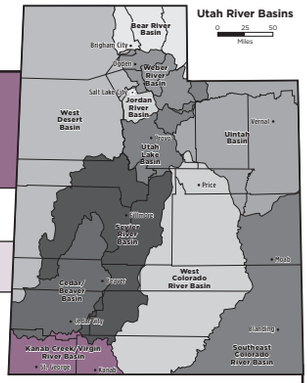
Jordan River Basin Water Plan



Decade	Population (ending) [1]	Conservation Goal [2]	Per Capita Use (GPCD) [3]	M&I Water Use (AF/yr) [3]	Additional Water Demand (AF/yr) [4]	Projected Water Project Costs [5] (millions [6])		Actions Needed (by)
						Supply & Infrastructure	Repair & Repacement	
2000[7]	879,850	0%	70 | 183 | 264	69,000 | 180,000 | 260,000	—	—	—	
2001-2010	1,031,130	18%	62 | 150 | 216	72,000 | 173,000 | 249,000	—	—	—	
2011-2020	1,182,809	23%	56 | 142 | 203	74,000 | 188,000 | 269,000	20,000	$443.6	$617.9	• Repair and Replacement (cities, districts) • Growth-Related Infrastructure (cities, districts) • Groundwater Development (cities, districts) • PRCEP, SWJVGW Project, and CWP supplies (districts) • Conservation (cities, districts, DWRe) • Bear River Project-Preconstruction & Option Preservation (DWRe, JVWCD) • Watershed Protection (cities, districts)
2021-2030	1,343,129	25%	53 | 138 | 197	80,000 | 208,000 | 296,000	27,000	$659.4	$851.3	• Repair and Replacement (cities, districts) • Growth-Related Infrastructure (cities, districts) • Groundwater Development (cities, districts) • Conservation (cities, districts, DWRe) • Bear River Project-Preconstruction (DWRe, JVWCD) • ULS Supplies & related infrastructure (JVWCD, MWDSLS) • Watershed Protection (cities, districts)
2031-2040	1,511,049	25%	53 | 138 | 197	90,000 | 234,000 | 333,000	37,000	$833.0	$1,191.2	• Repair and Replacement (cities, districts) • Growth-Related Infrastructure (cities, districts) • Groundwater Development (cities, districts) • Conservation (cities, districts, DWRe) • Bear River Project- Ph 1 Completion (DWRe, JVWCD) • Jordan River Ph 1 WTP (JVWCD) • Watershed Protection (cities, districts)
2041-2050	1,663,245	25%	53 | 138 | 197	99,000 | 257,000 | 367,000	34,000	$452.0	$1,487.3	• Repair and Replacement (cities, districts) • Growth-Related Infrastructure (cities, districts) • Groundwater Development (cities, districts) • Conservation (cities, districts, DWRe) • Bear River Project- Ph 2 Completion (DWRe, JVWCD) • Watershed Protection (cities, districts)
2051-2060	1,817,143	25%	53 | 138 | 197	108,000 | 281,000 | 401,000	34,000	$504.0	$1,644.8	• Repair and Replacement (cities, districts) • Growth-Related Infrastructure (cities, districts) • Groundwater Development (cities, districts) • Conservation (cities, districts, DWRe) • Jordan River Ph 2 WTP (JVWCD) • Watershed Protection (cities, districts)
					152,000	**$2,892.0**	**$5,792.5**	

1) Population ending data from Governor's Office of Management and Budget
2) Percentage reduction from 2000 per captia use, at end of decade, per state goal of 25% by 2025
3) Gallons per capita per day calculated by DWRe; first number is residential indoor use; second number is residential indoor and outdoor use (inc secondary); third number is residential indoor and outdoor plus commercial, industrial, and institutional (CI&I)
4) The aggregate water supply needed in addition to previous decade to meet demands of the decade for the basin as a whole; conditions may exist where shortages in one area of the basin cannot be met by the surpluses in another
5) Estimated from a several sources including Capital Plans of JVWCD, MWDSLS, SLC, water infrastructure asset value noted in Financial Reports submitted to the State Auditor, and DWRe Bear River estimates. Costs include conservation capital projects through 2025, after which the conservation goal is assumed to be achieved. Ongoing conservation O&M costs (and all other O&M costs) are excluded from cost estimates.
6) In 2013 dollars
7) 2000 is the baseline year; 2000 and 2010 data are current approximations for those decades; 2011-2060 data is projected

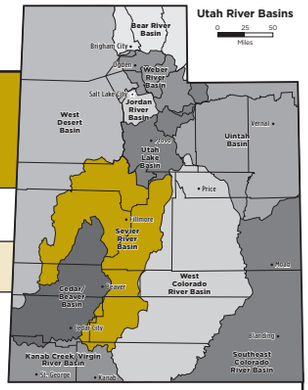
Kanab Creek/Virgin River Basin Water Plan



Decade	Population (ending) [1]	Conservation Goal [2]	Per Capita Use (GPCD) [3]	M&I Water Use (AF/yr) [3]	Additional Water Demand (AF/yr) [4]	Projected Water Project Costs [5] (millions [6])		Actions Needed (by)
						Supply & Infrastructure	Repair & Repacement	
2000[7]	85,540	0%	73 | 219 | 449	7,000 | 21,000 | 43,000	—	—	—	
2001-2010	146,060	26%	63 | 161 | 330	10,000 | 26,000 | 54,000	—	—	—	
2011-2020	206,208	28%	58 | 157 | 320	13,000 | 36,000 | 74,000	20,000	$434.5	$83.4	• Repair and Replacement (cities, districts) • Growth-Related Infrastructure (cities, districts) • Ash Creek Project - 3,080 af (WCWCD) • Warner Valley Reservoir - 10,080 af (WCWCD) • Lake Powell Pipeline - Planning/Permitting (UDWR, WCWCD, (KCWCD) • Water Rights, Stock Acquisitions & Ag Water Conversion (WCWCD, KCWCD) • Wastewater Reuse – 7,300 af (WCWCD) • Conservation & Watershed Protection (WCWCD, KCWCD) • Quail Creek Water Treatment Plant Ozone Addition • Sand Hollow Well Field Arsenic Treatment • Cove Reservoir - 6,800 af (KCWCD)
2021-2030	292,284	30%	55 | 153 | 312	18,000 | 50,000 | 102,000	28,000	$667.0	$162.1	• Repair and Replacement (cities, districts) • Growth-Related Infrastructure (cities, districts) • Lake Powell Pipeline - 86,000 af (UDWR, WCWCD, KCWCD) • Water Rights, Stock Acquisitions & Ag Water Conversion (WCWCD, KCWCD) • Conservation & Watershed Protection (WCWCD, KCWCD)
2031-2040	386,220	32%	55 | 150 | 305	24,000 | 65,000 | 132,000	30,000	$804.9	$274.1	• Repair and Replacement (cities, districts) • Growth-Related Infrastructure (cities, districts) • Water Rights, Stock Acquisitions & Ag Water Conversion (WCWCD, KCWCD) • Wastewater Reuse - 7,230 af (WCWCD) • Conservation & Watershed Protection (WCWCD, KCWCD)
2041-2050	490,223	33%	55 | 146 | 299	30,000 | 80,000 | 164,000	32,000	$883.1	$388.1	• Repair and Replacement (cities, districts) • Growth-Related Infrastructure (cities, districts) • Water Rights, Stock Acquisitions & Ag Water Conversion (WCWCD, KCWCD) • Conservation & Watershed Protection (WCWCD, KCWCD)
2051-2060	603,176	35%	55 | 142 | 292	37,000 | 96,000 | 197,000	33,000	$968.5	$509.3	• Repair and Replacement (cities, districts) • Growth-Related Infrastructure (cities, districts) • Water Rights, Stock Acquisitions & Ag Water Conversion (WCWCD, KCWCD) • Conservation & Watershed Protection (WCWCD, KCWCD) • RO Treatment of La Verkin Hot Springs (WCWCD) • Development of Additional Colorado River Water from Lake Powell
					143,000	**$3,758.0**	**$1,417.1**	

1) Population ending data from Governor's Office of Management and Budget
2) Percentage reduction from 2000 per captia use, at end of decade, per state goal of 25% by 2025
3) Gallons per capita per day calculated by DWRe; first number is residential indoor use; second number is residential indoor and outdoor use (inc secondary); third number is residential indoor and outdoor plus commercial, industrial, and institutional (CI&I)
4) The aggregate water supply needed in addition to previous decade to meet demands of the decade for the basin as a whole; conditions may exist where shortages in one area of the basin cannot be met by the surpluses in another
5) Capital costs are projected using average unit costs of cities and districts. Transmission and storage is estimated at $1,300 per ERU; treatment plant at $2.6 per gpd; source development at $10,700 per AF/yr; and conservation at $14,600 per AF. The total community cost of conservation is estimated using data from a 2010 Maddaus study. Repair and replacement costs are based on 2% of current asset value (auditor reports) and anticipated capital projects of cities and districts. Assets with an expected life greate rthan 50 yrs are excluded from repair and replacement.
6) In 2013 dollars
7) 2000 is the baseline year; 2000 and 2010 data are current approximations for those decades; 2011-2060 data is projected

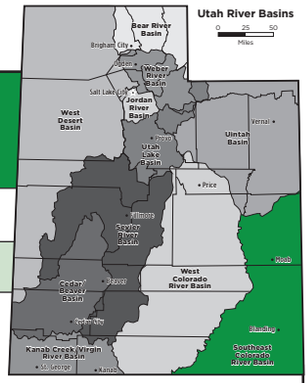
Sevier River Basin Water Plan



Decade	Population (ending) [1]	Conservation Goal [2]	Per Capita Use (GPCD) [3]	M&I Water Use (AF/yr) [3]	Additional Water Demand (AF/yr) [4]	Projected Water Project Costs [5] (millions [6])		Actions Needed (by)
						Supply & Infrastructure	Repair & Repacement	
2000[7]	47,820	0%	72 | 258 | 392	4,000 | 14,000 | 21,000	—	—	—	
2001-2010	57,790	25%	62 | 193 | 294	4,000 | 12,000 | 19,000	—	—	—	
2011-2020	63,738	25%	57 | 193 | 280	4,000 | 14,000 | 20,000	1,000	$85.0	$52.8	• Repair and Replacement (cities) • Growth-Related Infrastructure (cities) • Conservation & Watershed Protection (cities) • Water Rights, Stock Acquisitions & Agricultural Water Conversion (cities)
2021-2030	70,263	25%	54 | 194 | 292	4,000 | 15,000 | 23,000	3,000	$123.7	$77.5	• Repair and Replacement (cities) • Growth-Related Infrastructure (cities) • Conservation & Watershed Protection (cities) • Water Rights, Stock Acquisitions & Agricultural Water Conversion (cities)
2031-2040	75,406	25%	54 | 194 | 284	5,000 | 16,000 | 24,000	1,000	$110.6	$99.7	• Repair and Replacement (cities) • Growth-Related Infrastructure (cities) • Conservation & Watershed Protection (cities) • Water Rights, Stock Acquisitions & Agricultural Water Conversion (cities)
2041-2050	81,177	25%	54 | 194 | 286	5,000 | 18,000 | 26,000	2,000	$128.3	$125.3	• Repair and Replacement (cities) • Growth-Related Infrastructure (cities) • Conservation & Watershed Protection (cities) • Water Rights, Stock Acquisitions & Agricultural Water Conversion (cities)
2051-2060	91,035	25%	54 | 194 | 284	6,000 | 20,000 | 29,000	3,000	$151.4	$155.6	• Repair and Replacement (cities) • Growth-Related Infrastructure (cities) • Conservation & Watershed Protection (cities) • Water Rights, Stock Acquisitions & Agricultural Water Conversion (cities)
					10,000	**$598.9**	**$510.9**	

1) Population ending data from Governor's Office of Management and Budget
2) Percentage reduction from 2000 per captia use, at end of decade, per state goal of 25% by 2025
3) Gallons per capita per day calculated by DWRe; first number is residential indoor use; second number is residential indoor and outdoor use (inc secondary); third number is residential indoor and outdoor plus commercial, industrial, and institutional (CI&I)
4) The aggregate water supply needed in addition to previous decade to meet demands of the decade for the basin as a whole; conditions may exist where shortages in one area of the basin cannot be met by the surpluses in another
5) From list compiled by DWRe and State Auditor reports. 2011-2020 are numbers based on city/county data; funding increased by same percentage as population growth after 2020 and funding increased by $10,000 per AF after 2020, based on costs associated with building CWP.
6) In 2013 dollars
7) 2000 is the baseline year; 2000 and 2010 data are current approximations for those decades; 2011-2060 data is projected

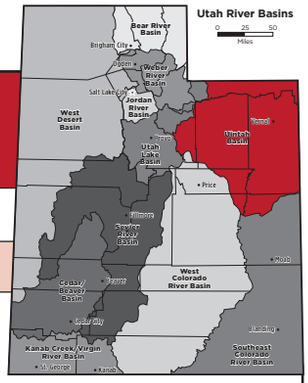
Southeast Colorado River Basin Water Plan



Decade	Population (ending) [1]	Conservation Goal [2]	Per Capita Use (GPCD) [3]	M&I Water Use (AF/yr) [3]	Additional Water Demand (AF/yr) [4]	Projected Water Project Costs [5] (millions [6])		Actions Needed (by)
						Supply & Infrastructure	Repair & Repacement	
2000[7]	16,470	0%	72 | 188 | 325	1,000 | 3,000 | 6,000	—	—	—	
2001-2010	17,710	0%	62 | 204 | 353	1,000 | 4,000 | 7,000	—	—	—	
2011-2020	19,435	14%	56 | 162 | 276	1,000 | 4,000 | 6,000	—	$7.0	$17.1	• Repair and Replacement (cities, counties, districts) • Growth-Related Infrastructure (cities) • Conservation & Watershed Protection (cities) • Water Rights, Stock Acquisitions & Agricultural Water Conversion (cities)
2021-2030	20,575	25%	54 | 141 | 217	1,000 | 3,000 | 5,000	—	$22.7	$17.6	• Repair and Replacement (cities, counties, districts) • Growth-related infrastructure (cities) • Conservation & Watershed Protection (cities) • Water Rights, Stock Acquisitions & Agricultural Water Conversion (cities)
2031-2040	21,509	25%	54 | 141 | 208	1,000 | 3,000 | 5,000	—	$1.1	$17.4	• Repair and Replacement (cities) • Growth-related infrastructure (cities) • Water Rights, Stock Acquisitions & Agricultural Water Conversion (cities) • Conservation & Watershed Protection (cities)
2041-2050	22,971	25%	54 | 141 | 233	1,000 | 4,000 | 6,000	1,000	$10.1	$17.7	• Repair and Replacement (cities, counties, districts) • Growth-related infrastructure (cities) • Water Rights, Stock Acquisitions & Agricultural Water Conversion (cities) • Conservation & Watershed Protection (cities)
2051-2060	25,349	25%	54 | 141 | 211	2,000 | 4,000 | 6,000	—	$1.0	$18.3	• Repair and Replacement (cities, counties, districts) • Water Rights, Stock Acquisitions & Agricultural Water Conversion (cities) • Conservation & Watershed Protection (cities) • Growth-related infrastructure (cities)
					1,000	**$41.9**	**$88.1**	

1) Population ending data from Governor's Office of Management and Budget
2) Percentage reduction from 2000 per captia use, at end of decade, per state goal of 25% by 2025
3) Gallons per capita per day calculated by DWRe; first number is residential indoor use; second number is residential indoor and outdoor use (inc secondary); third number is residential indoor and outdoor plus commercial, industrial, and institutional (CI&I)
4) The aggregate water supply needed in addition to previous decade to meet demands of the decade for the basin as a whole; conditions may exist where shortages in one area of the basin cannot be met by the surpluses in another
5) From list compiled by DWRe, State Auditor reports. 2011-2020 are numbers based on city/county data; funding increased by same percentage as population growth after 2020. Entities within the basin had no conservation costs data available and/or budgeted.
6) In 2013 dollars
7) 2000 is the baseline year; 2000 and 2010 data are current approximations for those decades; 2011-2060 data is projected

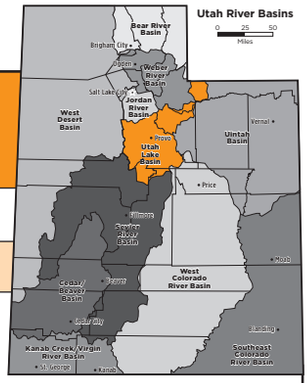
Uintah Basin Water Plan



Decade	Population (ending) [1]	Conservation Goal [2]	Per Capita Use (GPCD) [3]	M&I Water Use (AF/yr) [3]	Additional Water Demand (AF/yr) [4]	Projected Water Project Costs [5] (millions [6])		Actions Needed (by)
						Supply & Infrastructure	Repair & Repacement	
2000[7]	35,780	0%	71 | 199 | 324	3,000 | 8,000 | 13,000	—	—	—	
2001-2010	49,890	6%	61 | 187 | 304	3,000 | 10,000 | 17,000	—	—	—	
2011-2020	60,332	19%	56 | 162 | 252	4,000 | 11,000 | 17,000	—	$173.5	$55.4	• Repair and Replacement (cities) • Growth-Related Infrastructure (cities) • Conservation & Watershed Protection (cities) • Water Rights, Stock Acquisitions & Agricultural Water Conversion (cities)
2021-2030	64,178	25%	53 | 149 | 236	4,000 | 11,000 | 17,000	—	$127.6	$80.9	• Repair and Replacement (cities) • Growth-Related Infrastructure (cities) • Conservation & Watershed Protection (cities) • Water Rights, Stock Acquisitions & Agricultural Water Conversion (cities)
2031-2040	66,571	25%	53 | 149 | 241	4,000 | 11,000 | 18,000	1,000	$142.4	$109.4	• Repair and Replacement (cities) • Growth-Related Infrastructure (cities) • Conservation & Watershed Protection (cities) • Water Rights, Stock Acquisitions & Agricultural Water Conversion (cities)
2041-2050	71,498	25%	53 | 149 | 237	4,000 | 12,000 | 19,000	1,000	$152.2	$139.8	• Repair and Replacement (cities) • Growth-Related Infrastructure (cities) • Conservation & Watershed Protection (cities) • Water Rights, Stock Acquisitions & Agricultural Water Conversion (cities)
2051-2060	77,417	25%	53 | 149 | 242	5,000 | 13,000 | 21,000	2,000	$173.9	$174.6	• Repair and Replacement (cities) • Growth-Related Infrastructure (cities) • Conservation & Watershed Protection (cities) • Water Rights, Stock Acquisitions & Agricultural Water Conversion (cities)
					4,000	**$769.5**	**$560.2**	

1) Population ending data from Governor's Office of Management and Budget
2) Percentage reduction from 2000 per captia use, at end of decade, per state goal of 25% by 2025
3) Gallons per capita per day calculated by DWRe; first number is residential indoor use; second number is residential indoor and outdoor use (inc secondary); third number is residential indoor and outdoor plus commercial, industrial, and institutional (CI&I)
4) The aggregate water supply needed in addition to previous decade to meet demands of the decade for the basin as a whole; conditions may exist where shortages in one area of the basin cannot be met by the surpluses in another
5) From list compiled by DWRe and State Auditor reports. 2011-2020 are numbers based on city/county data; funding increased by same percentage as population growth after 2020 and funding increased by $10,000 per AF after 2020, based on costs associated with building CWP.
6) In 2013 dollars
7) 2000 is the baseline year; 2000 and 2010 data are current approximations for those decades; 2011-2060 data is projected

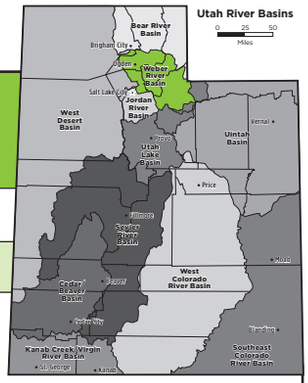
Utah Lake Basin Water Plan



Decade	Population (ending) [1]	Conservation Goal [2]	Per Capita Use (GPCD) [3]	M&I Water Use (AF/yr) [3]	Additional Water Demand (AF/yr) [4]	Projected Water Project Costs [5] (millions [6])		Actions Needed (by)
						Supply & Infrastructure	Repair & Repacement	
2000[7]	354,000	0%	68 | 185 | 275	27,000 | 73,000 | 109,000	—	—	—	
2001-2010	544,910	20%	56 | 148 | 220	34,000 | 90,000 | 134,000	—	—	—	
2011-2020	707,784	23%	53 | 142 | 209	42,000 | 113,000 | 166,000	31,700	$730.5	$951.6	• Repair and Replacement (cities, counties, CUWCD) • Growth-Related Infrastructure (cities, CUWCD) • Central Water Project (CUWCD) • ULS (CUWCD) • Water Rights, Stock Acquisitions & Agricultural Water Conversion (CUWCD) • Utah Valley Water Treatment Plant Expansion (CUWCD) • Conservation & Watershed Protection (CUWCD, cities) • Seismic Upgrades (CUWCD)
2021-2030	885,656	25%	51 | 139 | 206	51,000 | 138,000 | 204,000	38,000	$413.0	$951.6	• Repair and Replacement (cities, counties, districts, CUWCD) • Growth-Related Infrastructure (cities, CUWCD) • Central Water Project (CUWCD) • ULS (CUWCD) • Water Rights, Stock Acquisitions & Agricultural Water Conversion (CUWCD) • Conservation & Watershed Protection (CUWCD, cities)
2031-2040	1,087,931	25%	51 | 139 | 206	62,000 | 169,000 | 251,000	47,000	$383.8	$1,008.0	• Repair and Replacement (cities, counties, districts, CUWCD) • Growth-Related Infrastructure (cities, CUWCD) • Central Water Project (CUWCD) • Water Rights, Stock Acquisitions & Agricultural Water Conversion (CUWCD) • Conservation & Watershed Protection (CUWCD, cities)
2041-2050	1,303,253	25%	51 | 139 | 206	74,000 | 203,000 | 301,000	50,000	$436.9	$1,095.3	• Repair and Replacement (cities, counties, districts, CUWCD) • Growth-Related Infrastructure (cities, CUWCD) • Water Rights, Stock Acquisitions & Agricultural Water Conversion (CUWCD) • Conservation & Watershed Protection (CUWCD, cities)
2051-2060	1,506,822	25%	51 | 139 | 206	86,000 | 235,000 | 348,000	47,000	$470.0	$1,189.3	• Repair and Replacement (cities, counties, districts, CUWCD) • Growth-Related Infrastructure (cities, CUWCD) • Water Rights, Stock Acquisitions & Agricultural Water Conversion (CUWCD) • Conservation & Watershed Protection (CUWCD, cities)
					214,000	**$2,434.2**	**$5,195.8**	

1) Population ending data from Governor's Office of Management and Budget
2) Percentage reduction from 2000 per captia use, at end of decade, per state goal of 25% by 2025
3) Gallons per capita per day calculated by DWRe; first number is residential indoor use; second number is residential indoor and outdoor use (inc secondary); third number is residential indoor and outdoor plus commercial, industrial, and institutional (CI&I)
4) The aggregate water supply needed in addition to previous decade to meet demands of the decade for the basin as a whole; conditions may exist where shortages in one area of the basin cannot be met by the surpluses in another
5) From list compiled by DWRe, CUWCD Capital Plan, and State Auditor reports. 2011-2020 are numbers based on city/county data; funding increased by $10,000 per AF after 2020, based on costs associated with building CWP. When projects bring new supply to the system then that supply is subtracted from the "Additional Water Demand" column to get the amount multiplied by $10,000 per AF, i.e. in 2041 decade 50,000 AF is needed, but CWP adds 6,312 AF, leaving 43,688 AF. This is multiplied by $10,000 per AF to get $437 million.
6) In 2013 dollars
7) 2000 is the baseline year; 2000 and 2010 data are current approximations for those decades; 2011-2060 data is projected

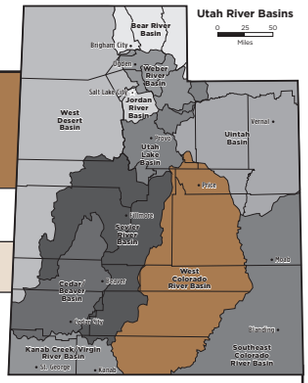
Weber River Basin Water Plan



Decade	Population (ending) [1]	Conservation Goal [2]	Per Capita Use (GPCD) [3]	M&I Water Use (AF/yr) [3]	Additional Water Demand (AF/yr) [4]	Projected Water Project Costs [5] (millions [6])		Actions Needed (by)
						Supply & Infrastructure	Repair & Repacement	
2000[7]	387,110	0%	68 | 231 | 330	29,000 | 100,000 | 143,000	—	—	—	
2001-2010	580,130	24%	59 | 175 | 249	38,000 | 114,000 | 162,000	—	—	—	
2011-2020	668,585	25%	54 | 174 | 247	40,000 | 130,000 | 185,000	23,000	$300.9	$607.9	• Repair and Replacement (cities, counties, districts, WBWCD) • Growth-Related Infrastructure (cities, WBWCD) • Davis County Groundwater Development (WBWCD) • Raise AV Watkins Dam (WBWCD) • Water Rights, Stock Acquisitions & Agricultural Water Conversion (WBWCD) • Bear River Project-Preconstruction & Option Preservation (DWRe, WBWCD) • Conservation & Watershed Protection (WBWCD, cities, DWRe)
2021-2030	759,006	25%	51 | 173 | 247	43,000 | 147,000 | 210,000	25,000	$559.1	$600.6	• Repair and Replacement (cities, counties, districts, WBWCD) • Growth-related infrastructure (WBWCD) • Davis County Groundwater Development (WBWCD) • Raise AV Watkins Dam (WBWCD) • Water Rights, Stock Acquisitions & Agricultural Water Conversion (WBWCD) • M&I Development at Willard Bay (WBWCD) • Aquifer Storage and Recovery (WBWCD) • Conservation & Watershed Protection (WBWCD, cities, DWRe) • Bear River Project-Preconstruction (DWRe, WBWCD)
2031-2040	858,305	25%	51 | 173 | 247	49,000 | 166,000 | 237,000	27,000	$707.7	$731.0	• Repair and Replacement (cities, WBWCD) • Growth-related infrastructure (cities, WBWCD) • Water Rights, Stock Acquisitions & Agricultural Water Conversion (WBWCD) • Waste Water Reuse (WBWCD) • Aquifer Storage and Recovery (WBWCD) • Conservation & Watershed Protection (WBWCD, cities, DWRe) • Bear River Project (DWRe, WBWCD)
2041-2050	965,699	25%	51 | 173 | 247	55,000 | 187,000 | 267,000	30,000	$524.0	$822.7	• Repair and Replacement (cities, counties, districts, WBWCD) • Growth-related infrastructure (cities, WBWCD) • Water Rights, Stock Acquisitions & Agricultural Water Conversion (WBWCD) • Waste Water Reuse (WBWCD) • Conservation & Watershed Protection (WBWCD, cities, DWRe) • Bear River Project (WBWCD)
2051-2060	1,075,828	25%	51 | 173 | 247	61,000 | 208,000 | 298,000	31,000	$627.6	$954.6	• Repair and Replacement (cities, counties, districts, WBWCD) • Water Rights, Stock Acquisitions & Agricultural Water Conversion (WBWCD) • Conservation & Watershed Protection (WBWCD, cities, DWRe) • Growth-related infrastructure (cities, WBWCD)
					136,000	**$2,719.3**	**$3,716.9**	

1) Population ending data from Governor's Office of Management and Budget
2) Percentage reduction from 2000 per captia use, at end of decade, per state goal of 25% by 2025
3) Gallons per capita per day calculated by DWRe; first number is residential indoor use; second number is residential indoor and outdoor use (inc secondary); third number is residential indoor and outdoor plus commercial, industrial, and institutional (CI&I)
4) The aggregate water supply needed in addition to previous decade to meet demands of the decade for the basin as a whole; conditions may exist where shortages in one area of the basin cannot be met by the surpluses in another
5) From list compiled by DWRe, WCD Capital Plan, State Auditor reports, DWRe Bear River estimates. 2011-2020 are numbers based on city/county data; funding increased by same percentage as population growth after 2020. Bear River costs split evenly among 4 benefiting parties. Supply and Infrastructure= (Addtnl supply needed – known supply added thru projects)*$10,000 + Known Project Costs + capital improvement plan + DWRe list Repair and Replacement= (City capital assets divided by 25 years+ projects from DWR list)*population growth + capital improvement plan
6) In 2013 dollars
7) 2000 is the baseline year; 2000 and 2010 data are current approximations for those decades; 2011-2060 data is projected

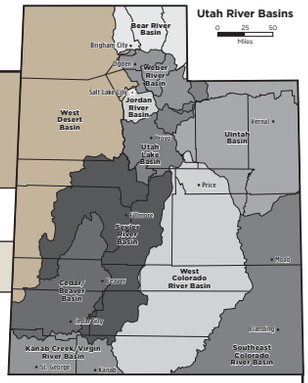
West Colorado River Basin Water Plan



Decade	Population (ending) [1]	Conservation Goal [2]	Per Capita Use (GPCD) [3]	M&I Water Use (AF/yr) [3]	Additional Water Demand (AF/yr) [4]	Projected Water Project Costs [5] (millions [6])		Actions Needed (by)
						Supply & Infrastructure	Repair & Repacement	
2000[7]	36,520	0%	73 | 278 | 391	3,000 | 11,000 | 16,000	--	--	--	
2001-2010	35,560	0%	66 | 285 | 402	3,000 | 11,000 | 16,000	--	--	--	
2011-2020	36,274	16%	59 | 234 | 320	2,000 | 10,000 | 13,000	—	$80.2	$38.9	• Repair and Replacement (cities, counties, districts) • Growth-Related Infrastructure (cities) • Conservation & Watershed Protection (cities) • Water Rights, Stock Acquisitions & Agricultural Water Conversion (cities)
2021-2030	38,199	25%	55 | 208 | 280	2,000 | 9,000 | 12,000	—	$20.2	$14.7	• Repair and Replacement (cities, counties, districts) • Growth-related infrastructure (cities) • Conservation & Watershed Protection (cities) • Water Rights, Stock Acquisitions & Agricultural Water Conversion (cities)
2031-2040	40,154	25%	55 | 208 | 289	2,000 | 9,000 | 13,000	1,000	$31.5	$14.7	• Repair and Replacement (cities) • Growth-related infrastructure (cities) • Water Rights, Stock Acquisitions & Agricultural Water Conversion (cities) • Conservation & Watershed Protection (cities)
2041-2050	41,626	25%	55 | 208 | 279	3,000 | 10,000 | 13,000	—	$5.0	$14.5	• Repair and Replacement (cities, counties, districts) • Growth-related infrastructure (cities) • Water Rights, Stock Acquisitions & Agricultural Water Conversion (cities) • Conservation & Watershed Protection (cities)
2051-2060	43,764	25%	55 | 208 | 286	3,000 | 10,000 | 14,000	1,000	$10.0	$14.7	• Repair and Replacement (cities, counties, districts) • Water Rights, Stock Acquisitions & Agricultural Water Conversion (cities) • Conservation & Watershed Protection (cities) • Growth-related infrastructure (cities)
					2,000	**$146.9**	**$97.5**	

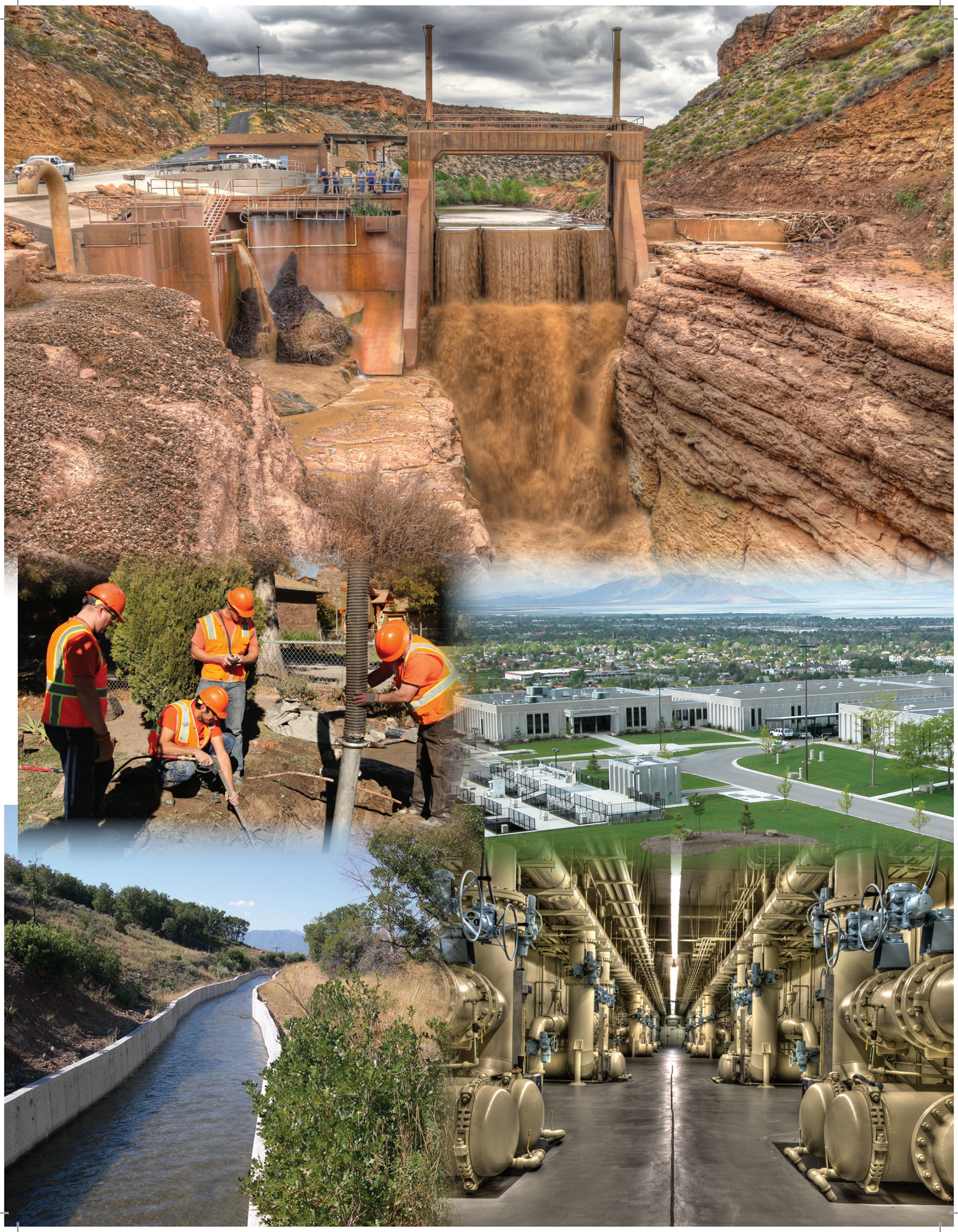
1) Population ending data from Governor's Office of Management and Budget
2) Percentage reduction from 2000 per captia use, at end of decade, per state goal of 25% by 2025
3) Gallons per capita per day calculated by DWRe; first number is residential indoor use; second number is residential indoor and outdoor use (inc secondary); third number is residential indoor and outdoor plus commercial, industrial, and institutional (CI&I)
4) The aggregate water supply needed in addition to previous decade to meet demands of the decade for the basin as a whole; conditions may exist where shortages in one area of the basin cannot be met by the surpluses in another
5) From list compiled by DWRe, State Auditor reports. 2011-2020 are numbers based on city/county data; funding increased by same percentage as population growth after 2020. Entities within the basin had no conservation costs data available and/or budgeted.
6) In 2013 dollars
7) 2000 is the baseline year; 2000 and 2010 data are current approximations for those decades; 2011-2060 data is projected

West Desert Basin Water Plan



Decade	Population (ending) [1]	Conservation Goal [2]	Per Capita Use (GPCD) [3]	M&I Water Use (AF/yr) [3]	Additional Water Demand (AF/yr) [4]	Projected Water Project Costs [5] (millions [6])		Actions Needed (by)
						Supply & Infrastructure	Repair & Repacement	
2000[7]	29,440	0%	73 | 160 | 303	2,000 | 5,000 | 10,000	--	--	--	
2001-2010	56,410	6%	62 | 150 | 285	4,000 | 9,000 | 18,000	--	--	--	
2011-2020	72,436	19%	57 | 130 | 246	5,000 | 11,000 | 20,000	2,000	$25.9	$11.8	• Repair and Replacement (cities, counties, districts) • Growth-Related Infrastructure (cities) • Water Rights, Stock Acquisitions & Agricultural Water Conversion (cities) • Conservation & Watershed Protection (cities, DWRe)
2021-2030	96,247	25%	55 | 120 | 223	6,000 | 13,000 | 24,000	4,000	$40.2	$12.0	• Repair and Replacement (cities, counties, districts) • Growth-related infrastructure (cities) • Conservation & Watershed Protection (cities) • Water Rights, Stock Acquisitions & Agricultural Water Conversion (cities)
2031-2040	123,789	25%	55 | 120 | 224	8,000 | 17,000 | 31,000	7,000	$71.1	$12.0	• Repair and Replacement (cities, counties, districts) • Growth-related infrastructure (cities) • Water Rights, Stock Acquisitions & Agricultural Water Conversion (cities) • Conservation & Watershed Protection (cities, DWRe)
2041-2050	152,097	25%	55 | 120 | 223	9,000 | 20,000 | 38,000	7,000	$71.3	$12.0	• Repair and Replacement (cities, counties, districts) • Growth-related infrastructure (cities) • Water Rights, Stock Acquisitions & Agricultural Water Conversion (cities) • Conservation & Watershed Protection (cities, DWRe)
2051-2060	182,206	25%	55 | 120 | 225	11,000 | 24,000 | 46,000	8,000	$83.2	$12.1	• Repair and Replacement (cities, counties, districts) • Water Rights, Stock Acquisitions & Agricultural Water Conversion (cities) • Conservation & Watershed Protection (cities, DWRe) • Growth-related infrastructure (cities)
					28,000	**$291.7**	**$59.9**	

1) Population ending data from Governor's Office of Management and Budget
2) Percentage reduction from 2000 per captia use, at end of decade, per state goal of 25% by 2025
3) Gallons per capita per day calculated by DWRe; first number is residential indoor use; second number is residential indoor and outdoor use (inc secondary); third number is residential indoor and outdoor plus commercial, industrial, and institutional (CI&I)
4) The aggregate water supply needed in addition to previous decade to meet demands of the decade for the basin as a whole; conditions may exist where shortages in one area of the basin cannot be met by the surpluses in another
5) From list compiled by DWRe, WCD Capital Plan, State Auditor reports. 2011-2020 are numbers based on city/county data; Entities within the basin had no conservation costs data available and/or budgeted.
6) In 2013 dollars
7) 2000 is the baseline year; 2000 and 2010 data are current approximations for those decades; 2011-2060 data is projected



PREPARE 60

SECURING UTAH'S ECONOMIC FUTURE

Prepare60 is the center established by the four largest water conservancy districts to protect what we have, use it wisely and provide for the future.

www.prep60.com