



# Update on Statewide Water Supply Initiative – South Platte Basin

## Statewide Water Supply Initiative Background

The Statewide Water Supply Initiative (SWSI) has identified how much water Colorado will need to help meet the needs of its growing population. By 2030, Colorado will have an additional 2.8 million residents and a total population of 7.1 million people. Most of the state's population (87 percent) will be along the Front Range from Pueblo to Weld County. However, the fastest growing areas will actually be on the West Slope in the Colorado and San Juan/Dolores/San Miguel Basins. Table 1 summarizes the population changes by river basin.

**Table 1 Population Projections by Basin**

Basin	2000	2030	Increase in Population	Percent Change 2000 to 2030	Percent Annual Growth Rate
Arkansas	835,100	1,293,000	457,900	55	1.5
Colorado	248,000	492,600	244,600	99	2.3
San Juan/Dolores/San Miguel	90,900	171,600	80,700	89	2.1
Gunnison	88,600	161,500	72,900	82	2.0
North Platte	1,600	2,000	400	25	0.7
Rio Grande	46,400	62,700	16,300	35	1.0
South Platte	2,985,600	4,911,600	1,926,000	65	1.7
Yampa/White/Green	39,300	61,400	22,100	56	1.5
<b>TOTAL</b>	<b>4,335,500</b>	<b>7,156,400</b>	<b>2,820,900</b>	<b>65</b>	<b>1.7</b>

Source: Colorado Department of Local Affairs Demography Section

SWSI is an 18-month study by the Colorado Water Conservation Board (CWCB) to take a comprehensive look at how Colorado will meet its future water needs. During the 1990s, Colorado was the third fastest growing state in the nation, surpassed only by Nevada and Arizona. The recent drought also highlights the importance of understanding how Colorado will manage water during times of increased scarcity. SWSI's approach to this problem is to both develop technical data and work with local interests and water experts to obtain consensus on the issues, identify where data are missing, and to understand the obstacles to meeting our water supply needs.

Working with Basin Technical Roundtables consisting of multiple interests (water providers, local governments, agricultural users, recreational interests, the environmental community, and the business sector interests) from Colorado's eight major river basins (Figure 1), SWSI is a "bottoms-up" process to make sure local expertise and knowledge is incorporated into the study findings. These roundtables have identified water supply needs ranging from ensuring that municipal and agricultural users have a safe and reliable water supply, to providing water for recreation and the environment—important drivers for our economy.

## Statewide Municipal and Industrial and Self-supplied Industrial Demands

SWSI has examined current water use and supply and has also estimated future water needs based on a per capita water use methodology. Per capita water use was



Figure 1 Colorado's Eight Major River Basins

obtained from over 75 percent of Colorado's water providers, and the data they provided were then combined with population estimates from the State Demographer's Office to develop future water demand projections. The results are shown in Table 2 for the year 2000 and year 2030. The state's eight major water basins will need an additional 630,000 acre-feet (AF) of new water by the year 2030 to meet projected demands, 53 percent more water than is being used today. An acre-foot of water is approximately 326,000 gallons. These projected water demands are reduced by

anticipated water conservation savings as a result of the National Energy Efficiency Act, which established mandatory standards for water use efficiency for certain plumbing fixtures.

Table 2 Preliminary Statewide Gross Municipal and Industrial and Self-supplied Industrial Water Demands–2000 to 2030

Basin	Total 2000 Gross Demand (AF)	Total Projected 2030 Gross Demand (AF)	Projected Conservation Savings (AF)	Increase in Gross Demand (AF)	Identified Gross Demand Shortfall (AF)
Arkansas	256,900	354,900	18,600	98,000	16,400
Colorado	74,100	136,000	7,800	61,900	4,000
San Juan/Dolores/San Miguel	23,600	42,400	2,400	18,800	5,000
Gunnison	20,600	35,500	2,100	14,900	1,800
North Platte	500	600	—	100	—
Rio Grande	17,400	21,700	1,400	4,300	—
South Platte	772,400	1,182,100	68,700	409,700	41,800
Yampa/White/Green	29,400	51,700	900	22,300	—
<b>TOTAL</b>	<b>1,194,900</b>	<b>1,824,900</b>	<b>101,900</b>	<b>630,000</b>	<b>69,000</b>

Columns and rows may not add up exactly due to rounding

Understanding **how** future water needs will be met is the real challenge that SWSI will be examining in more detail over the next 4 months. To date, the study team has identified how the major water suppliers plan on meeting their 2030 demands. This inventory of solutions includes conservation, water reuse, water transfers, enlargement and re-operation of facilities, and new facilities. Examples of some of the

projects include: Colorado Spring's Southern Delivery System, Denver's north system improvements, Northern Colorado Water Conservancy District's Windy Gap Firming Project and Northern Integrated Supply Plan (NISP), greater utilization of Ruedi and Wolford mountain reservoirs in the Colorado River drainage, and enlargement of Elkhead Reservoir in the Yampa/White/Green Basin. A more complete list of how our future needs will be met is still under development. Once it is developed, we will have a full understanding of how much remaining unmet need there will be and begin to focus on how to close the remaining gap between supply and demand in the year 2030.

SWSI has identified that most water providing entities are actively planning for future demand and have identified key projects to meet this demand. It is essential that these plans and projects move forward. If they do not move forward, alternative solutions will need to be implemented. SWSI has also found that the greatest needs for state assistance in meeting future water needs are with rural and small water providers and agricultural users.

## Statewide Agricultural Demands

The Colorado Decision Support System (CDSS) modeling tool was used to estimate existing agricultural water demands in the Colorado, Gunnison, Rio Grande, San Juan/Dolores/San Miguel, and the Yampa/White/Green Basins. Agricultural use in the Arkansas, North Platte, and South Platte Basins were estimated using a variety of available sources. Table 3 presents an estimate of current irrigated acres and average total diversions (in AF) over a period of record for each basin. It is important to note that the number of irrigated acres may vary on an annual basis for each basin over the period of record.

**Table 3 Preliminary Statewide Agricultural Demands**

Basin	Current Estimated Irrigated Acres	Average Total Diversions* (AF)	Period of Record for Average Diversions
Arkansas	538,100	1,769,900	1999 – 2001
Colorado	237,700	1,986,900	1975 – 1990
San Juan/Dolores/San Miguel	254,900	810,100	1975 – 1990
Gunnison	263,500	1,726,000	1950 – 2000
North Platte	95,700	396,900	1993 – 2002
Rio Grande	632,700	1,514,500	1950 – 1997
South Platte	1,003,500	2,545,500	1993 – 2002
Yampa/White/Green	118,500	629,900	1975 – 1990
<b>TOTAL</b>	<b>3,144,600</b>	<b>11,379,700</b>	-

\* Arkansas, South Platte and Rio Grande Basins include estimates of alluvial groundwater pumping

Agriculture represents approximately 91 percent of water used in Colorado for agricultural, municipal and industrial (M&I), and self-supplied industrial (SSI) purposes (Figure 2). SWSI projections indicate that it will make up 86 percent of the water use in 2030 (Figure 2). The greatest changes in agricultural water use are expected to occur in the Front Range as M&I growth moves into agricultural lands and/or as water is transferred from agriculture to support growth. Understanding the

impact of these changes on rural Colorado economies, and the effect on the open space provided by farms and ranches, is a key challenge for all Coloradans. In other areas of the state, localized decreases and increases in agricultural water use are also expected. A net increase in agricultural water use may occur in the Yampa/White/Green and the San Juan/Dolores/San Miguel Basins.

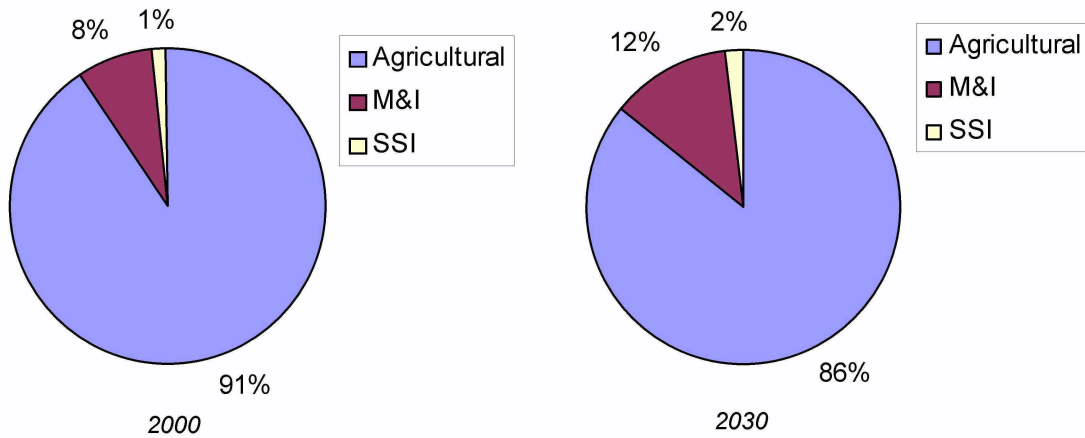


Figure 2  
 2000 and 2030 Statewide Agricultural, M&I, and SSI Demands

## South Platte Background

Nearly two-thirds of the increase in the state gross demand by 2030, approximately 409,700 AF, will be in the South Platte Basin. In SWSI, M&I is defined as all of the water use of a typical municipal system, including residential, commercial, industrial, irrigation and firefighting. Large industrial water uses that have their own water supplies or lease raw water from others are described as SSI water users. For the purposes of SWSI in evaluating these regional water needs, counties in the South Platte Basin have been aggregated into subbasins. These subbasins and changes in population from 2000 to 2030 on a county level are shown in Figure 3. Table 4 shows the total population and percent increases for the counties of the South Platte Basin.

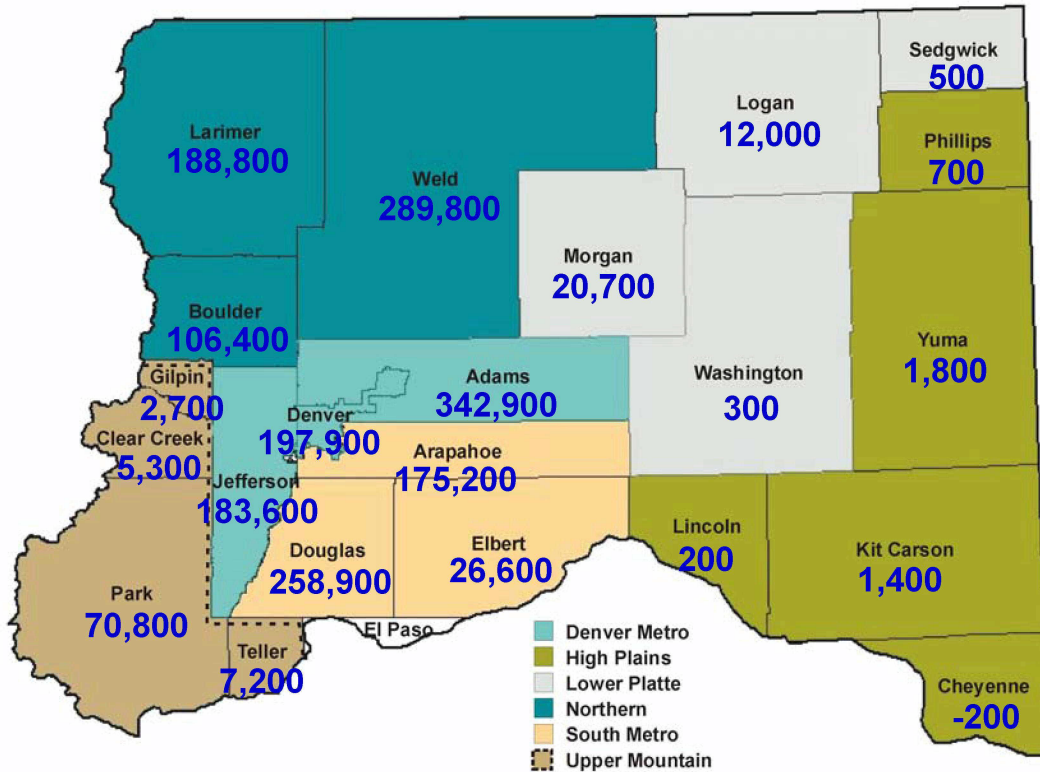


Figure 3 South Platte Subbasins and Changes in County Population 2000 to 2030  
 Note that Broomfield county (not in Figure 3) will have an increase in population of 32,500 people

Table 4 South Platte Population Projections by Subbasin

Subbasin Designation	2000 Population	2030 Population	Increase in Population 2000 to 2030	Percent Change 2000 to 2030	Percent Annual Growth Rate
Denver Metro	1,432,700	2,157,200	724,500	51	1.4
South Metro	685,800	1,146,400	460,600	67	1.7
Upper Mountain	39,200	125,300	86,100	220	3.9
High Plains	24,900	28,800	3,900	16	0.5
Northern	747,200	1,364,600	617,400	83	2.0
Lower Platte	55,800	89,300	33,500	60	1.6
<b>TOTAL</b>	<b>2,985,600</b>	<b>4,911,600</b>	<b>1,926,000</b>	<b>65</b>	<b>1.7</b>

M&I and SSI water demand forecasts for the South Platte Basin are shown in Table 5. Water use can be considered both in terms of gross water needs or demands – the total amount of water delivered to a user – and in consumptive use (CU), or the water that will actually be consumed. The 2000 and 2030 gross demands are presented in the table, along with the projected conservation savings. Of the 409,700 AF of increased water demands in the South Platte Basin, the majority of the demand is proposed to be met through existing supplies and water rights and through the implementation of identified projects and processes. However, there are still some anticipated shortfalls expected in certain portions of the basin. This is also shown in Table 5. The identified shortfalls will be the focus for supply alternatives developed for the basin.

**Table 5 South Platte Subbasins Preliminary M&I and SSI Demand Analysis**

Subbasin Designation	2000 Gross Demand (AF)	2030 Gross Demand (AF)	Projected Conservation Savings (AF)	Increase in Gross Demand (AF)	Identified Gross Demand Shortfall (AF)	Estimated CU Demand Shortfall (AF)
Denver Metro	366,000	486,600	26,800	120,600	12,500	4,400
South Metro	152,900	241,500	15,400	88,600	1,500	500
Upper Mountain	9,800	27,700	1,700	17,900	1,400	500
High Plains	9,700	10,500	700	800	—	—
Northern	212,500	377,400	22,600	164,900	18,400	6,400
Lower Platte	21,500	38,400	1,500	16,900	8,000	2,800
<b>TOTAL</b>	<b>772,400</b>	<b>1,182,100</b>	<b>68,700</b>	<b>409,700</b>	<b>41,800</b>	<b>14,600</b>

Columns and rows may not add up exactly due to rounding

Table 6 provides a list of the major identified projects and planning efforts that are underway or are planned in the South Platte Basin. It will be very important that these projects and plans move forward or significant additional water supplies will be required.

**Table 6 Major Identified Projects and Processes to Provide Additional Supply**

County	Identified Projects and Processes
Denver Metro	<ul style="list-style-type: none"> <li>■ Conservation</li> <li>■ Existing supplies</li> <li>■ Denver Northern FIRMing</li> <li>■ Thornton Water Supply and Storage Company transfer</li> <li>■ Agricultural transfers</li> <li>■ New storage and reservoir enlargements and reuse</li> </ul>
South Metro	<ul style="list-style-type: none"> <li>■ Conservation</li> <li>■ Implementation of South Metro Plan or alternative</li> <li>■ Aurora Long-range Plan</li> <li>■ East Cherry Creek Plan</li> <li>■ Agricultural transfers and reuse</li> </ul>
Upper Mountain	<ul style="list-style-type: none"> <li>■ Drilling of exempt wells</li> <li>■ Development of tributary groundwater supplies and plans for augmentation with agricultural transfers and new storage</li> </ul>
High Plains	<ul style="list-style-type: none"> <li>■ Additional non-tributary groundwater</li> </ul>
Northern	<ul style="list-style-type: none"> <li>■ Conservation</li> <li>■ Windy Gap FIRMing</li> <li>■ Colorado Big Thompson acquisitions</li> <li>■ Northern Integrated Supply Plan</li> <li>■ Halligan and Seamann Reservoirs enlargement</li> <li>■ Agricultural transfers and CBT acquisition, exchanges, and annexation policies</li> </ul>
Lower Platte	<ul style="list-style-type: none"> <li>■ Augmentation of tributary groundwater with agricultural transfers</li> <li>■ Colorado Big Thompson acquisitions</li> </ul>

The plans for nearly all South Platte water providers include some component of agricultural transfers and the optimization of existing supplies through new storage and/or reuse and exchanges. As urban growth continues, there will be some natural retirement of agricultural lands as these properties are converted to urban use. This will occur primarily in the Northern area, as very little agricultural use remains in the South metro and Denver metro areas. In addition to the urbanization of agricultural lands, most water providers continue to acquire agricultural water rights to some extent. If the new water projects and reservoir enlargements listed in Table 6 do not

produce the planned amounts of water, there will be significant pressure on water providers to acquire additional agricultural water rights beyond what will normally occur.

A final round of Basin Roundtable meetings will be held in August and September. The fourth meeting for the South Platte Basin will take place on Wednesday, August 25, 2004. You are welcome to attend the final round, but in either case, information regarding any results, decisions, and outcomes of the meetings will be available on the project website. For more information on meeting times, locations, and additional details, visit the CWCB website at [www.cwcb.state.co.us](http://www.cwcb.state.co.us) and click on Statewide Water Supply Initiative.