City of Dallas

2024 Long Range Water Supply Plan Update

Public Meeting
June 24, 2024

Planning
Dallas Water Utilities
City of Dallas

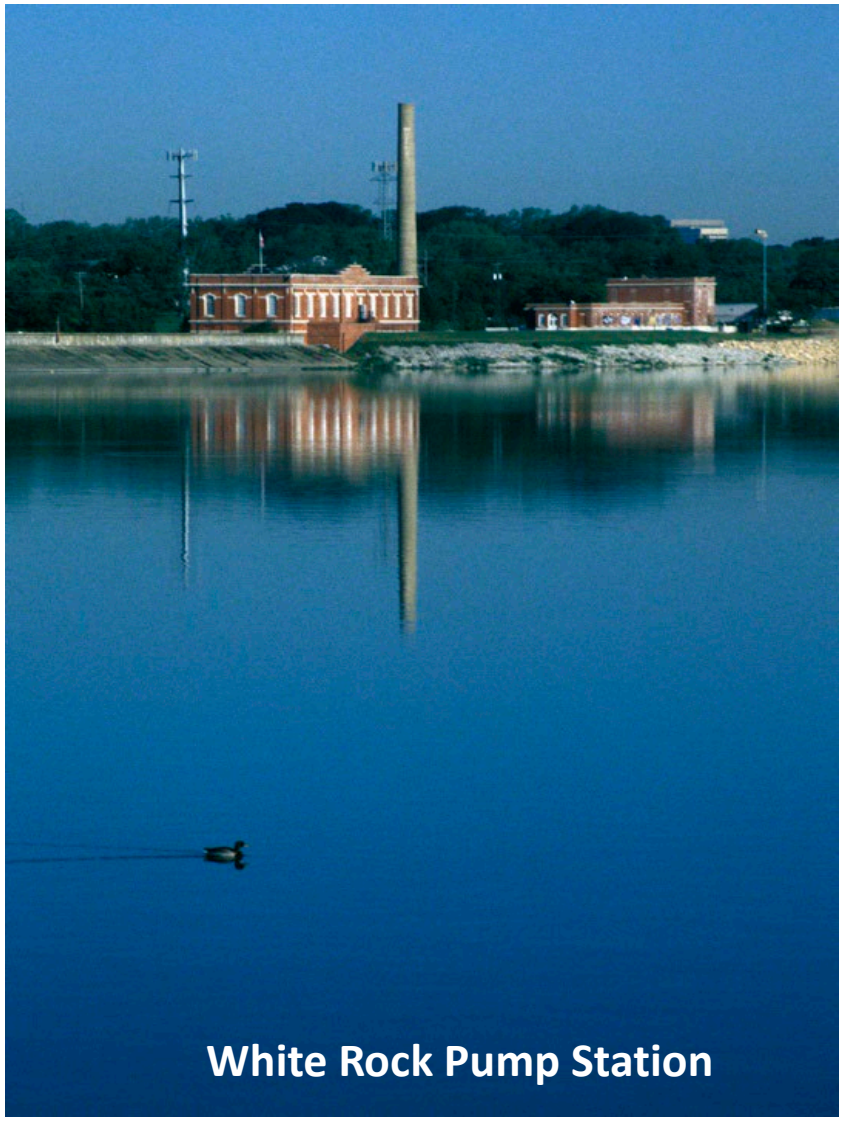
City of Dallas

- The meeting will be recorded, and the recording will be made available
- Place your questions in the Chat, Question will be answered at the end the presentation
- Closed captioning can be turned on in TEAMS by selecting the "… more" at the upper right of the TEAMS of Menu Bar, and from the drop-down menu, select "Language and Speech", then select "Turn on live captions"
- Public comment period will run from June 26, 2024 to August 9, 2024

Purpose

To provide information on:

- Dallas Water Utilities
- Introduction to Water Planning
- Dallas' 2014 Long Range Water Supply Plan Overview
- Statewide Water Plan
- Dallas' 2024 Long Range Water Supply Plan Update
- Schedule of upcoming
- Appendix



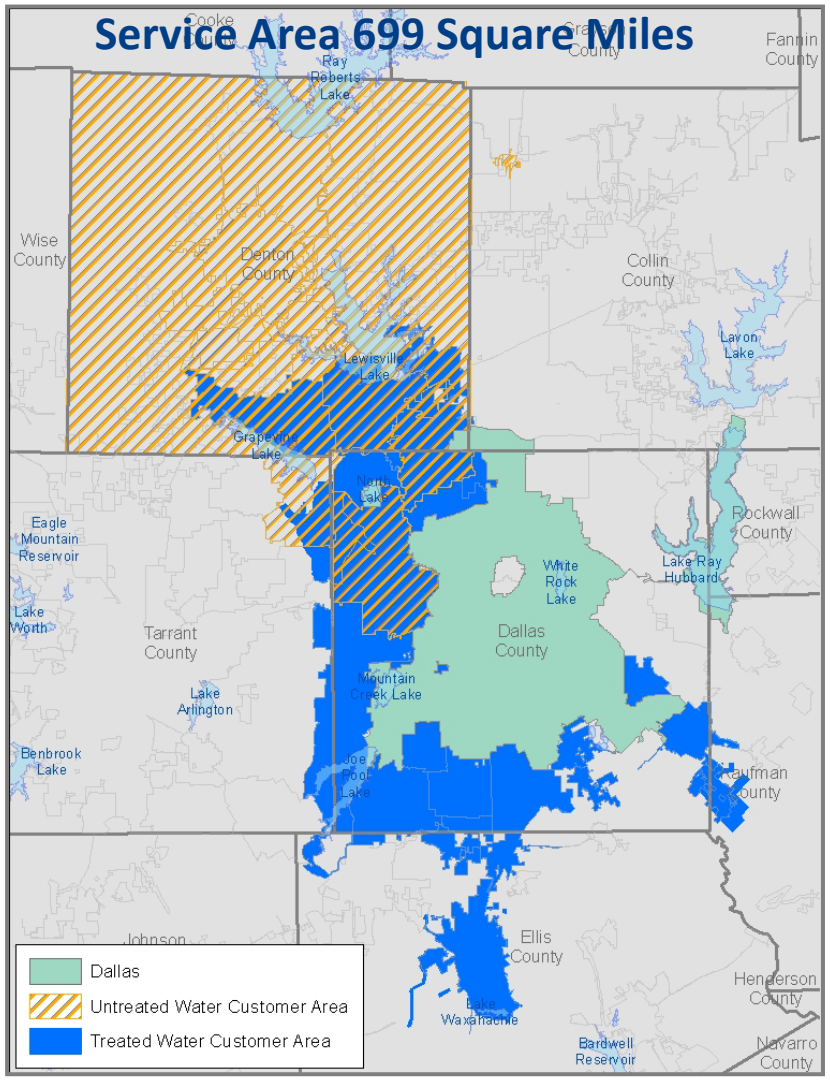
White Rock Pump Station

Dallas Water Utilities

"When the well is dry, we know the worth of water."

Benjamin Franklin, Poor Richard's Almanac, 1746

Dallas Water Utilities Overview



- Established by City Charter in 1881
- Operates under Dallas City Codes: 49, 51 and 19
- Regional provider of water, wastewater, stormwater and flood control services
- Fiscal Year 2023 net capital water and wastewater assets of $6.1B
- Funded from wholesale and retail water and wastewater revenues and stormwater fees (receives no tax dollars)
- Approximately 1,600 employees
- Combined operating and capital budgets of $1.23B

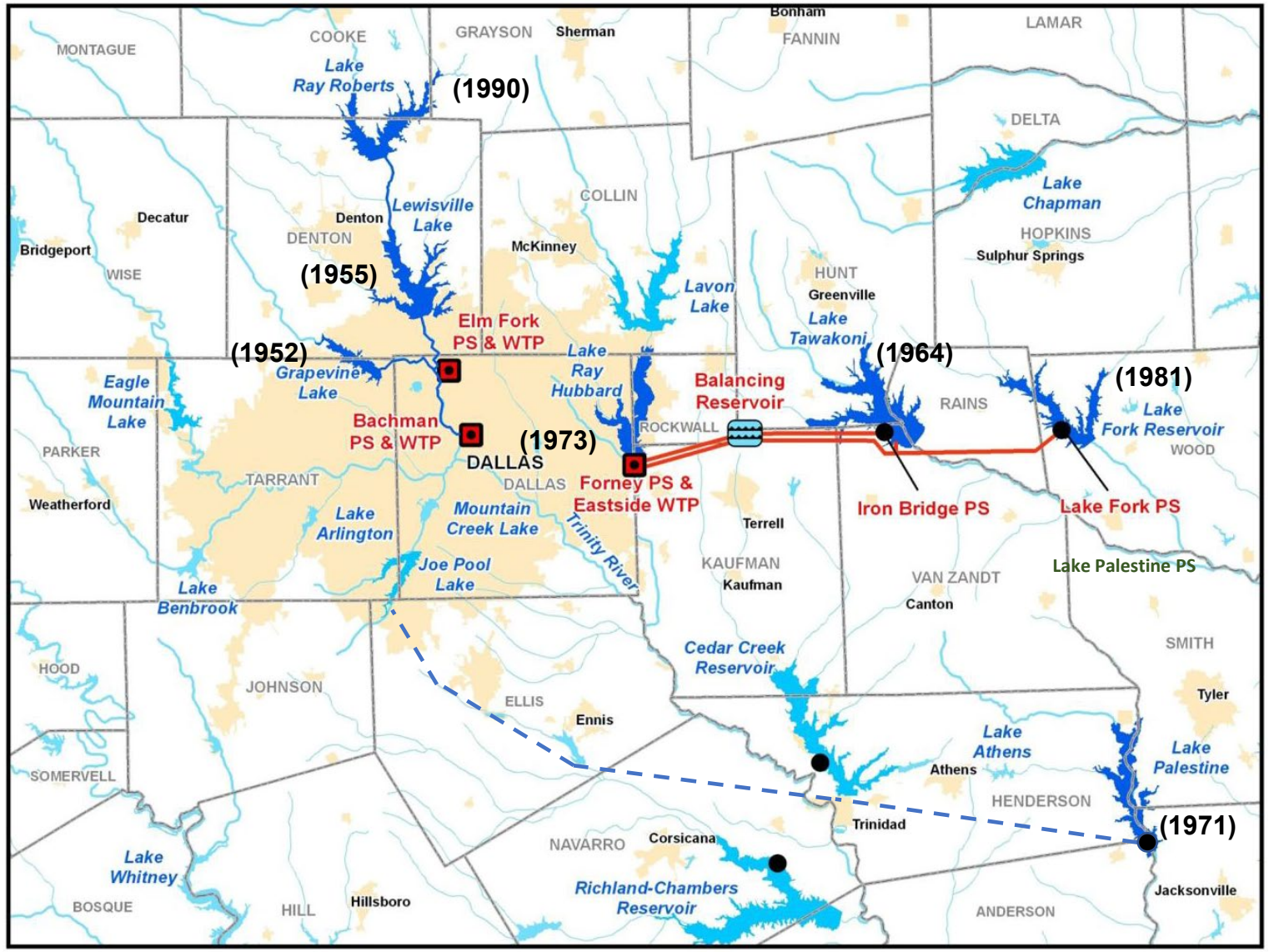
Fiscal Year 2023-24 Budgets

Budget	DWU	SDM	Total
Operations	$791.3 M	$80.1 M	$871.4 M
Capital	$319.5 M	$37.6 M	$357.1 M
Total	$1,110.8 M	$117.7 M	$1,228.5 M

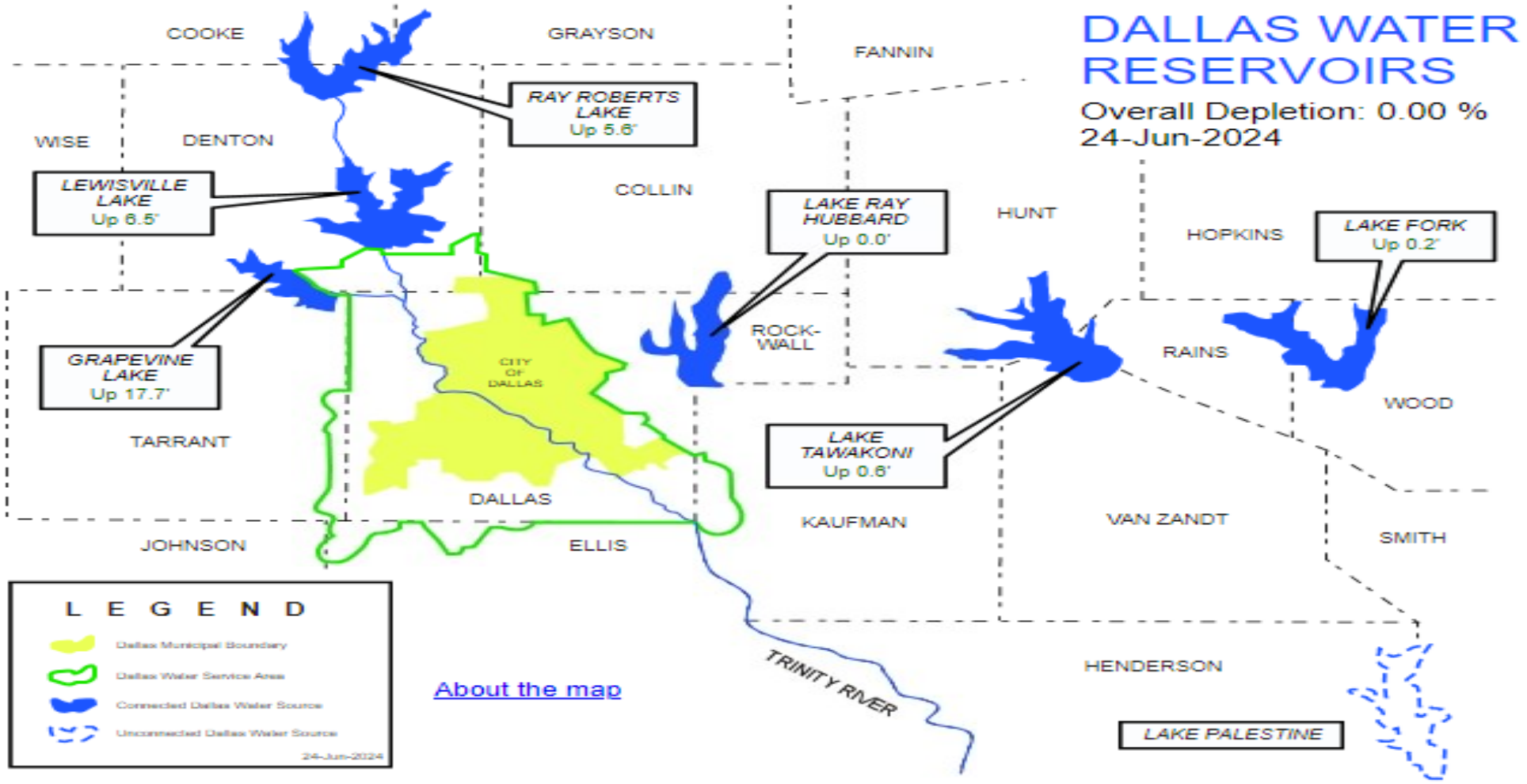
City of Dallas One Water

	ASSETS	CUSTOMERS
	**WATER** • 7 reservoirs, (6 connected) • 5,049 miles of water mains • 3 water treatment plants (900 MGD capacity) • 23 pump stations, 10 elevated and 12 ground storage tanks	**2.6 million treated water customers** • 1.3 million – Retail (City of Dallas) • 1.3 million – Wholesale • 23 wholesale treated water • 4 wholesale untreated water
	**WASTEWATER** • 2 wastewater treatment plants (280 MGD capacity) • 4,066 miles of wastewater main • 15 wastewater pump stations	**320,000+ retail customer accounts** • 11 wholesale wastewater
	**STORMWATER** • 8 major storm water pump stations (5.7 BGD capacity) • 1,963 miles of storm sewers • 30 miles of levees • 39,000 acres of floodplain	**300,000 storm water accounts** • 265,979 Residential • 29,470 Commercial

Dallas' Regional Water Supply System



Current Status of Water Supplies



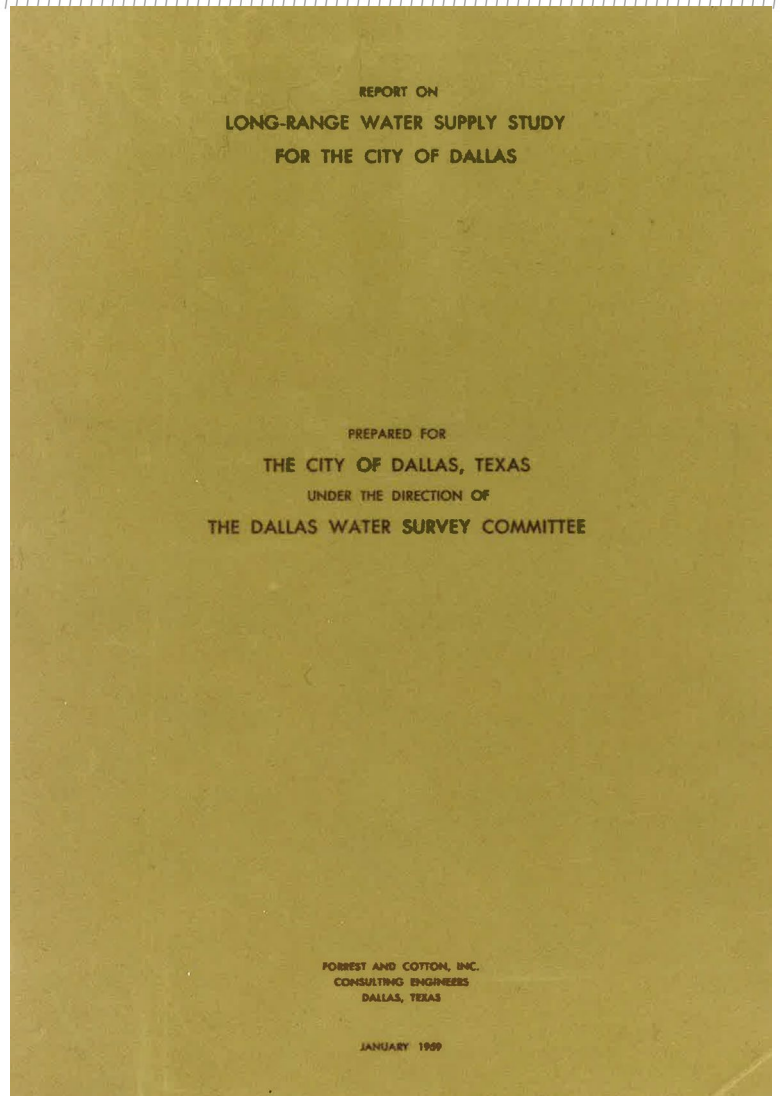
Introduction to Water Planning

"When the well is dry, we know the worth of water."

Benjamin Franklin, Poor Richard's Almanac, 1746

1950's Drought

City of Dallas Red River Pump Station, 1953-1957



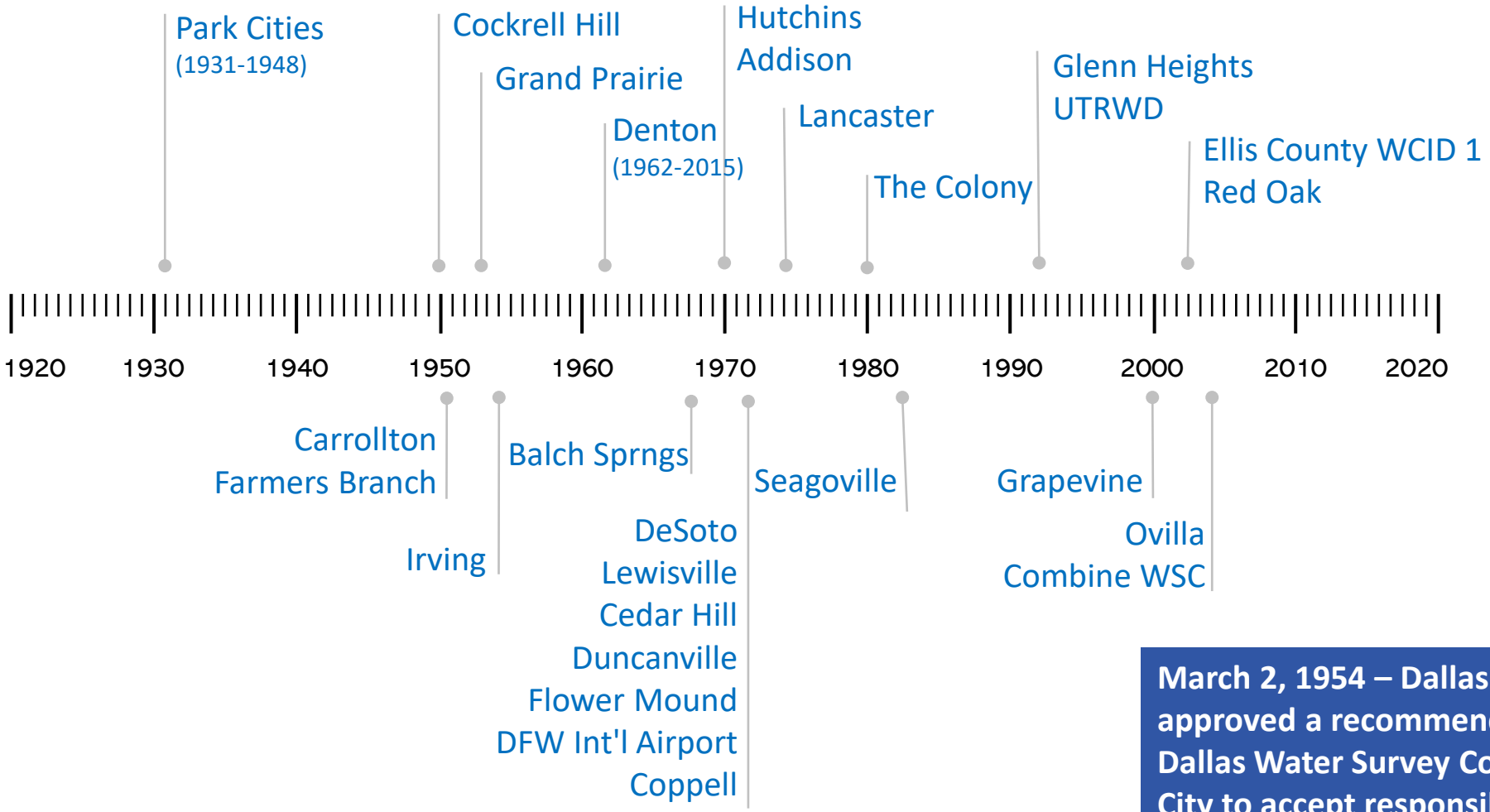
Long Range Water Supply Plan 1959.

Long Range Water Supply Planning

- The current era of long range water supply planning was In response to the drought of the 1950's
- The 1959 Plan was updated in 1975, 1989, 2000, 2005, and 2014
- As a result of the City's planning, the following lakes were constructed and/or contracted for:
  - Grapevine Lake(1952)
  - Lake Tawakoni (1964)
  - Lake Ray Hubbard (1973)
  - Ray Roberts Lake (1989)
  - Lewisville Lake (1955)
  - Lake Palestine (1971)
  - Lake Fork (1980)
- Later studies encouraged aggressive water conservation and reuse, connecting existing reservoirs, and revising Dallas Water Utilities' service area
- The new update will be completed in 2024.

Forney Dam at Lake Ray Hubbard
Tainter Gates

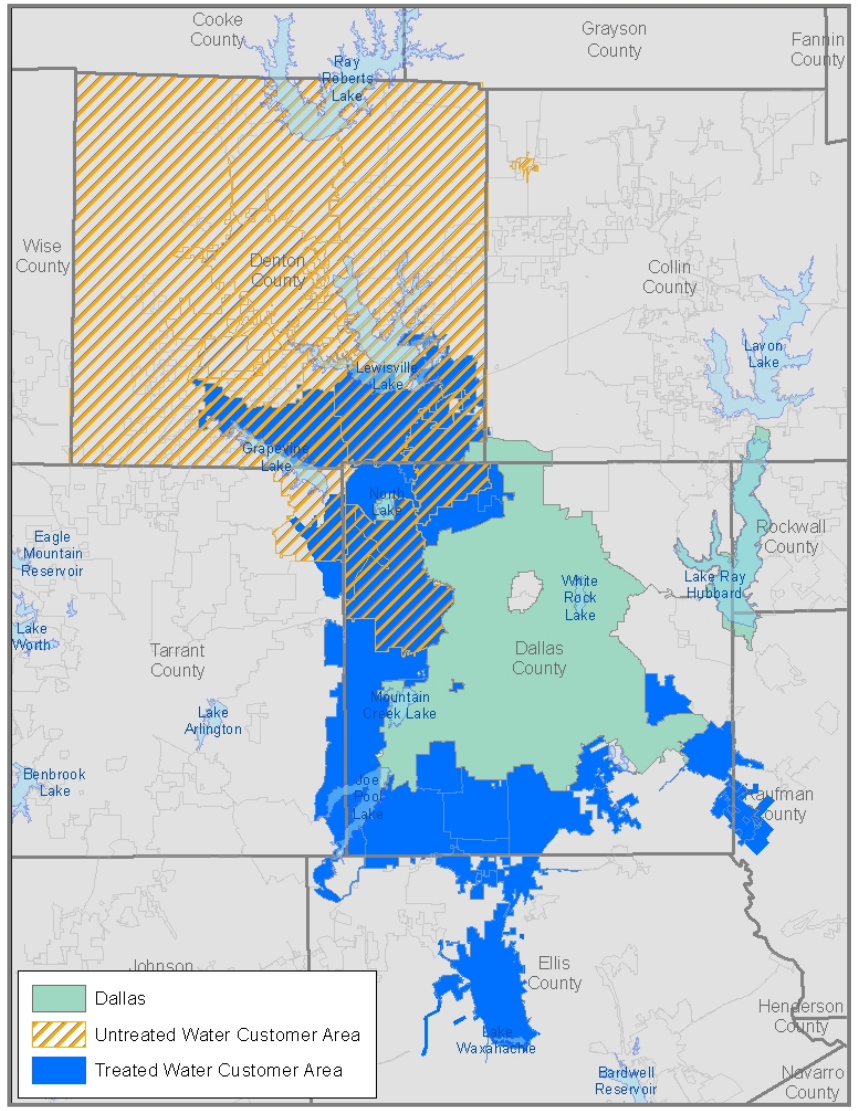
Wholesale Treated and Untreated Water Customers



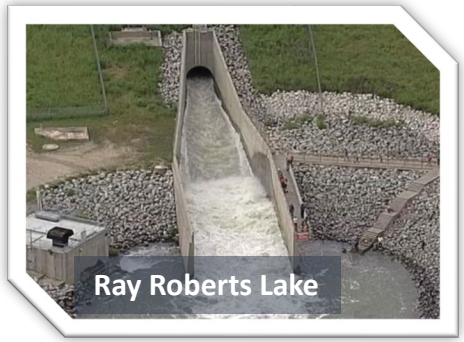
March 2, 1954 – Dallas City Council approved a recommendation by the Dallas Water Survey Committee for the City to accept responsibility for providing water supplies to all of Dallas County

Planning Area

- Dallas' 1959 Plan recommended that Dallas supply water to surrounding cities
- Under the Texas Constitution and state law, all surface water is owned by the State of Texas
- The state has granted Dallas extensive water rights in return for its promise to serve a defined area approved by City Council and included in the state water plan
- Defined service area includes customer cities



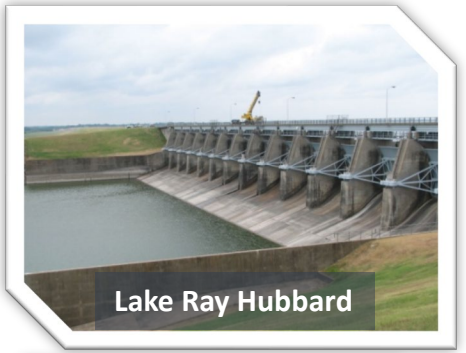
Foundation of Water Supply Planning



Existing Infrastructure must be:

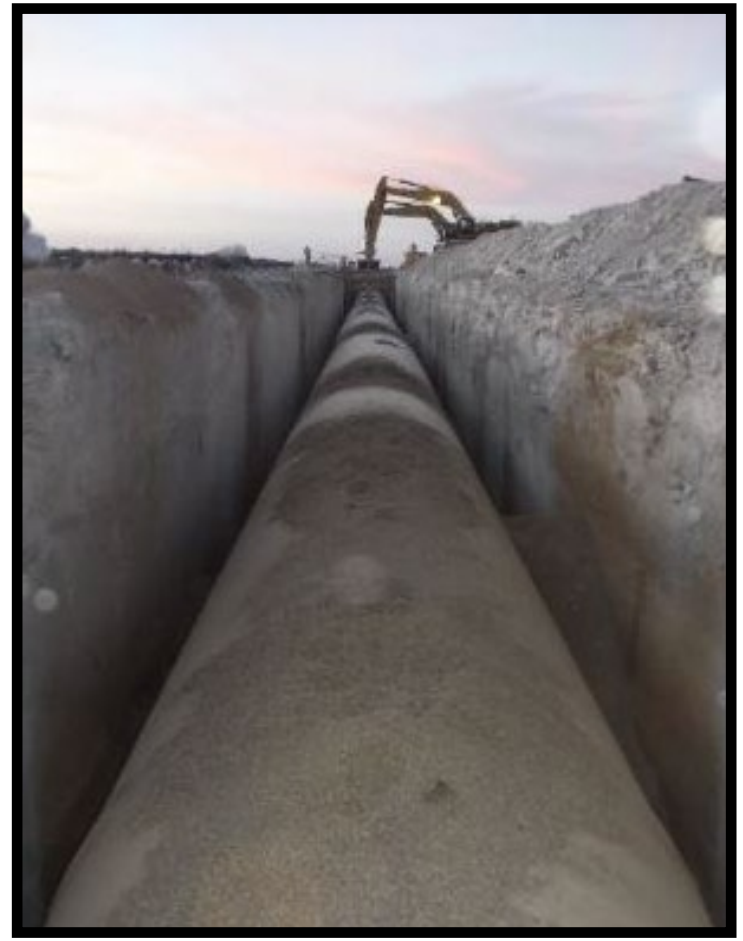
Maintained,
Operational,
and
Storing Water

throughout the Planning Horizon



Planning Guidelines

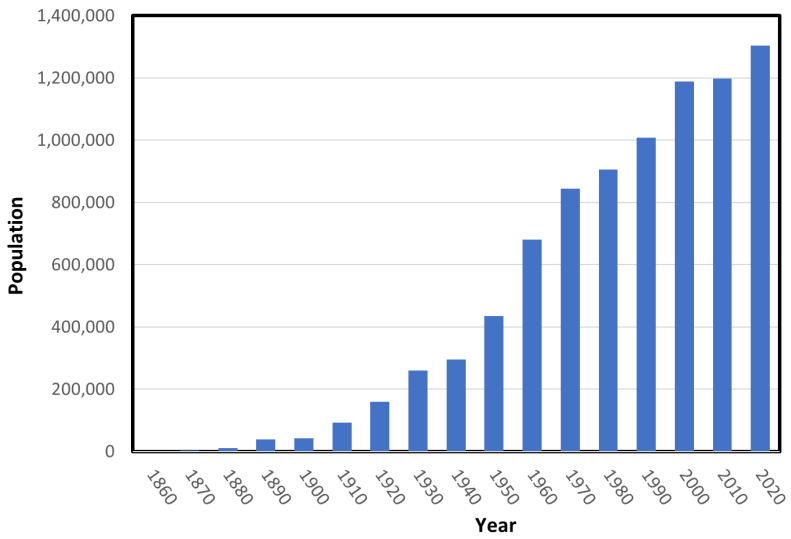
- **Dallas plans to have enough reservoir firm yield to meet water demands equivalent to the 1950s drought of record**
- Dallas' ranking for planned new water supply sources has been based on:
  - Costs – capital construction and power
  - Efficiency
  - Environmental impact
  - Likelihood for development
  - Treatability
- Water located closer to the City is generally less expensive
  - Lower infrastructure costs due to shorter pipelines
  - Lower pumping (energy) costs – a recurring, annual expense
- Working with other area water providers to achieve greater economies of scale and thus reduce costs



Installation of 108-inch pipe along IPL Section 17

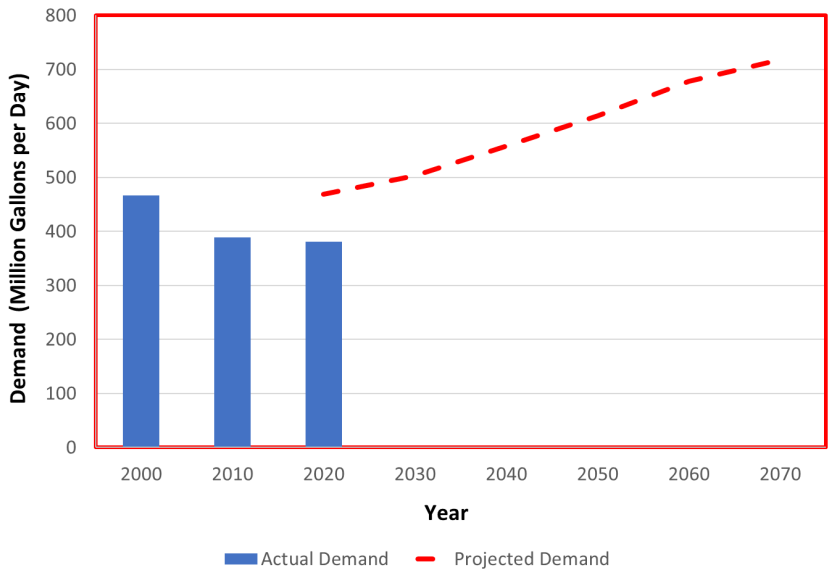
Water Demand Development

Population

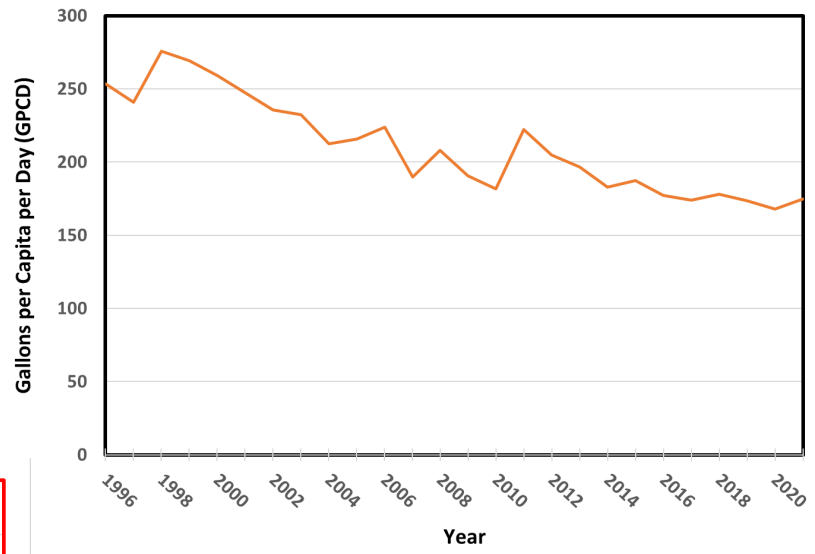


Population x GPCD = Demand

Demand

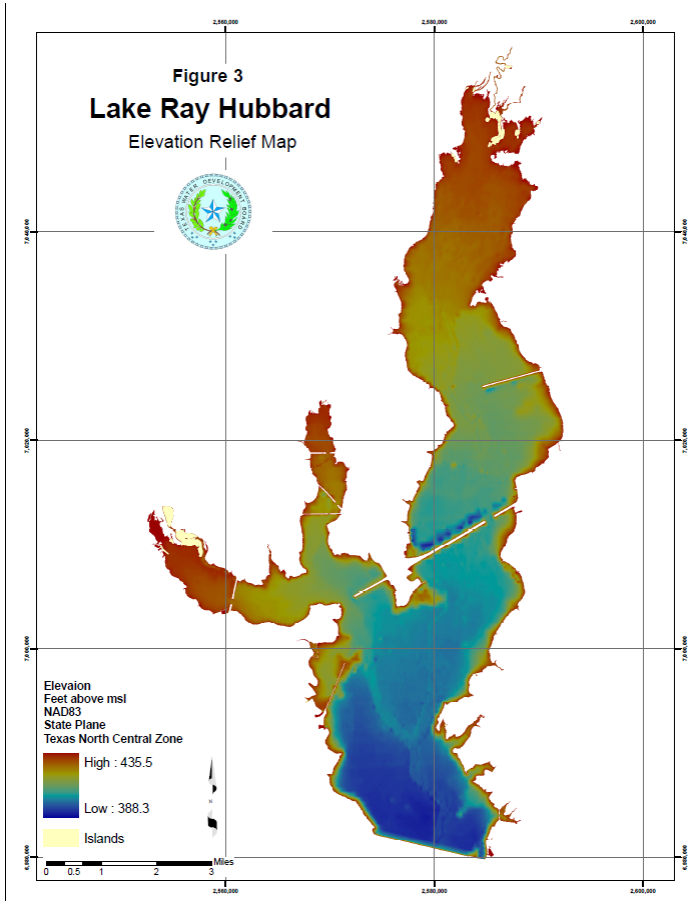


Gallons per Capita per Day (GPCD)



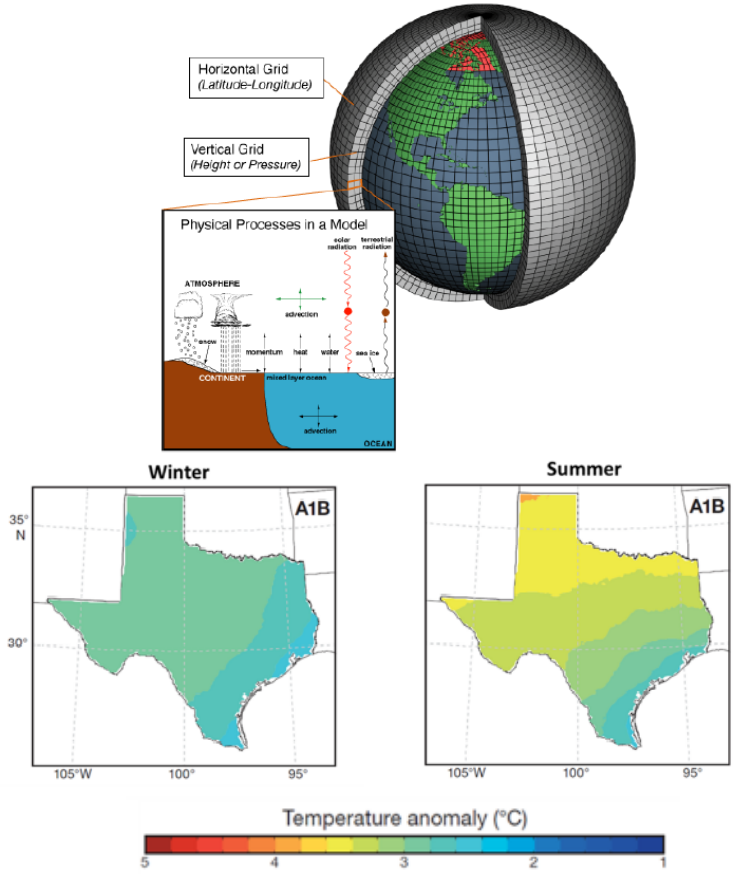
Effects on Existing Supplies

Sedimentation



Decreased Storage Volume

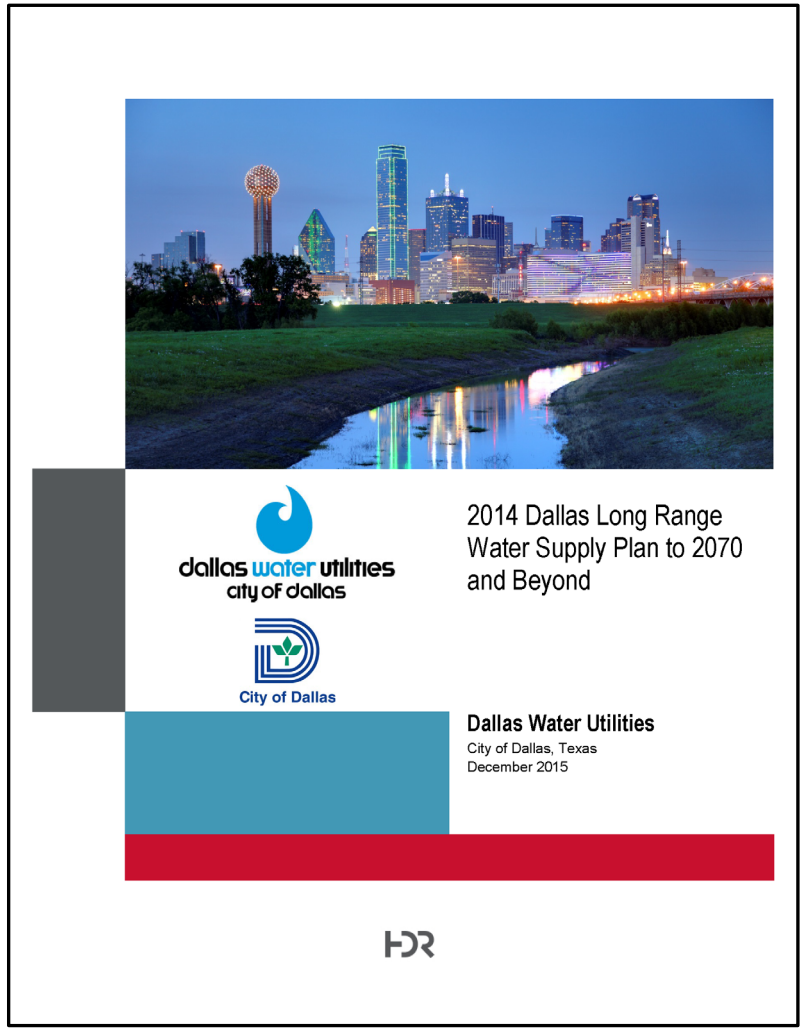
Climate Change



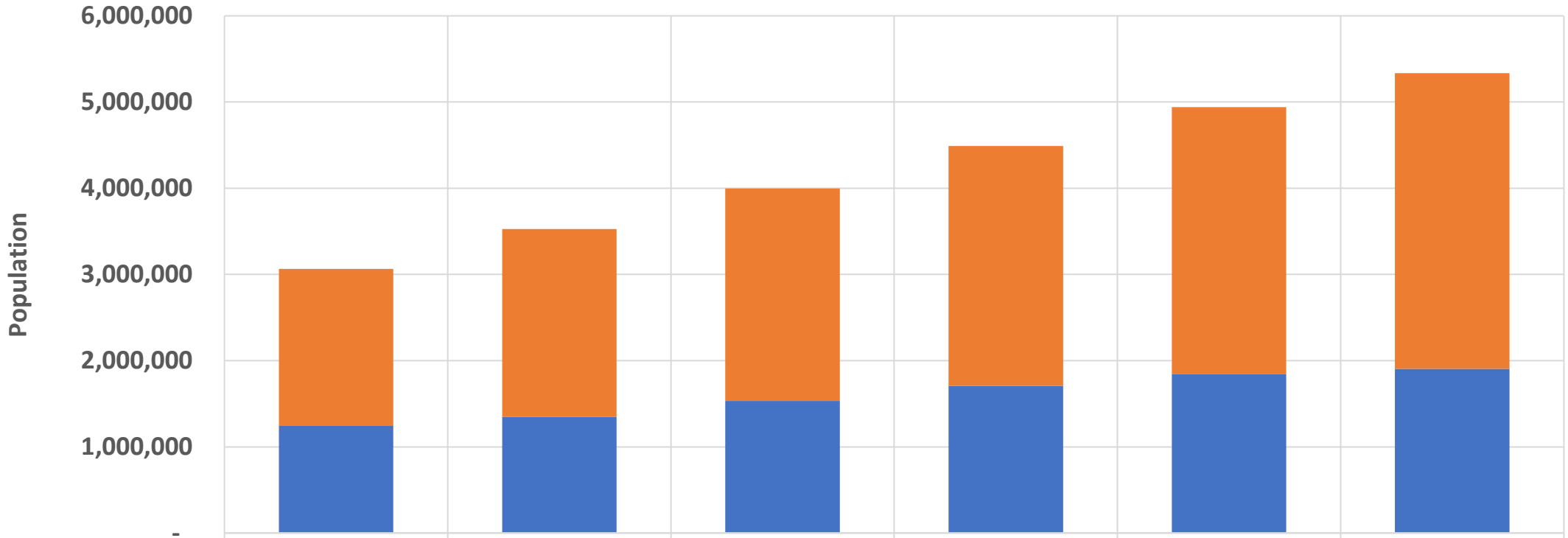
Increased Evaporation

Dallas "2014 Long Range Water Supply Plan Overview"

- Adopted by City Council on October 8, 2014
  - http://dallascityhall.com/departments/waterutilities/DCH%20Documents/2014_LRWSP_Final_Report_all_11302015.pdf
- System average day water demands reduced by 23% or approximately 151 million gallons per day (MGD) while population grows
- Connected firm yield reduced over time due to sedimentation and increased evaporation from higher temperatures
- Projected supply and demand deficit beginning in 2027
- Strategies to meet 2070 DWU system demands consist of:
  - 12% additional conservation
  - 36% indirect reuse
  - 27% connection to existing water supplies
  - 25% new surface water

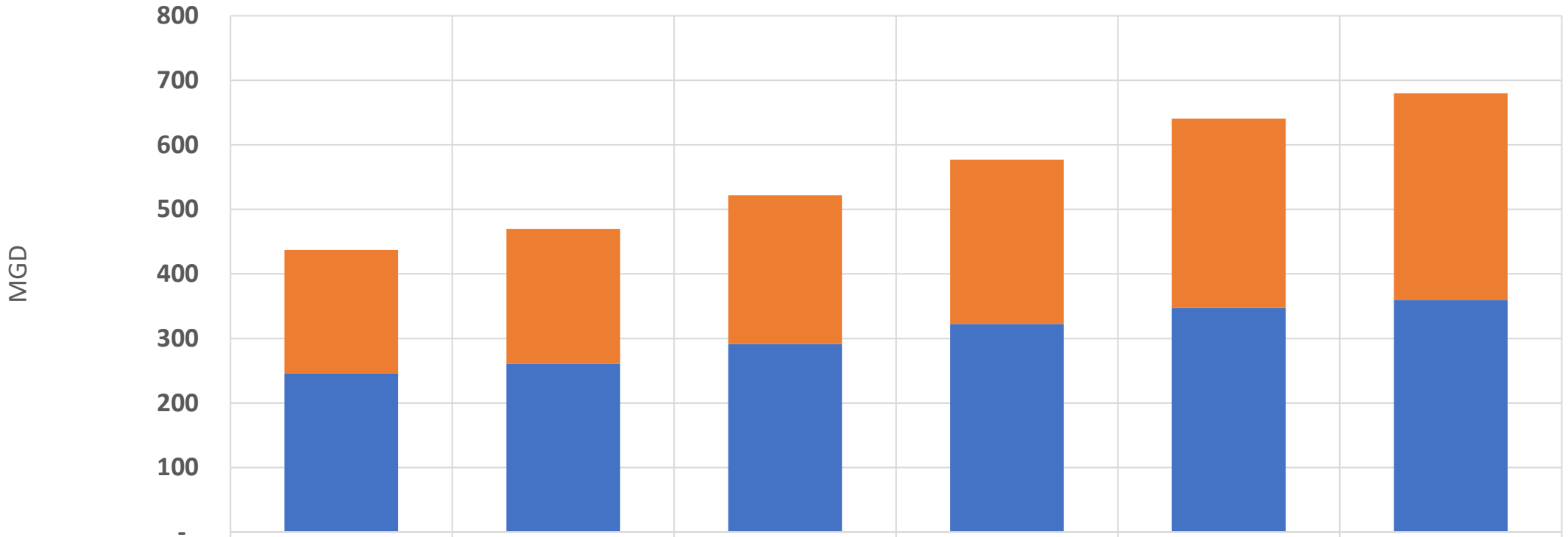


2014 LRWSP - Population Projection



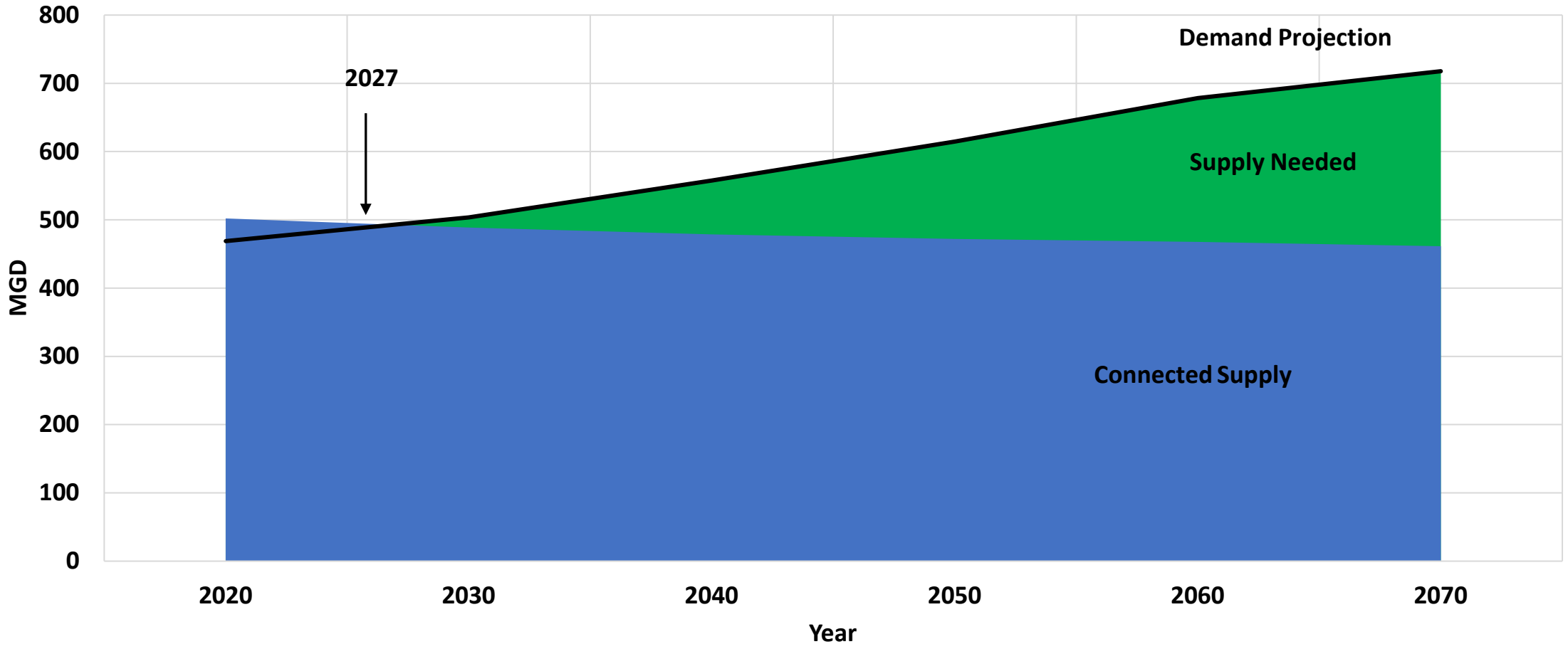
	2020	2030	2040	2050	2060	2070
Customer Cities	1,820,739	2,179,474	2,464,242	2,781,101	3,100,019	3,430,458
City of Dallas	1,242,135	1,347,717	1,531,681	1,707,057	1,841,064	1,905,498

2014 LRWSP - Demand Projection



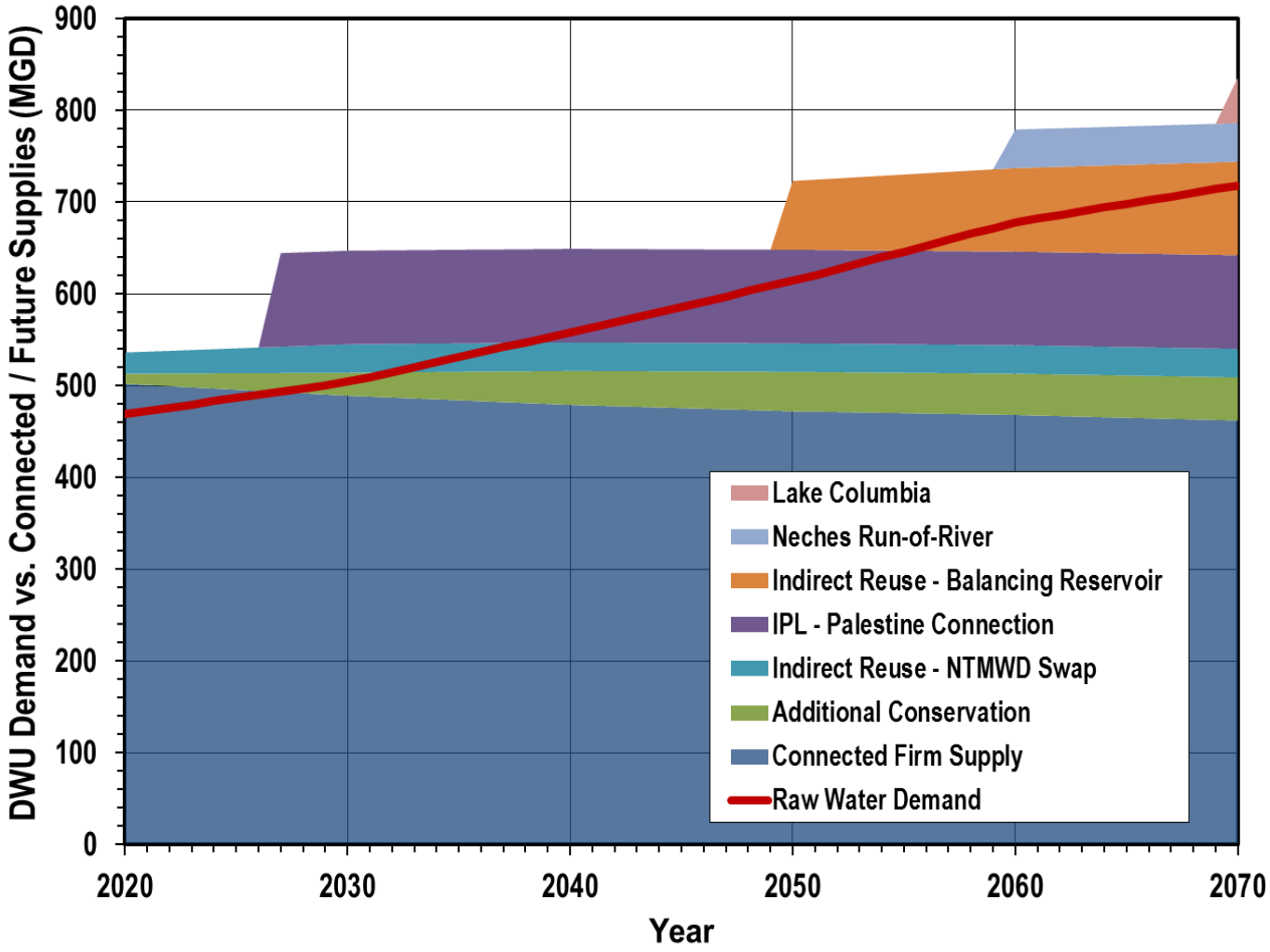
	2020	2030	2040	2050	2060	2070
Customer Cities	191	209	230	255	293	321
City of Dallas	246	261	292	323	347	359

2014 LRWSP – Supply Vs Demand



Recommended Strategy Implementation

Adopted Water Management Strategies	Projected Supply (MGD)	Date
Additional Conservation	46.4	Ongoing
Indirect Reuse Implementation - Main Stem Pump Station – NTMWD Swap Agreement	31.1	2020
Connect Lake Palestine	102	2030
Indirect Reuse Implementation - Main Stem Balancing Reservoir	102	2050
Neches Run-of-River	42.2	2060
Lake Columbia	50.0	2070
Totals	**373.7**	



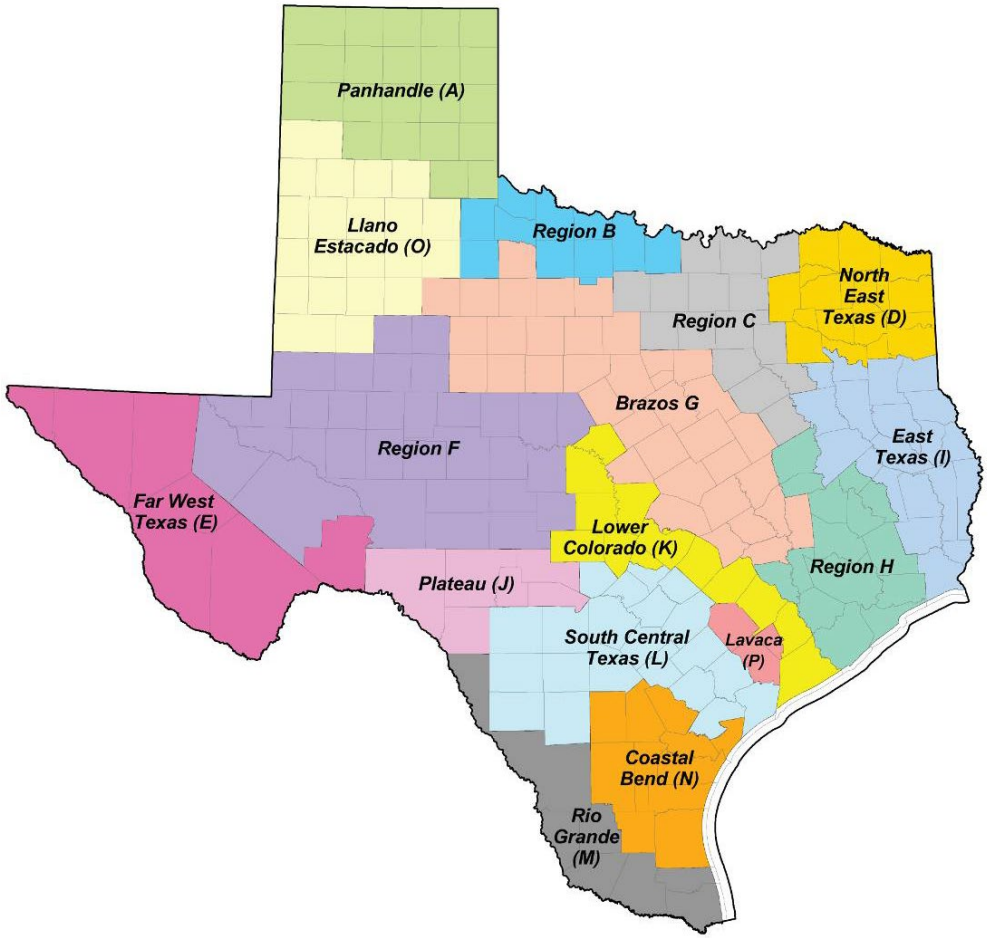
Statewide Water Plan

"Water, not oil, is the life blood of Texas…"

James A. Michener

State and Regional Water Planning

- The passage of Senate Bill 1 of the 75th Legislative Session in 1997 changed water supply planning throughout the State
  - Regional water planning groups established
  - Regional and State water plans required every five years
  - Local plans to be provided to the Regional Water Planning Group for consideration in the Regional Water Plan
- 6th State Planning Cycle
  - Local water management strategies due to Region C by January 2025
  - Region C Water Plan is due to Texas Water Development Board (TWDB) in November 2025
  - State Water Plan due to Governor and Legislature in 2027



City of Dallas

- The meeting will be recorded, and the recording will be made available
- Place your questions in the Chat, Question will be answered at the end the presentation
- Closed captioning can be turned on in TEAMS by selecting the "… more" at the upper right of the TEAMS of Menu Bar, and from the drop-down menu, select "Language and Speech", then select "Turn on live captions"
- Public comment period will run from June 26 to August 9, 2024

Dallas' 2024 Long Range Water Supply Plan

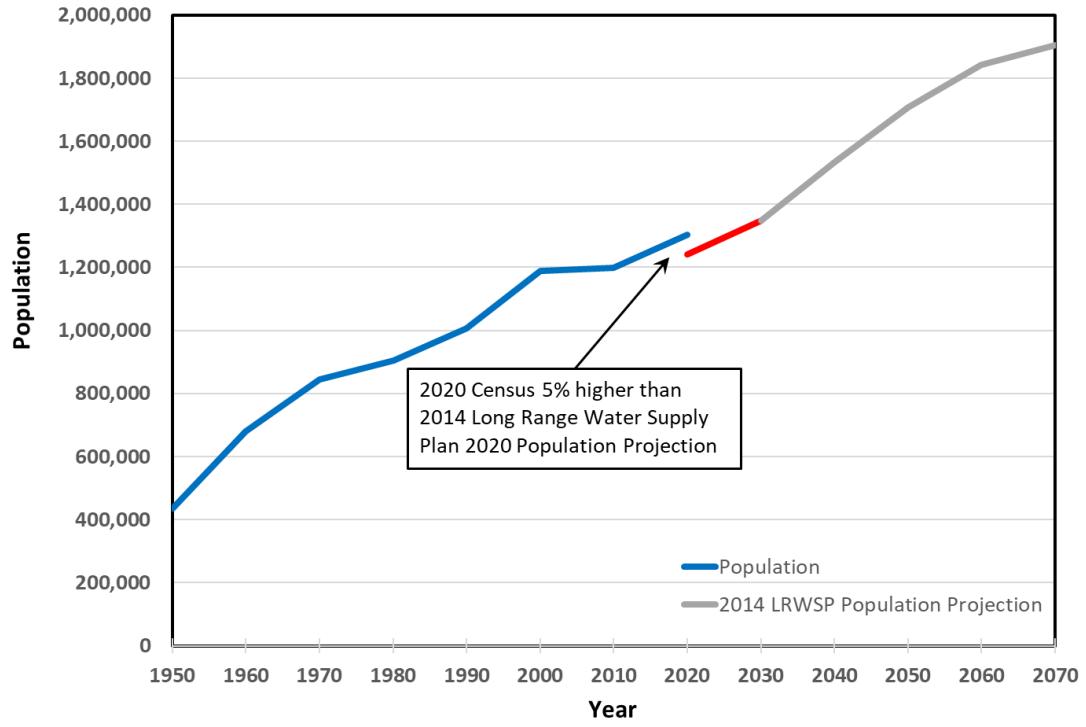
"Water is the driving force in nature."

Leonardo da Vinci

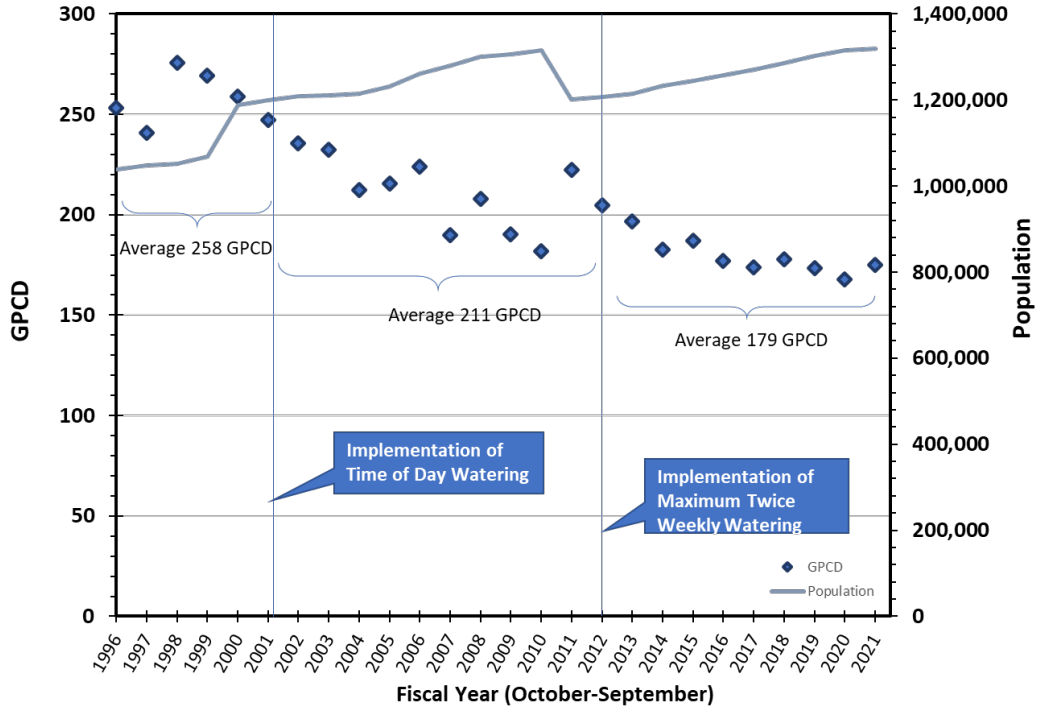
Long Range Water Supply Plan (LRWSP) Update

- Since the 2014 Update to the Long Range Water Supply Plan various 2014 planning assumptions have changed

Population



Water Conservation



Long Range Water Supply Plan (LRWSP) Update (Cont.)

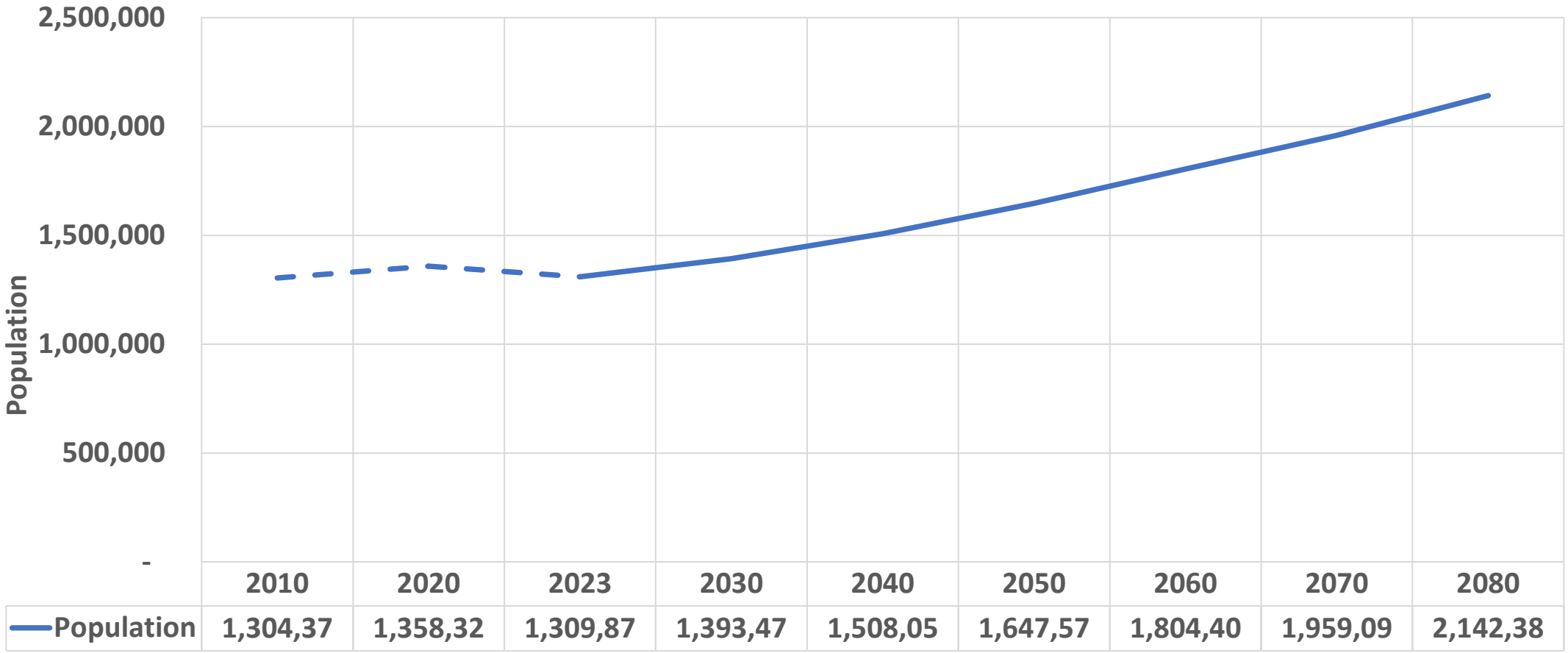
Climate Change

- Review 2014 LRWSP climate change assumptions
- Evaluate climate change models
- Recommend three scenarios (high, medium, and low)
- Adjust reservoir inflows, precipitation, and evaporation in reservoir operations model

Equity

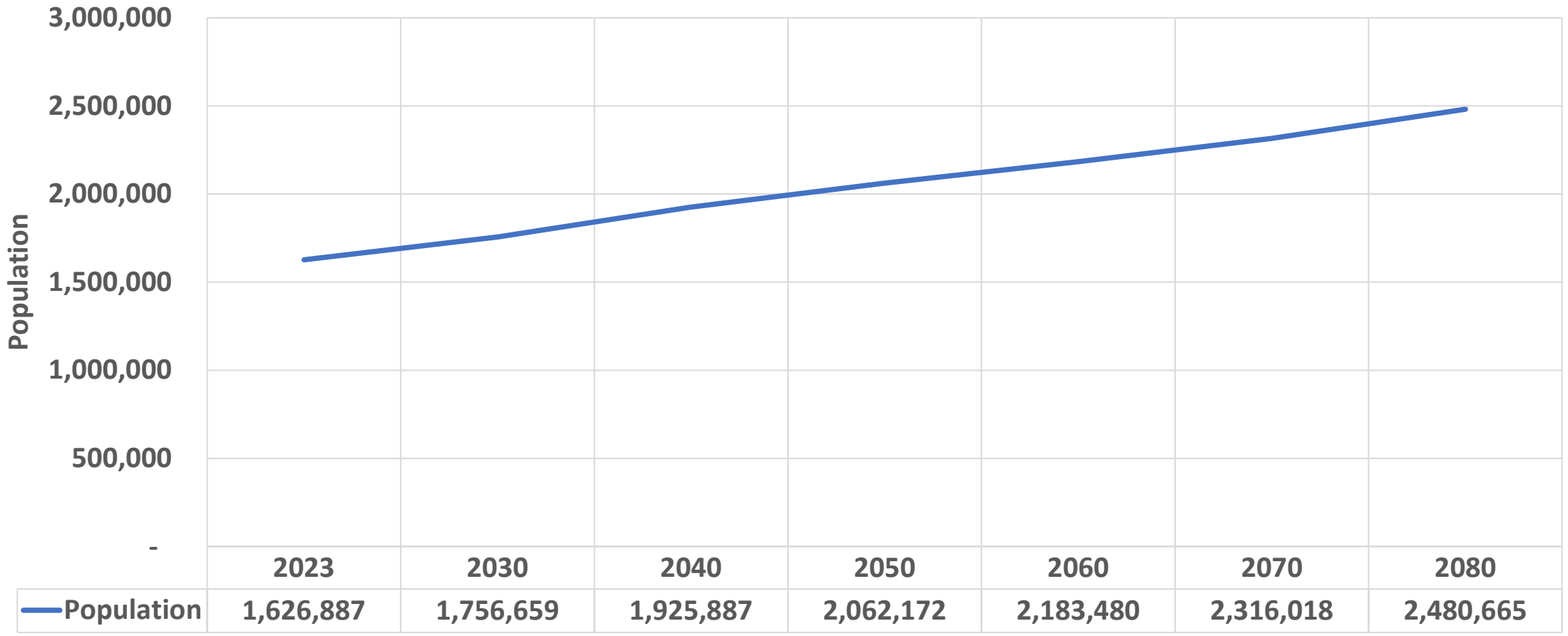
- Equity analysis of water management strategy sources, transmission and delivery areas
- Consider and report on:
  - Community needs
  - Historic and current lack of access and resources
  - Structural and institutional barriers
- Future measurable equity indicators for water supply

2024 LRWSP: Population Projection – City of Dallas



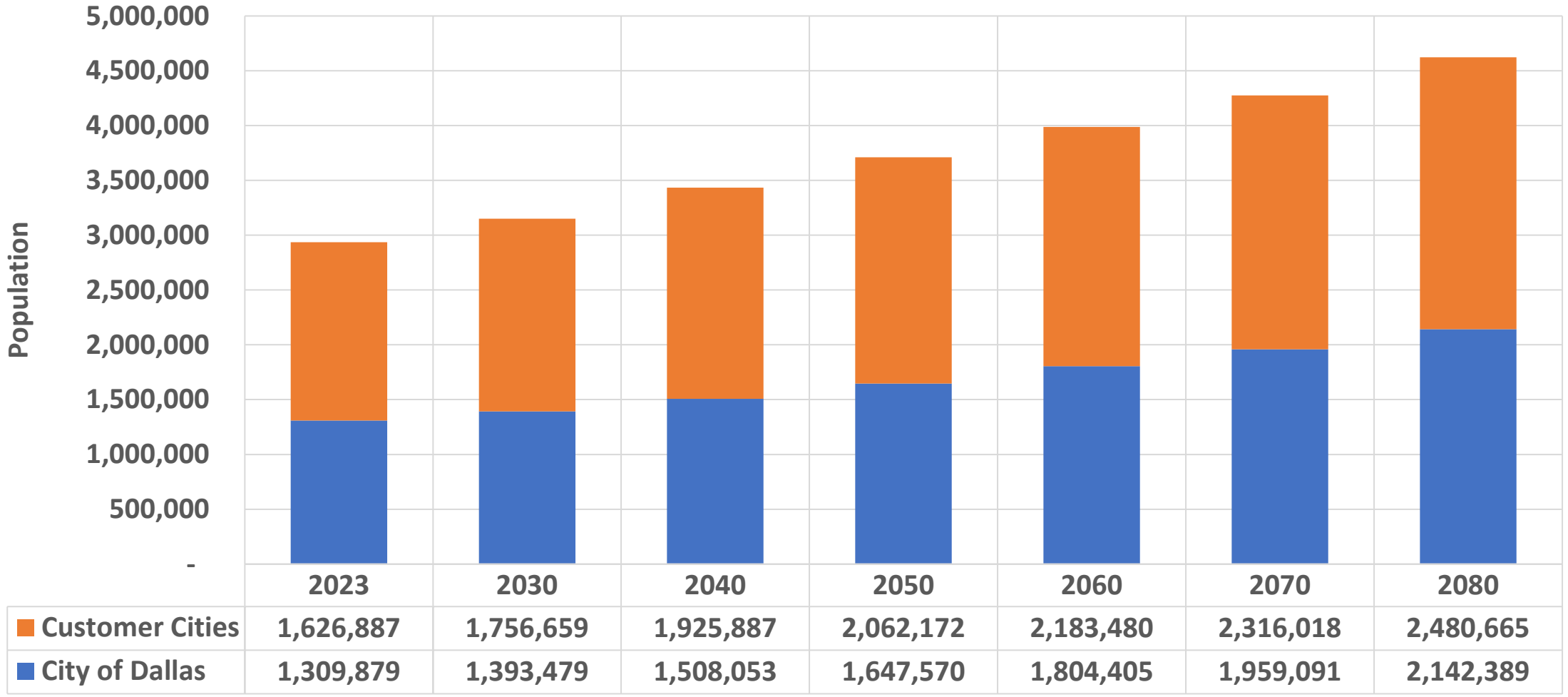
	2010	2020	2023	2030	2040	2050	2060	2070	2080
Population	1,304,37	1,358,32	1,309,87	1,393,47	1,508,05	1,647,57	1,804,40	1,959,09	2,142,38

2024 LRWSP: Population Projection – Customer Cities



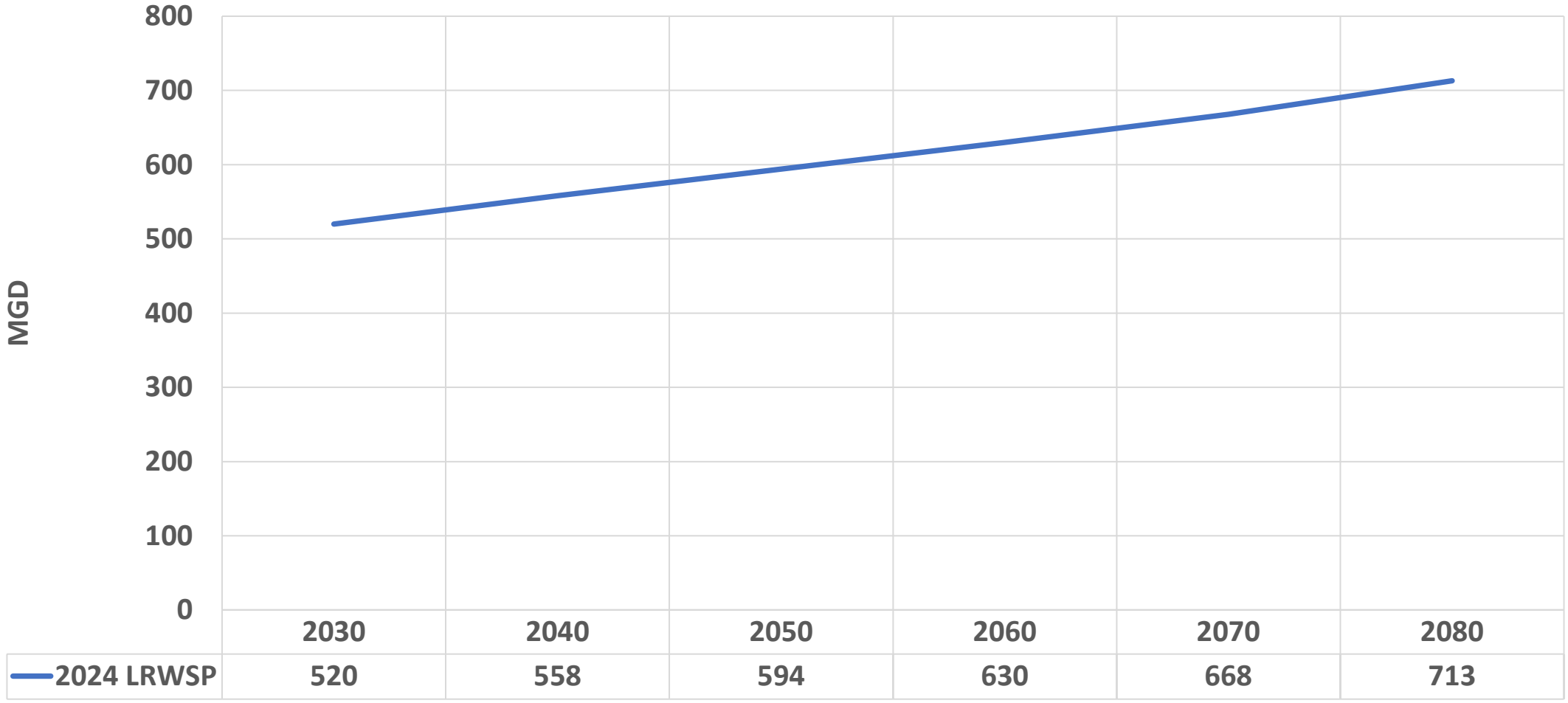
	2023	2030	2040	2050	2060	2070	2080
Population	1,626,887	1,756,659	1,925,887	2,062,172	2,183,480	2,316,018	2,480,665

2024 LRWSP: Total Population Projection



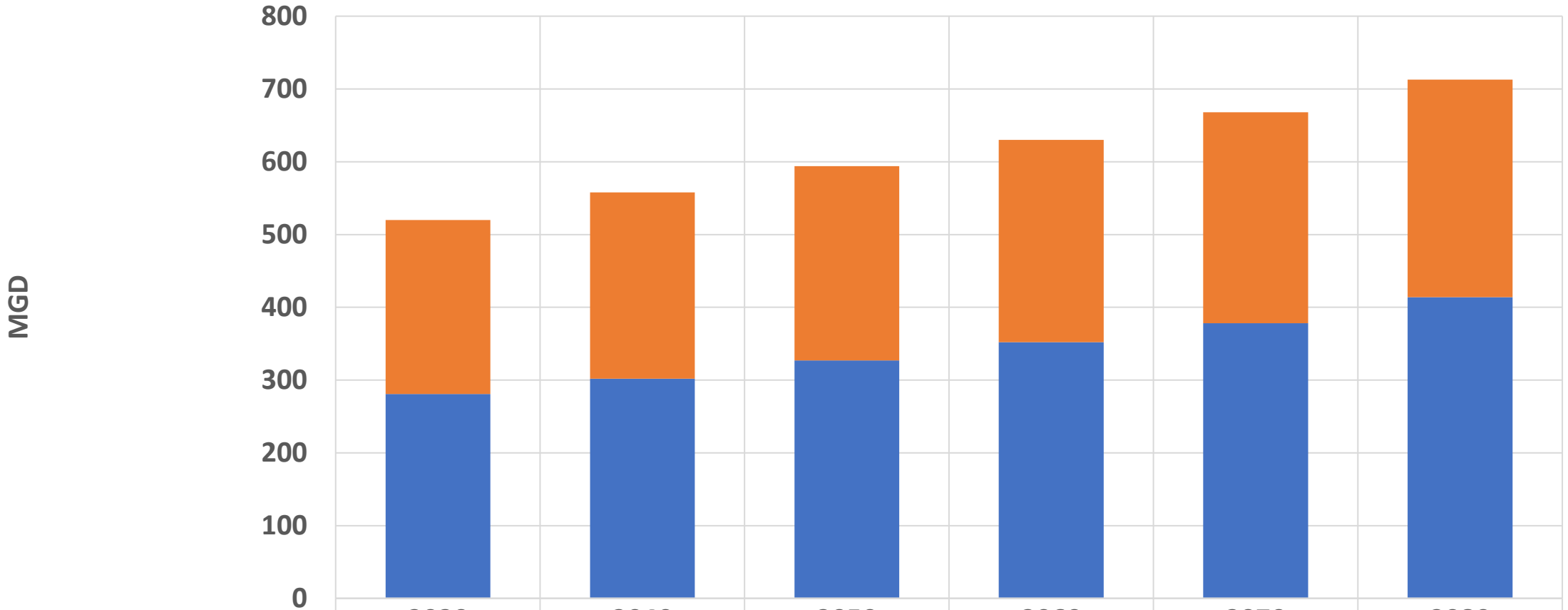
	2023	2030	2040	2050	2060	2070	2080
Customer Cities	1,626,887	1,756,659	1,925,887	2,062,172	2,183,480	2,316,018	2,480,665
City of Dallas	1,309,879	1,393,479	1,508,053	1,647,570	1,804,405	1,959,091	2,142,389

2024 LRWSP: Water Demand Projection



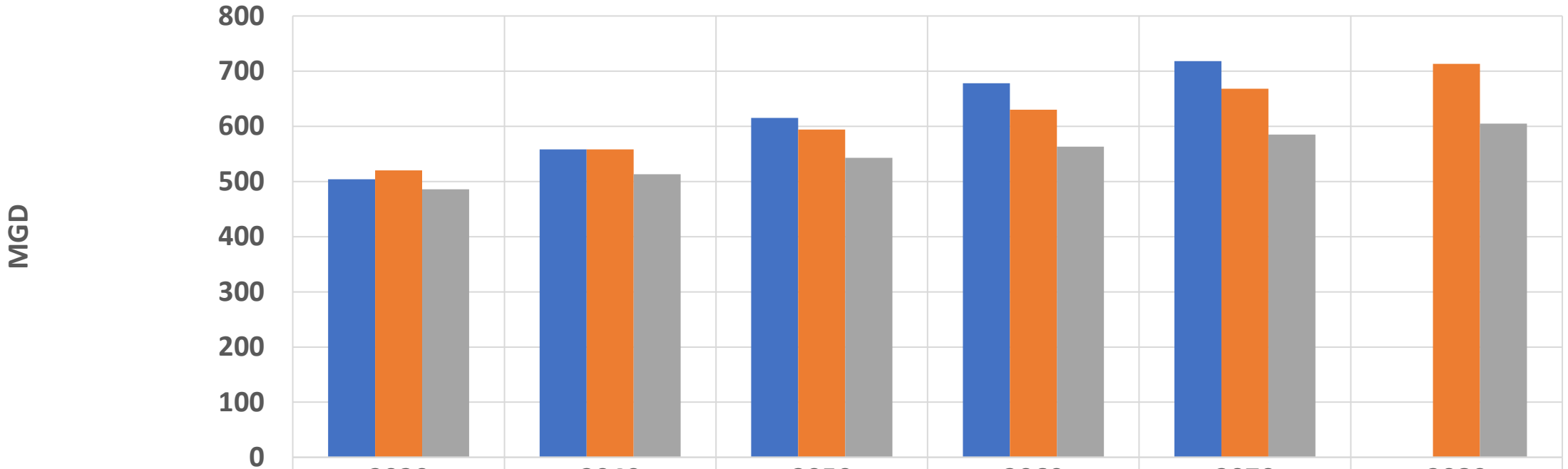
	2030	2040	2050	2060	2070	2080
2024 LRWSP	520	558	594	630	668	713

2024 LRWSP: Demand Projection – Dallas and Customer Cities



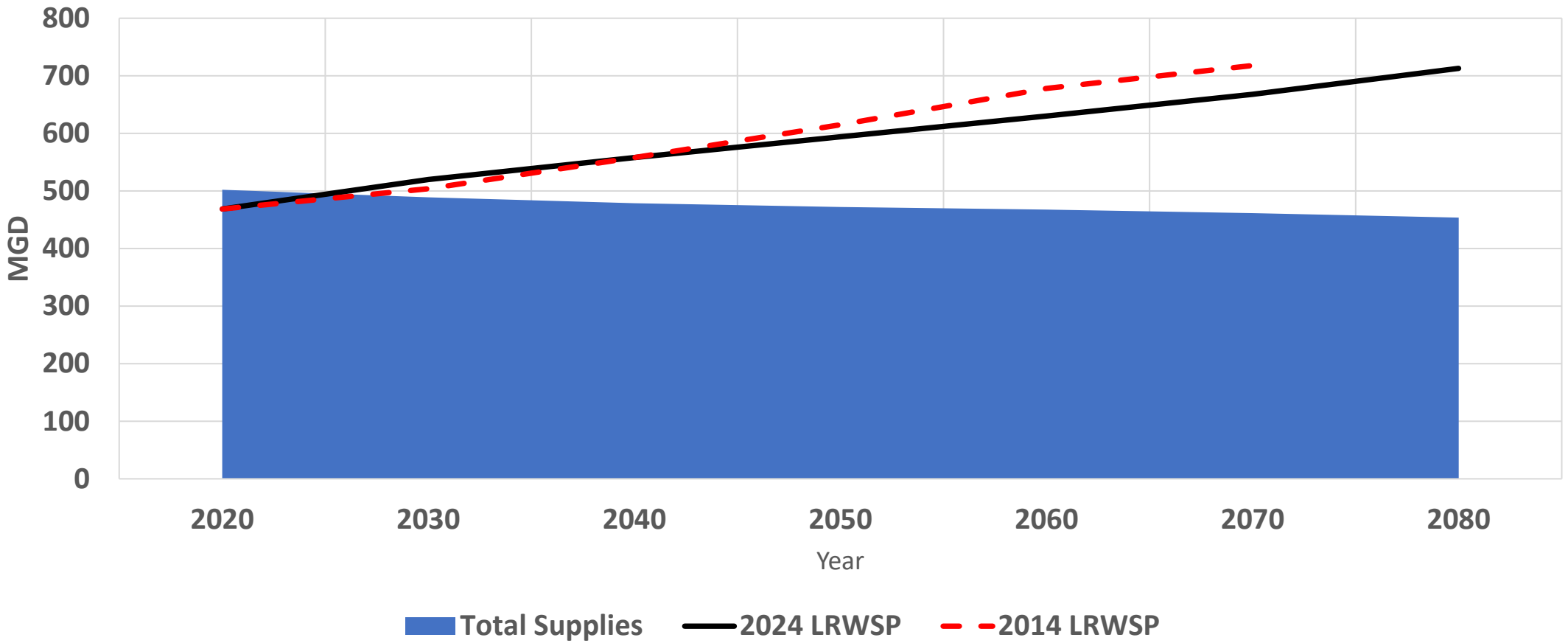
	2030	2040	2050	2060	2070	2080
Customer Cities (MGD)	239	256	267	278	290	299
City of Dallas (MGD)	281	302	327	352	378	414

Water Demand Comparison

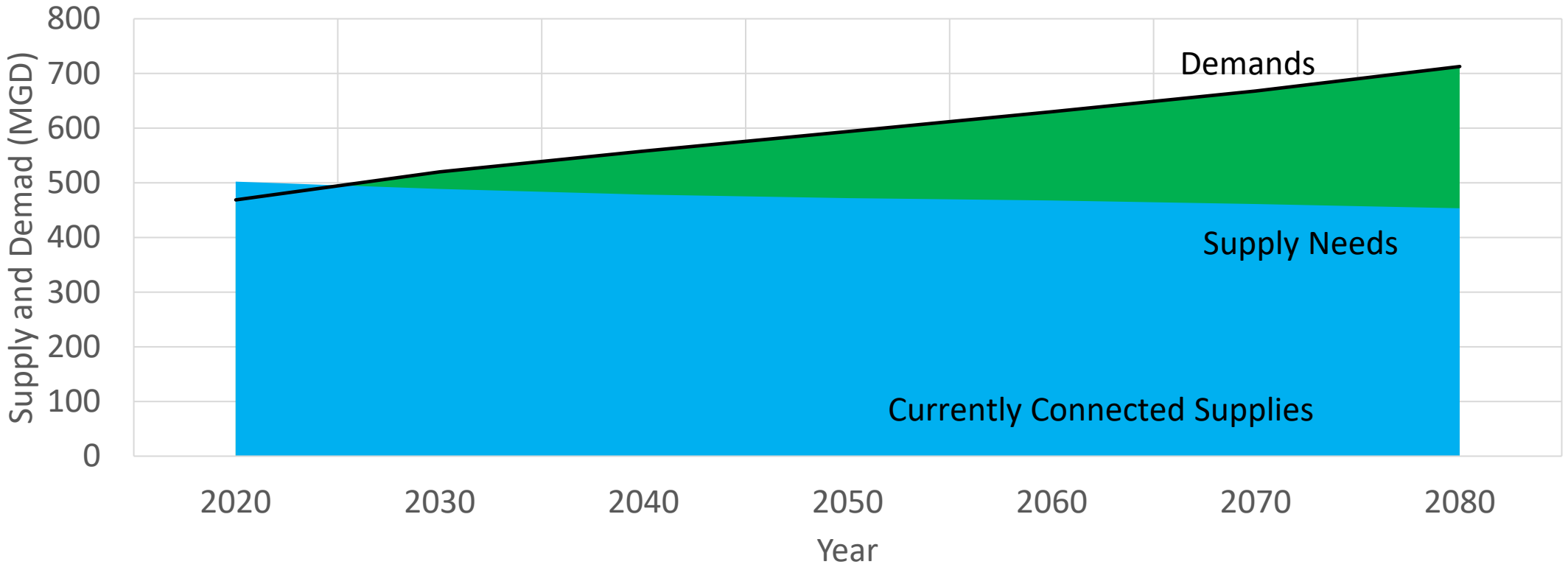


	2030	2040	2050	2060	2070	2080
2014 LRWSP	504	558	615	678	718	
2024 LRWSP	520	558	594	630	668	713
2026 Region C RWP	486	513	543	563	585	605

Supply Vs 2014 & 2024 Demands



2024 LRWSP: Supply, Demand and Need



Decade	2030	2040	2050	2060	2070	2080
Needs(MGD)	27.7	77.5	117.8	153.8	209	259

2024 LRWSP Potential Strategies for Evaluation

Strategy Methodology

SCORING & RANKING SCREENING CRITERIA

Quantitative	Qualitative
• Total Project Cost • Unit Cost • Annual Operation & Maintenance Cost • Supply Volume	• Environmental Impacts • Water Quality • Permitting Challenges/Legal Challenges/ Confidence • Flexibility/Phasing • Equity

32

2024 LRWSP Potential Strategies for Evaluation

Recommended Strategies - 2014

- Additional Conservation
- Main Stem Pump Station –NTMWD Swap Agreement
- Main Stem Balancing Reservoir
- Connect Lake Palestine
- Neches Run-of-River
- Lake Columbia

Alternative Strategies - 2014

- Direct Reuse – Alt. 1
- Carrizo Wilcox Groundwater - Alt. 2
- Sabine – Conjunctive Use (OCR and groundwater)
- Red River OCR
- Sulphur Basin Project - Wright Patman (232.5) / Marvin Nichols (296.5)
- Toledo Bend Reservoir
- Lake Texoma Desalination

Additional Potential Strategies-2024

- Aquifer Storage & Recovery
- Interstate Water Supplies
- Stormwater Supplies
- Riverbank Filtration Alternatives

Upcoming Schedules

- Collect public comments for 45 days (June 26 – August 9, 2024)
- Input public comments and suggestions for strategies evaluation
- Screen water supply strategies
- Recommend water supply strategies to Transportation and Infrastructure Committee (September 16, 2024)
- Approval recommended water supply strategies in the City Council (October 8, 2024)

Public Comments

- June 26 – August 9, 2024: 45-day Public Comment Period
- Comment survey at bit.ly/DWUwaterplanning (case-sensitive)

Q & A

Please enter your questions in the chat.

Senior Engineer Chang Lee, P.E., ENV SP
chang.lee@dallas.gov
214-670-5239

Appendix

"Water is the driving force of all nature"

Leonardo de Vinci

Lists

- Population Projection – City of Dallas
- Population Projection – Customer Cities
- Water Demand Projection of Customer Cities
- Total Water Demand Projection
- Supply Projection per Reservoir
- Climate Change Assumptions
- Water Supply Strategies

Population – City of Dallas

Pressure Zone	Acres	Population Estimates						
		2023	2030	2040	2050	2060	2070	2080
Arcadia Park	1,304	8,274	8,751	9,323	9,945	10,512	11,037	11,683
Brooklyn Heights Intermediate	550	4,259	4,529	4,911	5,540	6,196	6,770	7,408
Cedardale High	5,549	7,143	7,483	7,924	8,444	9,105	9,723	10,472
Central Low	68,469	277,203	296,124	326,330	364,197	410,473	460,694	521,129
Cypress Waters	1,688	1,466	1,474	1,633	1,815	2,052	2,285	2,587
East High	16,321	117,835	125,417	134,926	145,830	156,965	167,199	179,256
Lone Star Intermediate	169	0	0	6	21	64	93	134
Lovers Lane Intermediate	239	1,634	1,851	2,091	2,356	2,635	2,883	3,238
Meandering Way High	7,148	71,446	76,747	83,958	92,200	101,880	114,492	130,042
Meandering Way Intermediate	509	6,004	6,378	7,064	7,591	8,176	8,723	9,346
Mountain Creek High	6,367	4,115	3,046	3,259	3,605	4,030	4,536	5,201
North High	42,661	301,102	322,559	352,418	388,325	427,943	462,987	503,957
Pleasant Grove Intermediate	29,016	125,829	133,194	141,647	152,247	164,149	175,232	188,323
Polk Street Intermediate	586	3,797	4,012	4,233	4,420	4,598	4,767	4,966
Red Bird High	9,158	34,255	36,066	38,694	42,031	45,756	48,758	52,258
South High	276	298,866	315,882	335,556	360,768	387,084	411,847	440,311
Trinity Heights Intermediate	6,758	44,619	47,800	51,754	55,746	60,156	64,317	69,199
Whispering Hills	144	2,032	2,167	2,326	2,490	2,631	2,750	2,879
Population Totals	196,910	1,309,879	1,393,479	1,508,053	1,647,570	1,804,405	1,959,091	2,142,389

Population – Customer Cities

Customer City (Wholesale Entity)	Treated/Untreated Water Ratio	DWU Portion of Total Demands	Allocated Wholesal Population Served						
			2023	2030	2040	2050	2060	2070	2080
Treated Water Customers									
Addison	100%	100%	18,040	20,465	23,069	24,456	25,276	26,179	27,173
Balch Springs	100%	100%	24,486	26,209	28,020	28,979	29,535	30,146	30,819
Carrollton	100%	100%	133,138	133,138	133,138	133,138	133,138	133,138	133,138
Cedar Hill	100%	100%	42,461	44,678	46,970	48,179	48,868	49,627	50,462
Cockrell Hill	100%	100%	3,796	3,599	3,370	3,246	3,167	3,080	2,984
Combine WSC	100%	100%	3,321	3,604	4,094	4,678	5,309	6,009	6,784
De Soto	100%	100%	55,810	59,636	63,651	65,776	67,006	68,360	69,581
DFW Airport	100%	100%	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Duncanville	100%	100%	41,608	43,672	45,939	47,157	47,307	47,307	47,307
Farmers Branch	100%	100%	33,311	36,454	39,795	41,570	42,609	43,754	45,014
Flower Mound	100%	33%	26,826	31,619	39,636	48,070	56,641	66,079	76,473
Glenn Heights	100%	98%	19,053	21,769	25,431	28,689	31,701	35,010	38,650
Grand Prairie	100%	71%	140,616	145,329	150,203	152,774	154,239	155,851	157,627
Hutchins	100%	100%	7,455	8,346	9,300	9,808	10,107	10,436	10,799
Irving	57%	61%	160,394	173,323	182,487	182,487	182,487	182,487	182,457
Lancaster	100%	100%	42,033	44,667	47,419	48,875	49,713	50,637	51,653
Lancaster MUD 1	100%	100%	1,772	2,286	2,844	3,142	3,321	3,517	3,734
Wilmer	100%	100%	5,185	5,902	6,672	7,081	7,324	7,591	7,885

Population – Customer Cities - Continued

Customer City (Wholesale Entity)	Treated/Untreated Water Ratio	DWU Portion of Total Demands	Allocated Wholesal Population Served						
			2023	2030	2040	2050	2060	2070	2080
Treated Water Customers									
Lewisville	53%	100%	109,624	109,624	109,624	109,624	109,624	109,624	109,624
Denton County FWSD 1A	100%	51%	8,668	11,497	15,411	15,411	15,411	15,411	15,411
Ovilla	100%	100%	4,560	5,438	6,827	8,337	9,871	11,556	13,411
Red Oak	100%	100%	10,167	12,039	15,009	18,237	21,502	25,093	29,044
Seagoville	100%	100%	18,981	20,875	22,892	23,964	24,593	25,285	26,047
The Colony	100%	72%	33,276	37,218	43,727	48,857	48,857	48,857	48,857
Treated Water Totals			944,580	1,001,386	1,065,527	1,102,534	1,127,605	1,155,033	1,185,234
			Untreated Water Customers						
Coppell	100%	99%	42,417	42,496	42,496	42,496	42,496	42,496	42,496
Grapvine	100%	5%	2,330	2,438	2,438	2,438	2,438	2,438	2,438
Irving	43%	61%	Population served tracked under "Treated Water Customers"						
Lewisville	47%	100%	Population served tracked under "Treated Water Customers"						
UTRWD (Total)	100%	30%	108,863	165,459	189,041	213,841	237,710	263,677	297,910
Irrigation	100%	100%	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Untreated Water Totals			153,610	210,393	233,975	258,776	282,644	308,611	342,844
Treated and Untreated Water Totals			1,098,189	1,211,780	1,299,502	1,361,310	1,410,249	1,463,244	1,528,078

Customer City Demands

Customer City (Wholesale Entity)	Treated/Untreated Water Ratio	DWU Portion of Total Demands	Allocated Projected Baselin with Plumbing Code Water Demand (MGD)						
			2023	2030	2040	2050	2060	2070	2080
Treated Water Customers									
Addison	100%	100%	5.2	7.4	8.4	8.9	9.1	9.5	9.8
Balch Springs	100%	100%	2.1	2.3	2.5	2.6	2.6	2.7	2.7
Carrollton	100%	100%	20.4	21.6	21.5	21.5	21.5	21.5	21.5
Cedar Hill	100%	100%	6.4	7.8	8.2	8.4	8.5	8.7	8.8
Cockrell Hill	100%	100%	0.3	0.3	0.2	0.2	0.2	0.2	0.2
Combine WSC	100%	100%	0.3	0.3	0.3	0.4	0.4	0.5	0.6
De Soto	100%	100%	8.9	9.0	9.5	9.8	10.0	10.2	10.5
DFW Airport	100%	100%	2.7	3.1	3.3	3.5	3.6	3.7	3.9
Duncanville	100%	100%	4.9	5.4	5.6	5.8	5.8	5.8	5.8
Farmers Branch	100%	100%	8.0	9.5	10.3	10.8	11.0	11.3	11.6
Flower Mound	100%	33%	5.2	7.0	8.8	10.6	12.5	14.6	16.9
Glenn Heights	100%	98%	2.1	2.1	2.4	2.7	3.0	3.3	3.7
Grand Prairie	100%	71%	17.5	20.4	21.0	21.3	21.5	21.8	22.0
Hutchins	100%	100%	1.3	1.6	1.8	1.9	2.0	2.0	2.1
Irving	57%	61%	13.5	18.4	19.3	19.3	19.3	19.3	19.3
Lancaster	100%	100%	6.6	6.6	7.0	7.2	7.3	7.5	7.6
Lancaster MUD 1	100%	100%	0.2	0.2	0.2	0.2	0.2	0.2	0.3
Wilmer	100%	100%	0.6	0.5	0.6	0.6	0.6	0.7	0.7

Customer City Demands - Continued

Customer City (Wholesale Entity)	Treated/Untreated DWU Water Ratio	Portion of Total Demands	Allocated Projected Baselin with Plumbing Code Water Demand (MGD)						
			2023	2030	2040	2050	2060	2070	2080
Treated Water Customers									
Lewisville	53%	100%	8.9	9.5	9.5	9.5	9.5	9.5	9.5
Denton County FWSD 1A	100%	51%	3.2	2.6	3.5	3.5	3.5	3.5	3.5
Ovilla	100%	100%	0.7	1.1	1.4	1.7	2.1	2.4	2.8
Red Oak	100%	100%	1.2	1.6	1.9	2.4	2.8	3.2	3.8
Seagoville	100%	100%	1.9	2.0	2.2	2.3	2.3	2.4	2.5
The Colony	100%	72%	4.4	4.9	5.8	6.4	6.4	6.4	6.4
Treated Water Totals			126.2	145.3	155.3	161.6	166.1	171.1	176.5
Untreated Water Customers									
Coppell	100%	99%	8.8	9.9	9.8	9.8	9.8	9.8	9.8
Grapvine	100%	5%	0.6	0.8	0.8	0.8	0.8	0.8	0.8
Irving	43%	61%	10.3	14.2	14.9	14.9	14.9	14.9	14.9
Lewisville	47%	100%	7.8	8.4	8.3	8.3	8.3	8.3	8.3
UTRWD (Total)	100%	30%	5.9	28.5	32.6	36.9	41.2	45.7	51.7
Irrigation	100%	100%	0.6	0.6	0.6	0.6	0.6	0.6	0.6
Untreated Water Totals			34.0	62.3	67.0	71.3	75.5	80.1	86.1
Treated and Untreated Water Totals			160.2	207.6	222.3	232.9	241.7	251.2	262.6

Demands – City of Dallas & Customer Cities

Year	Total 2024 LRWSP Demand	City of Dallas	Customer Cities
2030	520	281	239
2040	558	302	256
2050	594	327	267
2060	630	352	278
2070	668	378	290
2080	713	414	299

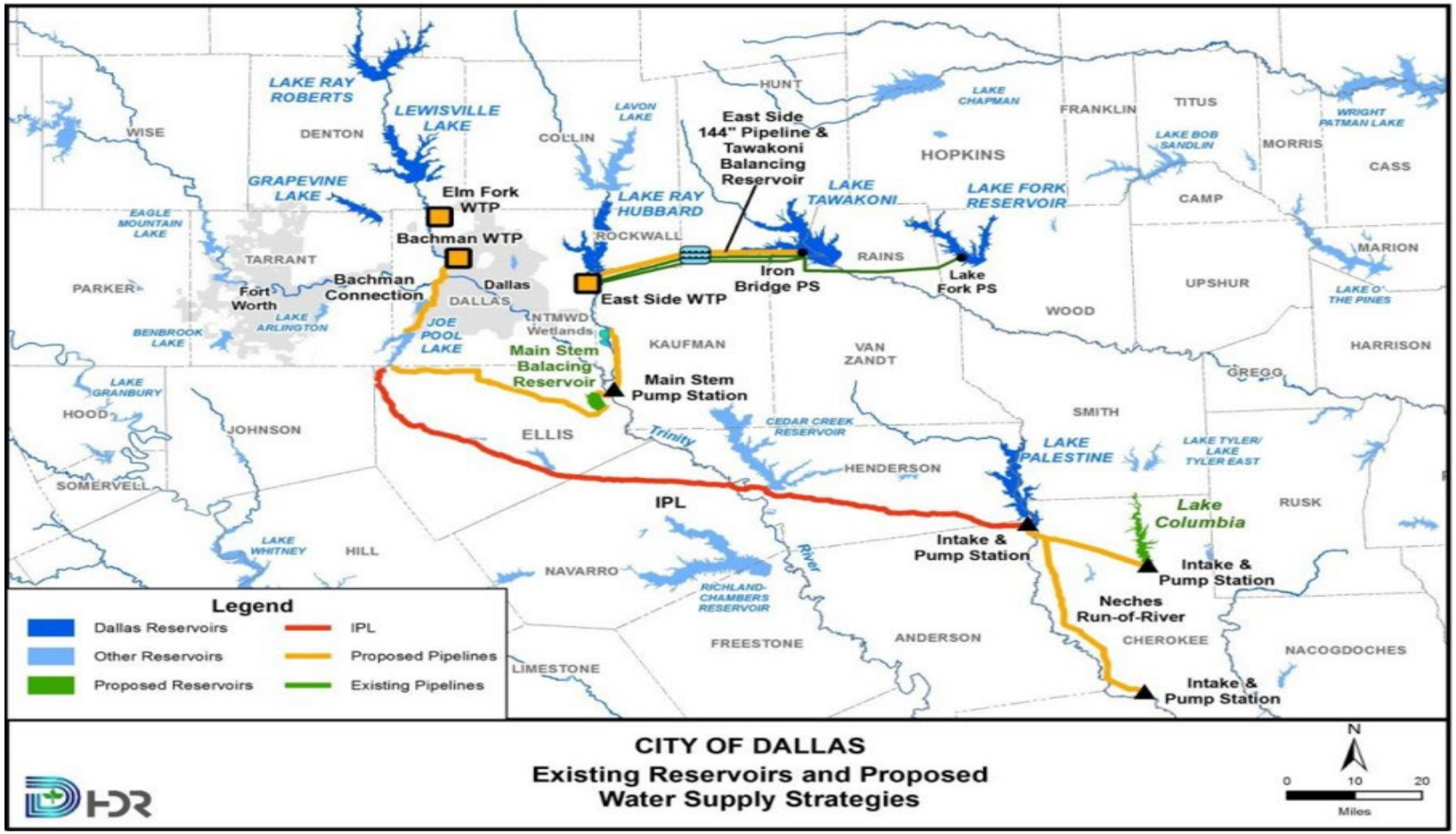
Supply per Reservoir

Source	2030	2040	2050	2060	2070	2080
Grapevine	9.2	8.8	8.4	8	7.6	7
Elm Fork	154	148.6	143.3	138	132.7	127
LRH	50	50	50	50	50	50
Tawakoni	152.1	147.8	143.5	143.5	134.8	130
Fork	105.3	102.5	99.6	99.6	93.8	91
Elm Fork Return Flows	21.7	22.8	31.4	31.4	40.1	48
Total	492.3	480.5	476.2	476.2	459	454

Climate Change: Climate Change Assumptions

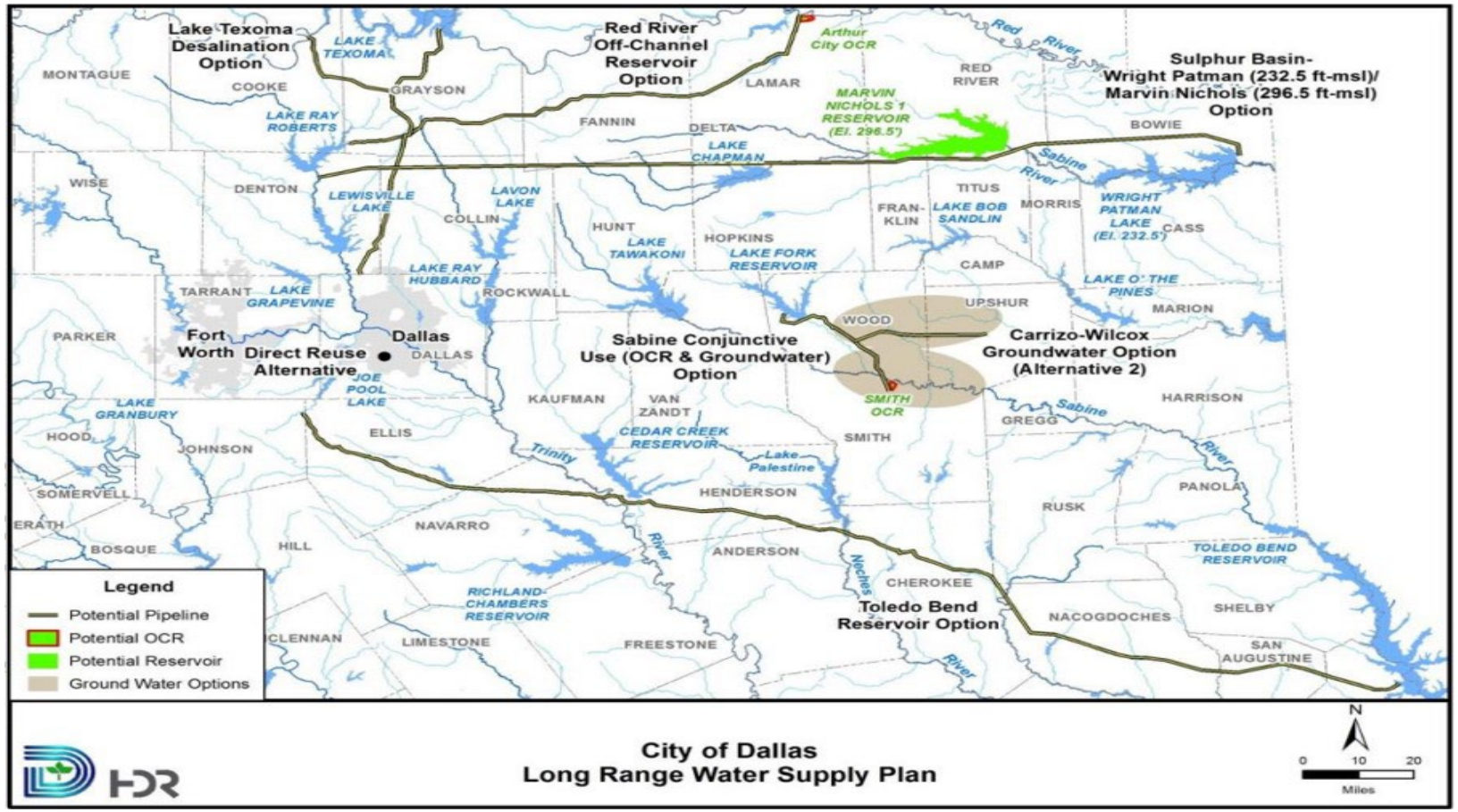
Year	March-May Change in Temperature (F)	June-February Change in Temperature (F)
2030	3	3
2040	4	4
2050	5	5
2060	6	6
2070	7	7
2080	8	8

2014 LRWSP Recommended Srategies



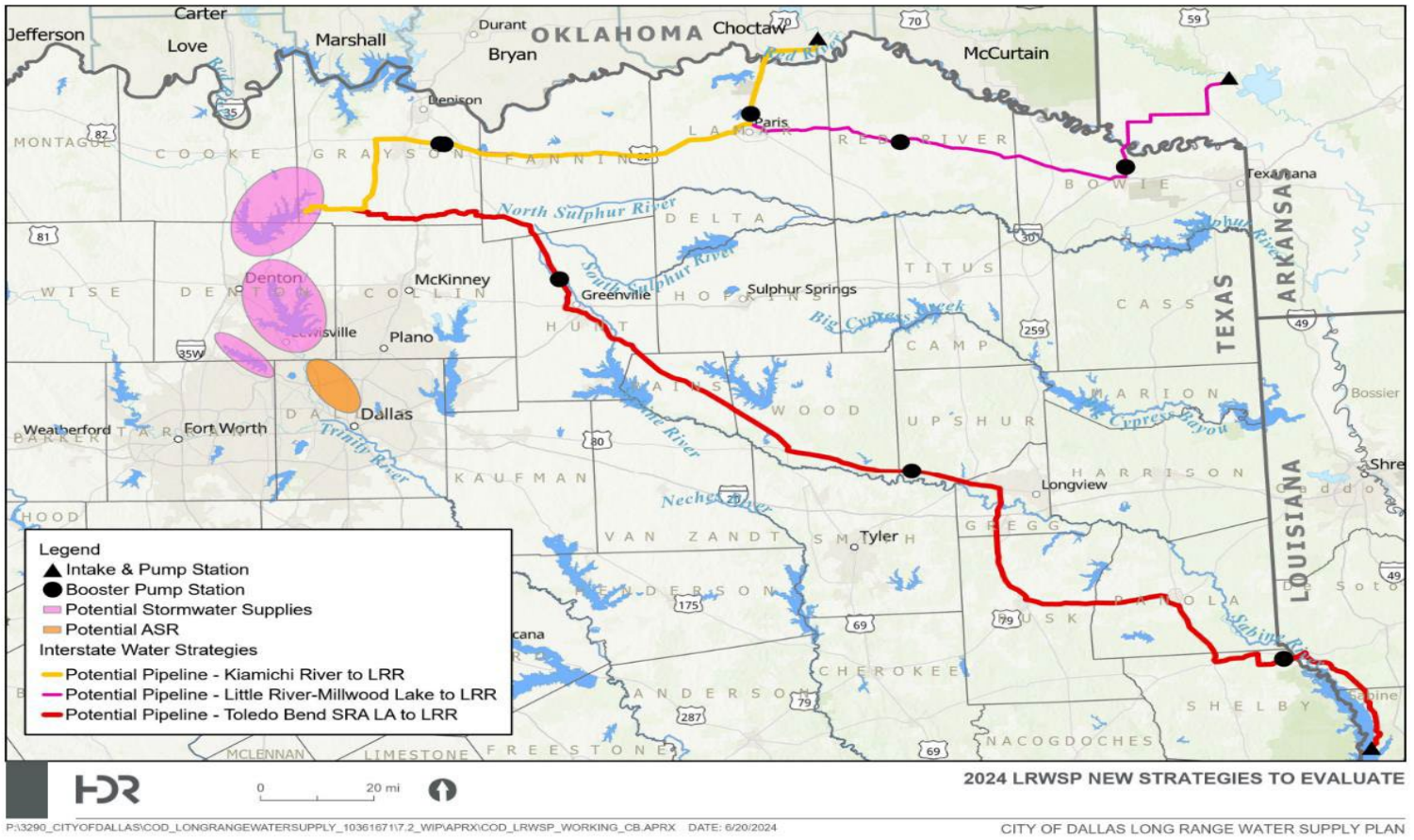
- Additional Conservation
- Main Stem Pump Station – NTMWD Swap Agreement
- Main Stem Balancing Reservoir
- Connect Lake Palestine
- Neches Run-of-River
- Lake Columbia

2014 LRWSP Alternative Strategies



- Direst Reuse – Alt 1
- Carrizo Wilcox Groundwater – Alt 2
- Sabine – Conjunctive Use (OCR and groundwater)
- Red River OCR
- Sulphur Basin Project – Wright Patman (232.5)/Marvin Nichols (296.5)
- Toledo Bend Reservoir
- Lake Texoma Desalination

2024 LRWSP New Strategies to Evaluate



- Aquifer Storage & Recovery
- Interstate Water Supplies
- Stormwater Supplies
- Riverbank Filtration Alternatives