Appendix A

Population and Demand Analysis Technical Memorandum

Pflugerville Water Master Plan

Population and Demand Analysis Technical Memorandum

Prepared by:

3755 S. Capital of Texas Highway
Suite 325
Austin, TX 78704

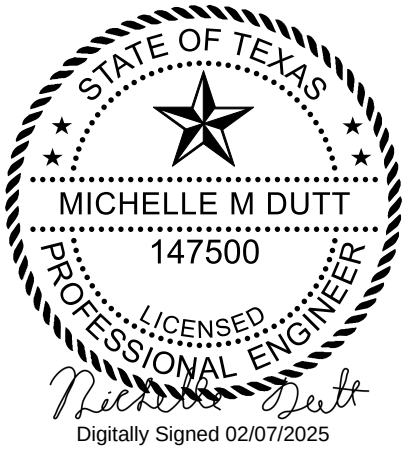
August 2025

Garver Project No. 23W07020

Engineer's Certification

I hereby certify that this Population and Demand Analysis Technical Memorandum for the Pflugerville Water Master Plan was prepared by Garver under my direct supervision for the City of Pflugerville.

Michelle M Dutt, PE
State of Texas PE License 147500



Digitally Signed 02/07/2025

Ian P Toohey, PE
State of Texas PE License 116105

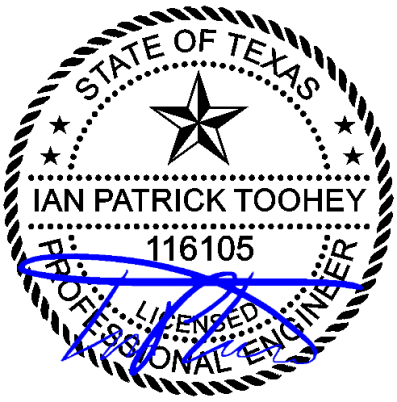


Table of Contents

List of Figures

List of Tables

List of Acronyms

Acronym	Definition
ADD	average day demand
API	application programming interface
CCN	certificate of convenience and necessity
conn	connections
gal	gallons
gpcd	gallons per capita per day
LCRA	Lower Colorado River Authority
MDD	maximum day demand
MGD	mllion gallons per day
SWTP	surface water treatment plant
UDC	unified development code
WSC	water supply corporation

1.0 Introduction

A demand analysis was performed for the City of Pflugerville (City) to identify historical trends and determine per connection or per land area demand values for different demand conditions to apply to future development. Upcoming planned development was mapped based on information provided by the City. Remaining future development through buildout was categorized based on the future land use designation from the City's most recent Comprehensive Plan, *Aspire 2040*. Demand projections were made for 2030, 2035, and buildout horizons.

Consistent terminology is used throughout this report. Supply refers to the total system input from sources. Demand is equal to supply and includes both metered and unmetered consumption. Usage represents total metered consumption (see Figure 1-1).

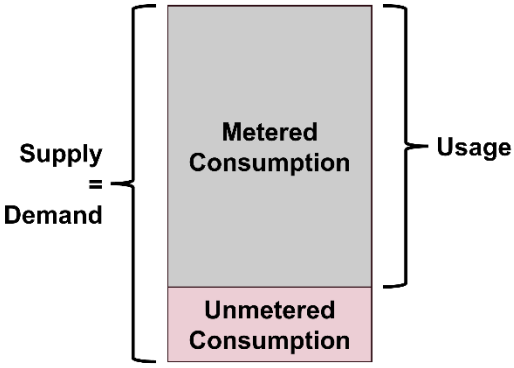


Figure 1-1: Water Supply Terminology

2.0 Data Sources

The data sources listed in Table 2-1 were used to evaluate water demands. All data was provided by the City.

Table 2-1: Data Sources

No.	Format	Description
1	Spreadsheet	Daily production data from January 2013 to August 2024 including volumes from each source and wholesale service connection
2	Spreadsheet	Monthly water utility customer billing data within the water certificate of convenience and necessity (CCN) from 2021 through 2023; includes account number, service address, customer class, monthly usage, and dates service began and ended
3	PDF	Wholesale customer contracts for the Lower Colorado River Authority (LCRA), Manville Water Supply Corporation (WSC), and Windermere Utility Company (Windermere)
4	Spreadsheet	2023 water use and loss summary spreadsheet that compares monthly water usage per customer class plus wholesale volumes to total production
5	Spreadsheet	Spreadsheet of single-family residential developments and apartment complexes that are under or soon to be under construction with number of units built to date and remaining to be built; spreadsheet does not contain developments under review

No.	Format	Description
6	PowerPoint	Maps of private development projects throughout the City with a symbol for every private development project that is in a stage of review or construction; larger private development projects are labeled by name; water demand information was not included with the maps; has overlap with spreadsheet of single-family residential developments and apartments
7	Shapefile	Shapefile with locations of construction plans that are currently under review, in construction, or completed; only includes developments with an accepted application-to-develop
8	PDF [(1)]	*Aspire 2040* Comprehensive Plan; includes a chapter on future land use, growth, and development with maps of developable properties and future land use and descriptions of future land use categories; includes general residential type mix for each future land use category
9	Shapefile	Future land use shapefile from *Aspire 2040* with future land use categories labeled
10	Online Document [(2)]	Unified Development Code (UDC) Subchapter 4 Establishment of District and Boundaries Section 2 Residential Zoning Districts; includes minimum lot area and maximum density
11	Shapefile	Travis Central Appraisal District (TCAD) parcels

[(1)] https://www.pflugervilletx.gov/241/Comprehensive-Plan
[(2)] https://online.encodeplus.com/regs/pflugerville/doc-viewer.aspx?tocid=004.002#secid-45

3.0 Historical Supply and Demand

An analysis of historical supply and demand was performed using daily data from January 2013 to August 2024. The dataset contained daily production volumes for each source and daily wholesale volumes for each wholesale service connection. The City has three existing sources of supply: a Surface Water Treatment Plant (SWTP) located near Weiss Ln and E Pflugerville Pkwy and two wells (Well #6 and Well #7) located in or near the Wells Point subdivision. The wells supply customers in the southwestern corner of the water CCN. The City supplies customers in its water CNN, the Manville Water Supply Corporation (WSC) through two wholesale service connections, and Windermere Utility Company (Windermere) through a single wholesale service connection. See Figure 3-1 for a system overview map.

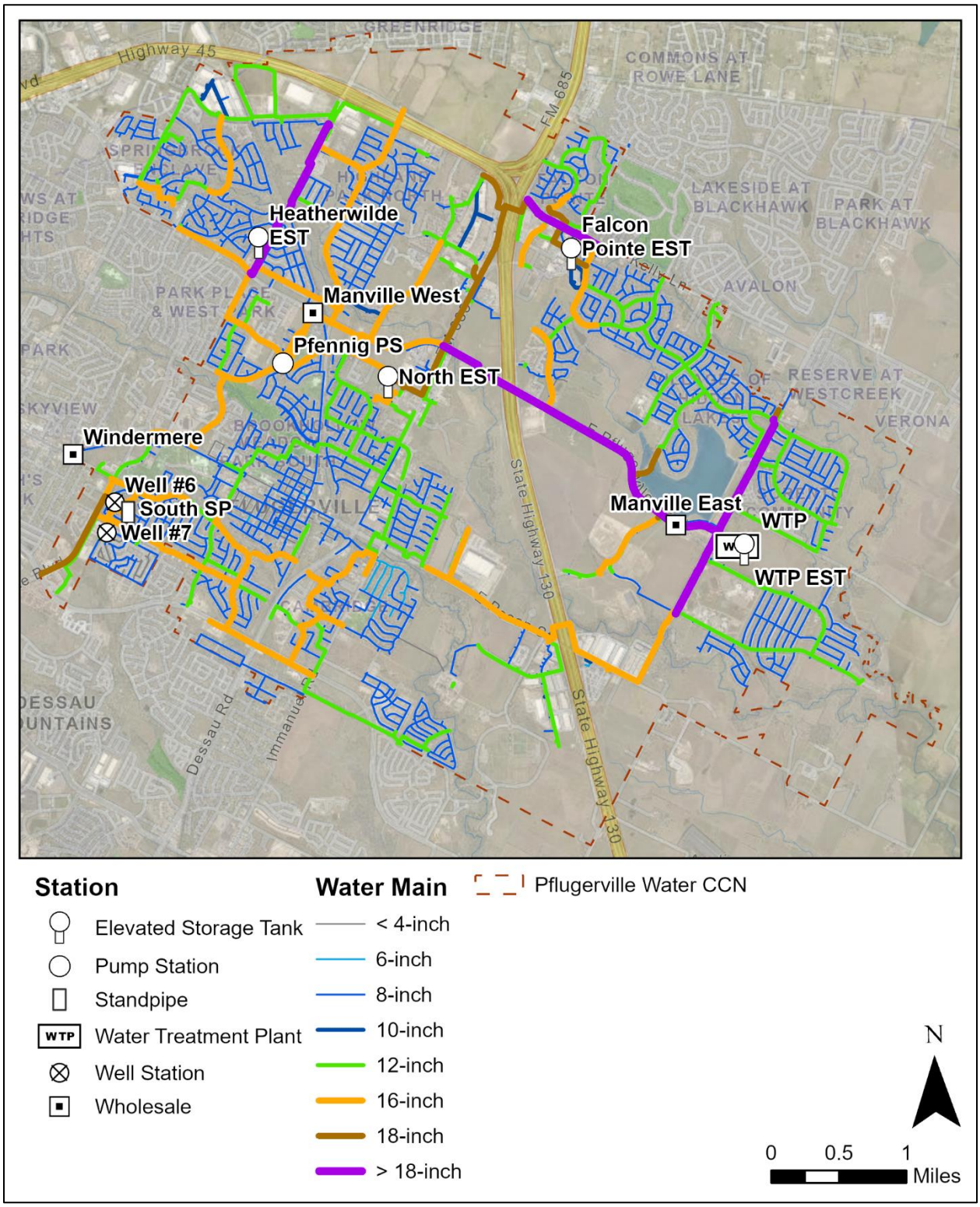


Figure 3-1: System Overview Map

Figure 3-2 and Figure 3-3 display historical monthly average supply and demand. The SWTP accounted for approximately 90% of total system supply in 2023. In 2013, almost 50% of total demand was for Manville and Windermere. This proportion has decreased significantly. In 2023, approximately 87% of total demand was for Pflugerville. There is a gap in the data for December 2014; data was not received for this month.

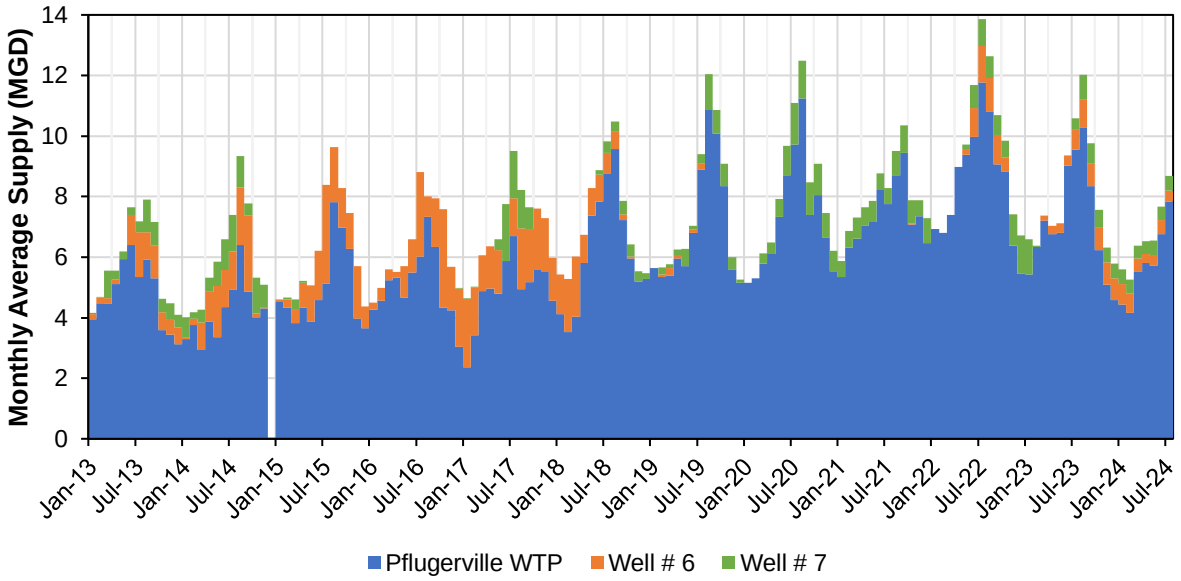


Figure 3-2: Historical Monthly Average Supply

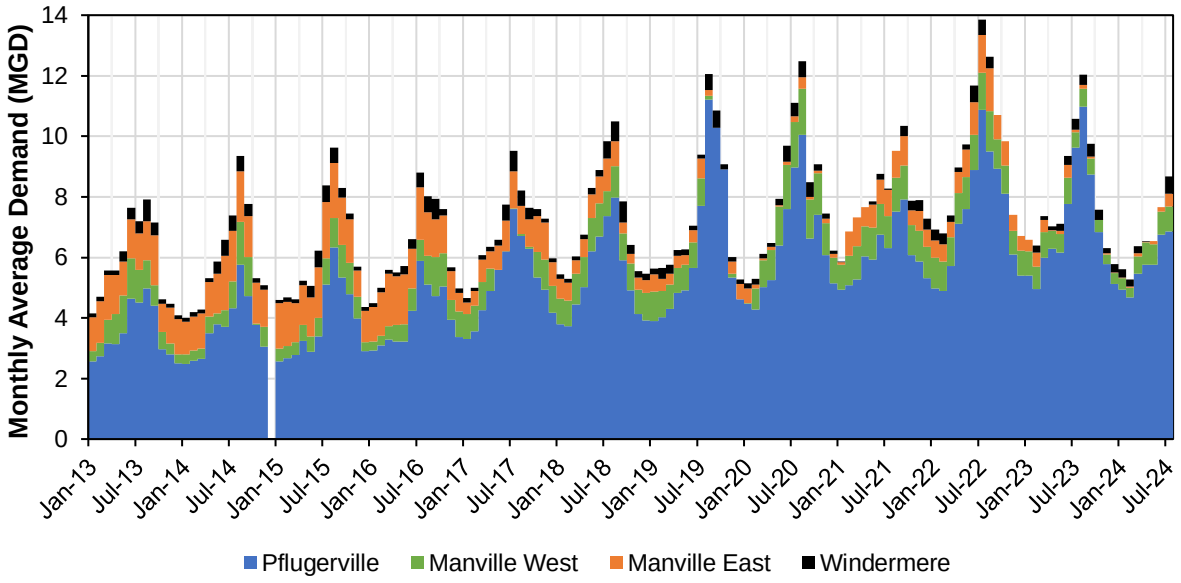


Figure 3-3: Historical Monthly Average Demand

Historical precipitation data was downloaded from the National Oceanic and Atmospheric Administration (NOAA) at the Austin Great Hills weather station. The data was visualized in terms of monthly total and annual rolling average precipitation (see Figure 3-4). The three highest years of precipitation from 2013 through 2023 were 2013, 2015, and 2021. Annual precipitation for 2022 and 2023 was amongst the lowest.

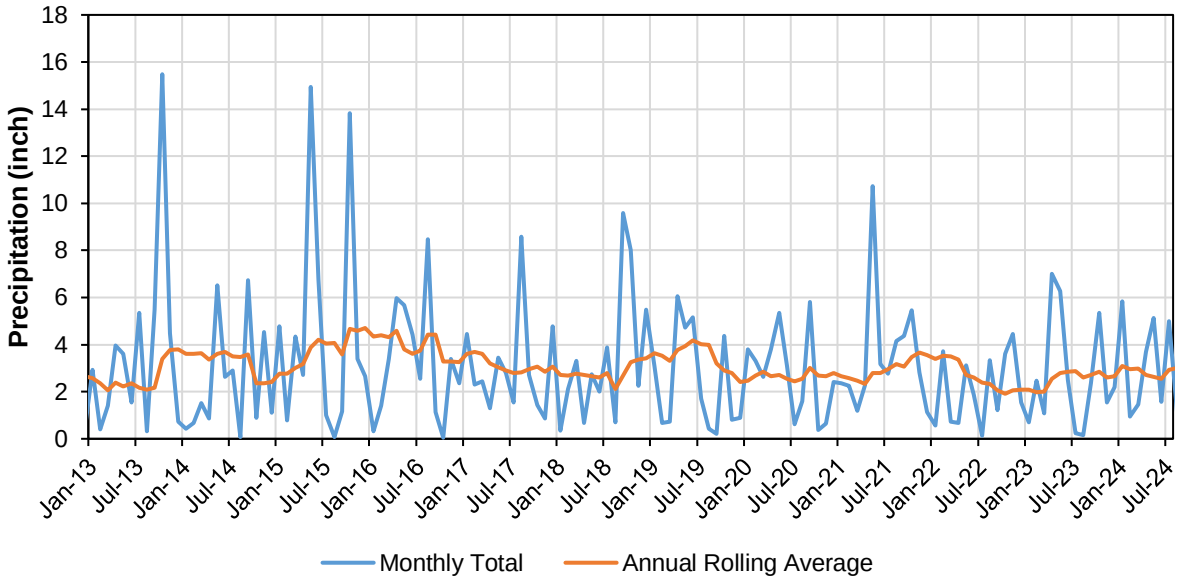


Figure 3-4. Historical Precipitation

The current wholesale contract volumes are summarized in Table 3-1. Manville has a maximum daily allocation of 1 MGD and Windermere has an annual allocation of 100 MG.

Table 3-1. Wholesale Contract Summary

Wholesale Customer	Allocation
Manville	Maximum daily allocation of 1 MGD
Windermere	Annual allocation of 100 MG

Between 2013 and 2022 supply increased steadily across all demand conditions (see Figure 3-5). However, from 2022 to 2023 demand went down due to water conservation measures. The greatest maximum day demand (MDD) of 16.6 MGD occurred on July 27, 2022. MDD in 2023 was lower at 13.4 MGD.

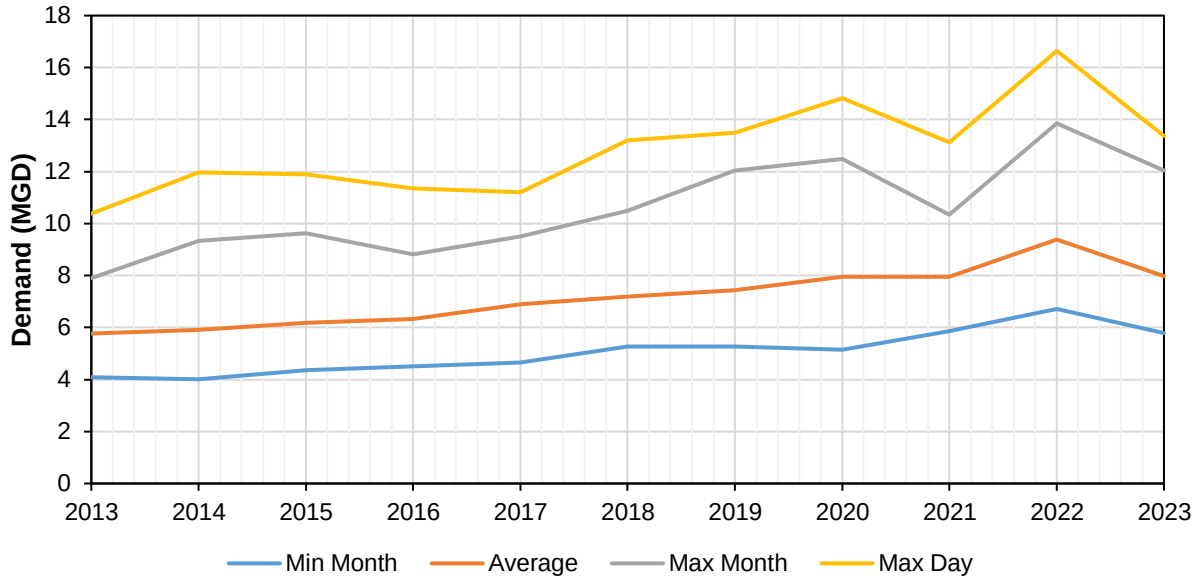


Figure 3-5: Historical Min Month, Average, Max Month, and Max Day Demand

Minimum month demand is typically 70% of average day demand (ADD). During the hottest summer months, maximum month demand increases to approximately 1.47 times ADD. MDD is typically 1.22 times maximum month demand (see Figure 3-6 and Table 3-2).

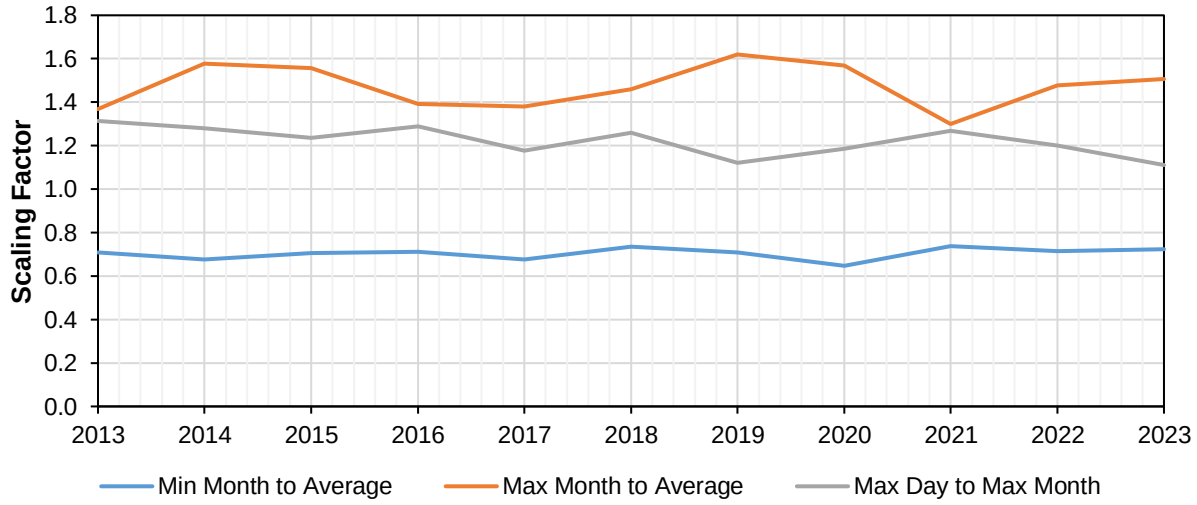


Figure 3-6: Historical Demand Scaling Factors

Table 3-2: Demand Scaling Factors

Scaling Factor	Value
Min Month to Average	0.70
Max Month to Average	1.47
Max Day to Max Month	1.22

2022 was the highest demand year of record with a total ADD and MDD of 9.4 MGD and 16.6 MGD, respectively (see Table 3-3). Pflugerville retail demand was calculated as total supply minus total wholesale demand. In 2022, Pflugerville retail demand was 7.4 MGD and 12.6 MGD for ADD and MDD, respectively. The lowest and highest demand months in 2022 were December and July, respectively.

Table 3-3: 2022 Supply and Demand Summary

Demand Condition	Total Supply (MGD)	Wholesale Demand (MGD)				Pflugerville Retail Demand (MGD)
		Manville East	Manville West	Windermere	Total Wholesale	
Min Month	6.72	0.49	0.84	0.00	1.33	5.39
Average	9.40	0.81	1.02	0.22	2.05	7.36
Max Month	13.85	1.25	1.22	0.51	2.98	10.88
Max Day	16.64	2.00	1.45	0.55	4.01	12.63

Total ADD and MDD decreased to 8.0 MGD and 13.4 MGD, respectively, in 2023 (see Table 3-4). The highest demand months in 2023 were February and August, respectively. Manville demands were higher on average in February than in August. Demands from 2022 and 2023 were used as a baseline for projecting future demands to achieve a middle ground between the highest demand on record and recent demand reductions due to water conservation measures.

Table 3-4: 2023 Supply and Demand Summary

Demand Condition	Total Supply (MGD)	Wholesale Demand (MGD)				Pflugerville Demand (MGD)
		Manville East	Manville West	Windermere	Total Wholesale	
Min Month	6.39	0.46	0.76	0.23	1.44	4.95
Average	8.00	0.18	0.60	0.25	1.02	6.98
Max Month	12.03	0.14	0.59	0.32	1.06	10.97
Max Day	13.36	0.62	0.86	0.28	1.77	11.60

4.0 Historical Usage

An analysis of historical usage was performed using monthly water utility billing data within the water CCN from 2021 through 2023 and a using a 2023 water use and loss summary spreadsheet. Existing water service addresses were geocoded using the Google Maps geocoding application programming interface (API) as shown in Figure 4-1. Customer type is based on the customer class listed within the water utility billing data.

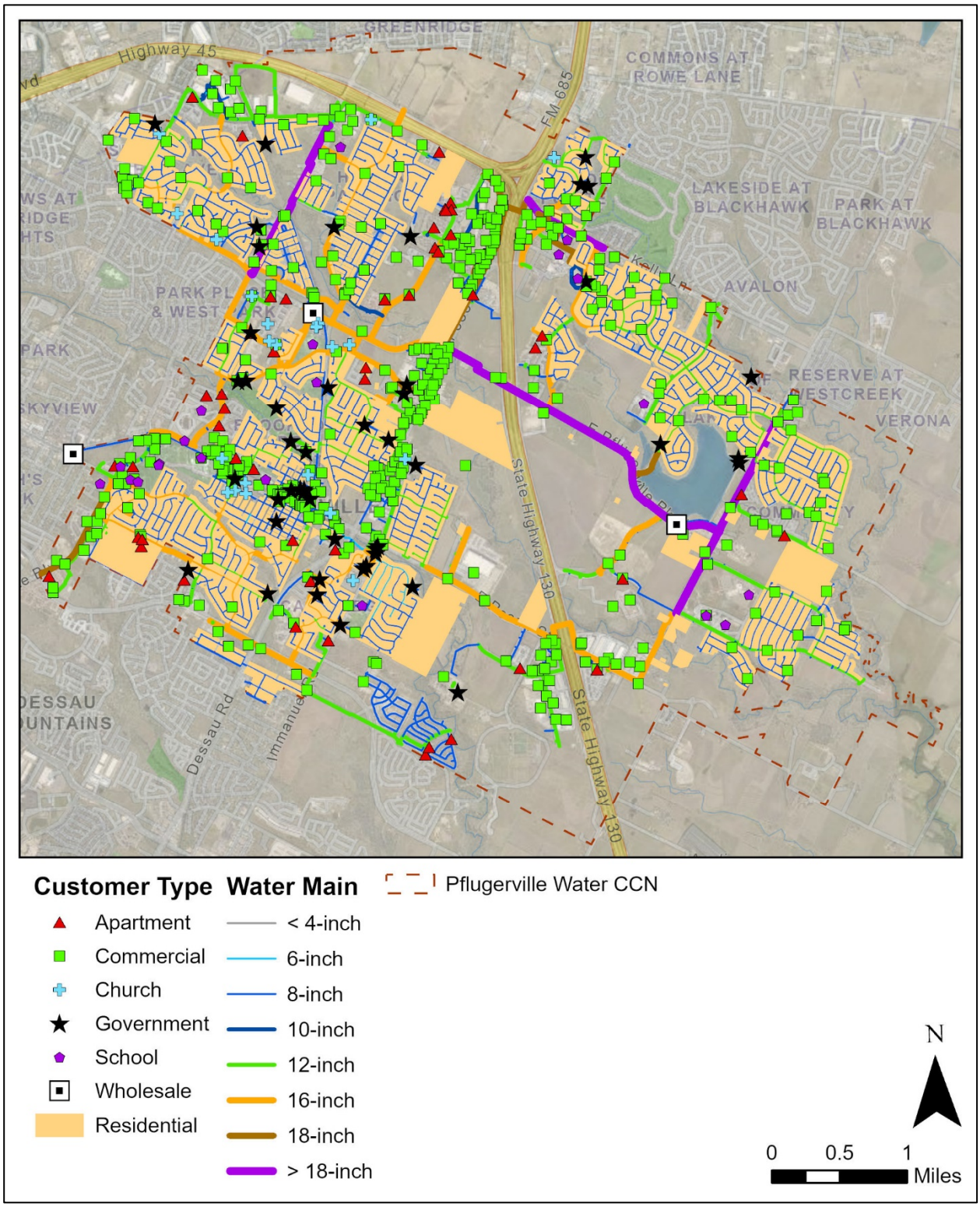


Figure 4-1: Existing Customers by Type

Approximately 96% of existing connections are single-family residential. The next two highest customer types in terms of connections are commercial and apartments at 3% and 0.3%, respectively. Approximately 62% of usage in 2023 was single-family residential (see Figure 4-2 and Figure 4-3). Although the number of commercial and apartment connections is low, the usage per connection is high. Commercial and apartment usage was 15% and 19% of total usage, respectively. Usage for apartments within the water utility billing data is for the entire apartment complex. Apartments are not sub metered; each apartment connection is the apartment complex master meter.

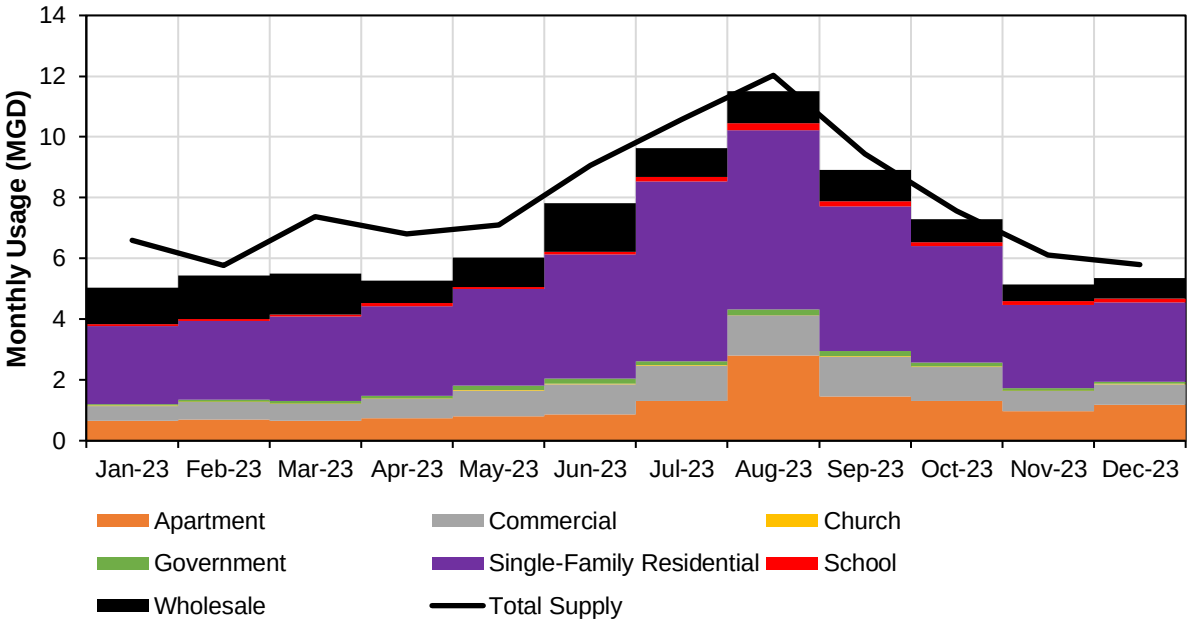


Figure 4-2: 2023 Monthly Usage by Customer Type

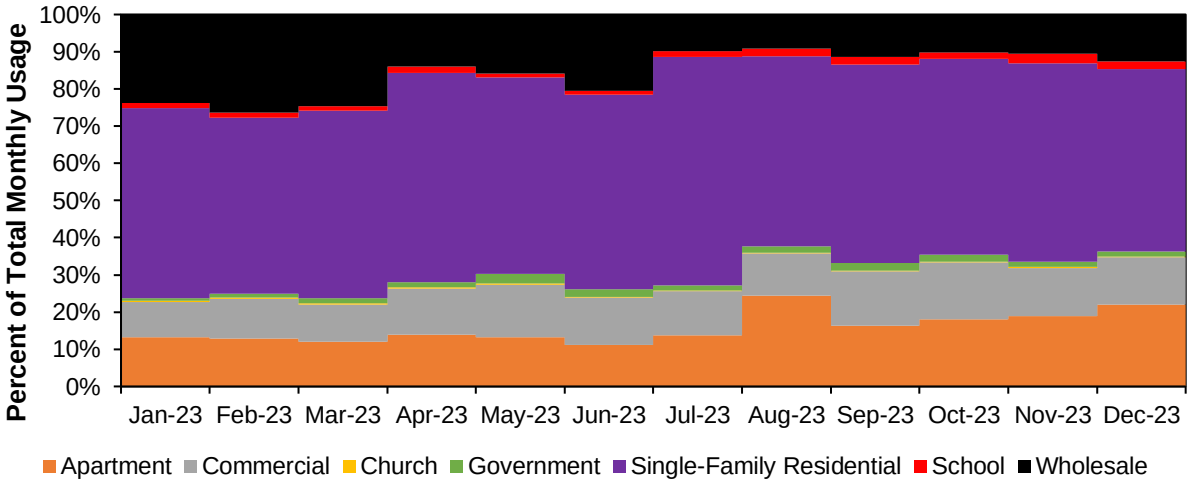


Figure 4-3: 2023 Percent of Total Monthly Usage by Customer Type

Historical usage per single-family residential connection or per commercial land area was calculated based on the water utility billing data from 2021 through 2023 for single-family residential and commercial customers. Single-family residential usage per connection was visualized in terms of cumulative probability, or the probability that the single-family residential usage per connection will be less than a given value for minimum month, average day, and maximum month conditions (see Figure 4-4). All zeros were removed from the data set. For instance, 50% of the time, single-family residential maximum month usage per connection was less than 307 gal/conn/day. Conversely, maximum month single-family residential usage per connection was greater than 817 gal/conn/day only 10% of the time.

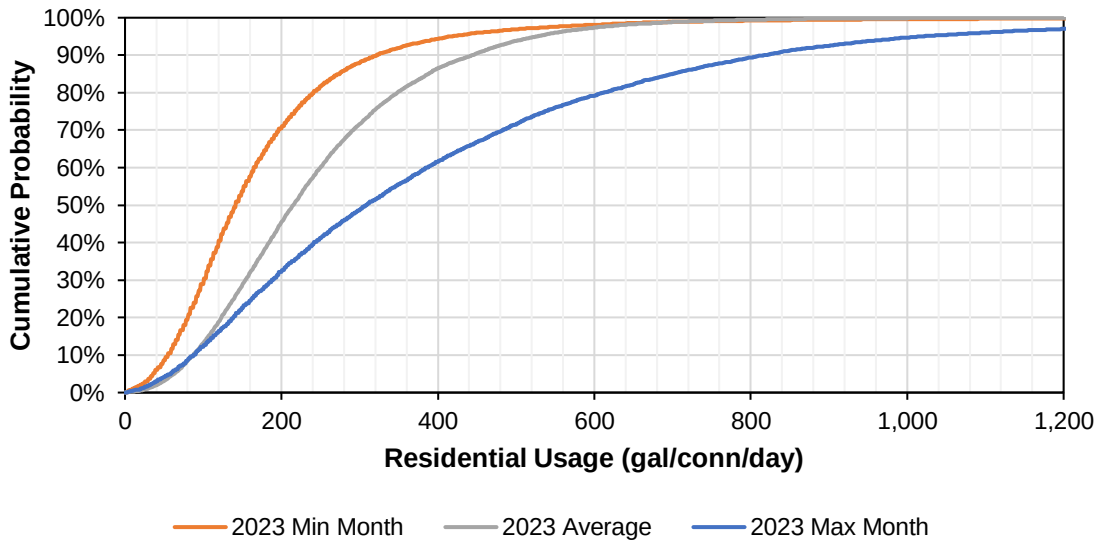


Figure 4-4: Cumulative Probability of Single-Family Residential Usage per Connection

Three statistics were calculated for single-family residential usage per connection: median (50th percentile), average, and average excluding values below the 5th percentile and above the 95th percentile. Average values excluding outliers of 219 gal/conn/day and 334 gal/conn/day were selected for projecting future demands for average day and maximum month conditions respectively (see Table 4-1). These values represent typical single-family residential demands from 2023 when drought conservation measures were in effect, ignoring any extremely low or extremely high water users.

Table 4-1: Single-Family Residential Usage per Connection

Statistic	Single-Family Residential Usage per Connection (gal/conn/day)		
	Min Month	Average	Max Month
Median	142	216	307
Average Excluding Outliers	148	219	334
Average	177	245	398

A similar analysis was conducted for apartment usage. An estimate of usage per apartment unit was made by taking the total monthly usage per apartment complex and dividing by the number of apartment units within the complex. However, the data set was too small to provide accurate insights. Instead, an apartment unit was assumed to use approximately 50% as much water as a single-family home. This assumption is based off the City's living unit equivalent (LUE) conversion factor of 0.5 for high-density apartment complexes. Accordingly, values of 110 gal/unit/day and 167 gal/unit/day were selected for projecting future demands for average day and maximum month, respectively (see Table 4-2).

Table 4-2: Apartment Usage per Unit

Apartment Usage per Unit (gal/unit/day)		
Min Month	Average	Max Month
74	110	167

Finally, a third analysis was performed for commercial usage. An estimate of commercial usage per acre was made by taking the monthly usage per commercial connection and dividing by the land area in acres of the associated parcels. If multiple commercial connections shared a parcel, the commercial usage was summed across the connections and then divided by the land area of the shared parcel. Commercial sub-classes were not included in the water utility billing data. Calculations could not be made to differentiate usage for commercial sub-classes such as restaurants, offices, retail, etc. Building square footage was also not available within the parcel data set. The commercial usage per acre was then visualized in terms of cumulative probability (see Figure 4-5).

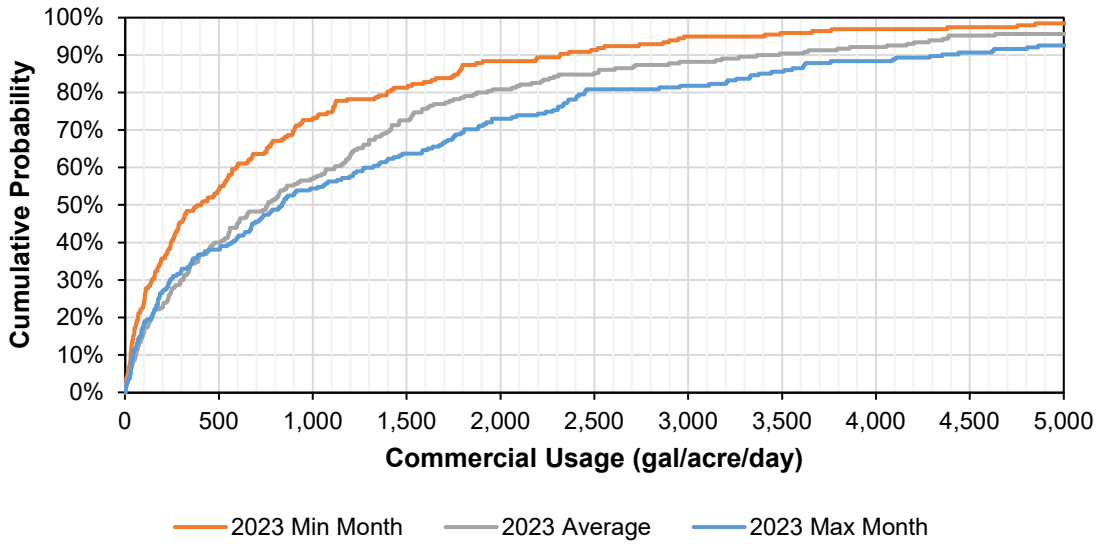


Figure 4-5: Cumulative Probability of Commercial Usage per Acre

Again, three statistics were calculated for commercial usage per acre: median (50th percentile), average, and average excluding values below the 5th percentile and above the 95th percentile. Average values excluding outliers of 1,079 gal/acre/day and 1,404 gal/acre/day were selected for projecting future demands for average day and maximum month conditions, respectively (see Table 4-3).

Table 4-3: Commercial Usage per Acre

Statistic	Commercial Usage per Acre (gal/acre/day)		
	Min Month	Average	Max Month
Median	382	756	836
Average Excluding Outliers	693	1,079	1,404
Average	1,581	2,568	4,278

5.0 Benchmarking

Benchmarking of water usage was performed against other local utilities of similar composition and size (see Table 5-1). Most of the utilities researched had recent average residential water usage of approximately 90 gpcd. The exception being Georgetown with an average residential water usage of 136 gpcd in 2018. Georgetown's target average residential water usage for 2024 per their Water Conservation Plan is 125 gpcd. Pflugerville's average single-family residential water usage in 2023 was similar at approximately 86 gpcd assuming an average household size of 2.85 people based on information from the City.

Table 5-1: Usage Benchmarking

City	Year	Average Residential Water Usage (gpcd)	Average Total Water Usage (gpcd)	Source
Cedar Park	2019	91	136	Cedar Park 2019 Water Conservation Plan
Hutto	2021	91 (1)	Not available	City of Hutto Water Master Plan Update
Round Rock	2023	88	146	Utility Profile and Water Conservation Plan
Georgetown	2018	136	187	Georgetown Water Conservation Plan 2019
Pflugerville	2023	86 (2)	130 (3)	

(1) Data reported in terms of gpd per LUE only; assuming 3 people per household based on US Census data.
(2) Assuming 2.85 people per household based information from the City.
(3) Does not included wholesale usage.

6.0 Demand Projections

Demand projections were made for 2030, 2035, and buildout horizons. Projections were made assuming that the City's water CCN is fixed and unchanging in the future per direction from the City. Projections through 2030 are based on current planned development. Projections through 2035 and buildout are based on future land use designations from *Aspire 2040*. Data is current as of November 2024.

Planned development through 2030 was identified by the City through three means:

- Spreadsheet of single-family residential developments and apartment complexes that are under or soon to be under construction with number of units built to date and remaining to be built; spreadsheet does not contain developments under review.
- Maps of private development projects throughout the City with a symbol for every private development project that is in a stage of review or construction; larger private development projects are labeled by name; water demand information was not included with the maps; maps have overlap with spreadsheet of single-family residential developments and apartments.
- Shapefile with locations of construction plans that are currently under review, in construction, or completed; only includes developments with an accepted application-to-develop.

These data sources were combined in a single shapefile to outline the extent of current development. Planned single-family residential development and apartment demands were projected based on the number of units remaining and the unit demand assumptions listed in Table 6-1. Planned commercial development demands were projected based on the area in acres and the unit demand assumption listed in Table 6-1. Estimated water demand information for planned developments was requested from the City but not available. More information about the unit demand assumptions can be found in *Section 4.0* of this report. MDD was determined from maximum month demand by applying a 1.22 peaking factor. This is the historical maximum month to maximum day peaking factor.

Table 6-1: Unit Demand Assumptions per Customer Type

Customer Type	Min Month	Average	Max Month	Max Day
Single-Family Residential (gal/conn/day)	148	219	334	407
Apartment (gal/unit/day)	74	110	167	204
Commercial (gal/acre/day)	693	1,079	1,404	1,713

The planned single-family residential developments, apartments, and commercial developments with projected ADD and MDD are listed in Table 6-2, Table 6-3, and Table 6-4, respectively. The IDs listed in Table 6-2 through Table 6-4 correspond to the labels in Figure 6-1.

Table 6-2: Planned Single-Family Residential Development Demand Projections

ID	Development Name	Units Remaining	ADD (MGD)	MDD (MGD)
8	The Pfarm	2	0.000	0.001
13	Kuempel Townhomes	18	0.004	0.007
19	Paradise Cove Condominiums	15	0.003	0.006
28	Townhomes of Old Town East	18	0.004	0.007
32	Lakeside Meadows Single-Family	442	0.097	0.180
35	Sorento	52	0.011	0.021
42	Lisso Tract	369	0.081	0.150
47	Carmel West	794	0.174	0.324
49	Murchison Subdivision	176	0.039	0.072
	Total	**1,886**	**0.413**	**0.769**

Table 6-3: Planned Apartment Demand Projections

ID	Development Name	Units Remaining	ADD (MGD)	MDD (MGD)
7	Chisolm Station Multi-Family	3,125	0.342	0.637
10	Wilke Lane Multi-Family	0	0.000	0.000
11	Lifestyle Communities (Mixed Use)	919	0.101	0.187
12	Hill Country Bible Church (Sparrow Apartments)	196	0.021	0.040
15	Pflugerville Farms Apartments	162	0.018	0.033
16,17	Northpointe (Mixed Use)	4,000	0.438	0.815
25	The Commons at Heatherwilde (Pecan District)	978	0.107	0.199
26	Heatherwilde Multi-Family	46	0.005	0.009
29	Dessau Creekside Mixed Use	60	0.007	0.012
31	Lakeside Meadows Multi-Family	1,200	0.131	0.244
33	Tacara at Weiss Ranch Mixed Use	300	0.033	0.061
37	17314 Weiss Lane (Weiss Lane Multi-Use)	354	0.039	0.072
38	Village at Wells Branch (Multi-Family)	506	0.055	0.103
41	Wuthrich Hill Farms (w/Olympic Dr Apts)	266	0.029	0.054
44	Pecan Street Subdivision	453	0.050	0.092
46	Pecan Estates Multi-Family	210	0.023	0.043
48	Cameron 96 Planned Development	300	0.033	0.061
	Total	**13,075**	**1.432**	**2.664**

Table 6-4: Planned Commercial Development Demand Projections

ID	Development Name	Zoning Type	Area (acres)	ADD (MGD)	MDD (MGD)
1	Springbrook South Commerce Center	LI	25.6	0.028	0.044
2	Skybox Data Centers, Pflugerville Business Park, and Kenney Fort Extension	CI	20.4	0.022	0.035
3	Skybox	CI	10.1	0.011	0.017
4	Timmermann West	CL-5	72.0	0.078	0.123
5	Deck - Wilke	CL-5	67.2	0.073	0.115
6	Timmermann East	CL-5	123.1	0.133	0.211
9	Crux Climbing Center	CL-4	3.0	0.003	0.005
14	Retail Strip Center	GB-1	1.4	0.001	0.002
18	Shops at Kelly Lane & Villages of Hidden Lake Commercial	R	67.7	0.073	0.116
20	Pfennig Place	CL-3	14.6	0.016	0.025
21	Austin Achieve High School	GB-1	18.2	0.020	0.031
22	Baylor Scott and White Medical Center	PUD	26.4	0.028	0.045
23	Quik Trip 4180	GB-1	1.7	0.002	0.003
24	HEB	CL-5	22.1	0.024	0.038
27	Downtown East	PUD	29.6	0.032	0.051

ID	Development Name	Zoning Type	Area (acres)	ADD (MGD)	MDD (MGD)
30	Wash N' Roll	GB-1	4.8	0.005	0.008
34	Gas Station at Jesse Bohls	R	4.7	0.005	0.008
36	Lakeside Meadows Corporate Campus	PUD	96.2	0.104	0.165
39	BASIS Charter School	GB-1	11.3	0.012	0.019
40	Wells Branch Retail	GB-1	12.9	0.014	0.022
43	SH130 Commerce Center	CL-5	24.4	0.026	0.042
45	Pecan Crossing Industrial	CI	104.8	0.113	0.179
50	Cameron Rd Industrial	CL-4	148.7	0.160	0.255
	Total		**910.8**	**0.983**	**1.560**

Future development through 2035 and buildout was estimated based on the remaining undeveloped area within the water CCN and corresponding future land use designation from *Aspire 2040*. Undeveloped parcels fell into four future land use types: low to medium density single-family residential, medium to high density single-family residential, mixed use, and employment. Mixed use and employment areas are divided further based on the zoning type (CL-3, CL-4, or CL-5). Single-family residential and mixed use areas were assigned a density in terms of units per acre based on maximum densities within the City's Unified Development Code (UDC). The total number of units was then estimated by multiplying the units per acre by the total area in acres of each land use type. Demands were calculated for single-family residential areas using the single-family residential unit demands listed in Table 6-1 and for mixed use areas using the apartment unit demands listed in Table 6-1. Demands for employment areas were estimated by taking the total area for this land use type and multiplying by the commercial unit demands listed in Table 6-1. A summary of the future development demand projections is provided in Table 6-5. Approximately 30% of the future development was projected to occur between 2030 and 2035 and the remaining 70% was projected to occur between 2035 and buildout.

Table 6-5: Future Development Demand Projections

Future Land Use Type	Units Per Acre	Total Area (acres)	Total Units	ADD (MGD)	MDD (MGD)
Low to Medium Density Single-Family Residential	3	872	2,616	0.573	1.066
Medium to High Density Single-Family Residential	5	760	3,802	0.833	1.549
Mixed Use (CL-3)	20	2	41	0.004	0.008
Mixed Use (CL-4)	75	130	9,721	1.064	1.981
Mixed Use (CL-5)	90	151	13,632	1.493	2.777
Employment (CL-4)	n/a	391	n/a	0.422	0.670
Employment (CL-5)	n/a	238	n/a	0.257	0.408
Total		**2,545**	**29,811**	**4.646**	**8.459**

Figure 6-1 shows planned and future development throughout the water CCN. Developments are generally labeled from northwest to southeast within the water CCN.

Figure 6-1. Development Map

Pflugerville Water CCN

Water Main

Planned Development

Single-Family

Apartment

Commercial

Future Development

Employment (CL-4)

Employment (CL-5)

Low to Med Density Res

Med to High Density Res

Mixed Use (CL-3)

Mixed Use (CL-4)

Mixed Use (CL-5)

* Zoning types for planned commercial developments are listed in Table 6-4.

0 0.25 0.5 Miles

N

GARVER

Overall, the total number of connections within the City's water CCN is projected to be approximately 17,867 in 2030 and 21,076 in 2035 (see Figure 6-2). Estimated connections in 2030 include existing connections plus 1,886 single-family residential units (as listed in Table 6-2), 10 apartment complexes from Table 6-3 where construction has yet to begin, and 23 commercial developments (as listed in Table 6-4). Estimated connections in 2035 includes an additional 3,209 single-family residential units (50% of the total listed in Table 6-5). An estimated connection count associated with new apartment complexes or commercial developments was not made.

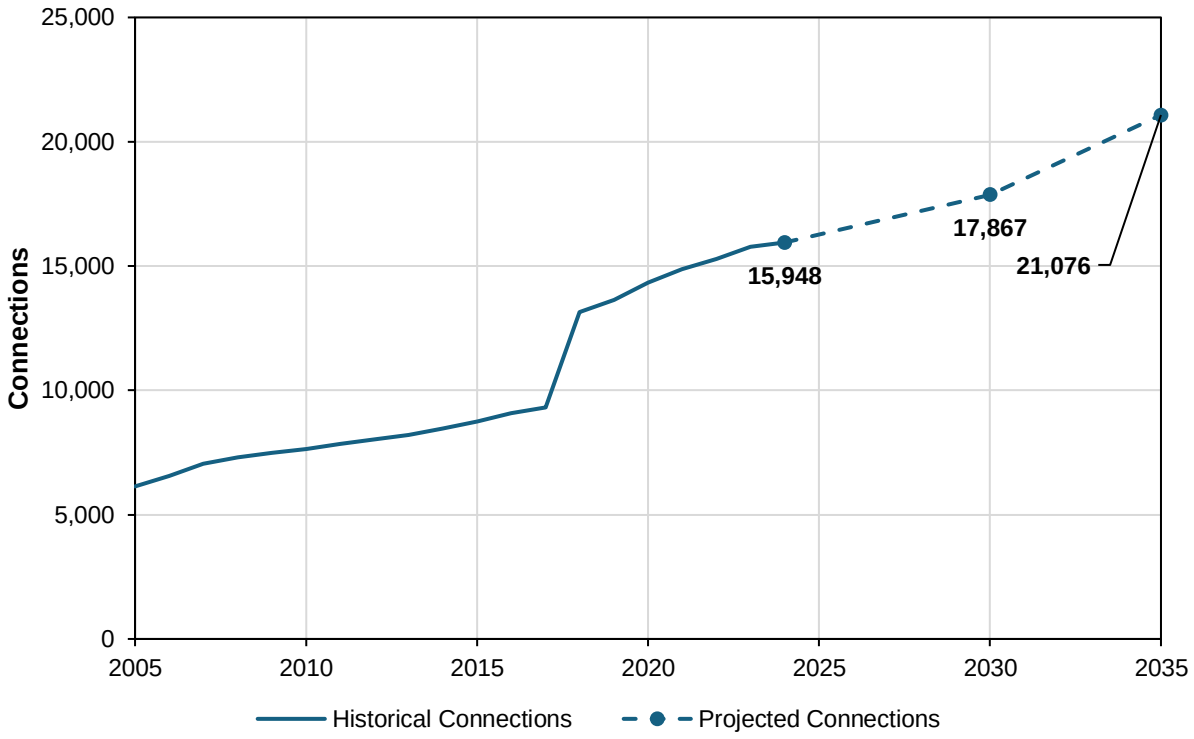


Figure 6-2: Historical and Projected Connections

Planned and future demands were added to average historical demands from 2022 and 2023. Demands from 2022 and 2023 were used as a baseline for projecting future demands to achieve a middle ground between the highest demand on record and recent demand reductions due to water conservation measures. Wholesale demands for all three future horizons are 1.3 MGD and 1.5 MGD for ADD and MDD, respectively. Manville has a daily allocation of 1 MGD. Windermere daily allocations were projected as 0.3 MGD for average day and 0.5 MGD for max day. In total, ADD is projected to be 11.3 MGD, 13.6 MGD, and 15.9 MGD in 2030, 2035, and at buildout, respectively (see Table 6-6). MDD is projected to be 18.6 MGD, 22.8 MGD, and 27.1 MGD in 2030, 2035, and at buildout, respectively.

Table 6-6: Demand Projections

Year	Average Day Demand (MGD)			Max Day Demand (MGD)		
	Pflugerville	Wholesale	Total	Pflugerville	Wholesale	Total
Existing (1)	7.2	1.5	8.7	12.1	2.9	15.0
2030	10.0	1.3	11.3	17.1	1.5	18.6
2035	12.3	1.3	13.6	21.3	1.5	22.8
Buildout	14.6	1.3	15.9	25.6	1.5	27.1
(1) Average of demands from 2022 and 2023.						

Figure 6-3 displays historical and projected ADD and MDD. Historical demands are shown as colored solid lines, and projected demands are shown as colored dashed lines. Exponential best fit lines of historical ADD and MDD are overlayed as black dashed lines. Best fit lines are extrapolated to 2035.

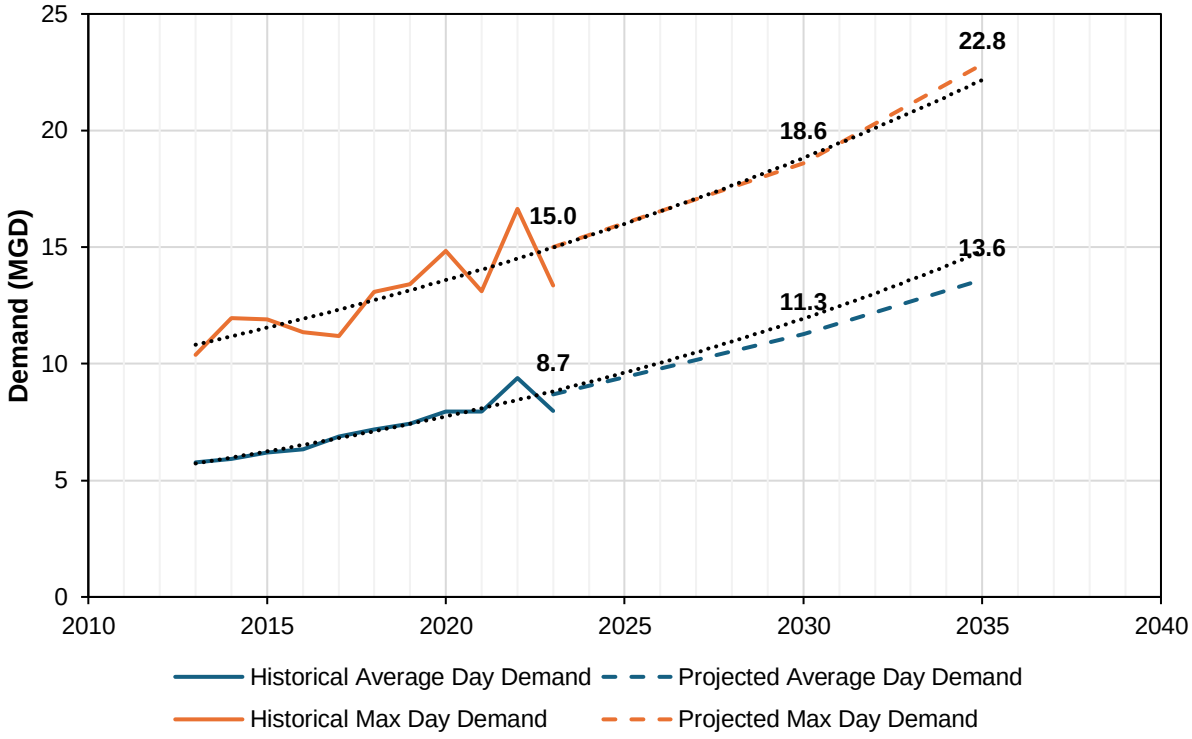


Figure 6-3: Historical and Projected Demand

Projected ADD and MDD have approximately the same slope as the exponential best fit lines, meaning that demands are projected to increase at approximately the same exponential rate as they have for the past 20 years, at least through 2035.

7.0 Summary

An analysis of historical supply and demand was performed using daily production and wholesale data from January 2013 to August 2024. In 2023, approximately 87% of total demand was for Pflugerville with only 13% of total demand for Manville and Windermere. The greatest maximum day demand (MDD) of 16.6 MGD occurred on July 27, 2022. MDD in 2023 was lower at 13.4 MGD. Demands from 2022 and 2023 were used as a baseline for projecting future demands to achieve a middle ground between the highest demand on record and recent demand reductions due to water conservation measures.

An analysis of historical usage was performed using monthly water utility billing data within the water CCN from 2021 through 2023 and a using a 2023 water use and loss summary spreadsheet. Approximately 96% of existing connections are single-family residential accounting for 62% of total usage. The next two highest customer types are commercial and apartments at 3% and 0.3%, respectively, accounting for 15% and 19% of total usage, respectively. Historical usage per single-family residential connection and per commercial land area was visualized in terms of cumulative probability. Average values excluding outliers below the 5th percentile and above the 95th percentile were selected for projecting future demands. Usage per apartment unit was assumed to be 50% of usage per single-family residential connection.

Benchmarking of water usage was performed against other local utilities of similar composition and size. Pflugerville's average single-family residential water usage in 2023 was the same at approximately 86 gpcd as compared to most other utilities which had average residential water usages of approximately 90 gpcd.

Demand projections were made for 2030, 2035, and buildout horizons. Projections through 2030 are based on current planned development. Projections through 2035 and buildout are based on future land use designations from *Aspire 2040.* Overall, the total number of connections within the City's water CCN is projected to be approximately 17,867 in 2030 and 21,076 in 2035. ADD is projected to be 11.3 MGD, 13.6 MGD, and 15.9 in 2030, 2035, and at buildout, respectively. MDD is projected to be 18.6 MGD, 22.8 MGD, and 27.1 MGD in 2030, 2035, and at buildout, respectively. Demands are projected to increase at approximately the same exponential rate as they have for the past 20 years, at least through 2035.