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UTILITY ADMINISTRATION

Memo

To: Jon Fortune, Assistant City Manager, Utilities

From: Kenneth Banks, Director of Utilities

Date: April 24, 2017

Re: Comparisons of employment metrics for Water and Wastewater Departments.

The Public Utility Board requested information concerning "how many employees we have compared to other cities that have the same services as the City of Denton, with reasons" on May 23, 2016. Analyses of this type are usually done by comparing metrics collected as a part of large industry studies or surveys. For example, the American Water Works Association publication entitled "Benchmarking Performance Indicators for Water and Wastewater" is a large national water and wastewater industry survey that Denton staff uses for a variety of benchmarking analyses. The data collected in the AWWA survey is collected annually, and is further subdivided into regions of the United States (five geographical regions) and by broad utility size categories based on population served (0-10,000, 10,001- 50,000, 50,001-100,000, 100,001-500,000 and more than 500,000). While the AWWA survey and similar national surveys provide a comprehensive overview of water and wastewater utilities and some ability to sub-divide information, these surveys do not provide the data needed to perform more detailed analyses of operational characteristics of each utility. While differences in more specific utility operational characteristics can influence comparisons between utilities, data concerning these operational characteristics can only be obtained by surveys of individual utilities.

Regional data: Detailed analyses

The number of employees in any given utility can be influenced by operational issues such as the number of plants, size of the area served compared to population served, type and status of infrastructure, whether water and wastewater services are purchased, if services are provided regionally to multiple entities, treatment technologies, regulatory compliance issues, etc. Unfortunately, comprehensive information at this level of detail is not available without extensive efforts to obtain the information directly from individual utilities.

During 2015, Burton and Associates developed a new Water Utilities Cost of Service and Rate Design Study for the City of Denton. One of the tasks for this study was to benchmark Denton Water and Wastewater Utilities against regional entities providing similar services. Burton and Associates was also tasked with collecting operational characteristics of each regional entity in order to provide information that is not available in national surveys such as the AWWA report. Operational data and performance metrics were researched and documented for 10 utilities in same general region as Denton, and data was obtained by directly contacting these utilities. The entities selected were the cities of Arlington, Garland, Grand Prairie, Irving, Lewisville, McKinney, Mesquite, Frisco, Waco, and Wichita Falls.

Many municipalities near Denton have a significant regional component to their organization and operations, either purchasing water or wastewater treatment services from larger entities, or providing water/wastewater services to nearby areas in such volume as to materially affect unit costs. Denton owns two water treatment plants and one wastewater treatment plant (excluding the small plant at Robson Ranch), does not purchase its water or wastewater from a regional system, and does not provide wholesale services to an extent that impacts its cost structure. These factors make it difficult to find a truly comparable utility. The entities listed above were selected based on a various number of attributes, such as annual volume of water produced, number of customers, nature and size of water and wastewater facilities, total outstanding debt, capital asset value, population, and location. Even with this level of effort, comparability can be challenging. Information from the survey is summarized in Tables 1 and 2.

Table 1. Summary information for surveyed entities.

	MG /yr Water	Connections	Water System	Water length*	WW System	WW length*	Debt (Millions)	Asset Value**	Population
Denton	6,827	31,837	2 plants	572	1 plant	509	161.1	491.4	117,397
Lewisville	5,515	21,662	Dallas	381	1 plant	318	50.0	262.8	99,453
Garland	10,971	67,822	NTMW	1,117	2 plants	1003	225.6	706.1	231,618
Mesquite	5,790	54,000	NTMW	567	NTMW	493	67.0	229.3	140,240
Frisco	9,417	44,988	NTMW	810	NTMD	620	114.6	375.3	135,920
Waco	10,556	44,336	2 plants	1035	1 plant	846	208.0	469.2	128,125
Wichita Falls	5,681	35,000	1 plant	578	2 plants	546	122.6	343.4	104,552
McKinney	9,746	46,791	NTMW	820	NTMW	662	64.4	373.7	140,826
Grand Prairie	8,578	64,154	Dallas	804	TRA	798	57.2	329.7	181,303
Irving	12,879	45,230	Dallas	699	TRA	645	179.7	638.5	220,750
Arlington	17,920	100,453	2 plants	1,575	TRA	1300	111.6	865.4	365,930

Data collected in 2015; Denton WW system does not include small Robson Ranch Plant.
Dallas, North Texas Municipal Water District (NTMWD), and Trinity River Authority (TRA) are regional providers
***pipe length expressed in miles; ** Asset value represents original capital asset value, expressed in millions of dollars**
MG = millions of gallons

Table 2. Customer accounts and volume processed per employee for surveyed entities.

	Employees		Customer accounts per employee		Volume processed per employee	
	Water	**Wastewater**	**Water**	**Wastewater**	**Water**	**Wastewater**
Denton	89*	87*	391	415	0.20	0.19
Lewisville	49	41	446	504	0.31	0.30
Garland	63	97	1,077	678	0.48	0.35
Mesquite	73	36	741	1,525	0.22	0.46
Frisco	57	23	790	1,871	0.45	0.43
Waco	57	36	351	520	0.23	0.35
Wichita Falls	111	72	318	431	0.14	0.13
McKinney	38	72	1,245	1,245	0.71	1.15
Grand Prairie	82	29	784	2,239	0.29	0.50
Irving	90	72	506	601	0.39	0.40
Arlington	113	111	892	892	0.44	0.93
Minimum	38	23	318	431	0.14	0.13
Maximum	113	111	1,245	2,239	0.71	1.15
Median	73	72	763	785	0.35	0.42
Average	75	61	620	921	0.30	0.34

Denton metric data is from 2016. Denton FTE counts and data for other entities from 2015 Burton Rate Study. Summary statistics (in bold) do not include Denton's data.
***Water excludes Customer Service and Utility Administration, and Wastewater excludes drainage.**

Customer Accounts per Employee (Water and Wastewater)

The City's Water Department has approximately 391 water accounts per employee, which is among the lowest of the compared utilities. Reasons for this result include the fact that the many of the entities surveyed purchase water from larger regional entities. Denton, in contrast, owns and maintains two water treatment plants and has additional staffing requirements to operate these facilities. The Water Department also has two full-time construction crews within its water distribution division, which is more than most communities. The City's Wastewater Department has 415 accounts per employee, which is the lowest of the assessed utilities. Like Water, many of the surveyed entities have wastewater services provided by large regional entities. Denton's Wastewater Department has two construction crews in the wastewater collections division, and also has the Beneficial Reuse program, which is a unique program to Denton. Since Denton owns and operates a wastewater treatment plant, it is most comparable to Lewisville, Waco, and Wichita Falls, and Denton is much closer in terms of customer accounts per employee when compared to these entities. In summary, while the City of Denton's employment metrics on the surface appear higher than average, the average reflects many regional systems with significantly larger customer bases. If you isolate the employment metrics to the nonregional utility systems with similar facilities (such as Waco and Wichita Falls), Denton is very comparable.

MGD Water Delivered/Wastewater Processed per Employee

Comparisons of water volume processed per employee show the City's result of 0.20 MGD per employee for the Water Department is in the lower range of the surveyed group. However, when compared to those entities that own and operate their own plants, Denton is quite comparable, particularly when accounting for the two construction crews within water distribution division.

The City's 0.19 MGD per employee for Wastewater is most consistent with Lewisville and Wichita Falls, and is also in the lower range of the surveyed group. This result is mainly due to the two construction crews in wastewater collections, the employees needed for activities necessary to meet the United States Environmental Protection Agency administrative order to reduce sanitary sewer overflows, and the fact that the Beneficial Reuse division is included within Wastewater employee numbers.

It should be noted that the full costs of construction crews in Water and Wastewater is routinely assessed against costs for obtaining the same services via outside contractors, and there are significant savings obtained by using internal crews. The internal crews also provide more rapid responses than could be obtained from outside contractors, which helps ensure that other departments (such as the Streets department) are not delayed by water and wastewater activities associated with their projects. Both utilities also benchmark rates for major customer classes against a list of peer group municipalities each budget cycle, and results indicate that Denton's rates are competitive compared to the peer group. Graphs of the latest rate comparisons are provided as an Exhibit to this memo.

National data: General Analyses

Staff used the "number of customer accounts per employee" and the "volume of water / wastewater treated per employee" to compare Denton Water and Wastewater utilities to national survey data. The 2016 AWWA "Benchmarking Performance Indicators for Water and Wastewater" was used as the data source for these two metrics, and Denton results are compared to all respondents by utility type, only those utilities in AWWA Region IV (comprised of 13 states, which includes Texas, Oklahoma, Louisiana, New Mexico), and utilities that serve populations of 100,001-500,000 people. Table 3 summarizes this information for the number of customer accounts per employee.

Table 3. Summary of 2016 AWWA "Customer Accounts Per Employee"

Data source	Upper Quartile	Median	Lower Quartile
All respondents	641	480	372
Region IV	758	469	393
100,001-500,000	676	469	372
Denton Water	391		
All respondents	732	530	360
Region IV	899	695	329
100,001-500,000	669	521	365
Denton Wastewater	415		

As seen in Table 3, there is a large range between the upper quartile and lower quartile for all data source types, and substantial variability between data sources. The variability in responses is highest for the upper quartile for Water utilities and for the median for Wastewater utilities. Using this information, Denton Water and Wastewater metrics fall between the median and lower quartile of the metric, indicating somewhat lower customer accounts per employee than half of the survey respondents.

Information for the volume of water and wastewater processed per employee is summarized in Table 4.

Table 4. Summary of 2016 AWWA "Volume Processed Per Employee"

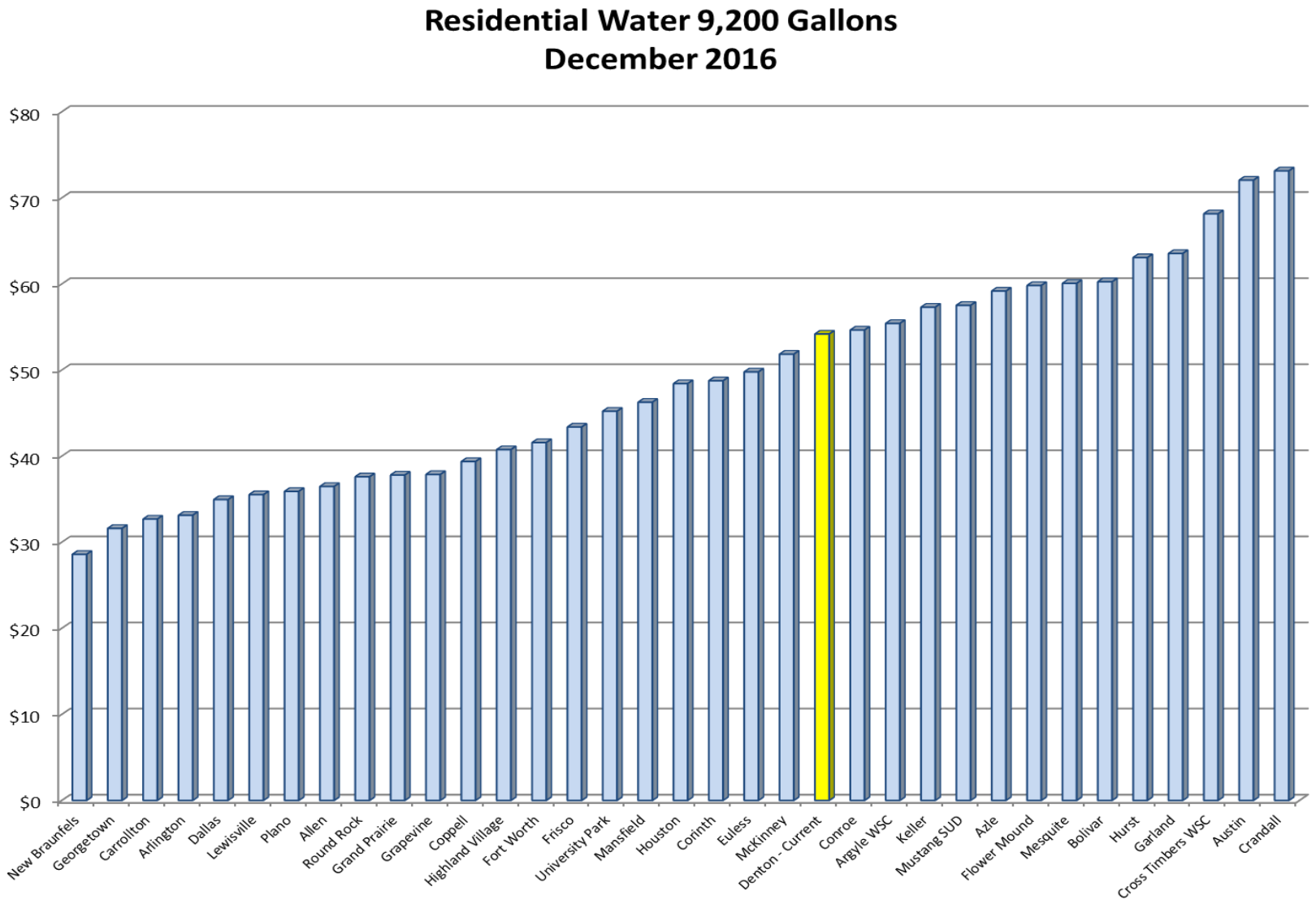
Data source	Upper Quartile	Median	Lower Quartile
All respondents	0.29	0.19	0.13
Region IV	0.37	0.22	0.16
100,001-500,000	0.30	0.21	0.15
Denton Water		0.20	
All respondents	0.34	0.23	0.17
Region IV	0.29	0.21	0.18
100,001-500,000	0.26	0.19	0.15
Denton Wastewater		0.19	

This data set also shows a sizable range between the upper quartile and lower quartile for all data source types, with the highest variability observed in the upper quartile. Using this information, both Water and Wastewater are "at" or "slightly below" the median depending on the data source being used for comparison, indicating that Denton's Volume Processed per Employee metrics are very comparable to those of approximately half of the survey respondents.

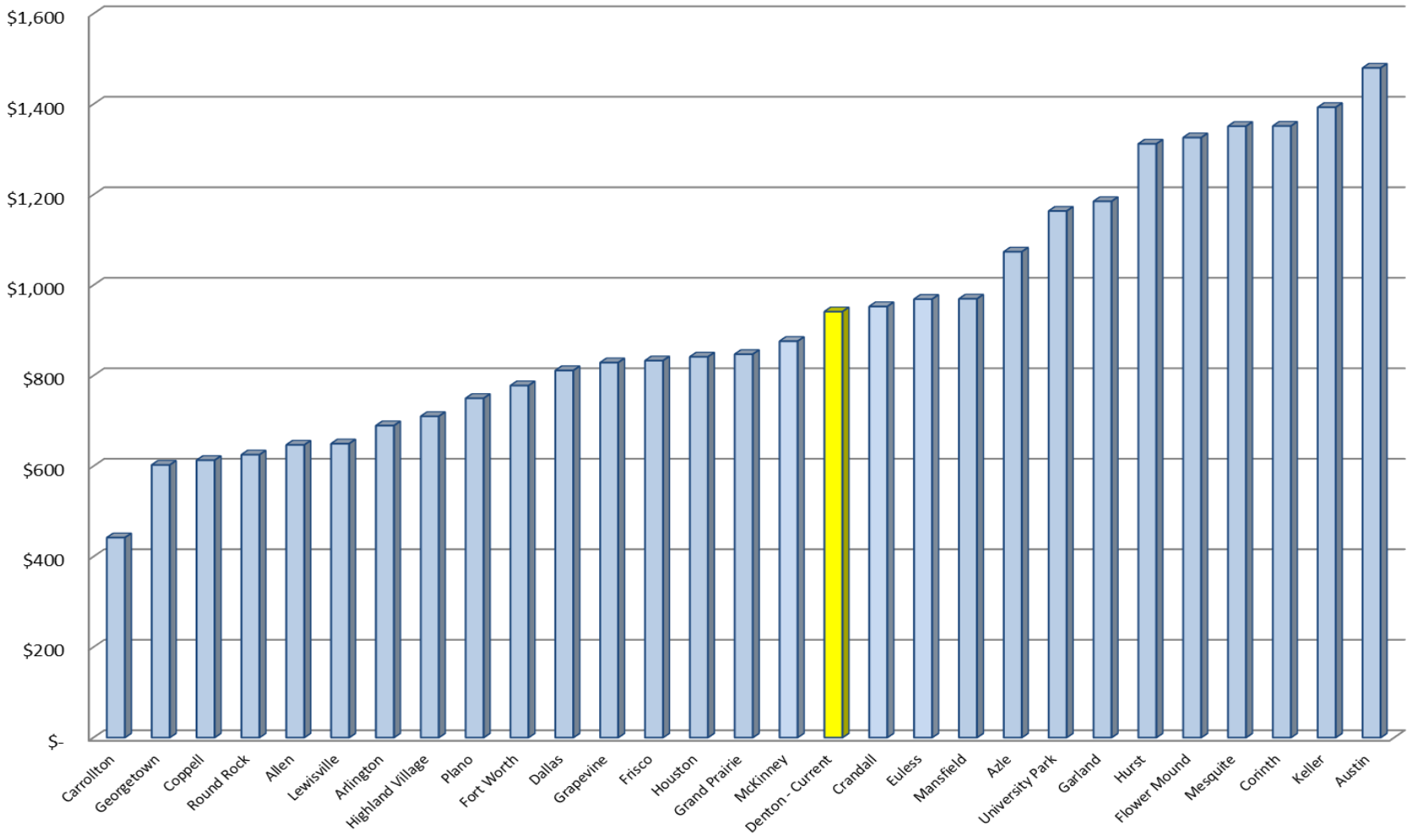
In summary, there are several operational issues for Denton Water and Wastewater utilities that influence the number of employees. Denton has two large water plants that are approximately 17 miles apart and located on two different reservoirs. Transmission infrastructure for both plants is significant, with the Lewisville plant having significant raw water transmission distances and the Ray Roberts plant having significant treated water transmission distances. Denton is considered as a low-density city in terms of population per square mile, which creates a situation where the water distribution and wastewater collection networks will tend to be larger on a per capita basis when compared with a more densely populated city. Denton's Water and Wastewater utilities do not purchase water or wastewater services from regional entities, or provide significant regional services. Denton also accomplishes a substantial amount of its construction using internal crews as opposed to contracting out this work, and has unique programs. These operational characteristics will produce lower numbers for both Customer Accounts per Employee and for Volumes Processed per employee, although the effects tend to be less pronounced for the volume based metric.

Staff has provided this information to demonstrate how Denton's Water and Wastewater employment metrics compare to national and regional survey information for two relatively simple full time employee metrics and to illustrate to some of the issues that should be considered when making these types of comparisons. Staff will be glad to provide additional information to the Public Utility Board upon request.

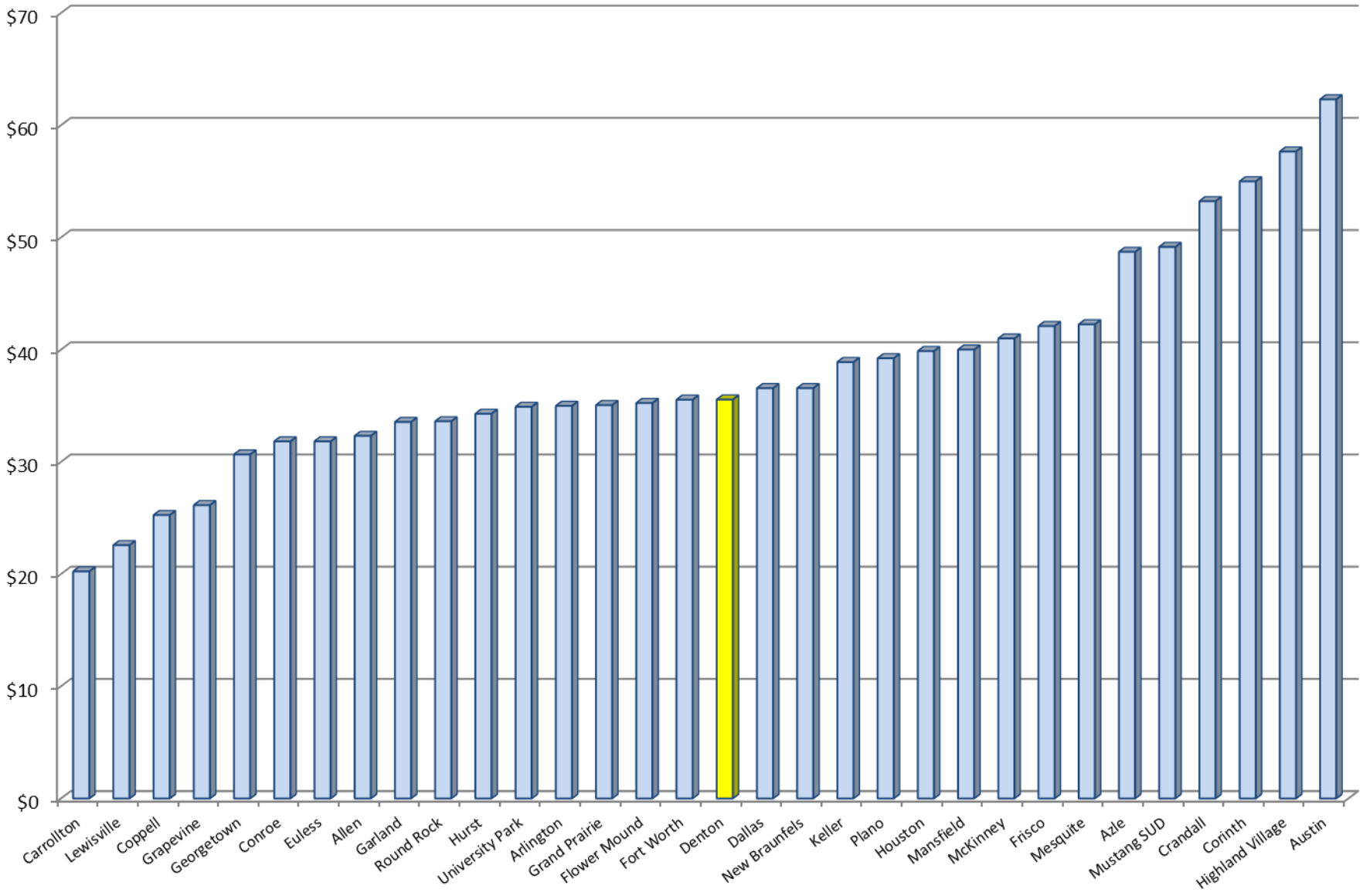
Exhibit. Comparisons of Water and Wastewater Customer Costs for major customer classes (average residential and commercial)



Commercial Water 200,000 Gallons
2" Meter – December 2016



Residential Wastewater
6,000 Gallons - December 2016



Commercial Wastewater
200,000 Gallons - December 2016