City of Chandler, Arizona
System Development Fee Update:

2018-2028 Land Use Assumptions and Infrastructure Improvements Plan

duncan associates

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EXECUTIVE SUMMARY

Impact fees are charges assessed on new development to cover the costs of capital improvements needed to accommodate growth. The City of Chandler calls its impact fees "system development fees," or SDFs. Duncan Associates has been retained by the City of Chandler to update the City's system development fees in compliance with the five-year update requirement of the Arizona development impact fee enabling act. This report provides all the analysis required prior to the adoption of updated impact fees, including land use assumptions, infrastructure improvements plans and fee calculations.

Background

In 2011, the legislature passed SB 1525, which was signed by the governor on April 26, 2011. SB 1525 constituted a major overhaul of Arizona's impact fee enabling act for municipalities. The City updated its system development fees in compliance with the statute based on a study completed in 2014.[1] The current fees that have been effective since July 28, 2014 are summarized in Table 1.

Table 1. Current System Development Fee Schedule

Fee Type	Single-Family* (dwelling)	Multi-Family* (dwelling)	Retail/ Comm. (sq. ft.)	Office (sq. ft.)	Indust./ Whse (sq. ft.)	Public/ Instit. (sq. ft.)
Arterial Streets**	$3,901	$2,419	$4.13	$4.36	$2.30	$1.44
Parks NW	$2,241	$1,602	$0.00	$0.00	$0.00	$0.00
Parks NE	$3,138	$2,244	$0.00	$0.00	$0.00	$0.00
Parks SE	$3,246	$2,321	$0.00	$0.00	$0.00	$0.00
Library	$61	$44	$0.00	$0.00	$0.00	$0.00
Fire	$412	$295	$0.48	$0.32	$0.10	$0.14
Police	$277	$198	$0.32	$0.21	$0.07	$0.09
Public Buildings	$110	$79	$0.12	$0.08	$0.02	$0.03
Subtotal, Non-Utility Fees (Streets Service Area)			$5.05	$4.97	$2.49	$1.70
Water	$5,680	$2,147	***	***	***	***
Wastewater	$5,804	$2,751	***	***	***	***
Reclaimed Water	$838	$397	***	***	***	***
Total (with Streets), Parks NW	$19,324	$9,932	***	***	***	***
Total (with Streets), Parks NE	$20,221	$10,574	***	***	***	***
Total (with Streets), Parks SE	$20,329	$10,651	***	***	***	***
Total (w/o Streets), Parks NW	$15,423	$7,513	***	***	***	***
Total (w/o Streets), Parks NE	$16,320	$8,155	***	***	***	***
Total (w/o Streets), Parks SE	$16,428	$8,232	***	***	***	***

* single-family defined as a dwelling unit with an individual water meter, multi-family as sharing a meter with other units
** arterial street fee applies only in arterial street service area (see Figure 3)
*** nonresidential utility fees based on meter size (see Table 3)
Source: City of Chandler, *System Development Fee Schedule, Effective July 28, 2014*.

[1] Duncan Associates, *System Development Fee Update*, January 2014

Summary of Changes

No major changes to the fee calculation methodology and system are recommended as part of this update. However, some minor changes are proposed for the arterial street fee.

- The updated arterial street fees no longer include a pass-through adjustment (see page 26), which was determined not to be necessary.

- A portion of the downtown area has been removed from the arterial street service area. This change to the service area is intended to encourage development in the affected area and to recognize that part of this area has paid for arterial street improvements through public improvement districts.

It is worth noting the major changes that were made in the 2014 study to comply with the new State enabling act and to make the fees as defensible as possible. The 2014 study added a ten-year cost analysis, and the fees were based on the lowest of the existing, ten-year or buildout cost per service unit. The addition of the ten-year analysis was intended to ensure compliance with SB 1525's requirement that the infrastructure improvements plan may not cover a period longer than ten years. The arterial street methodology was modified in 2014 to take into account pass-by trips and average trip lengths associated with retail and office land uses. For the utility fees, an existing cost per service unit calculation was also added, as required by SB 1525. Finally, the 2014 update merged the separate water resources fee with the water fee, and the separate wastewater treatment and trunkline fees were combined.

The City has pledged library and public building system development fees for the repayment of bonds and interfund loans. The City has no plans to build another library, and public building fees are no longer authorized except to repay pledged debt. Consequently, updated infrastructure improvements plans are not prepared for libraries and public buildings. The City can retain its current library and public building system development fees and use them to repay pledged debt until the remaining obligations have been retired.

Summary of Findings

The updated non-utility system development fees are summarized in Table 2 below, along with a comparison to current fees.

It is not possible to show a single total updated non-utility fee, because the park fees differ between three service areas. Also note that the arterial street fees apply only in the arterial street service area (see Figure 3) – total current and updated fees would be lower outside this area. Total updated non-utility fees are lower for all land use types except retail in all areas of the city.

Table 2. Updated and Current Non-Utility System Development Fees

Fee Type	Single-Family (dwelling)	Multi-Family (dwelling)	Retail/ Comm. (sq. ft.)	Office (sq. ft.)	Indust./ Whse (sq. ft.)	Public/ Instit. (sq. ft.)
Updated Fees						
Arterial Streets*	$3,869	$2,190	$5.04	$4.04	$1.17	$0.97
Parks, NW Service Area	$983	$729	$0.00	$0.00	$0.00	$0.00
Parks, NE Service Area	$237	$176	$0.00	$0.00	$0.00	$0.00
Parks, SE Service Area	$2,338	$1,735	$0.00	$0.00	$0.00	$0.00
Library	$61	$44	$0.00	$0.00	$0.00	$0.00
Fire	$218	$161	$0.22	$0.20	$0.04	$0.06
Police	$127	$94	$0.13	$0.11	$0.02	$0.03
Public Building	$110	$79	$0.12	$0.08	$0.02	$0.03
Total Updated Fees, Parks NW	$5,368	$3,297	$5.51	$4.43	$1.25	$1.09
Total Updated Fees, Parks NE	$4,622	$2,744	$5.51	$4.43	$1.25	$1.09
Total Updated Fees, Parks SE	$6,723	$4,303	$5.51	$4.43	$1.25	$1.09
Current Fees						
Arterial Streets*	$3,901	$2,419	$4.13	$4.36	$2.30	$1.44
Parks, NW Service Area	$2,241	$1,602	$0.00	$0.00	$0.00	$0.00
Parks, NE Service Area	$3,138	$2,244	$0.00	$0.00	$0.00	$0.00
Parks, SE Service Area	$3,246	$2,321	$0.00	$0.00	$0.00	$0.00
Library	$61	$44	$0.00	$0.00	$0.00	$0.00
Fire	$412	$295	$0.48	$0.32	$0.10	$0.14
Police	$277	$198	$0.32	$0.21	$0.07	$0.09
Public Building	$110	$79	$0.12	$0.08	$0.02	$0.03
Total Current Fees, Parks NW	$7,002	$4,637	$5.05	$4.97	$2.49	$1.70
Total Current Fees, Parks NE	$7,899	$5,279	$5.05	$4.97	$2.49	$1.70
Total Current Fees, Parks SE	$8,007	$5,356	$5.05	$4.97	$2.49	$1.70
Percent Change						
Arterial Streets*	-1%	-9%	22%	-7%	-49%	-33%
Parks, NW Service Area	-56%	-54%	n/a	n/a	n/a	n/a
Parks, NE Service Area	-92%	-92%	n/a	n/a	n/a	n/a
Parks, SE Service Area	-25%	-23%	n/a	n/a	n/a	n/a
Library	0%	0%	n/a	n/a	n/a	n/a
Fire	-47%	-45%	-54%	-38%	-60%	-57%
Police	-54%	-53%	-59%	-48%	-71%	-67%
Public Building	0%	0%	0%	0%	0%	0%
Total Change, Parks NW	-23%	-29%	9%	-11%	-50%	-36%
Total Change, Parks NE	-41%	-48%	9%	-11%	-50%	-36%
Total Change, Parks SE	-16%	-20%	9%	-11%	-50%	-36%

* arterial street fee applies only in arterial street service area (see Figure 3) – totals only apply to the arterial streets service area
Source: Updated fees from Table 26 (streets), Table 41 (parks), Table 55 (fire), and Table 64 (police); current fees from Table 1.

The updated utility system development fees are summarized in Table 3 below, along with a comparison to current fees. The combined updated utility fees are about one-third less than current fees.

The change in total (utility plus non-utility) system development fees can only be shown for residential uses, because nonresidential utility fees are assessed based on meter size. Updated total system development fees per single-family unit are between one-quarter to one-half lower than current fees, depending on the area in which the new unit is located (see Table 4 below).

Table 3. Updated and Current Utility System Development Fees

Housing/Meter Type	Water	Waste-Water	Reclaimed Water	Total
Updated Fees				
Single-Family Unit	$3,397	$4,024	$837	$8,258
Multi-Family Unit	$1,281	$1,940	$403	$3,624
3/4" Disc	$5,096	$6,036	$1,256	$12,388
1" Disc	$8,493	$10,060	$2,093	$20,646
1 1/2" Disc	$16,985	$20,120	$4,185	$41,290
2" Disc/Turbine	$27,176	$32,192	$6,696	$66,064
3" Compound	$54,352	$64,384	$13,392	$132,128
3" Turbine	$59,448	$70,420	$14,648	$144,516
4" Compound	$84,925	$100,600	$20,925	$206,450
4" Turbine	$101,910	$120,720	$25,110	$247,740
6" Compound	$169,850	$201,200	$41,850	$412,900
6" Turbine	$212,313	$251,500	$52,313	$516,126
8" Compound	$271,760	$321,920	$66,960	$660,640
8" Turbine	$305,730	$362,160	$75,330	$743,220
Current Fees				
Single-Family Unit	$5,680	$5,804	$838	$12,322
Multi-Family Unit	$2,147	$2,751	$397	$5,295
3/4" Disc	$8,520	$8,706	$1,257	$18,483
1" Disc	$14,200	$14,510	$2,095	$30,805
1 1/2" Disc	$28,400	$29,020	$4,190	$61,610
2" Disc/Turbine	$45,440	$46,432	$6,704	$98,576
3" Compound	$90,880	$92,864	$13,408	$197,152
3" Turbine	$99,400	$101,570	$14,665	$215,635
4" Compound	$142,000	$145,100	$20,950	$308,050
4" Turbine*	$170,400	$174,120	$25,140	$369,660
6" Compound	$284,000	$290,200	$41,900	$616,100
6" Turbine	$355,000	$362,750	$52,375	$770,125
8" Compound	$454,400	$464,320	$67,040	$985,760
8" Turbine	$511,200	$522,360	$75,420	$1,108,980
Percent Change				
Single-Family Unit	-40%	-31%	0%	-33%
Multi-Family Unit	-40%	-29%	2%	-32%
3/4" Disc	-40%	-31%	0%	-33%
1" Disc	-40%	-31%	0%	-33%
1 1/2" Disc	-40%	-31%	0%	-33%
2" Disc/Turbine	-40%	-31%	0%	-33%
3" Compound	-40%	-31%	0%	-33%
3" Turbine	-40%	-31%	0%	-33%
4" Compound	-40%	-31%	0%	-33%
4" Turbine	-40%	-31%	0%	-33%
6" Compound	-40%	-31%	0%	-33%
6" Turbine	-40%	-31%	0%	-33%
8" Compound	-40%	-31%	0%	-33%
8" Turbine	-40%	-31%	0%	-33%

* calculated in 2014 study, but omitted from City Code

Note: City's ordinance provides that the City Engineer will determine fees for meters larger than 8".

Source: Updated fees from Table 88 (water), Table 104 (wastewater) and Table 115 (reclaimed water); current fees from City of Chandler City Code, Chapter 38 and 2014 study.

Table 4. Updated and Current Single-Family System Development Fees

Fee Type	Updated Fees		Current Fees		Percent Change	
	Art. Streets Serv. Area	Rest of City	Art. Streets Serv. Area	Rest of City	Art. Streets Serv. Area	Rest of City
Arterial Streets	$3,869	$0	$3,901	$0	-1%	n/a
Parks, NW Service Area	$983	$983	$2,241	$2,241	-56%	-56%
Parks, NE Service Area	$237	$237	$3,138	$3,138	-92%	-92%
Parks, SE Service Area	$2,338	n/a	$3,246	n/a	-28%	n/a
Library	$61	$61	$61	$61	0%	0%
Fire	$218	$218	$412	$412	-47%	-47%
Police	$127	$127	$277	$277	-54%	-54%
Public Building	$110	$110	$110	$110	0%	0%
Water	$3,397	$3,397	$5,680	$5,680	-40%	-40%
Wastewater	$4,024	$4,024	$5,804	$5,804	-31%	-31%
Reclaimed Water	$837	$837	$838	$838	0%	0%
Total, Parks NW	$13,626	$9,757	$19,324	$15,423	-29%	-37%
Total, Parks NE	$12,880	$9,011	$20,221	$16,320	-36%	-45%
Total, Parks SE	$14,981	n/a	$20,329	n/a	-26%	n/a

Source: Table 2 and Table 3 ("na" indicates not applicable – all of the southeast parks service area is within the arterial streets service area).

While fee changes differ by facility type, land use and area, overall system development fee revenue over the next ten years, based on the land use assumptions, will be about one-third less than under current fees, as shown in Table 5 below. However, revenues by buildout will be sufficient to fully fund all remaining capital needs, as described on the following page.

Table 5. Updated and Current Fee Revenue, 2018-2028

Fee Type	Current Fees	Updated Fees	Percent Change
Parks, NW Service Area	$257,175	$115,011	-55%
Parks, NE Service Area	$11,558,304	$901,074	-92%
Parks, SE Service Area	$6,082,764	$4,411,806	-27%
Subtotal, Parks	$17,898,243	$5,427,891	-70%
Arterial Streets	$40,129,342	$31,938,595	-20%
Library	$347,878	$347,878	0%
Fire	$5,807,810	$3,026,712	-48%
Police	$3,893,336	$1,763,268	-55%
Public Building	$1,444,255	$1,444,255	0%
Total, Non-Utility Fees	$69,520,864	$43,948,599	-37%
Water	$127,004,800	$75,956,920	-40%
Wastewater	$149,302,096	$103,513,376	-31%
Reclaimed Water	$21,556,712	$21,530,988	0%
Total Utility Fees	$297,863,608	$201,001,284	-33%
Grand Total	$367,384,472	$244,949,883	-33%

Source: Current fee revenue is current fees from Table 1 times new 2018-2028 development units/EDUs from Table 8 (residential) and Table 11 (nonresidential), Table 73 (water) and Table 94 (wastewater), updated fee revenue from Table 29 (arterial streets), Table 44 (parks), Table 58 (fire), Table 69 (public building), Table 67 (police), Table 91 (water), Table 107 (wastewater), and Table 118 (reclaimed water) – library and public building fees are not being updated, so revenue under updated and current fees are the same.

All the updated fees are based on buildout capital needs. In every case, the buildout cost per service unit is less than both the existing level of service and the 10-year cost per service unit. The updated fees all generate less revenue in the next ten years than 10-year capital needs, and enough revenue for buildout capital needs. The grandfathered library and public building fees are not being updated - revenues for those fees are capped at the amount of remaining pledged debt.

Table 6. Capital Needs and Fee Revenue, 10-Year and Buildout

Fee Type	10-Year Needs	10-Year Revenue	% of Needs	Buildout Needs	Buildout Revenue	% of Needs
Parks, NW Service Area	$203,081	$115,011	57%	$205,413	$205,447	100%
Parks, NE Service Area	$2,045,959	$901,074	44%	$2,087,556	$2,090,577	100%
Parks, SE Service Area	$8,730,968	$4,411,806	51%	$8,752,939	$8,751,134	100%
Subtotal, Parks	$10,980,008	$5,427,891	49%	$11,045,908	$11,047,158	100%
Arterial Streets	$51,104,363	$31,938,595	62%	$76,509,338	$76,517,213	100%
Library	$443,289	$347,878	78%	$443,289	$443,289	100%
Fire	$6,700,357	$3,026,712	45%	$6,766,257	$6,762,796	100%
Police	$3,873,429	$1,763,268	46%	$3,939,329	$3,939,794	100%
Public Building	$2,695,733	$1,444,255	54%	$2,695,733	$2,695,733	100%
Total, Non-Utility Fees	$75,797,179	$43,948,599	58%	$101,399,854	$101,405,983	100%
Water	$159,057,447	$75,956,920	48%	$159,189,247	$159,176,626	100%
Wastewater	$217,171,729	$103,513,376	48%	$217,237,629	$217,231,616	100%
Reclaimed Water	$45,106,433	$21,530,988	48%	$45,172,333	$45,184,608	100%
Total, Utility Fees	$421,335,609	$201,001,284	48%	$421,599,209	$421,592,850	100%
Grand Total	$497,132,788	$244,949,883	49%	$522,999,063	$522,998,833	100%

Source: Table 29 (arterial streets), Table 44 (parks), Table 45 and Table 46 (library), Table 58 (fire), Table 67 (police), Table 68 and Table 69 (public building), Table 91 (water), Table 107 (wastewater), and Table 118 (reclaimed water;

LEGAL FRAMEWORK

Impact fees are a way for local governments to require new developments to pay a proportionate share of the infrastructure costs they impose on the community. In contrast to traditional "negotiated" developer exactions, impact fees are charges that are assessed on new development using a standard formula based on objective characteristics, such as the number and type of dwelling units constructed. The fees are one-time, up-front charges, with the payment made at the time of building permit issuance. Impact fees require each new development project to pay its pro-rata share of the cost of new capital facilities required to serve that development.

Arizona's enabling act for municipalities is codified in Sec. 9-463.05, Arizona Revised Statutes (ARS). In 2011, the legislature passed SB 1525, which was signed by the governor on April 26, 2011. SB 1525 constituted a major overhaul of Arizona's enabling act for municipalities. This chapter summarizes some of the major provisions of the current state act.

Eligible Facilities

Prior to SB 1525, municipalities could assess impact fees for any "necessary public services" (which was not defined) that constituted "costs to the municipality." SB 1525 amended the statute to limit the types of facilities for which impact fees can be assessed. Authorized facilities for which impact fees can be assessed, after January 1, 2012, are limited to the following defined "necessary public services:"

> *"Necessary public service" means any of the following facilities that have a life expectancy of three or more years and that are owned and operated by or on behalf of the municipality:*
>
> *(a) Water facilities, including the supply, transportation, treatment, purification and distribution of water, and any appurtenances for those facilities.*
>
> *(b) Wastewater facilities, including collection, interception, transportation, treatment and disposal of wastewater, and any appurtenances for those facilities.*
>
> *(c) Storm water, drainage and flood control facilities, including any appurtenances for those facilities.*
>
> *(d) Library facilities of up to ten thousand square feet that provide a direct benefit to development, not including equipment, vehicles or appurtenances.*
>
> *(e) Street facilities located in the service area, including arterial or collector streets or roads that have been designated on an officially adopted plan of the municipality, traffic signals and rights-of-way and improvements thereon.*
>
> *(f) Fire and police facilities, including all appurtenances, equipment and vehicles. Fire and police facilities do not include a facility or portion of a facility that is used to replace services that were once provided elsewhere in the municipality, vehicles and equipment used to provide administrative services, helicopters or airplanes or a facility that is used for training firefighters or officers from more than one station or substation.*

(g) Neighborhood parks and recreational facilities on real property up to thirty acres in area, or parks and recreational facilities larger than thirty acres if the facilities provide a direct benefit to the development. Park and recreational facilities do not include vehicles, equipment or that portion of any facility that is used for amusement parks, aquariums, aquatic centers, auditoriums, arenas, arts and cultural facilities, bandstand and orchestra facilities, bathhouses, boathouses, clubhouses, community centers greater than three thousand square feet in floor area, environmental education centers, equestrian facilities, golf course facilities, greenhouses, lakes, museums, theme parks, water reclamation or riparian areas, wetlands, zoo facilities or similar recreational facilities, but may include swimming pools.

(h) Any facility that was financed and that meets all of the requirements prescribed in subsection R *of this section.* (Sec. 9-463.05.T.7, ARS)

No longer authorized are fees for public building facilities, sanitation facilities, library buildings larger than 10,000 square feet and library books or equipment, fire and police administrative and training facilities and aircraft, parks larger than 30 acres and community centers larger than 3,000 square feet. No changes were made to authorized improvements for road, stormwater drainage, water or wastewater facilities, other than the new requirement that eligible facilities must have a life expectancy of at least three years.

Pledged Debt

Municipalities are authorized to continue to charge impact fees that were enacted prior to the January 1, 2012 effective date of SB 1525 without updating them according to the new enabling act if they were pledged to retire debt, pursuant to Section 9-463.05.R, Arizona Revised Statutes:

R. A municipality may continue to assess a development fee adopted before January 1, 2012 for any facility that was financed before June 1, 2011 if:

1. Development fees were pledged to repay debt service obligations related to the construction of the facility.

2. After August 1, 2014, any development fees collected under this subsection are used solely for the payment of principal and interest on the portion of the bonds, notes or other debt service obligations issued before June 1, 2011 to finance construction of the facility.

The Arizona League of Cities and Towns has construed the word "pledged" to include the expressed intent to use impact fees to repay interfund loans or more formal debt instruments, such as general obligation or revenue bonds. The City has pledged fee revenue in this sense for all its system development fees. However, whether debt is pledged pursuant to SB 1525 is of real significance only for improvements that are no longer authorized after January 1, 2012. Consequently, pledged debt is of significance only for parks (Chandler has pledged the use of park fees to retire outstanding debt used for improvements to three parks larger than 30 acres), library (the City has pledged debt on the Sunset Branch library, which is larger than 10,000 square feet) and public buildings (public building fees are no longer authorized, but the City has interfund loans for the construction of City Hall).

Compliance Deadlines

SB 1525 added numerous new requirements related to how impact fees are calculated. Land use assumptions (growth projections) must be prepared for each service area, covering at least a ten-year period. Many new requirements were added for the infrastructure improvements plan (IIP) and the impact fee analysis. Compliance with these was required by August 1, 2014, and the City of Chandler met that deadline.

> *A development fee that was adopted before January 1, 2012 may continue to be assessed only to the extent that it will be used to provide a necessary public service for which development fees can be assessed pursuant to this section and shall be replaced by a development fee imposed under this section on or before August 1, 2014. (9-463.05K, ARS)*

Significant changes were made to the requirements for adopting updated infrastructure improvements plans and fee schedules. These requirements are effective as of January 1, 2012, but only apply to the updated IIP and impact fee schedules that must be in place by August 1, 2014.

Provisions were also added relating to refunds. However, these provisions only apply to fees collected after August 1, 2014. Other changes, however, were effective as of January 1, 2012. These include new provisions or amendments related to developer credits, the locking-in of fee schedules for 24 months following development approval, and annual reporting requirements. In addition, the expenditure of impact fees collected after January 1 is restricted to facilities authorized by SB 1525 (including repayment of pledged debt for unauthorized facilities).

Service Areas

Service areas are a key requirement for impact fees under SB 1525. A service area is defined as "any specified area within the boundaries of a municipality in which development will be served by necessary public services or facility expansions and within which a substantial nexus exists between the necessary public services or facility expansions and the development being served as prescribed in the infrastructure improvements plan." Land use assumptions (growth projections) and an infrastructure improvements plan (list of capital improvements and impact fee analysis) must be prepared for each service area.

It should be noted that multiple service areas are not mandated by SB 1525. As long it can be shown that developments located anywhere within the service area will be served by or benefit from improvements in the service area – which is another way of saying that a "substantial nexus" can be demonstrated – a single service area may be permitted. Service areas for this update are described in the Service Areas chapter (see page 14).

Service Units

In impact fee analysis, demand for facilities must be expressed in terms of a common unit of measurement, called a "service unit." SB 1525 defines a service unit as "a standardized measure of

consumption, use, generation or discharge attributable to an individual unit of development calculated pursuant to generally accepted engineering or planning standards for a particular category of necessary public services or facility expansions." The service unit used by the City for all its system development fees is the Equivalent Dwelling Unit, or EDU. One EDU represents the average demand for services generated by a single-family dwelling unit.

Level of Service (LOS) Standards

SB 1525 does not define the term "level of service" (LOS), nor does it require the formal adoption of LOS standards. It does require, however, that impact fees be based on the same LOS provided to existing development in the service area. This does not mean that impact fees cannot be based on a higher standard than is currently actually provided to existing development in a service area. If the fees are based on a higher-than-existing LOS, however, there must be a plan to use non-impact fee funds to remedy the existing deficiency.

Methodology

SB 1525 is sometimes misunderstood to dictate a particular methodology for calculating impact fees. Because cities must forecast anticipated growth over a fixed time period and identify improvements over the same time period, some are led to think that a "plan-based" methodology is required, where the cost per service unit is calculated by dividing planned costs by anticipated new service units. In fact, however, SB 1525 does not dictate this methodology, and most impact fees in the state have not been calculated in this way. The reason is that, to support a plan-based methodology, the list of planned improvements must be developed using a rigorous analysis, such as the modeling used to develop a transportation master plan, to establish the required nexus between the anticipated growth and the specific list of improvements required to serve that growth. In many cases, such a master plan is not available.

The principal alternative to the plan-based methodology is "standards-based." The key difference is that the plan-based approach is based on a complex level of service (LOS) standard, such as "every road shall function at LOS D or better," or "the average fire response time shall not exceed three minutes," that requires projecting growth by small areas and using sophisticated modeling or analysis to determine the specific improvements needed to maintain the desired LOS. In contrast, a standards-based approach uses a generalized LOS standard, such as the ratio of park acres to population, which does not require an extensive master planning effort to determine the improvements and costs that are attributable to a specific quantity of growth.

There are advantages and disadvantages to the two methodologies. The major advantage of a standards-based methodology is that it is more flexible, since the fees are not dependent on the specific projects included in the list of improvements, only on the average cost to construct a unit of capacity. Changing the list of planned projects typically does not require recalculation of standards-based impact fees, since a single project is likely to have an insignificant impact on the average cost of capacity added by all the improvements. This allows the capital plan to change in response to unforeseen development without triggering the need for an impact fee update. The major disadvantage of the standards-based approach is that it may not be appropriate for cities such as Chandler that are landlocked and approaching buildout. In the case of cities that are near buildout, the standards-based

approach could end up collecting more revenue than is needed to pay for remaining improvement costs or remaining costs to pay for existing facilities with excess capacity.

SB 1525 made three major changes that were addressed in the 2014 update methodology. First, it required that fees not be based on a higher standard than is currently actually provided to existing development in a service area. Second, it limited the infrastructure improvements plan (IIP) to a maximum of ten years. Third and finally, SB 1525 mandates that fees must be spent within ten years from when they are collected (15 years in the case of water and wastewater fees).

To ensure compliance with SB 1525, three costs per service unit are calculated in the 2014 study and this update. The fees are based on the lowest of the three: existing level of service, buildout cost per service unit, and 10-year cost per service unit. This modified methodology complies with all the relevant requirements of SB 1525.

Land Use Assumptions

An impact fee update must now include the development of land use assumptions (growth projections) for each service area. SB 1525 defines land use assumptions as "projections of changes in land uses, densities, intensities and population for a specified service area over a period of at least ten years and pursuant to the general plan of the municipality." Since the infrastructure improvements plan (IIP) that must be prepared for each service area must identify improvement needs for a period not to exceed 10 years, a 10-year time-frame would seem to be the most appropriate for both the land use assumptions and the IIP. Land use assumptions are provided in the Land Use Assumptions chapter of this report (see page 20).

Infrastructure Improvements Plan

SB 1525 requires that an infrastructure improvements plan (IIP) be prepared for each facility type and service area. Impact fees may only be collected to pay for improvements identified in the IIP. By implication, impact fees can only be spent on improvements listed in the IIP. The IIP must identify planned projects over a period of not more than ten years. The updated IIP will cover the ten-year period from 2018-2028.

The IIP is often confused with a list of planned capital improvements. While the IIP must include such a list, it must also contain much more analysis. The IIP is basically the impact fee study. To avoid confusion, this study refers to the list of improvements that must be included in the IIP as the "capital plan." This study provides a single, consolidated document that includes land use assumptions, infrastructure improvement plans and impact fee analyses for all of the City's system development fees.

The IIP must include only new improvements that add capacity to accommodate future growth, or costs attributable to existing improvements that have excess capacity to accommodate future growth. Replacing an existing fire truck or an existing fire station, or remodeling or repairing an existing building, are examples of improvements that do not add capacity. Some projects may be partially eligible. For example, replacing an existing two-bay fire station with a larger three-bay fire station would be partially eligible for impact fee funding.

Refunds

A common and understandable misinterpretation of SB 1525 is that a municipality may be required to refund fees collected if any improvement listed in the IIP is not completed within the timeframe of the IIP. Section 9-463.05.B.7 provides that collection of impact fees is allowed only to pay for a project that is identified in the IIP, "and the municipality plans to complete construction and have the service available within the time period established in the infrastructure improvements plan, but in no event longer than the time period provided in subsection H, paragraph 3 of this section [i.e., 15 years for water and wastewater, and 10 years for other facilities]." The key terms in this section are "plans to complete" and "have the service available." No community has a crystal ball that allows it to know with certainty how much development is going to occur over a 10-15 year period in the future. While the City may plan to complete an improvement in this time period in order to serve anticipated growth, if the anticipated growth does not materialize the improvement may not be needed to serve the growth that does occur.

The refund provisions in the referenced refund subsection (H) reinforce this interpretation. The first two subparagraphs refer to the collection of fees when "service is not provided" (H.1) or when "service is not available" and the municipality has failed to complete construction within the time period identified in the IIP (H.2), a clear echo of the "have the service available" phrase in subsection B.7. In general, impact fees are not collected when services are not available. A clear case would be collecting water and wastewater fees from a development that is not able to connect to the water and wastewater system. However, the City of Chandler does not do this. For other facilities, service is provided immediately upon development, even if a planned facility could provide service from a closer location. Section 9-463.05.B.7 directly references only the final paragraph of subsection H (H.3), which simply requires that the impact fees be spent within a certain time period (15 years for water and wastewater, and 10 years for other facilities) from the date they were collected. It is reasonable to conclude that this is the only refund provision that will likely be applicable, as long as the City does not collect impact fees and deny access to services. However, there is the possibility that refunds could be required if a construction project comes in significantly lower than its estimated cost, per Section 9-463.05.I.

Offsets

New development should not be required to pay twice for the cost of new facilities – once through impact fees and again through other taxes or fees that are used to fund the same facilities. To avoid such potential double-payment, impact fees may be reduced, and such a reduction is referred to as an "offset." Offsets are incorporated into the impact fee calculation. While this has long been a part of impact fee practice in Arizona, the current statute contains the following provision:

> *The municipality shall forecast the contribution to be made in the future in cash or by taxes, fees, assessments or other sources of revenue derived from the property owner towards the capital costs of the necessary public service covered by the development fee and shall include these contributions in determining the extent of the burden imposed by the development. Beginning August 1, 2014, for purposes of calculating the required offset to development fees pursuant to this subsection, if a municipality imposes a construction contracting or similar excise tax rate in excess of the percentage amount of the transaction privilege tax rate imposed on the majority*

> *of other transaction privilege tax classifications, the entire excess portion of the construction contracting or similar excise tax shall be treated as a contribution to the capital costs of necessary public services provided to development for which development fees are assessed, unless the excess portion was already taken into account for such purpose pursuant to this subsection.* (Section 9-463.05.B.12)

The revenue forecast required by Section 9-463.05.B.12 is provided in Appendix E. In general, offsets are only required for funding that is dedicated for capacity-expanding improvements of the type addressed by the impact fee. A municipality is not required to use general fund revenue to pay for growth-related improvements. If, for example, a municipality decides that the existing level of service on which impact fees are based is insufficient and opts to use general revenue to raise the level of service for both existing and new development, no offset would be required.

The clearest situation that requires an offset is when there is outstanding debt on the facilities that are providing existing development with the level of service that new development will be expected to pay for through impact fees. In this case, new development will be paying for the facilities that will serve them, while also paying for a portion of the cost of facilities serving existing development through property or other taxes. Consequently, the impact fees should be reduced to avoid this potential double-payment.

Another clear case requiring offsets is when the impact fees for a particular service area have been adopted based on a level of service that is higher than what is currently provided to existing development in the service area. In such a case, the cost of remedying the existing deficiency will almost always be funded by future revenue sources to which new development in the service area will contribute. To the extent that this is the case, an offset is required. Because the updated fees do not exceed the cost of the existing level of service, such an offset is not applicable to this study.

As noted above, an offset will generally be warranted when new development will be contributing toward a funding source that is dedicated to fund the same growth-related improvements addressed by the impact fee. Offsets are also often provided for anticipated grant funding that may be available to help fund growth-related improvements, although the uncertainty of such funding and the fact that it is not generated specifically by new development generally make this type of offset discretionary.

Finally, the language inserted in the state enabling act by SB 1525, cited above, requires municipalities to provide offsets for the excess portion of any construction contracting excise tax. Since the City of Chandler does not charge a construction excise tax higher than for other types of business activities, no such offset is required.

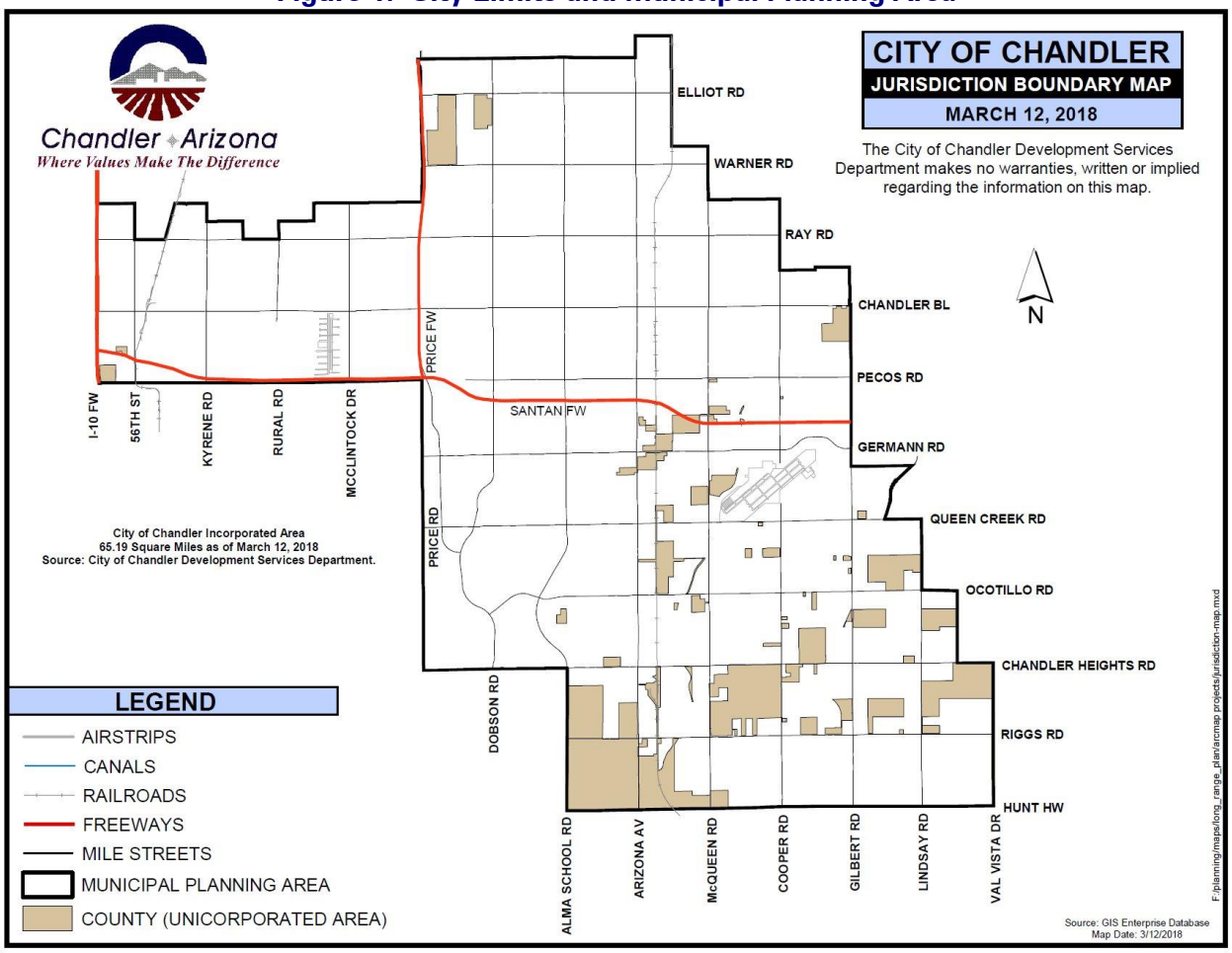
SERVICE AREAS

As noted in the Legal Framework chapter, service areas are a key requirement for impact fees under SB 1525. Land use assumptions (growth projections) and an infrastructure improvements plan (list of capital improvements and impact fee analysis) must be prepared for each service area. Multiple service areas are not mandated by SB 1525, as long as it can be shown that developments located anywhere within the service area will be served by or benefit from improvements anywhere in the service area – which is another way of saying that a "substantial nexus" can be demonstrated.

Chandler currently charges system development fees for arterial streets, water (including water resources), wastewater, reclaimed water, parks, libraries, fire, police and public building facilities. Except for arterial streets and parks, the current service areas are city-wide.

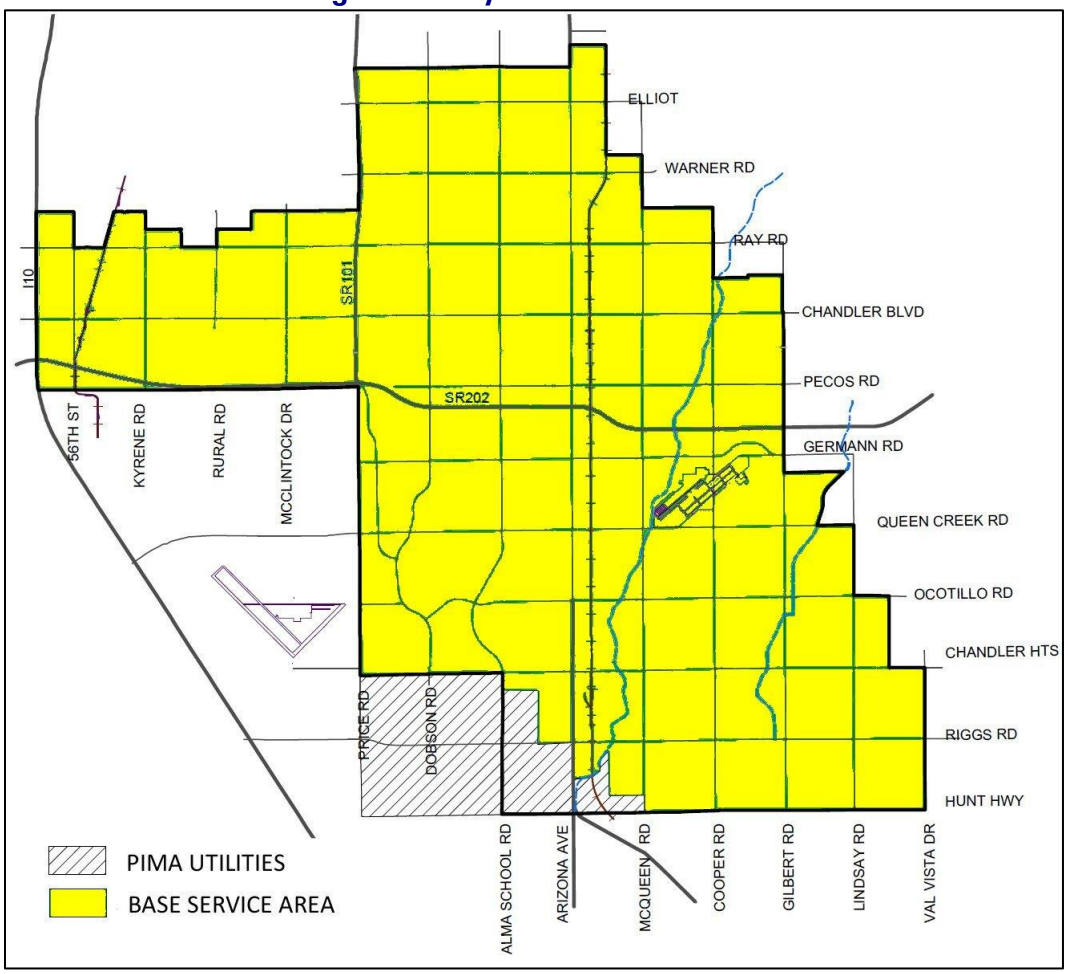
The service areas include unincorporated areas within the City's municipal planning area. Non-utility system development fees are not assessed in the unincorporated areas, unless they annex into the City. Utility system development fees may be assessed on new City utility customers located in unincorporated areas. The municipal planning area and the areas that are currently unincorporated are shown in Figure 1.

Figure 1. City Limits and Municipal Planning Area



The city-wide service area excludes the unincorporated area in the southwest corner of the planning area that is served by Pima Utilities, because the City does not anticipate ever annexing or providing services to this area. As discussed below, the city-wide service area continues to be appropriate for the water, wastewater, reclaimed water, fire, and police system development fees.

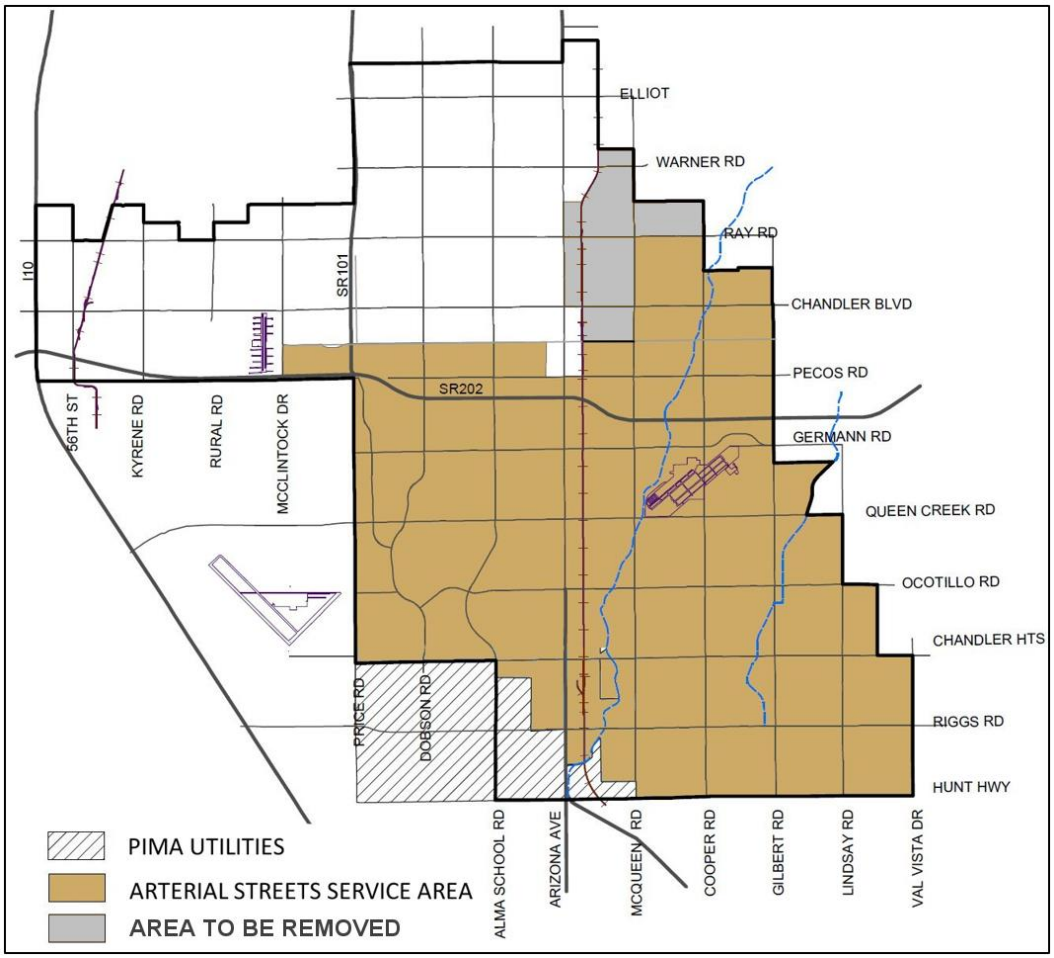
Figure 2. City-Wide Service Area



Arterial Streets

Transportation planners classify roadways according to function. The primary function of arterial streets is to move traffic long distances within a community. Since arterial streets are designed to move traffic throughout the community, a single service area continues to be appropriate. The City's current arterial streets service area excludes an area in the northwest part of the city where arterial streets have been funded with improvement districts. It also excludes the largely developed downtown area, where the arterial street system is in place and the City desires to encourage redevelopment. As part of this update, the service area will be reduced to exclude additional land in the downtown area. Specifically, areas north of Frye, north of Ray, and west of McQueen will be excluded, as shown in Figure 3.

Figure 3. Arterial Streets Service Area



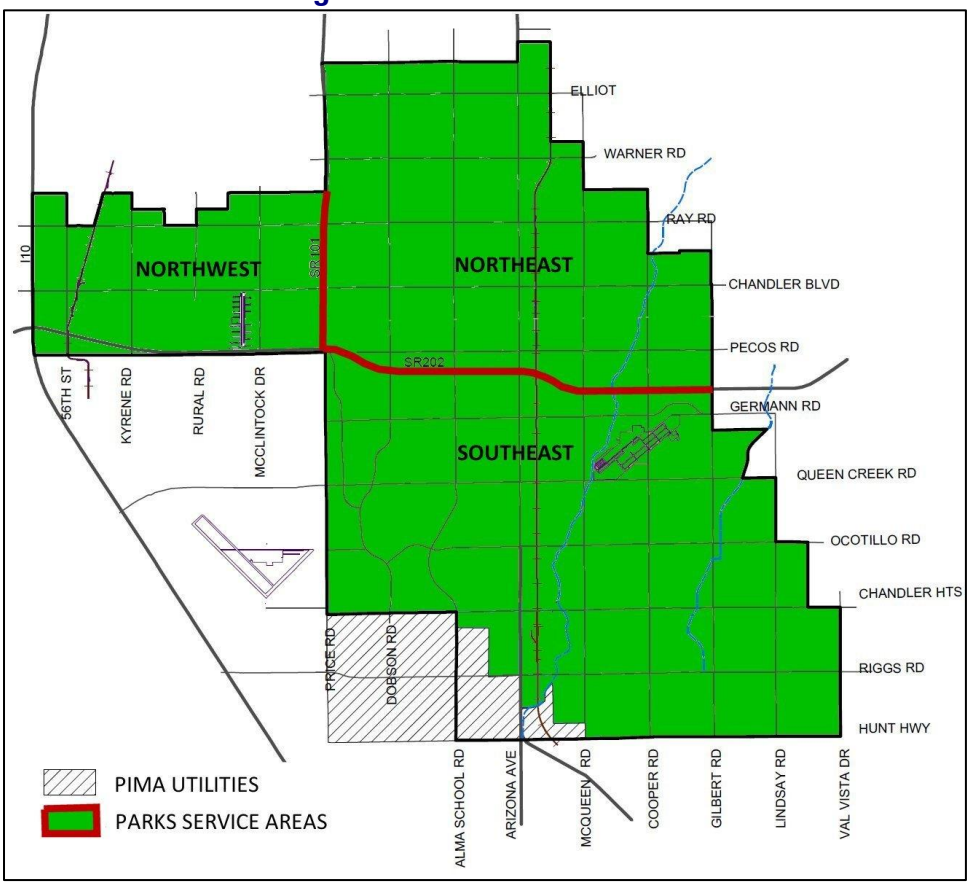
Parks

SB 1525 authorizes fees for "neighborhood parks," although the term is undefined except for certain restrictions. The most important restriction is that neighborhood parks cannot not exceed 30 acres (unless a "direct benefit" - another undefined term - can be demonstrated).

The City's *Parks and Recreation Master Plan Update 2000* contains planning standards for neighborhood and community parks. A neighborhood park should be 5-10 acres and serve an area of about a one-half mile radius, while a community park has a recommended size of 25-50 acres and should serve an area of about a two-mile radius. The 30-acre park size authorized for impact fees falls somewhere between Chandler's neighborhood and community park planning standards.

Park impact fee service areas can reasonably be larger than the area served by a single park. Residents do not always use the park closest to them. A park impact fee system where each existing or potential park has its own service area would be unworkable. The City's three park service areas are shown in Figure 4. Each is roughly the size of one or two community park areas.

Figure 4. Park Service Areas



Libraries and Public Buildings

The City continues to assess library and public building fees to retire pledged debt incurred prior to 2011. These fees are not required to be updated in conformance with the current state impact fee enabling act. The fees are collected on new development city-wide.

Fire and Police

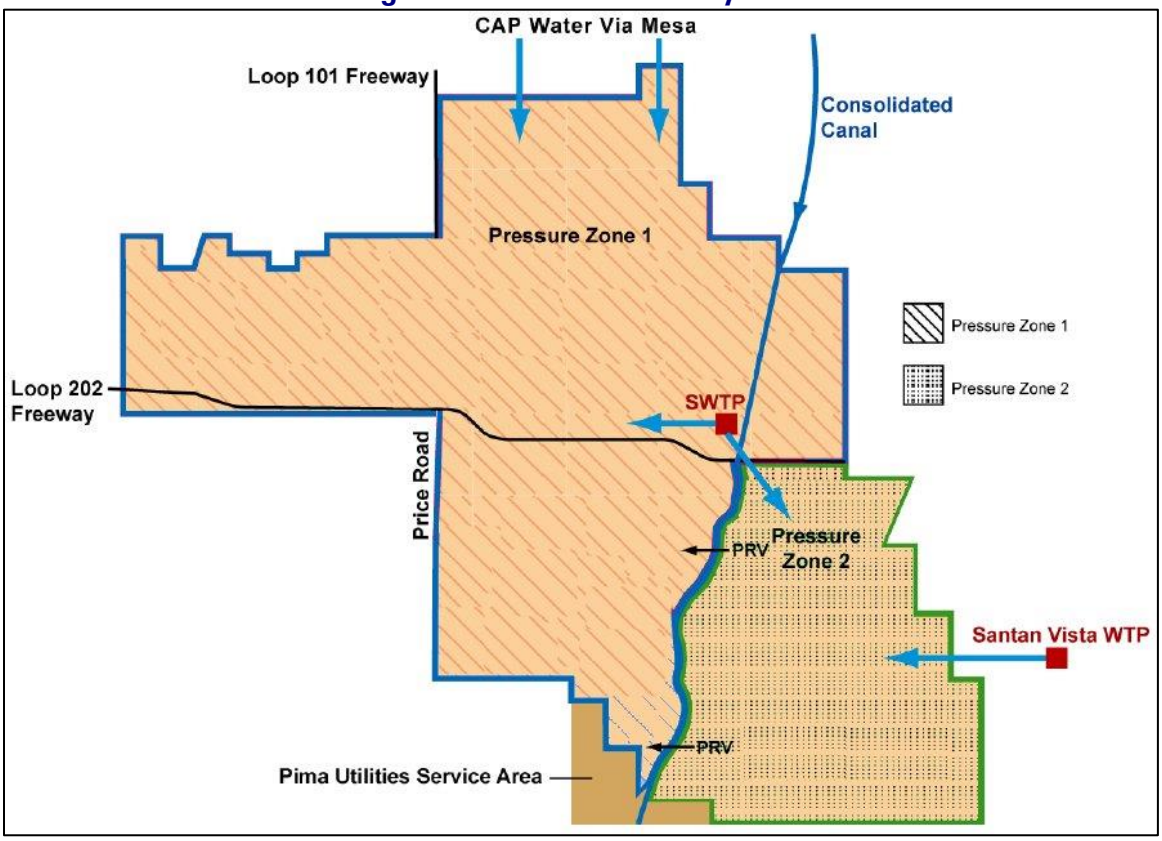
The current service areas for fire and police system development fees are city-wide. Police services are deployed from the Police Main Station, Desert Breeze Substation and Chandler Heights Substation, and are supported by a Property and Evidence Facility. Police protection and response are provided by patrol officers assigned to a specific geographic area but available to respond to any incident, as needed. Fire protection and emergency response is provided by response units located in 11 stations, supported by administrative facilities. While units are typically dispatched to an incident from the nearest station, units from other stations may respond if the unit from the closest station is responding to another incident. In addition, units from multiple stations may be dispatched to a major incident. Fire and police facilities thus form an integrated system, and the city-wide service area is appropriate.

Water, Wastewater and Reclaimed Water

A single city-wide service area continues to be appropriate for water, wastewater and reclaimed water, because of the interconnected nature of the City's water and wastewater systems.

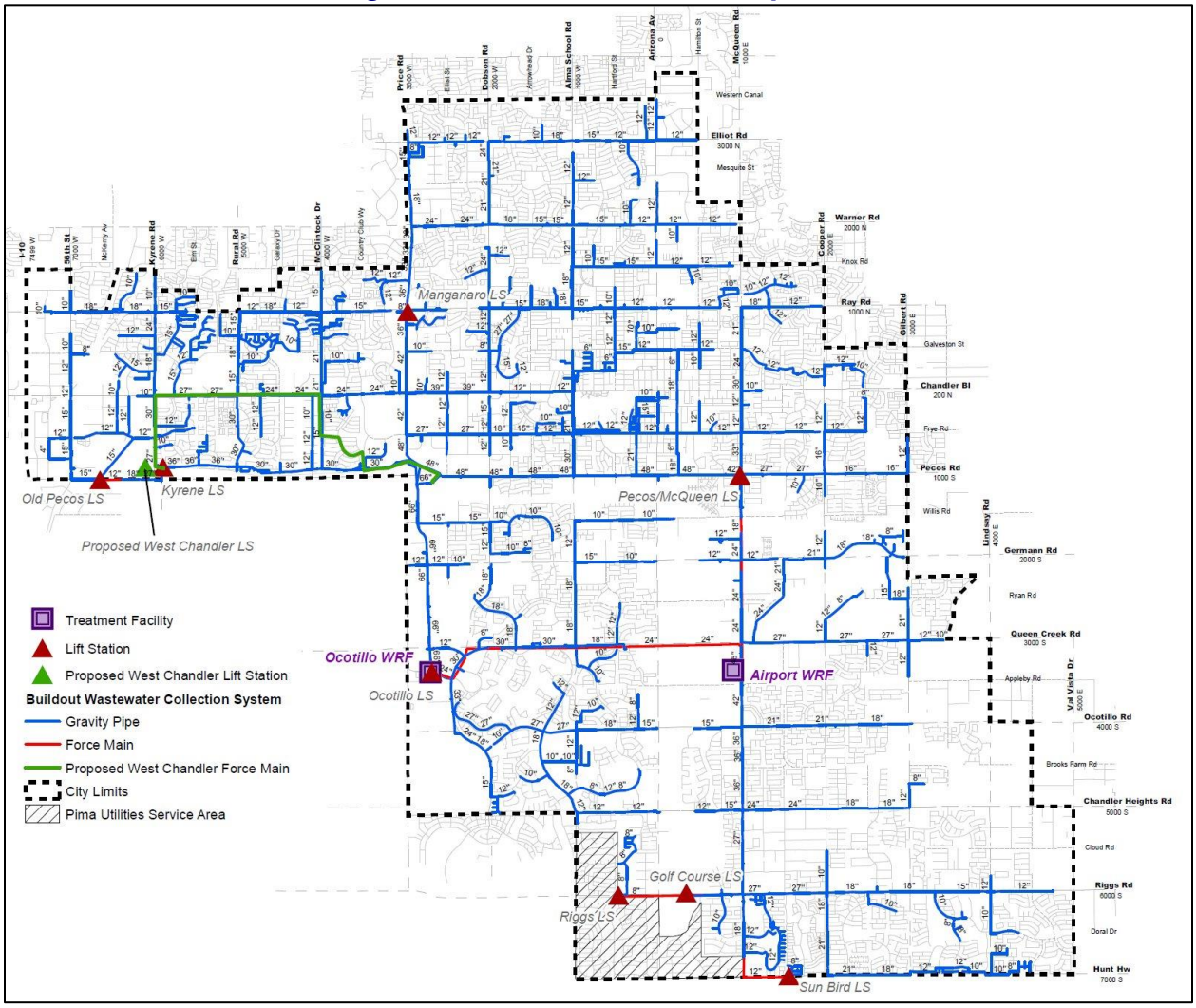
The City's surface water supplies include Salt River Project (SRP) water, Roosevelt Water Conservation District (RWCD) water, New Conservation Storage (NCS) water (which was developed by increasing the capacity of Roosevelt Dam), and Colorado River water delivered through the Central Arizona Project (CAP). Groundwater is pumped from wells throughout the City to supplement surface water supplies and to provide additional supply during times of surface water shortage. Surface water treatment facilities include the Surface Water Treatment Plant and the City's share of the San Tan Vista Water Treatment Plant it jointly owns with the Town of Gilbert. There are currently two pressure zones, although the configuration of these zones may change in the future. Pressure reducing valves provide interconnections between the two pressure zones to provide backup water supply. Chandler's buildout water system as recommended by the master plan is conceptually illustrated in Figure 5. No area of the City is served by a separate set of facilities. The City's water system is a pressurized, integrated system suitable for a single service area.

Figure 5. Planned Water System



Chandler's wastewater is currently treated at three facilities: the Ocotillo Water Reclamation Facility, the Airport Water Reclamation Facility and the Lone Butte Wastewater Treatment Plant. The Lone Butte plant will eventually be decommissioned. At buildout, the city will be served by two treatment plants, which are already interconnected with two force mains from the Ocotillo to Airport plant. Chandler's buildout wastewater system as recommended by the master plan is illustrated in Figure 6. The wastewater system is an integrated system appropriate for a single service area.

Figure 6. Planned Wastewater System



The City charges a separate reclaimed water system development fee. The reclaimed water system is part of both the water and wastewater systems. Reclaimed water provides both an efficient method of disposing of wastewater and a supplemental water supply source. Consequently, the water/wastewater service area is also the appropriate service area for the reclaimed water system development fee.

LAND USE ASSUMPTIONS

This chapter presents land use assumptions covering a ten-year period (2018-2028) to serve as the basis for the infrastructure improvements plan and impact fee calculations for the City of Chandler's update of arterial streets, parks, fire, police, water, wastewater, and reclaimed water system development fees. State law requires that land use assumptions be developed for each service area. It defines land use assumptions as "projections of changes in land uses, densities, intensities and population for a specified service area over a period of at least ten years and pursuant to the general plan of the municipality."

Chandler's Development Services Department maintains a database on existing and buildout development that is broken down by small areas and contains information on residential population, dwelling units by housing type and nonresidential building square footage by land use type. The Land Use Assumptions are based on the City's existing land use data and buildout projections.

The City's land use data includes all the land within the City's municipal planning area, with the exception that they exclude the area served by Pima Utilities and unincorporated islands that are unlikely to be annexed. Estimates of existing nonresidential square footage are based on Maricopa County Assessor records. Nonresidential square footage and residential units for future projects that have received zoning approval or are currently under review are included in the build-out estimates. Undeveloped parcels that have not yet received zoning entitlements are assigned a land use that is consistent with the General Plan and any specific area plans that may have been adopted for the area. Building permit data are utilized to update newly constructed homes and nonresidential buildings in a GIS database on a quarterly basis. Density assumptions applied to undeveloped/un-entitled parcels are average densities derived from existing developments in Chandler. Residential population estimates are based on population per housing unit ratios. The City's Development Services Department can provide a more detailed description of assumptions upon request.

While the City has exceptionally good data on existing and buildout development, it does not have intermediate projections required for the 10-year Land Use Assumptions. An estimate of the percent of new development to buildout that will occur over the next ten years is derived from the Maricopa Association of Governments' (MAG) socioeconomic projections of population and employment by land use type for small areas, prepared in 2016.

MAG projections are available for 2015, 2020, 2030, 2040, and 2050. A 2025 projection can be interpolated between 2020 and 2030, and the resulting ten-year (2015-2025) projection used as a reasonable approximation of the growth likely to occur over the next ten years. The 2015-2050 projection is a reasonable approximation of the growth likely to occur to buildout.

Population and Housing

Based on MAG projections of residential population growth, the percentages of buildout (assumed 2050) residential growth anticipated to occur over the next ten years are shown in Table 7.

Table 7. Ten-Year Percent of Buildout New Population

	Service Area		Residential Population					New Population		New 15-25
RAZ	Parks	Strts	2015	2020	2025*	2030	2050	2015-25	2015-50	% of 15-50
310	NE		52,209	55,996	59,436	62,876	69,497	7,227	17,288	n/a
315	NW		38,596	40,057	41,251	42,444	43,336	2,655	4,740	n/a
316	NE		36,114	38,336	39,686	41,036	44,223	3,572	8,109	n/a
317	NE	Yes	32,267	34,344	35,099	35,854	38,478	2,832	6,211	n/a
325	SE	Yes	42,415	46,563	47,573	48,582	52,162	5,158	9,747	n/a
327	SE	Yes	17,668	20,792	23,819	26,846	34,982	6,151	17,314	n/a
328	SE	Yes	43,846	49,954	52,288	54,621	55,986	8,442	12,140	n/a
Subtotal, Parks NW			38,596	40,057	41,251	42,444	43,336	2,655	4,740	56.0%
Subtotal, Parks NE			120,590	128,676	134,221	139,766	152,198	13,631	31,608	43.1%
Subtotal, Parks SE			103,929	117,309	123,680	130,049	143,130	19,751	39,201	50.4%
City-Wide Population			263,115	286,042	299,152	312,259	338,664	36,037	75,549	47.7%
Arterial Streets Area			136,196	151,653	158,779	165,903	181,608	22,583	45,412	49.7%

* 2025 interpolation is average of 2020 and 2030

Source: Maricopa Association of Governments (MAG), *Socioeconomic Projections*, June 2016 Final.

Projections of ten-year (2018-2028) and buildout population and housing units are derived from the City's current estimates and buildout projections, assuming the above percentages of remaining residential development that will occur over the next ten years. Existing, ten-year, and buildout projections of population and housing units by service area are shown in Table 8.

Table 8. Housing Units and Population by Service Area, 2018-Buildout

Service Area	Single-Family	Multi-Family	Total Units	Popu-lation
Parks Northwest, 2018	11,703	4,951	16,654	42,175
Parks Northeast, 2018	34,733	15,814	50,547	127,299
Parks Southeast, 2018	32,403	7,117	39,520	104,251
City-Wide, 2018	78,839	27,882	106,721	273,725
Streets, 2018	43,198	11,142	54,340	142,124
Parks Northwest, 2028	11,762	5,029	16,791	42,489
Parks Northeast, 2028	35,257	20,232	55,489	137,160
Parks Southeast, 2028	33,938	7,591	41,529	109,450
City-Wide, 2028	80,957	32,852	113,809	289,099
Streets, 2028	44,665	11,717	56,382	147,324
Parks Northwest, Buildout	11,809	5,090	16,899	42,736
Parks Northeast, Buildout	35,949	26,064	62,013	150,179
Parks Southeast, Buildout	35,449	8,057	43,506	114,566
City-Wide, Buildout	83,207	39,211	122,418	307,481
Streets, Buildout	46,150	12,298	58,448	152,586

Note: single-family defined as a dwelling unit with an individual water meter, multi-family as sharing a meter with other units

Source: 2018 estimates and buildout projections from City of Chandler Planning Division, August 28 and September 14, 2018; 2028 projections based on ten-year percentages of buildout new development from Table 7,

The impact of a dwelling unit on the need for capital facilities is often proportional to the number of persons residing in the dwelling unit. Population density can be measured for different housing types in terms of either average household size (average number of persons per occupied dwelling unit) or persons per unit (average number of persons per dwelling unit, including vacant as well as occupied units). In this analysis, average household size is used. Current information on average household size by housing type in Chandler is available from the U.S. Census Bureau's American Community Survey, as shown in Table 9. These population densities are used to determine residential demand per unit by housing type for parks, fire and police system development fees.

Table 9. Average Household Size by Housing Type

Housing Type	Household Population	Occupied Units	Avg. HH Size
Single-Family*	199,927	67,111	2.98
Multi-Family	41,394	18,747	2.21
Total	241,321	85,858	2.81

* includes single-family attached, detached, and mobile home units
Source: U.S. Census Bureau, American Community Survey 5% sample data based on 1% samples taken in 2012 through 2016 for the City of Chandler.

Nonresidential Development

Using the same procedure described above for residential, the MAG data on employment are used to develop the percentages of buildout (2050) nonresidential growth for the Chandler municipal planning area anticipated to occur over the next ten years. These are shown by land use type in Table 10.

Table 10. Ten-Year Percent of Buildout New Employment

Year	Retail	Office	Indust.	Public	Total
2015	32,720	35,410	30,510	6,450	105,090
2020	36,550	42,970	33,050	6,980	119,550
2025*	38,935	50,245	34,605	7,415	131,200
2030	41,320	57,520	36,160	7,850	142,850
2040	45,700	61,190	40,570	8,590	156,050
2050	48,060	63,090	43,760	8,950	163,860
New 2015-2025	6,215	14,835	4,095	965	26,110
÷ New 2015-2050	15,340	27,680	13,250	2,500	58,770
10-Yr % of New	40.51%	53.59%	30.91%	38.60%	44.43%

* interpolated (average of 2020 and 2030)
Source: Maricopa Association of Governments (MAG), *Socioeconomic Projections*, June 2016 Final.

Projections of ten-year (2018-2028) and buildout nonresidential building square footage by land use type are derived from the City's buildout projections, utilizing the percentages of remaining growth that will occur over the next ten years from Table 10 above. Because park fees are not assessed on nonresidential development, it is not necessary to prepare nonresidential projections for the park service areas. The resulting nonresidential projections by city-wide and arterial street service areas are shown in Table 11.

Table 11. Nonresidential Square Feet by Service Area, 2018-Buildout

Service Area	Commercial	Office	Industrial	Public	Total
City-Wide, 2018	18,429,785	8,178,366	35,102,493	12,457,968	74,168,612
Streets, 2018	7,469,767	3,464,461	15,862,789	6,488,886	33,285,903
City-Wide, 2028	20,058,930	13,443,781	44,080,890	13,202,842	90,786,443
Streets, 2028	8,738,893	5,800,487	23,033,358	7,251,799	44,824,537
City-Wide, Buildout	22,451,372	18,003,734	64,149,395	14,387,694	118,992,195
Streets, Buildout	10,602,638	7,823,532	39,061,008	8,465,345	65,952,523

Source: 2018 estimates and buildout projections from City of Chandler Planning Division, August 28 and September 14, 2018; 2028 projections based on ten-year percentages of buildout new employment from Table 10,

Employee densities can be derived from the current nonresidential square footage estimates detailed above and Maricopa Association of Governments employment estimates, as shown in Table 12. These are used in the functional population estimates (see Appendix C) to develop the fire and police service unit multipliers.

Table 12. Nonresidential Employment Densities

Land Use Type	Employees	Bldg. Sq. Ft.	Sq. Feet/ Employee	Employees/ 1,000 sq. ft.
Retail Commercial	35,018	18,429,785	526	1.90
Office	39,946	8,178,366	205	4.88
Industrial/Warehouse	32,034	35,102,493	1,096	0.91
Public	6,768	12,457,968	1,841	0.54

Source: Employees from Table 10 (2018 interpolation between 2015 estimates and 2020 projections); 2018 building square footage from Table 11.

ARTERIAL STREETS

This chapter updates the City's arterial street system development fees in compliance with the Arizona impact fee enabling act for municipalities (SB 1525). The City of Chandler currently charges an arterial street system development fee on new development in the arterial street service area. The City's system development fee ordinance defines the arterial street system to be funded with the fees as arterial streets within the service area – the definition excludes collector streets and freeways. An inventory of the existing arterial street system in the service area was compiled for this update and is presented in Table 119 in Appendix A.

Service Units

As described in the Service Unit section of the Legal Framework chapter, the service unit for all the City's system development fees is the Equivalent Dwelling Unit, or EDU, which represents the demand for facilities of a typical single-family dwelling unit. For the arterial street system development fees, the demand for facilities is based on afternoon peak hour trip generation. Trip generation rates are based on information published in the most recent edition of the Institute of Transportation Engineers' (ITE) *Trip Generation Manual.*

Trip generation rates need to be adjusted to exclude pass by and diverted-linked trips. Pass by trips are those trips that are already on a particular route for a different purpose and simply stop at a development on that route. For example, a stop at a convenience store on the way home from the office is a pass by trip for the convenience store. A pass by trip does not create an additional burden on the street system and therefore should not be counted in the assessment of system development fees. Diverted-linked trips are similar to pass by trips in that an intermediate stop is made on the way to the primary destination, but a short diversion is made from the most direct path to the primary destination. The adjustment is made in this update to include only primary trips generated by the development. Published information on pass by and diverted-linked trips is available only for retail/commercial uses. However, office uses also have some of these kinds of trips. The new trips factor for office uses is based on recent traffic studies in Florida.

It is also necessary to adjust trip generation rates for differences in the average length of trips. A shorter trip imposes a smaller burden on the arterial street system than a longer trip. While published information is available for average trip lengths by trip purpose, the average trip length for peak hour trips of residential, office, industrial/warehouse and public/institutional land uses are dominated by the home-to-work trip and tend to be relatively similar. The exception is retail/commercial uses, which tend to have shorter trip lengths than the home-to-work commute. An adjustment is made to the retail/commercial trip rate to account for the shorter-than-average shopping trip.

The result of combining trip generation rates, primary trip factors and the retail trip length adjustment is a schedule that establishes the number of arterial street service units generated by various land use types per unit of development for Chandler. The recommended service unit multipliers are presented in Table 13.

Table 13. Arterial Street Service Unit Multipliers

Land Use	ITE Code	Unit	Pk Hr Trip Rate	New Trips Factor	Trip Length Factor	Adjusted Trip Rate	EDUs/ Unit
Single-Family	210	Dwelling	0.99	100%	100%	0.990	1.000
Multi-Family	220	Dwelling	0.56	100%	100%	0.560	0.566
Retail/Commercial	820	1000 sq. ft.	3.81	44%	77%	1.291	1.304
Office	710	1000 sq. ft.	1.15	90%	100%	1.035	1.045
Industrial/Warehouse	130/150	1000 sq. ft.	0.30	100%	100%	0.300	0.303
Public/Institutional	560	1000 sq. ft.	0.25	100%	100%	0.250	0.253

Source: Trip rates during the p.m. peak hour of adjacent street traffic on a weekday from the Institute of Transportation Engineers (ITE), *Trip Generation*, 10th ed., 2017 (retail/commercial based on shopping center, office based on general office, industrial/warehouse based on average for industrial park and warehousing; public/institutional based on church); new trips factor for retail/commercial based on shopping center data from ITE, *Trip Generation Handbook*, 2017; new trips factor for office based on two recent studies in Florida cited in Tindale-Oliver, *Hillsborough County Mobility Fee Study*, April 26, 2016, p. A-18; trip length factor for retail/commercial based on ratio of average shopping trip length to average trip length for all trips in the western census region from U.S. Department of Transportation, *National Household Travel Survey*, 2017; adjusted trip rate is product of trip rate, new trip factor and trip length factor; EDUs per unit is ratio of adjusted trip rate to single-family adjusted trip rate.

The current arterial street service unit multipliers were based on peak hour trip generation from the 9th edition of the *Trip Generation* manual published in 2012. In this update, trip generation rates are based on the 10th edition, published in 2017. New trip factors have also been updated based on the new trip generation manual. Trip lengths factors were updated from the 2009 to 2017 edition of the National Household Travel Survey. These updated travel demand inputs resulted in the following changes in service unit multipliers summarized in Table 14.

Table 14. Comparison of Arterial Street Service Unit Multipliers

Land Use	Unit	Current EDUs/Unit	Updated EDUs/Unit	Percent Change
Single Family	Dwelling	1.000	1.000	0%
Multi-Family	Dwelling	0.620	0.566	-9%
Retail/Commercial	1000 sq. ft.	1.060	1.304	23%
Office	1000 sq. ft.	1.118	1.045	-7%
Industrial/Warehouse	1000 sq. ft.	0.590	0.303	-49%
Public/Institutional	1000 sq. ft.	0.370	0.253	-32%

Source: Current EDUs per unit from Duncan Associates, *City of Chandler, Arizona System Development Fee Update*, January 2014, Table 9; proposed EDUs per unit from Table 13.

The estimates of existing, ten-year and buildout arterial street service units are based on the service unit multipliers above and the Land Use Assumptions. The results are shown in Table 15.

Table 15. Arterial Street Service Units, 2018-Buildout

Land Use	Unit	Units	EDUs/Unit	EDUs
Single Family, 2018	Dwelling	43,198	1.000	43,198
Multi-Family, 2018	Dwelling	11,142	0.566	6,306
Retail/Commercial, 2018	1000 sq. ft.	7,470	1.304	9,741
Office, 2018	1000 sq. ft.	3,464	1.045	3,620
Industrial/Warehouse, 2018	1000 sq. ft.	15,863	0.303	4,806
Public/Institutional, 2018	1000 sq. ft.	6,489	0.253	1,642
Total 2018 EDUs				69,313
Single Family, 2028	Dwelling	44,665	1.000	44,665
Multi-Family, 2028	Dwelling	11,717	0.566	6,632
Retail/Commercial, 2028	1000 sq. ft.	8,739	1.304	11,396
Office, 2028	1000 sq. ft.	5,800	1.045	6,061
Industrial/Warehouse, 2028	1000 sq. ft.	23,033	0.303	6,979
Public/Institutional, 2028	1000 sq. ft.	7,252	0.253	1,835
Total 2028 EDUs				77,568
Single Family, Buildout	Dwelling	46,150	1.000	46,150
Multi-Family, Buildout	Dwelling	12,298	0.566	6,961
Retail/Commercial, Buildout	1000 sq. ft.	10,603	1.304	13,826
Office, Buildout	1000 sq. ft.	7,824	1.045	8,176
Industrial/Warehouse, Buildout	1000 sq. ft.	39,061	0.303	11,835
Public/Institutional, Buildout	1000 sq. ft.	8,465	0.253	2,142
Total Buildout EDUs				89,090
New EDUs, 2018-2028				8,255
New EDUs, 2018-Build-out				19,777

Source: 2018, 2028 and buildout units for arterial street service area from Table 8 and Table 11; EDUs per unit from Table 13; EDUs is product of units and EDUs per unit.

Cost per Service Unit

As described in the Methodology section of the Legal Framework chapter, the updated system development fees are based on the lowest of three costs per service units: existing level of service, ten-year cost and buildout cost. The 2014 update reduced the fees to account for pass-through traffic. However, the study noted that such an adjustment is not required because of the counter-balancing nature of spill-over effects between jurisdictions. This update does not include an adjustment for pass-through traffic.

Existing Level of Service

One measure of level of service used in road impact fee analysis is the system-wide ratio of demand to capacity. This is similar to the volume/capacity (V/C) ratio used to measure levels of service on individual roadway segments, but it applies to the entire roadway system. The system-wide measure is expressed in vehicle-miles as the ratio of vehicle-miles of travel (VMT) to vehicle-miles of capacity (VMC).

An analysis of the existing level of service was conducted by preparing a detailed inventory of the existing arterial street network (see Appendix A). For each roadway segment, information was gathered on segment length in miles, number of through lanes, and recent traffic counts. Vehicle-miles of capacity are based on generalized maximum volumes at LOS D from the City's 2010 *Transportation Master Plan Update*, shown in Table 16 below.

Table 16. Arterial Street Capacities at Level of Service D

	2-Lane	4-Lane	5-Lane	6-Lane
Average Daily Capacity at LOS D	15,300	32,200	37,100	48,500
x Peak Hour Factor	0.085	0.085	0.085	0.085
Peak Hour Capacity at LOS D	1,300	2,700	3,200	4,100

Source: Average daily capacities at LOS D from Parsons Brinckerhoff, *City of Chandler Transportation Master Plan Update*, Final Report, April 2010; peak hour factor from City of Chandler Public Works & Utilities Department.

The inventory data demonstrate that average congestion on the arterial street system will increase from now to buildout, as summarized in Table 17. This reflects the fact that some of the existing capacity in the system has been constructed prior to actual need, and is consistent with the fact that the City has pledged future arterial street system development fees to repay outstanding debt/interfund loans attributable to existing improvements with excess capacity.

Table 17. Arterial Street VMT/VMC Ratios, Existing and Buildout

	Existing	Buildout
Total Vehicle-Miles of Travel (VMT)	134,837	204,198
÷ Total Vehicle-Miles of Capacity (VMC)	255,472	289,926
VMT/VMC Ratio	0.53	0.7

Source: Existing VMC and VMT from Table 119 in Appendix A; buildout VMC and VMT from Table 120 in Appendix A.

The existing level of service can also be quantified in terms of dollars per service unit. The first step is to determine the average cost (in today's dollars) to construct a new vehicle-mile of capacity. The average cost of capacity added by the ten-year planned improvements is $6,252 per new VMC, as shown in Table 18.

Table 18. Average Cost per Vehicle-Mile of Capacity, 2018-2028

				Lanes		Total	Capacity		New	Cost/
Arterial Street	From	To	Miles	Exist	Fut	Project Cost	Exist	Future	VMC	VMC
Chandler Hts Rd	Arizona Ave	McQueen Rd	1.00	2	4	$11,531,523	1,300	2,700	1,400	$8,237
Chandler Hts Rd	McQueen Rd	Gilbert Rd	1.96	2	4	$27,480,000	1,300	2,700	2,744	$10,015
Cooper Rd	Queen Crk Rd	Riggs Rd	3.00	2	4	$17,824,110	1,300	2,700	4,200	$4,244
Lindsay Rd	Ocotillo Rd	Hunt Hwy	3.00	2	4	$22,685,000	1,300	2,700	4,200	$5,401
Ocotillo Rd	Gilbert Rd	148th St	1.50	2	4	$12,300,499	1,300	2,700	2,100	$5,857
Queen Creek Rd	McQueen Rd	Cooper Rd	1.00	2	6	$17,246,860	1,300	4,100	2,800	$6,160
Total			11.46			$109,067,992			17,444	$6,252

Source: Improvements and costs (total costs including costs incurred over last 10 years) from City of Chandler, *2018-2027 Capital Improvements Plan*; new VMC based on existing and future lanes and generalized capacities from Table 16; new VMC is the product of miles and increase in capacity; cost per VMC is project cost divided by new VMC.

An additional step is to determine the value of excess capacity available to be utilized by future development. This is necessary to confirm that the outstanding debt/interfund loan amount to be repaid by the arterial street system development fee fund is a reasonable representation of the cost of existing excess capacity. As shown in Table 19, the replacement cost of existing capacity available to serve future development amounts to an estimated $393 million. This far exceeds the $41 million in eligible outstanding debt/interfund loans (see Table 124) that will be paid by future arterial street system development fees. Consequently, it is reasonable to say that the existing eligible outstanding debt/interfund loan amount represents the cost of excess capacity available for future development.

Table 19. Replacement Cost of Excess Arterial Street Capacity

Existing Vehicle-Miles of Capacity (VMC)	255,472
– VMC Utilized by Existing Traffic	-192,624
Existing VMC Available for Future Development	62,848
x Cost per Vehicle-Mile of Capacity (VMC)	$6,252
Replacement Cost of Excess Capacity	$392,925,696

Source: Existing VMC from Table 17; VMC utilized by existing development from Table 20; average cost per VMC from Table 18.

The calculation of the existing arterial street level of service in terms of the cost per service unit is presented in Table 20. The first step is to compute the existing capacity utilized by existing traffic. This is done by dividing existing VMT by the buildout VMT/VMC ratio. The VMC utilized by existing traffic is multiplied by the average cost per VMC to determine the cost of existing facilities serving existing traffic. There is no deduction of outstanding debt/interfund loans related to existing facilities, because these represent the unpaid-for cost of existing facilities with excess capacity to serve future development. The final step is to divide the cost of facilities serving existing development by the number of existing service units. This results in the existing cost per service unit of $17,375 per EDU.

Table 20. Arterial Street Existing Cost per Service Unit

Existing Vehicle-Miles of Travel (VMT)	134,837
÷ Buildout VMT/VMC Ratio	0.7
Vehicle-Miles of Capacity (VMC) Utilized by Existing Traffic	192,624
x Cost per Vehicle-Mile of Capacity (VMC)	$6,252
Replacement Cost of Facilities Serving Existing Traffic	$1,204,285,248
÷ 2018 Service Units (EDUs)	69,313
Existing Cost per Service Unit	$17,375

Source: Existing VMT and buildout VMT/VMC ratio from Table 17; cost per VMC from Table 18; 2018 arterial street EDUs from Table 15.

Ten-Year Cost

Some of the City's planned ten-year improvement costs will be paid for by regional transportation funds administered through the Maricopa Association of Governments (MAG). MAG funding sources include Federal and State transportation funds and Regional Arterial Road Funding (RARF), which comes from dedicated county-wide transportation sales tax revenue. Funding from the voter-approved authorization runs out in FY 2026, and the remaining RARF funding for arterial street improvements in Chandler will occur in the 2018-2028 period. Total anticipated outside funding over the next ten years is summarized in Table 21 below.

Table 21. Federal/State/Regional Funding for Arterial Street Improvements, 2018-2028

Improvement	Phase	Fiscal Years	Fed./State Funding	RARF Funding	Total Funding
Chandler Hts, Arizona-McQueen	ROW	2018-2019	$0	$598,000	$598,000
Chandler Hts, Arizona-McQueen	Construction	2018	$6,037,000	$0	$6,037,000
Chandler Hts, McQueen-Gilbert	ROW	2019	$1,000,000	$0	$1,000,000
Chandler Hts, McQueen-Gilbert	Construction	2020, 2023	$6,582,000	$0	$6,582,000
Chandler Hts, Gilbert-Val Vista	Construction	2023	$2,587,000	$0	$2,587,000
Cooper Rd, Alamosa-Riggs	ROW	2018	$0	$1,160,000	$1,160,000
Cooper Rd, Alamosa-Riggs	Construction	2019, 2022	$10,025,000	$0	$10,025,000
Lindsay Rd, Ocotillo-Hunt Hwy	Design	2020	$1,214,000	$0	$1,214,000
Lindsay Rd, Ocotillo-Hunt Hwy	ROW	2022	$994,000	$0	$994,000
Lindsay Rd, Ocotillo-Hunt Hwy	Construction	2024	$5,243,000	$0	$5,243,000
Ocotillo, Cooper-Gilbert	Design/ROW/Const.	2018-2019	$0	$6,397,000	$6,397,000
Ocotillo, Gilbert-148th St	Construction	2019	$2,358,000	$0	$2,358,000
Queen Crk, McQueen-Gilbert	Construction	2018	$8,782,000	$0	$8,782,000
Total			$44,822,000	$8,155,000	$52,977,000

Source: Maricopa Association of Governments, *FY 2019 Arterial Life Cycle Program (ALCP)*, June 27, 2018 (excludes funding for intersection improvements, which are not funded with Chandler's system development fees).

The ten-year cost per service unit represents costs that will be incurred by the City over the next ten years to build new capacity to serve anticipated development, repay outstanding debt/interfund loans associated with existing capacity available to serve new development, pay for encumbrances on current projects, and pay for updated SDF studies. The results are shown in Table 22 and indicate a ten-year cost per service unit of $6,191 per EDU.

Table 22. Arterial Street 10-Year Cost per Service Unit

Cost of Planned Improvements, 2018-2028	$103,053,696
– Anticipated Federal/State/Regional Funding, 2018-2028	-$52,977,000
City Cost of Planned Improvements	$50,076,696
Debt/Interfund Loans for Past Capacity Improvements	$40,570,432
Encumbrances on Current Projects	$9,397,718
Required System Development Fee Studies	$32,950
– Current Fund Balance	-$48,973,433
Needed Revenue, 2018-2028	$51,104,363
÷ New Service Units (EDUs), 2018-2028	8,255
Ten-Year Cost per Service Unit	$6,191

Source: Planned improvement costs from Table 28; Federal/State/regional funding from Table 21; outstanding debt/interfund loans, encumbrances and current fund balance from Table 124; cost of required studies from Table 127; new service units from Table 15.

Buildout Cost

Some of the buildout project costs will be paid for with Federal/State highway funds. The amount of such funding that will be available for capacity improvements beyond ten years will tend to decrease with the buildout of the City's arterial street system. A reasonable assumption is that Federal/State funding will pay for the same percentage of capacity project costs beyond 2028 that it will over the next ten years. Based on this assumption, the City could expect to receive about $64.3 million from now to buildout in Federal/State funding for the completion of the arterial street system, as shown in Table 23.

Table 23. Federal State Funding, 2018-Buildout

	2018-2028	2028-Buildout	2018-Buildout
Federal/State Funding	$44,822,000	$19,508,845	$64,330,845
÷ Planned Improvement Cost	$103,053,696	$44,847,920	$147,901,616
Federal/State Funding Percent	43.5%	43.5%	43.5%

Source: 2018-2028 Federal/State Funding from Table 21; planned improvement costs from Table 22 (2018-2028) and Table 24 (2018-buildout); Federal/State funding for 2018-2028 from Table 21; Federal/State funding for 2028-buildout based on percentage for 2018-2028.

The buildout cost per service unit represents costs that will be incurred by the City to buildout to build capacity to serve anticipated development in the city, repay outstanding debt/interfund loans associated with existing capacity to serve new development, pay for encumbrances that represent remaining costs associated with projects currently under construction, and pay for future study updates. The planned expenditures shown in Table 24 on the following page result in a buildout cost per service unit of $3,869 per EDU.

Table 24. Arterial Street Buildout Cost per Service Unit

Alma School Rd, Chandler Hts-Queen Crk, widen 2-4 lanes, 2.25 miles	$1,245,500
Alma School Rd, Frye-Pecos, widen 4-6 lanes, 0.50 miles	$4,376,400
Alma School Rd, Pecos-Loop 202, widen 4-6 lanes, 0.30 miles	$2,625,840
Alma School Rd, Willis-Germann, widen 4-6 lanes, 0.50 miles	$4,376,400
Alma School Rd, Germann-Queen Creek, widen 4-6 lanes, 0.98 miles	$8,577,744
Alma School Rd, Queen Creek-Ocotillo, widen 4-6 lanes, 1.12 miles	$9,803,136
Chandler Hts Rd, Arizona-McQueen Rd, widen 2-4 lanes, 1.00 miles	$3,597,874
Chandler Hts Rd, McQueen Rd-Gilbert Rd, widen 2-4 lanes, 1.96 miles	$19,898,000
Chandler Hts Rd, Lindsay-Val Vista, widen 2-4 lanes, 1.00 miles	$8,752,800
Cooper Rd, Queen Creek-Riggs Rd, widen 2-4 lanes, 3.00 miles	$5,123,189
Germann Rd, City Limits-Price, widen 2-4 lanes, 0.25 miles	$2,188,200
Germann Rd, Arizona Ave-Cooper, widen 4-6 lanes, 2.00 miles	$17,505,600
Lindsay Rd, Ocotillo-Hunt Hwy, widen 2-4 lanes, 3.00 miles	$15,234,000
McQueen Rd, Ray-Chandler, widen 4-6 lanes, 1.00 miles	$8,752,800
McQueen Rd, Chandler-Pecos, widen 4-6 lanes, 1.00 miles	$8,752,800
Ocotillo Rd, Gilbert-148th St, widen 2-4 lanes, 1.50 miles	$8,003,701
Pecos Rd, Ellis Rd-Dobson, widen 2-4 lanes, 0.50 miles	$4,376,400
Queen Creek Rd, McQueen-Gilbert, widen 2-6 lanes, 2.00 miles	$5,958,432
Ray Rd, McQueen-Cooper, widen 4-6 lanes, 1.00 miles	$8,752,800
Cost of Planned Improvements, 2018-Buildout	$147,901,616
– Anticipated Regional Funding, 2018-Buildout	-$8,155,000
– Anticipated Federal/State Funding, 2018-Buildout	-$64,330,845
City Cost of Planned improvements	$75,415,771
Debt/Interfund Loans for Past Capacity Improvements	$40,570,432
Encumbrances on Current Projects	$9,397,718
Required System Development Fee Studies	$98,850
– Current Fund Balance	-$48,973,433
Needed Revenue, 2018-Buildout	$76,509,338
÷ New Service Units (EDUs), 2018-Buildout	19,777
Buildout Cost per Service Unit	$3,869

Source: Planned improvement costs for 10-year projects from Table 28; 2028-buildout projects are those needed to complete the buildout inventory in Table 120; costs for 2028-buildout projects based on VMC added derived from miles and lanes indicated in this table, capacities from Table 16, and average cost per VMC from Table 18; anticipated regional funding from Table 21; anticipated Federal/State funding to buildout from Table 23; outstanding debt/interfund loans, encumbrances and current fund balance from Table 124; cost of required studies from Table 127; new service units from Table 15.

Cost per Service Unit Summary

The three costs per service unit calculated above are summarized in Table 25. The updated system development fees are based on the buildout cost per service unit, which is the lowest of the three.

Table 25. Arterial Street Cost per Service Unit

Existing Cost per Service Unit	$17,375
Ten-Year Cost per Service Unit	$6,191
Buildout Cost per Service Unit	$3,869
Lowest Cost per Service Unit	$3,869

Source: Table 20, Table 22 and Table 24.

Net Cost per Service Unit

As noted in the Legal Framework chapter of this report, system development fees should be reduced (or "offset") in order to account for other types of revenues that will be generated by new development and used to fund capacity-expanding improvements of the same type as those to be funded by the fees. Cases in which such an offset is warranted include funding of existing deficiencies, outstanding debt payments on existing facilities, and dedicated revenue sources to fund growth-related improvements.

The arterial street system development fees calculated in this report are based on a system-wide buildout cost per service unit that is lower than the existing level of service. Consequently, there are no existing deficiencies from an impact fee perspective.

As has been demonstrated, all outstanding arterial street debt/interfund loans can be attributable to existing excess capacity available for future development. Consequently, the debt/loan amount has been included in the calculation of ten-year and buildout costs per service unit.

The City has funded arterial street capacity improvements with system development fees and general obligation bonds, supplemented with Federal, State, and regional transportation funding. Such outside funding has been taken into account in the calculation of the ten-year and buildout costs per service unit.

In sum, no additional offsets are warranted and the net cost per service unit is the same as the cost per service unit calculated above.

Updated System Development Fees

The updated arterial street system development fees that may be adopted by the City based on this study are the products of the number of service units (EDUs) generated by a unit of development and the net cost per service unit calculated above. The updated fee schedule is presented in Table 26.

Table 26. Arterial Street Net Cost Schedule

Land Use Type	Unit	EDUs/ Unit	Net Cost/ EDU	Net Cost/ Unit
Single-Family	Dwelling	1.000	$3,869	$3,869
Multi-Family	Dwelling	0.566	$3,869	$2,190
Retail/Commercial	Sq. Foot	0.001304	$3,869	$5.04
Office	Sq. Foot	0.001045	$3,869	$4.04
Industrial/Warehouse	Sq. Foot	0.000303	$3,869	$1.17
Public/Institutional	Sq. Foot	0.000253	$3,869	$0.97

Source: EDUs per unit from Table 13 (nonresidential divided by 1,000 to convert from per 1,000 sq. ft. to per square foot); net cost per EDU is lowest cost per EDU from Table 25.

The updated arterial street system development fees are compared to the City's current fees in Table 27. The updated fees are higher than current fees for retail/commercial uses, and lower for all other land uses.

Table 27. Current and Updated Arterial Street Fees

Land Use Type	Unit	Current Fee	Updated Fee	Percent Change
Single-Family	Dwelling	$3,901	$3,869	-1%
Multi-Family	Dwelling	$2,419	$2,190	-9%
Retail/Commercial	Sq. Foot	$4.13	$5.04	22%
Office	Sq. Foot	$4.36	$4.04	-7%
Industrial/Warehouse	Sq. Foot	$2.30	$1.17	-49%
Public/Institutional	Sq. Foot	$1.44	$0.97	-33%

Source: Current fees from City of Chandler City Code, Chapter 38; updated fees from Table 26.

Capital Plan

Assuming that growth occurs as projected in the land use assumptions, the City plans to fund approximately $90.7 million in growth-related expenditures related to the major road system over the next ten years, as summarized in Table 28. Some of the improvements may be constructed by developers in return for credits against their arterial street system development fees.

Table 28. Arterial Street Capital Plan, 2018-2028

Improvement	10-Year CIP Cost	Encumb-rances	10-Year Cost	Non-City Funding	City Cost
Alma School Rd, Chandler Hts to Queen Creek	$1,245,500	$0	$1,245,500	$0	$1,245,500
Chandler Hts Rd, Arizona Ave to McQueen Rd	$8,676,000	$1,556,874	$10,232,874	-$6,635,000	$3,597,874
Chandler Hts Rd, McQueen Rd to Gilbert Rd	$27,480,000	$0	$27,480,000	-$7,582,000	$19,898,000
Chandler Hts Rd, Gilbert Rd-Val Vista	$0	$0	$0	-$2,587,000	-$2,587,000
Cooper Rd, Queen Creek Rd to Riggs Rd	$12,552,000	$3,756,189	$16,308,189	-$11,185,000	$5,123,189
Lindsay Rd, Ocotillo to Hunt Hwy	$22,685,000	$0	$22,685,000	-$7,451,000	$15,234,000
McQueen Rd, Queen Creek-Riggs	$0	$54,522	$0	$0	$0
Ocotillo Rd, Cooper-Gilbert	$0	$0	$0	-$6,397,000	-$6,397,000
Ocotillo Rd, Gilbert to 148th St	$7,670,000	$2,691,701	$10,361,701	-$2,358,000	$8,003,701
Queen Creek Rd, McQueen to Cooper Rd	$13,402,000	$1,338,432	$14,740,432	-$8,782,000	$5,958,432
Subtotal, Planned Improvements, 2018-2028	$93,710,500	$9,397,718	$103,053,696	-$52,977,000	$50,076,696
Outstanding Pledged Debt/Interfund Loans			$40,570,432	$0	$40,570,432
Required SDF Studies, 2018-2028			$32,950	$0	$32,950
Total			$143,657,078	-$52,977,000	$90,680,078

Source: 10-year CIP cost is programmed expenditures from City of Chandler, *2018-2027 Capital Improvements Plan*; encumbrances from Table 126; non-City funding from Table 21; outstanding debt/interfund loans from Table 124; study update cost from Table 127.

The new development anticipated by the land use assumptions would generate the revenues shown in Table 29. Anticipated arterial street system development fee revenues plus the current fund balance would cover all of costs the anticipated to be incurred by buildout, but would only cover 62% of the costs anticipated over the next ten years. The City may need to defer repayment of some interfund loans beyond the next ten years.

Table 29. Potential Arterial Street Fee Revenue, 2018-Buildout

	2018-2028	2018-Buildout
New Arterial Street EDUs	8,255	19,777
x Net Cost per EDU	$3,869	$3,869
Potential Revenue	$31,938,595	$76,517,213
÷ Needed Revenue	$51,104,363	$76,509,338
Percent of Needed Revenue Generated	62%	100%

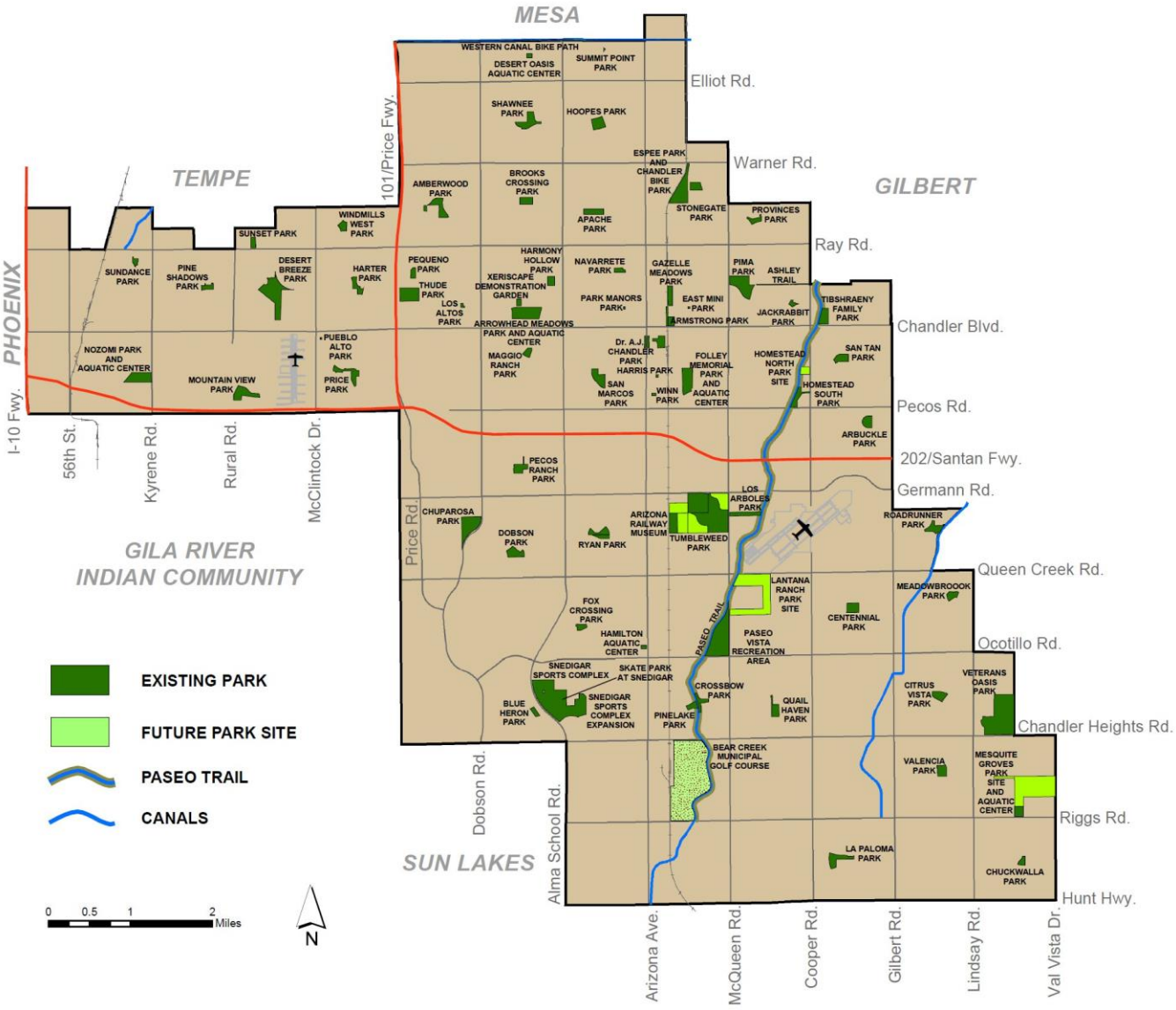
Source: New EDUs from Table 15; net cost per EDU is lowest cost per EDU from Table 25; needed revenue from Table 22 (2018-2028) and Table 24 (2018-buildout).

PARKS

The City of Chandler adopted a community park system development fee in 1997 and a neighborhood park system development fee in 2005. In 2008, the neighborhood and community park fees were combined into a single park fee. The park fees were updated to be compliant with SB 1525 in 2014. This chapter updates the City's park system development fees in compliance with the Arizona impact fee enabling act for municipalities.

The locations of existing and planned parks are illustrated in Figure 7. An inventory of existing parks, including name, park classification, service area and developed and undeveloped acreage, is presented in Table 121 in Appendix B.

Figure 7. Existing and Planned Parks



Service Units

As described in the Service Unit section of the Legal Framework chapter, the service unit for all the City's fees is the Equivalent Dwelling Unit, or EDU, which represents the demand for facilities generated by a typical single-family dwelling unit.

SB 1525 provides that "… the fees shall be assessed against commercial, residential and industrial development, except that the municipality may distinguish between different categories of residential, commercial and industrial development in assessing the costs to the municipality of providing necessary public services to new development and in determining the amount of the development fee applicable to the category of development." (9-463.05.B.13, A.R.S.) Park impact fees are traditionally only assessed on residential development, because there is a much clearer nexus between the number of residents and the demand for park facilities than is the case for nonresidential development. Company-sponsored events in parks are paid for with facility reservation fees. Any additional demand on park facilities attributable to nonresidential development would come from nonresidents who work in the city using parks during their lunch breaks – any such impact would be difficult to measure and relatively insignificant. Consequently, the park fees will continue to be assessed only on residential development.

A single-family unit is, by definition, one park service unit (equivalent dwelling unit or EDU). The number of service units associated with other housing types is determined by dividing the average household size by the average household size of a single-family unit. Average household size (the ratio of household population to occupied units) is preferable as the basis of the service unit to persons per unit (the ratio of household population to total units), because it eliminates the volatile factor of occupancy rates. The resulting service unit multipliers are presented in Table 30.

Table 30. Park Service Unit Multipliers

Housing Type	Avg. HH Size	EDUs/ Unit
Single-Family	2.98	1.000
Multi-Family	2.21	0.742

Source: Average household size (AHHS) from Table 9; EDUs per unit is ratio of AHHS to single-family AHHS.

The number of service units in each of the three park service areas can be determined by multiplying the number of housing units by the single-family and multi-family service unit multipliers and summing for the area. Existing and projected service units (EDUs) are calculated in Table 31.

Table 31. Park Service Units, 2018-Buildout

	Northwest			Northeast			Southeast			City-Wide
	Single-Family	Multi-Family	Total	Single-Family	Multi-Family	Total	Single-Family	Multi-Family	Total	Total
EDUs/Unit	1.000	0.742	na	1.000	0.742	na	1.000	0.742	na	n/a
2018 Units	11,703	4,951	16,654	34,733	15,814	50,547	32,403	7,117	39,520	106,721
2018 EDUs	11,703	3,674	15,377	34,733	11,734	46,467	32,403	5,281	37,684	99,528
2028 Units	11,762	5,029	16,791	35,257	20,232	55,489	33,938	7,591	41,529	113,809
2028 EDUs	11,762	3,732	15,494	35,257	15,012	50,269	33,938	5,633	39,571	105,334
Buildout Units	11,809	5,090	16,899	35,949	26,064	62,013	35,449	8,057	43,506	122,418
Buildout EDUs	11,809	3,777	15,586	35,949	19,339	55,288	35,449	5,978	41,427	112,301
New EDUs, 2018-2028			117			3,802			1,887	5,806
New EDUs, 2018-Buildout			209			8,821			3,743	12,773

Source: EDUs per unit from Table 30; housing units from Table 8; EDUs are product of units and EDUs/unit.

Cost per Service Unit

As described in the Methodology section of the Legal Framework chapter, the updated system development fees are based on the lowest of three costs per service units: existing level of service, ten-year cost and buildout cost.

Existing Level of Service

SB 1525 limits park impact fees to "neighborhood parks," an undefined term that excludes parks larger than 30 acres in size, unless a larger park can be shown to provide a "direct benefit" to development. SB 1525 also excludes a number of park improvements from being funded with park impact fees, including

> *… that portion of any facility that is used for amusement parks, aquariums, aquatic centers, auditoriums, arenas, arts and cultural facilities, bandstand and orchestra facilities, bathhouses, boathouses, clubhouses, community centers greater than three thousand square feet in floor area, environmental education centers, equestrian facilities, golf course facilities, greenhouses, lakes, museums, theme parks, water reclamation or riparian areas, wetlands, zoo facilities or similar recreational facilities, but may include swimming pools.*

According to SB 1525, impact fees cannot be based on a level of service that exceeds the level of service currently being provided to existing development. For park facilities, the existing level of service will be quantified in terms of the replacement value of existing eligible park facilities per service unit.

A key component of the park level of service is the cost of land. Recent park land acquisitions are all located in the Southeast service area, where land is the least expensive of the three service areas. The City's most recent park land purchase in this area, completed in May 2013, cost $117,545 per acre, as shown in Table 32. This is the same land cost used in the 2014 study.

Table 32. Park Land Cost per Acre

Centennial Park Site	$353,433
÷ Acres	3.0068
Cost per Acre	$117,545

Source: City of Chandler, July 15, 2013.

Pursuant to SB 1525, only the first 3,000 square feet of recreation centers are eligible to be funded with impact fees. The City has two recreation centers, both located in the Southeast service area. The total costs of these facilities and the eligible costs are shown in Table 33.

Table 33. Eligible Recreation Center Costs

Recreation Center	Service Area	Sq. Feet	Total Cost	Eligible Cost
Snediger Park Recreation Center	SE	8,266	$1,981,546	$719,167
Tumbleweed Recreation Center	SE	59,905	$16,680,000	$835,323
Total		68,171	$18,661,546	$1,554,490

Source: Square feet and costs from City of Chandler, 2017 Statement of Values; eligible cost is pro rata share for 3,000 sq. ft.

SB 1525 prohibits aquatic centers but allows swimming pools. This poses some problems of interpretation, since aquatic centers include swimming pools. The Arizona League of Cities and Towns proposes the following definition of an excluded aquatic center:

> *A facility primarily designed to host non-recreational competitive functions generally occurring within water, including, but not limited to, water polo games, swimming meets, and diving events. Such facility may be indoors, outdoors, or any combination thereof, and includes all necessary supporting amenities, including but not limited to, locker rooms, offices, snack bars, bleacher seating, and shade structures.*

While some of the City's swimming facilities are called "aquatic centers," they do not meet the League of Cities and Town's definition of an aquatic center, because they are not designed primarily for non-recreational competitive functions. Nevertheless, the approach that will be used is to charge only for the pool itself, without the cost of associated amenities. The replacement cost of existing pools is estimated based on the cost per square foot of water surface area for the City's most recently-constructed pool in the Mesquite Groves Aquatic Center. The cost of a pool itself is estimated to be $322 per square foot of water surface area, as shown in Table 34 below. This is the same cost used on the 2014 study.

Table 34. Mesquite Groves Pool Cost per Square Foot

Pool Cost (including pumphouse)	$3,439,477
Other Water Features Cost	$778,663
Building Cost (excluding pumphouse)	$1,352,377
Total Building/Pool Costs	$5,570,517
Site Work/Contingency/Indirect Costs	$3,296,901
x Pool Share of Building/Pool Costs	61.7%
Pool-Related Other Cost	$2,034,188
Total Pool Cost	$5,473,665
÷ Water Surface Area (sq. feet)	17,002
Pool Cost per Square Foot of Water Area	$322

Source: City of Chandler, Mesquite Groves' aquatic center cost sheet, June 2, 2008; pumphouse share of total building costs based on 3,625 out of 9,759 total sq. ft., per Chandler Parks and Recreation, October 7, 2011; total pool cost is pool cost plus pool-related other cost; square feet from City of Chandler Park Development and Operations Division, July 22, 2013.

Multiplying the water area of each pool by the cost per square foot calculated above yields the following replacement costs for the City's existing swimming pools.

Table 35. Swimming Pool Replacement Costs

Swimming Facility	Service Area	Water Sq. Feet	Cost per Sq. Foot	Pool Cost
Arrowhead Pool	NE	21,064	$322	$6,782,608
Desert Oasis Aquatic Center	NE	8,880	$322	$2,859,360
Folley Pool	NE	5,703	$322	$1,836,366
Hamilton Aquatic Center	SE	12,040	$322	$3,876,880
Mesquite Groves Aquatic Center	SE	17,002	$322	$5,474,644
Nozomi Aquatic Center	NW	12,468	$322	$4,014,696
Total Pool Cost				$24,844,554

Source: Square feet of water surface area from City of Chandler, September 2017; cost per sq. ft. from Table 34.

The replacement cost of existing facilities in each of the three park service area can be determined based on the existing park inventory in Appendix B, the unit costs for land acquisition and swimming pools, eligible recreation center costs and the average cost per acre to develop neighborhood and community parks. The total replacement values of existing land and facilities serving the three park service areas are shown in Table 36.

Table 36. Existing Park Facility Replacement Costs

	Neighborhood Park	Community Park	Total
NW Total Eligible Acres			110.44
x Land Cost/Acre			$117,545
NW Eligible Land Value			$12,981,670
NW Developed Eligible Acres	60.44	50.00	n/a
x Development Cost/Acre	$210,741	$251,874	n/a
NW Eligible Development Cost	$12,737,186	$12,593,700	$25,330,886
NW Eligible Amenity Cost			$4,014,696
NW Total Eligible Cost			$42,327,252
NE Total Eligible Acres			304.73
x Land Cost/Acre			$117,545
NE Eligible Land Value			$35,819,488
NE Developed Eligible Acres	178.36	113.92	n/a
x Development Cost/Acre	$210,741	$251,874	n/a
NE Eligible Development Cost	$37,587,765	$28,693,486	$66,281,251
NE Eligible Amenity Cost			$11,478,334
NE Total Eligible Cost			$113,579,073
SE Total Eligible Acres			323.51
x Land Cost/Acre			$117,545
SE Eligible Land Value			$38,026,983
SE Developed Eligible Acres	129.06	133.34	n/a
x Development Cost/Acre	$210,741	$251,874	n/a
SE Eligible Development Cost	$27,198,233	$33,584,879	$60,783,112
SE Eligible Amenity Cost			$10,906,014
SE Total Eligible Cost			$109,716,109

Source: Total and developed eligible acres from existing park inventory in Table 121 in Appendix B; land cost per acre from Table 32; neighborhood and community park development costs per acre from City of Chandler Park Development and Operations Division, October 12, 2017; amenity costs are recreation center costs from Table 33 plus pool costs from Table 35.

The existing levels of service in the park service areas can be expressed in terms of the current cost per service unit, as shown in Table 37. The capital investment represented by existing facilities and current fund balances is reduced to account for outstanding debt that will be paid by future system development fees.

Table 37. Existing Park Levels of Service

	Northwest	Northeast	Southeast
Existing Eligible Cost	$42,327,252	$113,579,073	$109,716,109
Current Fund Balance	$1,725,789	$7,281,593	$16,925,559
– Outstanding Pledged Debt/Loans	-$1,927,598	-$6,504,981	-$4,977,419
Net Eligible Cost	$42,125,443	$114,355,685	$121,664,249
÷ Existing EDUs	15,377	46,467	37,684
Existing LOS (Cost/EDU)	$2,740	$2,461	$3,229

Source: Eligible park costs from Table 36; eligible debt/interfund loans and fund balance from Table 124 in Appendix B; existing EDUs from Table 31.

Ten-Year Cost per Service Unit

The ten-year cost per service unit represents costs that will be incurred by the City over the next ten years to build new capacity to serve anticipated development in the city, to repay outstanding debt/interfund loans associated with existing capacity available to serve new development, to pay encumbrances for projects under construction, and to pay for updated studies. The results are shown in Table 38.

Table 38. Park Ten-Year Cost per Service Unit

	Northwest	Northeast	Southeast
Homestead N Park Development (7.60 ac)	$0	$1,766,000	$0
Homestead S Park Development (4.85 ac.)	$0	$1,036,553	$0
Lantana Ranch Park Design (30-ac. part)	$0	$0	$60,000
Lantana Ranch Park Development (30 ac. part)	$0	$0	$6,457,214
Layton Lakes Park Development (7.11 ac.)	$0	$0	$3,726,221
Mesquite Groves Park Development (30 ac. part)	$0	$0	$9,090,600
Subtotal, Planned Improvements	$0	$2,802,553	$19,334,035
Debt/Interfund Loan Obligations	$1,927,598	$6,504,981	$4,977,419
Encumbrances for Projects Under Construction	$0	$0	$1,333,413
Required System Development Fee Studies	$1,272	$20,018	$11,660
– Fund Balance	-$1,725,789	-$7,281,593	-$16,925,559
Total Revenue Needs	$203,081	$2,045,959	$8,730,968
÷ New Service Units (EDUs), 2018-2028	117	3,802	1,887
Ten-Year Cost per Service Unit (EDU)	$1,736	$538	$4,627

Source: Planned improvements and costs from City of Chandler, 2018-2027 *Capital Improvement Program* and City of Chandler Parks Department; debt/interfund loans from Table 125; encumbrances from Table 126, study cost from Table 127 (allocated by service area based on 2018-2028 new EDUs); fund balance from Table 124; service units from Table 31.

Buildout Cost per Service Unit

The buildout cost per service unit represents costs that will be incurred by the City to buildout to build capacity to serve anticipated development in the city, repay outstanding debt/interfund loans associated with existing capacity to serve new development, pay encumbrances for projects under construction, and pay for updated studies. The results are shown in Table 39 for each of the three park service areas.

Table 39. Park Buildout Cost per Service Unit

	Northwest	Northeast	Southeast
Homestead N Park Development (7.60 ac)	$0	$1,766,000	$0
Homestead S Park Development (4.85 ac.)	$0	$1,036,553	$0
Lantana Ranch Park Design (30-ac. part)	$0	$0	$60,000
Lantana Ranch Park Development (30 ac. part)	$0	$0	$6,457,214
Layton Lakes Park Development (7.11 ac.)	$0	$0	$3,726,221
Mesquite Groves Park Development (30 ac. part)	$0	$0	$9,090,600
Subtotal, Planned Improvements	$0	$2,802,553	$19,334,035
Debt/Interfund Loan Obligations	$1,927,598	$6,504,981	$4,977,419
Encumbrances for Projects Under Construction	$0	$0	$1,333,413
Required System Development Fee Studies	$3,604	$61,615	$33,631
– Fund Balance	-$1,725,789	-$7,281,593	-$16,925,559
Total Revenue Needs	$205,413	$2,087,556	$8,752,939
÷ New Service Units (EDUs), 2018-Buildout	209	8,821	3,743
Buildout Cost per Service Unit (EDU)	$983	$237	$2,338

Source: Study cost from Table 127 (allocated by service area based on 2018-2028 new EDUs); new EDUs from Table 31; all other data fromTable 38.

Cost per Service Unit Summary

The three costs per service unit calculated above are summarized in Table 40. The updated system development fees are based on the buildout cost per service unit, which is the lowest for all three service areas.

Table 40. Park Cost per Service Unit

	Northwest	Northeast	Southeast
Existing Cost per Service Unit	$2,740	$2,461	$3,229
Ten-Year Cost per Service Unit	$1,736	$538	$4,627
Buildout Cost per Service Unit	$983	$237	$2,338
Lowest Cost per Service Unit	$983	$237	$2,338

Source: Existing from Table 37; ten-year from Table 38; buildout from Table 39.

Net Cost per Service Unit

As noted in the Legal Framework chapter of this report, impact fees should be reduced (or "offset") to account for other types of revenues that will be generated by new development and used to fund capacity-expanding improvements of the same type as those to be funded by the impact fees. Cases in which such an offset is warranted include funding of existing deficiencies, outstanding debt payments on existing facilities, and dedicated revenue sources to fund growth-related improvements.

The parks system development fees calculated in this report are based on the existing level of service (unless the ten-year or buildout cost per service unit is lower), so there are no existing deficiencies. Other than system development fees, the City has no dedicated source of revenue to fund growth-related parks improvements. The City has not received any grant funding for park improvements in recent years, and does not anticipate any grants over the next ten years.

The City has funded park improvements with system development fees or general fund monies or general obligation bond proceeds in return for a pledge against future SDF revenues. Since outstanding pledged debt/interfund loans have been excluded from the calculation of the existing level of service, future system development fees can be used to repay those obligations without raising double-payment issues. Consequently, no additional offsets are warranted, and the cost per service unit calculated above is the same as the net cost per service unit.

Updated System Development Fees

The updated parks system development fees that may be adopted by the City based on this study are the products of the numbers of service units generated by a unit of development and the net cost per service unit calculated above. The resulting fee schedule is presented in Table 41 below.

Table 41. Park Net Cost Schedule

	Northwest	Northeast	Southeast
Single-Family EDUs per Dwelling Unit	1.000	1.000	1.000
Multi-Family EDUs per Dwelling Unit	0.742	0.742	0.742
x Net Cost per Service Unit	$983	$237	$2,338
Single-Family Fee per Dwelling Unit	$983	$237	$2,338
Multi-Family Fee per Dwelling Unit	$729	$176	$1,735

Source: EDUs per unit from Table 30; net cost per EDU is cost per EDU from Table 40.

The updated park fees are compared to current fees in Table 42. The updated fees are lower than current fees for all three service areas.

Table 42. Current and Updated Park System Development Fees

	Northwest	Northeast	Southeast
Updated Single-Family Fee per Dwelling Unit	$983	$237	$2,338
Current Single-Family Fee per Dwelling Unit	$2,241	$3,138	$3,246
Percent Change	-56%	-92%	-28%
Updated Multi-Family Fee per Dwelling Unit	$729	$176	$1,735
Current Multi-Family Fee per Dwelling Unit	$1,602	$2,244	$2,321
Percent Change	-54%	-92%	-25%

Source: Current fees from City of Chandler, *System Development Fee Schedule, Effective July 28, 2014*; updated fees from Table 41.

Capital Plan

Assuming that growth occurs as projected in the land use assumptions, the City plans to complete the park improvements listed in Table 43 over the next ten years, as well as repay outstanding debt/interfund loans on existing improvements with excess capacity, pay encumbrances on projects currently underway, and pay for a minimum of two update studies required by SB 1525.

Table 43. Park Capital Plan, 2018-2028

Improvement/Expenditure	Northwest	Northeast	Southeast
Homestead N Park Development (7.60 ac)	$0	$1,766,000	$0
Homestead S Park Development (4.85 ac.)	$0	$1,036,553	$0
Lantana Ranch Park Design (30 ac.)	$0	$0	$60,000
Lantana Ranch Park Development (30 ac. part)	$0	$0	$6,457,214
Layton Lakes Park Development (7.11 ac.)	$0	$0	$3,726,221
Mesquite Groves Park Development (30 ac. part)	$0	$0	$9,090,600
Subtotal, Planned Improvements	$0	$2,802,553	$19,334,035
Debt/Interfund Loan Obligations	$1,927,598	$6,504,981	$4,977,419
Encumbrances for Projects Under Construction	$0	$0	$1,333,413
Required System Development Fee Studies	$1,272	$20,018	$11,660
Total Planned Eligible Expenditures	$1,928,870	$9,327,552	$25,656,527

Source: Planned improvements and costs from City of Chandler, 2018-2027 *Capital Improvement Program*; debt/interfund loans from Table 125; encumbrances from Table 126, study cost from Table 127 (allocated by service area based on 2018-2028 new EDUs).

For all three service areas, the updated park fees would provide all the needed revenue by buildout, but less than the revenue needed over the next ten years, as shown in Table 44 below. The City may need to defer repayment of some interfund loans beyond ten years.

Table 44. Potential Park System Development Fee Revenue, 2018-Buildout

	2018-2028	2018-Buildout
New Park EDUs, Northwest Service Area	117	209
x Net Cost per EDU	$983	$983
Potential Revenue	$115,011	$205,447
÷ Needed Revenue	$203,081	$205,413
% of Needed Revenue, Northwest	57%	100%
New Park EDUs, Northeast Service Area	3,802	8,821
x Net Cost per EDU	$237	$237
Potential Revenue	$901,074	$2,090,577
÷ Needed Revenue	$2,045,959	$2,087,556
% of Needed Revenue, Northeest	44%	100%
New Park EDUs, Southeast Service Area	1,887	3,743
x Net Cost per EDU	$2,338	$2,338
Potential Revenue	$4,411,806	$8,751,134
÷ Needed Revenue	$8,730,968	$8,752,939
% of Needed Revenue, Southeast	51%	100%

Source: New service units from Table 31; net cost per EDU is the lowest cost per EDU from Table 40; needed revenue from Table 38 (2018-2028) and Table 39 (2018-buildout).

LIBRARY

The City has no plans to build another library. The City's library system development fees were updated on January 1, 2012 to cover only the cost of retiring the pledged debt for the acquisition of the Sunset Branch Library. Fees that are used solely to retire debt issued prior to June 1, 2011 and pledged to be paid with future fee revenues are exempt under the terms of SB 1525 from the requirements to prepare infrastructure improvements plans, and may continue to be charged until the debt pledge is satisfied.

The City pledged future library system development fees to retire $1.29 million of the $5.71 million currently outstanding for the portion of the 2011A general obligations bonds used to acquire the Sunset branch. In the revisions to the fees that were adopted effective January 1, 2012, the City reduced its library fees to cover only the cost of this pledged debt. Some adjustments were made in the 2014 study that reduced the fees even more. The City is not obligated to revisit grandfathered fees uses to repay pledged debt every five years. No changes are proposed as part of this update. The City may continue to collect the library fee until the outstanding debt/interfund loan obligations have been retired. The remaining obligations are shown in Table 45.

Table 45. Remaining Library Pledged Debt

Outstanding Pledged Debt/Interfund Loan	$1,290,000
– Current Fund Balance	-$846,711
Future Revenue Needed	$443,289

Source: Outstanding pledged debt and fund balance from Table 124.

Based on the land use assumptions, new development can be expected to generate most of the revenue needed over the next ten years to fully repay the outstanding pledged debt obligation, as shown in Table 46. The library fee will cease to be collected once the debt is repaid.

Table 46. Library Revenue Projection, 2018-2028

Land Use	Unit	New Units	Fee/ Unit	Potential Revenue
Single-Family	Dwelling	2,118	$61	$129,198
Multi-Family	Dwelling	4,970	$44	$218,680
Total				$347,878

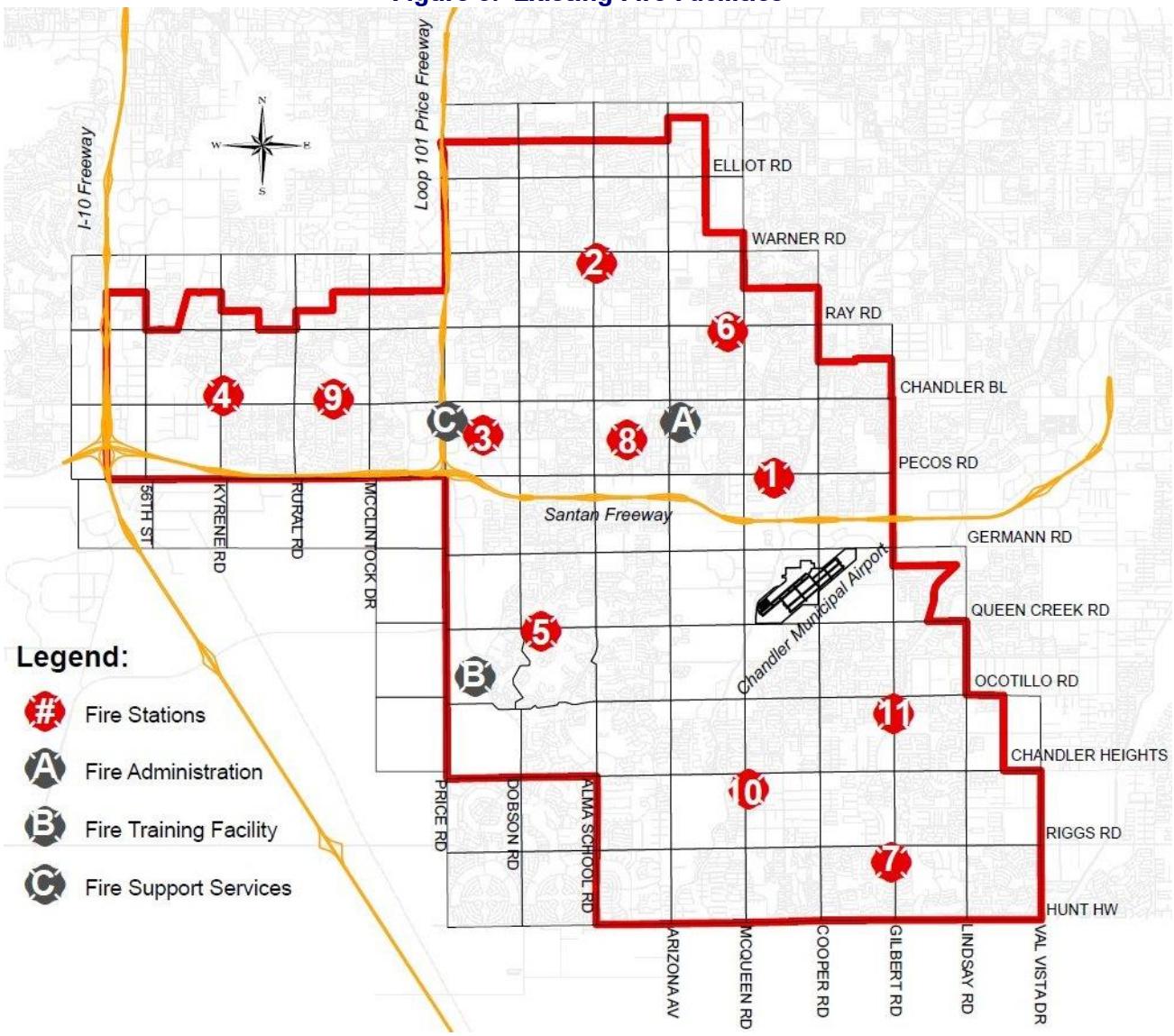
Source: New units from Table 8; fee per unit from Table 1.

FIRE

This chapter updates the City's fire system development fees in compliance with the Arizona impact fee enabling act for municipalities.

The Chandler Fire Department operates out of eleven fire stations, a fire administration building and a support services facility. The locations of existing fire facilities, including the newly-opened Station 11, are shown in Figure 8.

Figure 8. Existing Fire Facilities



Service Units

Disparate types of development must be translated into a common unit of measurement that reflects the impact of new development on the demand for fire facilities. This unit of measurement is called a "service unit."

The two most common methodologies used in calculating public safety service units and impact fees are the "calls-for-service" approach and the "functional population" approach. A major problem with relying on call data is that it tends to be unstable over time. This means that fees often go up or down significantly for individual land uses each time the fees are updated. This update continues to use the "functional population" approach to calculate and assess the fire system development fees. This approach is a generally-accepted methodology for these impact fee types and is based on the observation that demand for public safety facilities tends to be proportional to the presence of people.

Similar to the concept of full-time equivalent employees, functional population represents the number of "full-time equivalent" people present at the site of a land use. Functional population represents the average number of equivalent persons present at the site of a land use for an entire 24-hour day. For residential development, functional population is simply average household size times the percent of time people spend at home. For nonresidential development, functional population is based on a formula that includes square feet per employee ratios, trip generation rates, average vehicle occupancy and average number of hours spent by employees and visitors at a land use. These all tend to be relatively stable characteristics that do not change significantly over short periods of time. Functional population multipliers by land use are calculated in Appendix C. The functional population multipliers are converted into service units (Equivalent Dwelling Units or EDUs), by dividing the functional population per unit for each land use type by the functional population for a single-family unit, as shown in Table 47.

Table 47. Fire Service Unit Multipliers

Land Use	Unit	Func. Pop./ Unit	EDUs/ Unit
Single-Family	Dwelling	2.00	1.000
Multi-Family	Dwelling	1.48	0.740
Retail/Commercial	1,000 sq. ft.	2.06	1.030
Office	1,000 sq. ft.	1.80	0.900
Industrial/Warehouse	1,000 sq. ft.	0.33	0.165
Public/Institutional	1,000 sq. ft.	0.51	0.255

Source: Functional population per unit from Table 122 (residential) and Table 123 (nonresidential) in Appendix C; EDUs per unit is functional population per unit divided by functional population per single-family unit.

The number of service units in the fire service area can be determined by multiplying the amount of development by the service unit multipliers for each land use type and summing for the area. Existing and projected service units (EDUs) are calculated in Table 48 below for the 2018-2028 planning horizon and for buildout.

Table 48. Fire Service Units, 2018-Buildout

Land Use	Unit	Units	EDUs per Unit	EDUs
Single-Family	Dwelling	78,839	1.000	78,839
Multi-Family	Dwelling	27,882	0.740	20,633
Retail/Commercial	1,000 sq. ft.	18,430	1.030	18,983
Office	1,000 sq. ft.	8,178	0.900	7,360
Industrial/Warehouse	1,000 sq. ft.	35,102	0.165	5,792
Public/Instititional	1,000 sq. ft.	12,458	0.255	3,177
Total 2018 Service Units (EDUs)				134,784
Single-Family	Dwelling	80,957	1.000	80,957
Multi-Family	Dwelling	32,852	0.740	24,310
Retail/Commercial	1,000 sq. ft.	20,059	1.030	20,661
Office	1,000 sq. ft.	13,444	0.900	12,100
Industrial/Warehouse	1,000 sq. ft.	44,081	0.165	7,273
Public/Instititional	1,000 sq. ft.	13,203	0.255	3,367
Total 2028 Service Units (EDUs)				148,668
Single-Family	Dwelling	83,207	1.000	83,207
Multi-Family	Dwelling	39,211	0.740	29,016
Retail/Commercial	1,000 sq. ft.	22,451	1.030	23,125
Office	1,000 sq. ft.	18,004	0.900	16,204
Industrial/Warehouse	1,000 sq. ft.	64,149	0.165	10,585
Public/Instititional	1,000 sq. ft.	14,388	0.255	3,669
Total Buildout Service Units (EDUs)				165,806
New EDUs, 2018-2028				13,884
New EDUs, 2018-Buildout				31,022

Source: Units from Table 8 and Table 11; EDUs per unit from Table 47.

Cost per Service Unit

As described in the Methodology section of the Legal Framework chapter, the updated system development fees are based on the lowest of three costs per service units: existing level of service, ten-year cost and buildout cost.

Existing Level of Service

The cost per service unit to provide fire protection to new development is based on the existing level of service provided to existing development. The level of service is quantified as the ratio of the replacement cost of existing fire capital facilities to existing fire service units. The inventory of the City's existing fire facilities is provided in Table 49. The inventory was conducted prior to the 2018 completion of Station 11, which is excluded from the calculation of the existing level of service. The City's fire training facility has also been excluded, as it is no longer eligible for fire impact fees under SB 1525. Replacement costs of existing facilities are estimated based on the construction cost per square foot for the most recent fire station and the land cost per acre of the City's most recent land purchase.

Table 49. Existing Fire Facilities

Facility	Year Built	Bldg. (s.f.)	Land (ac.)
Fire Station #1	2015	13,500	2.00
Fire Station #2	1985	8,000	2.91
Fire Station #3	1999	11,974	1.72
Fire Station #4	1985	7,328	1.85
Fire Station #5	1998	8,200	0.79
Fire Station #6	2002	8,000	1.54
Fire Station #7	2003	8,000	1.66
Fire Station #8	2004	9,434	1.84
Fire Station #9	2006	10,200	1.84
Fire Station #10	2008	10,264	2.81
Fire Administration Building	2009	18,700	1.35
Fire Maintenance Facility	1985	15,010	1.29
Total		128,610	21.60
x Unit Cost		$308	$117,545
Total Value		$39,611,880	$2,538,972

Source: City of Chandler Fire Department, February 2, 2018, cost per building square foot from cost for Station #11; cost per acre is park land cost from Table 32.

In addition to land and buildings, fire services require firefighting apparatus. The City's current fire vehicles have a total replacement cost, based on current unit costs, of $15.9 million, as summarized in Table 50.

Table 50. Fire Apparatus

Fire Appartus	Quantity	Unit Cost	Replacment Value
Engine	16	$600,000	$9,600,000
Ladder Truck, 95'	3	$1,300,000	$3,900,000
Ladder Truck, 75'	1	$1,100,000	$1,100,000
Heavy Rescue	1	$700,000	$700,000
Tanker	1	$150,000	$150,000
Utility	1	$450,000	$450,000
Total			$15,900,000

Source: City of Chandler, February 2, 2018.

The existing level of service can be expressed in terms of current cost per service unit. However, in addition to the costs of existing facilities, current fund balances and outstanding debt/interfund loans for existing facilities must also be taken into consideration. The existing level of service is $411 per EDU, as shown in Table 51.

Table 51. Fire Existing Level of Service

Building Cost	$39,611,880
Land Cost	$2,538,972
Apparatus Cost	$15,900,000
Total Replacement Cost	$58,050,852
– Interfund Loan Obligations	-$7,123,657
Fund Balance	$4,434,991
Net Replacement Cost	$55,362,186
÷ Existing Service Units (EDUs)	134,784
Existing Level of Service (Cost per EDU)	$411

Source: Building and land cost from Table 49; apparatus cost from Table 50; outstanding debt/interfund loans and fund balance from Table 124; existing (2018) EDUs from Table 48.

Ten-Year Cost per Service Unit

The City plans to construct all the new capital improvements required to serve buildout over the next ten years, including the construction of the new fire station in the southeast part of the city that was completed this year. Despite being completed, it is retained in the capital plan because its cost has simply been converted to a lower fund balance and/or more interfund loans. The ten-year cost per service unit represents costs that will be incurred by the City over the next ten years to build new capacity to serve anticipated development in the city, repay outstanding interfund loans associated with existing capacity available to serve new development, pay encumbrances for projects currently underway, and pay for updated studies. The results are shown in Table 52 and indicate a ten-year cost per service unit of $483 per EDU.

Table 52. Fire Ten-Year Cost per Service Unit

New Southeast Fire Station #11, FY 2018	$3,930,000
Interfund Loan Obligations	$7,123,657
Encumbrances for Projects Under Construction	$48,741
Required System Development Fee Studies	$32,950
– Fund Balance	-$4,434,991
Total Revenue Needs	$6,700,357
÷ New Service Units (EDUs), 2018-2028	13,884
Ten-Year Cost per Service Unit (EDU)	$483

Source: Cost of new Southeast fire station from City of Chandler, 2018-2027 *Capital Improvement Program*; outstanding interfund loans, encumbrances, and fund balance from Table 124; study costs from Table 127; new service units from Table 48.

Buildout Cost per Service Unit

The buildout cost per service unit includes the ten-year costs plus additional update studies. The results are shown in Table 53 and indicate a buildout cost per service unit of $218 per EDU.

Table 53. Fire Buildout Cost per Service Unit

New Southeast Fire Station #11, FY 2018	$3,930,000
Interfund Loan Obligations	$7,123,657
Encumbrances for Projects Under Construction	$48,741
Required System Development Fee Studies	$98,850
– Fund Balance	-$4,434,991
Total Revenue Needs	$6,766,257
÷ New Service Units (EDUs), 2018-Buildout	31,022
Buildout Cost per Service Unit (EDU)	$218

Source: Cost of new Southeast fire station from City of Chandler, 2018-2027 *Capital Improvement Program*; outstanding debt/interfund loans, encumbrances, and fund balance from Table 124; study costs from Table 127; new service units from Table 48.

Cost per Service Unit Summary

The three costs per service unit calculated above are summarized in Table 54. The updated system development fees are based on the buildout cost per service unit, which is the lowest of the three.

Table 54. Fire Cost per Service Unit

Existing Cost per Service Unit	$411
Ten-Year Cost per Service Unit	$483
Buildout Cost per Service Unit	$218
Lowest Cost per Service Unit	$218

Source: Existing from Table 51; ten-year from Table 52; buildout from Table 53.

Net Cost per Service Unit

As noted in the Legal Framework chapter of this report, impact fees should be reduced (or "offset") to account for other types of revenues that will be generated by new development and used to fund capacity-expanding improvements of the same type as those to be funded by the impact fees. Cases in which such an offset is warranted include funding of existing deficiencies, outstanding debt payments on existing facilities, and dedicated revenue sources to fund growth-related improvements.

The fire system development fees calculated in this report are based on a lower cost per service unit than the existing level of service, so there are no existing deficiencies. Other than system development fees, the City has no dedicated source of revenue to fund growth-related fire improvements. The City has not received any grant funding for fire improvements in recent years, and does not anticipate any grants over the next ten years.

The City has funded fire improvements with system development fees or using loans from the general fund to advance-fund certain improvements. The updated fees are lower than they would be based on the existing level of service, which was reduced to account for outstanding interfund loans used to build existing capacity that will serve future development. Future system development fees can be used to repay outstanding interfund loans without raising double-payment issues. The City does have some additional non-eligible debt on the fire training facility, but this can legitimately be retired with future general funds raised from both existing and future development, because the training facility has not been included in determining the existing level of service. Consequently, no additional offsets are warranted, and the cost per service unit calculated above is the same as the net cost per service unit.

Updated System Development Fees

The updated fire system development fees that may be adopted by the City based on this study are the products of the numbers of service units generated by a unit of development and the net cost per service unit calculated above. The resulting fee schedule is presented in Table 55.

Table 55. Fire Net Cost Schedule

Land Use	Unit	EDUs/ Unit	Net Cost/ EDU	Net Cost/ Unit
Single-Family	Dwelling	1.000000	$218	$218
Multi-Family	Dwelling	0.740000	$218	$161
Retail/Commercial	Sq. Ft.	0.001030	$218	$0.22
Office	Sq. Ft.	0.000900	$218	$0.20
Industrial/Warehouse	Sq. Ft.	0.000165	$218	$0.04
Public/Institutional	Sq. Ft.	0.000255	$218	$0.06

Source: EDUs per unit from Table 47 (nonresidential divided by 1,000 to convert from per 1,000 sq. ft. to one square foot); net cost per EDU is the lowest cost per EDU from Table 54.

The updated fire fees are compared to current fees in Table 56. The updated fees are lower than current fees for all land uses.

Table 56. Current and Updated Fire System Development Fees

Land Use	Unit	Current Fees	Updated Fees	Percent Change
Single-Family	Dwelling	$412	$218	-47%
Multi-Family	Dwelling	$295	$161	-45%
Retail/Commercial	Sq. Ft.	$0.48	$0.22	-54%
Office	Sq. Ft.	$0.32	$0.20	-38%
Industrial/Warehouse	Sq. Ft.	$0.10	$0.04	-60%
Public/Institutional	Sq. Ft.	$0.14	$0.06	-57%

Source: Current fees from Table 1; updated fees from Table 55.

Capital Plan

Assuming that growth occurs as projected in the land use assumptions, the City plans to fund approximately $11.1 million in growth-related fire expenditures over the next ten years, as summarized in Table 57.

Table 57. Fire Capital Plan, 2018-2028

Improvement	10-Year Cost
New Southeast Fire Station #11 (FY 2018)	$3,930,000
Encumbances for Current Projects	$48,741
Outstanding Interfund Loans	$7,123,657
Required System Development Fee Studies	$32,950
Total	$11,135,348

Source: Cost of new Southeast fire station from City of Chandler, 2018-2027 *Capital Improvement Program*; interfund loan balances and encumbrances from Table 124; study cost from Table 127.

Potential fire system development fee revenue over the next ten years, based on new development anticipated by the land use assumptions, would be sufficient to cover only about 67% of ten-year costs. The percentage of ten-year costs that will be covered by system development fees is low because the City plans to incur most of the improvements needed to buildout within the next ten years, whereas buildout will probably not occur for another 20 years or more. However, assuming the City continues to collect fire system development fees until it reaches buildout, future fees plus the current fund balance would cover all the costs, as shown in Table 58. The City may need to defer repayment of some interfund loans beyond ten years.

Table 58. Potential Fire System Development Fee Revenue, 2018-Buildout

	2018-2028	2018-Buildout
New Service Units (EDUs)	13,884	31,022
x Net Cost per Service Unit (EDU)	$218	$218
Potential Revenue	$3,026,712	$6,762,796
Current Fund Balance	$4,434,991	$4,434,991
Total System Development Fee Funds Available	$7,461,703	$11,197,787
÷ Planned Expenditures	$11,135,348	$11,201,248
Percent of Costs Covered by Fire Fees	67%	100%

Source: New service units from Table 48; net cost per service unit is the lowest cost per EDU from Table 54; current fund balance from Table 124; 2018-2028 planned expenditures from Table 57; 2018-buildout expenditures from Table 53 (revenue needs plus fund balance).

POLICE

This chapter updates the City's police system development fees in compliance with the Arizona impact fee enabling act for municipalities.

Service Units

Disparate types of development must be translated into a common unit of measurement that reflects the impact of new development on the demand for police facilities. This unit of measurement is called a "service unit." This update continues to use the "functional population" approach to calculate and assess the police system development fees. This approach is a generally-accepted methodology for these impact fee types and is based on the observation that demand for public safety facilities tends to be proportional to the presence of people at a particular site. It is more fully described in the Fire chapter and in Appendix C.

As with the City's fire system development fees, the police service area is also city-wide. Since the number of fire service units is also calculated using functional population, the existing and projected police service units (Equivalent Dwelling Units or EDUs) for the 2018-2028 planning horizon and to buildout are the same as those calculated earlier for the fire system development fees (see Table 48 in the Fire chapter).

Cost per Service Unit

As described in the Methodology section of the Legal Framework chapter, the updated system development fees are based on the lowest of three costs per service units: existing level of service, ten-year cost and buildout cost.

Existing Level of Service

The cost per service unit to provide police protection to new development should not exceed the existing level of service provided to existing development. The existing level of service is quantified as the ratio of the replacement cost of existing police capital facilities to existing police service units. The inventory of the City's existing police facilities is provided in Table 59. Replacement costs of existing facilities are estimated based on the estimated construction cost per square foot for pthe lanned Public Safety Training Center and the land cost per acre based on the City's most recent land purchases for parks.

Table 59. Existing Police Facilities

Facility	Year Built	Bldg. (s.f.)	Land (ac.)
Police Headquarters	1998	67,529	5.85
Police Dispatch/Family Advocacy Center	1990	11,243	0.46
Property & Evidence	1976/2003	30,430	1.83
Chandler Heights Substation	2008	21,841	4.50
Desert Breeze Substation	2006	21,253	5.00
Hamilton Facility	1990	13,816	1.74
Total Building Square Feet/Acres		166,112	19.38
x Unit Cost		$346	$117,545
Total Replacement Value		$57,474,752	$2,278,022

Source: Year built, square feet, and land area from City of Chandler Police Department, September 6, 2017, cost per building square foot is estimated construction cost per square foot for phase 1 of Public Safety Training Center per City of Chandler Police Department, September 6, 2017; land cost per acre is park cost per acre from Table 32.

The existing level of service can be expressed in terms of the current cost per service unit. In addition to the costs of existing facilities, the current fund balance and interfund loans must also be taken into consideration. The existing level of service is $415 per EDU, as shown in Table 60.

Table 60. Police Existing Level of Service

Police Buildings	$57,474,752
Land Value	$2,278,022
Total Replacement Cost	$59,752,774
Fund Balance	$1,317,946
– Interfund Loan Obligations	-$5,158,425
Total Existing Facility Value	$55,912,295
÷ Existing Service Units (EDUs)	134,784
Existing LOS (Replacement Value per EDU)	$415

Source: Building and land cost from Table 59; outstanding debt/interfund loans from Table 125; fund balance from Table 124; existing (2018) EDUs from Table 48.

Ten-Year Cost per Service Unit

The City does not plan to construct any new impact fee-eligible police capital improvements over the next ten years. The City has already constructed all the improvements it will need to serve buildout development. However, not all the improvements have been fully paid for. The City will need to repay interfund loans from the general fund and to pay for a minimum of two updates of the system development fees over the next ten years. The results are shown in Table 61 and indicate a ten-year cost per service unit of $279 per EDU.

Table 61. Police Ten-Year Cost per Service Unit

Interfund Loans for Past Projects	$5,158,425
Required System Development Fee Studies	$32,950
– Fund Balance	-$1,317,946
Total Revenue Needs	$3,873,429
÷ New Service Units (EDUs), 2018-2028	13,884
Ten-Year Cost per Service Unit (EDU)	$279

Source: Outstanding interfund loans and fund balance from Table 124; study cost from Table 127; new service units from Table 48.

Buildout Cost per Service Unit

The buildout cost per service unit represents costs that will be incurred by the City to buildout to repay outstanding interfund loans associated with existing capacity to serve new development, and to pay for updated studies. Since most of these costs will be incurred over the next ten years, the City's buildout revenue needs are the same as its ten-year needs, with the exception that additional fee update studies will be required. The results are shown in Table 62 and indicate a buildout cost per service unit of $127 per EDU.

Table 62. Police Buildout Cost per Service Unit

Interfund Loans for Past Projects	$5,158,425
Required System Development Fee Studies	$98,850
– Fund Balance	-$1,317,946
Total Revenue Needs	$3,939,329
÷ New Service Units (EDUs), 2018-Buildout	31,022
Buildout Cost per Service Unit (EDU)	$127

Source: Interfund loans from Table 125; study cost from Table 127; fund balance from Table 124; new service units from Table 48.

Cost per Service Unit Summary

The three costs per service unit calculated above are summarized in Table 63. The updated system development fees are based on the buildout cost per service unit, which is the lowest of the three.

Table 63. Police Cost per Service Unit

Existing Cost per Service Unit	$415
Ten-Year Cost per Service Unit	$279
Buildout Cost per Service Unit	$127
Lowest Cost per Service Unit	$127

Source: Existing from Table 60; ten-year from Table 61; buildout from Table 62.

Net Cost per Service Unit

As noted in the Legal Framework chapter of this report, impact fees should be reduced (or "offset") in order to account for other types of revenues that will be generated by new development and used to fund capacity-expanding improvements of the same type as those to be funded by the impact fees. Cases in which such an offset is warranted include funding of existing deficiencies, outstanding debt payments on existing facilities, and dedicated revenue sources to fund growth-related improvements.

The police system development fees calculated in this report are based on the buildout level of service, which is lower than the existing level of service, so there are no existing deficiencies. Other than system development fees, the City has no dedicated source of revenue to fund growth-related police improvements. The City has not received any grant funding for police improvements in recent years, and does not anticipate any grants over the next ten years.

The City has funded police improvements with system development fees or using general fund revenues, either on a pay-go basis or to retire debt. The updated fees are lower than the existing level of service, which has been reduced to account for outstanding interfund loans used to build some existing capacity that will serve future development. Future system development fees can be used to repay that obligation without raising double-payment issues. The City does have some additional non-eligible debt on the police driver training facility, but this can legitimately be retired with future general funds raised from both existing and future development, since the driver training facility has not been included in determining the existing level of service. Consequently, no additional offsets are warranted, and the net cost per service unit is the same as the cost per service unit calculated above.

Updated System Development Fees

The updated police system development fees that may be adopted by the City based on this study are the products of the number of service units generated by a unit of development for each land use and the net cost per service unit calculated above. The resulting updated fee schedule is presented in Table 64.

Table 64. Police Net Cost Schedule

Land Use	Unit	EDUs/ Unit	Net Cost/ EDU	Net Cost/ Unit
Single-Family	Dwelling	1.000000	$127	$127
Multi-Family	Dwelling	0.740000	$127	$94
Retail/Commercial	Sq. Ft.	0.001030	$127	$0.13
Office	Sq. Ft.	0.000900	$127	$0.11
Industrial/Warehouse	Sq. Ft.	0.000165	$127	$0.02
Public/Institutional	Sq. Ft.	0.000255	$127	$0.03

Source: EDUs per unit same as for fire from Table 55; net cost per EDU is the lowest cost per EDU from Table 63.

The updated police fees are compared to current fees in Table 65. The updated fees are lower than current fees for all land uses.

Table 65. Current and Updated Police System Development Fees

Land Use	Unit	Current Fees	Updated Fees	Percent Change
Single-Family	Dwelling	$277	$127	-54%
Multi-Family	Dwelling	$198	$94	-53%
Commercial	Sq. Ft.	$0.32	$0.13	-59%
Office	Sq. Ft.	$0.21	$0.11	-48%
Industrial/Warehouse	Sq. Ft.	$0.07	$0.02	-71%
Public/Institutional	Sq. Ft.	$0.09	$0.03	-67%

Source: Current fees from Table 1; updated fees from Table 64.

Capital Plan

The City has approximately $5.2 million in growth-related police capital costs that could be paid over the next ten years, as summarized in Table 66.

Table 66. Police Capital Plan, 2018-2028

Improvement/Expenditure	10-Year Cost
FY 2006/2007 Interfund Loan for South Substation	$5,158,425
Required System Development Fee Studies	$32,950
Total	$5,191,375

Source: Interfund loan amount from Table 125; study cost from Table 127.

If the updated fees are adopted at 100%, potential police system development fee revenue over the next ten years, based on new development anticipated by the land use assumptions, would be $1.76 million. With the inclusion of the current fund balance, the City would have $3.08 million in system development fee funds available to spend over the next ten years, as shown in Table 67. The City will need to defer some of the interfund loan repayment beyond ten years, but should recover the full cost by buildout.

Table 67. Potential Police System Development Fee Revenue, 2018-Buildout

	2018-2028	2018-Buildout
New Service Units (EDUs)	13,884	31,022
x Net Cost per Service Unit (EDU)	$127	$127
Potential Revenue	$1,763,268	$3,939,794
Current Fund Balance	$1,317,946	$1,317,946
Total System Development Fee Funds Available	$3,081,214	$5,257,740
÷ Planned Expenditures	$5,191,375	$5,257,275
Percent of Costs Covered by Police Fees	59%	100%

Source: New service units from Table 48; net cost per service unit is the lowest cost per EDU from Table 63; current fund balance from Table 124 in Appendix D; 2018-2028 planned expenditures from Table 66; 2018-buildout planned expenditures from Table 62.

PUBLIC BUILDING

Public building fees are no longer authorized by SB 1525 as of January 1, 2012. However, SB 1525 allows cities to continue to collect public building fees to repay debt service obligations for improvement financed before June 1, 2011 that impact fees were pledged to repay.

Attorneys working with the Arizona League of Cities and Towns have interpreted the language of SB 1525 to allow pledges of impact fees to include repayment of interfund loans as well as formal debt instruments. The League's model development impact fee ordinance defines the term "financing or debt" as follows:

> *Any debt, bond, note, loan, interfund loan, fund transfer, or other debt service obligation used to finance the development or expansion of a Capital Facility.*

The City recorded two interfund loans from the general fund to the public building system development fee fund for a portion of the cost of construction of the City Hall complex, which was completed in 2010. The interfund loans were made in fiscal years 2010 and 2011, for a total of $4,369,352. The current interfund loan balance is $2,789,427. Public building system development fees were pledged to retire this loan by repaying the general fund.

Relying on the League's interpretation of SB 1525, the City reduced its public building fees as of January 1, 2012 to cover only the cost of repaying the pledged debt. The 2014 study included a recommendation that the City escrow public building fees pending the resolution of a lawsuit filed by the homebuilders against the grandfathered general government fee charged by City of Surprise. One part of their argument was that interfund loans do not qualify as pledged debt. The homebuilders recently dropped that lawsuit pursuant to a settlement in which Surprise agreed to reduce its general government fee for single-family homes.[2] Consequently, there no longer appears to be a need for the City to escrow public building fees.

Because public building fees are no longer authorized, SB 1525 update requirements, including preparation of infrastructure improvements plans, do not apply, and the City may continue to charge its current fees until the interfund loan is repaid. The current outstanding interfund loan amount, net of the current fund balance, is shown in Table 68.

Table 68. Remaining Public Building Pledged Debt

Outstanding Interfund Loan	$2,789,427
– Current Fund Balance	-$93,694
Future Revenue Needed	$2,695,733

Source: Outstanding interfund loan and fund balance from Table 124.

Based on the land use assumptions, new development will generate approximately $1.44 million over the next ten years, as shown in Table 69 below. By buildout, new development could generate about $3.28 million, but the public building fees will cease to be collected when the pledged debt obligation is repaid.

[2] City of Surprise Resolution No. 2018-105, effective July 1, 2018.

Table 69. Public Building Revenue Projections, 2018-2028 and 2018-Buildout

Land Use	Unit	New Units 10-Year	New Units Buildout	Fee/ Unit	Potential Revenue 10-Year	Potential Revenue Buildout
Single-Family	Dwelling	2,118	4,368	$110	$232,980	$480,480
Multi-Family	Dwelling	4,970	11,329	$79	$392,630	$894,991
Retail/Commercial	Sq. Foot	1,629,145	4,021,587	$0.12	$195,497	$482,590
Office	Sq. Foot	5,265,415	9,825,368	$0.08	$421,233	$786,029
Industrial/Warehouse	Sq. Foot	8,978,397	29,046,902	$0.02	$179,568	$580,938
Public/Institutional	Sq. Foot	744,874	1,929,726	$0.03	$22,346	$57,892
Total					$1,444,255	$3,282,921

Source: New Units from Table 8 (residential) and Table 11 (nonresidential); fee per unit from Table 1; potential revenue is new units times fee per unit.

WATER

This chapter updates the City's water system development fees in compliance with the Arizona impact fee enabling act for municipalities.

Service Units

To calculate water and wastewater impact fees, the demand associated with different types of customers must be expressed in a common unit of measurement, called a "service unit." The service unit for the City's water and wastewater system development fees is an "equivalent dwelling unit" (EDU). An EDU is a single-family dwelling unit or its equivalent in terms of water demand.

Residential development is charged per dwelling unit. A single-family unit is, by definition, one EDU. Multi-family development is assessed based on the average water demand of a multi-family unit compared to a single-family unit. Average demand during the summer months is used for this purpose, because water facilities must be sized to accommodate peak usage. Based on average water demand per unit during the summer months for the last five years, a multi-family unit represents 0.377 water EDUs, as shown in Table 70.

Table 70. Water Demand per Multi-Family Unit

Average Daily Summer Water Consumption (gpd) per Multi-Family Unit	157
÷ Average Daily Summer Water Consumption (gpd) per Single-Family Unit	416
Multi-Family EDUs/Unit	0.377

Source: City of Chandler water billing data for the summer months (May through September), average of fiscal year 2013-2017 data by City provided on February 15 and March 2, 2018.

The number of water service units associated with a nonresidential customer is determined by the capacity of the water meter relative to the capacity of the smallest meter size. Table 71 below presents EDU multipliers for various meter sizes based on meter capacities from the American Water Works Association.

Table 71. Meter Capacity Ratios

Meter Size	Type	Capacity (gpm)	EDU Multiplier
5/8"x3/4"	Disc	10	1.0
3/4"	Disc	15	1.5
1"	Disc	25	2.5
1 1/2"	Disc	50	5.0
2"	Disc/Turbine	80	8.0
3"	Compound	160	16.0
4"	Compound	250	25.0
6"	Compound	500	50.0
8"	Compound	800	80.0
3"	Turbine	175	17.5
4"	Turbine	300	30.0
6"	Turbine	625	62.5
8"	Turbine	900	90.0
10"	Turbine	1,450	145.0
12"	Turbine	2,150	215.0
16"	Turbine	3,100	310.0

Source: Meter capacities in gallons per minute (gpm) represent the recommended maximum rates for continuing operations from the American Water Works Association for disc meters (AWWA C700), compound meters (AWWA C702) and vertical shaft and low-velocity horizontal turbine meters (AWWA C701; capacity of 16" turbine from Chandler Public Works & Utilities Department, October 24, 2017.

The number of existing water service units are estimated based on the number of current City water customers and the service unit multipliers described above. As shown in Table 72, the City's current water customer base amounts to 114,716 service units (EDUs).

Table 72. Existing Water Service Units

Meter Size	Type	Units or Meters	EDU Multiplier	EDUs
5/8"x3/4"	Disc	552	1.00	552
3/4"	Disc	295	1.50	443
1"	Disc	1,196	2.50	2,990
1 1/2"	Disc	1,120	5.00	5,600
2"	Disc/Turbine	1,658	8.00	13,264
3"	Comp./Turbine	143	16.75	2,395
4"	Comp./Turbine	24	27.50	660
6"	Turbine	10	62.50	625
8"	Turbine	4	90.00	360
10"	Turbine	4	145.00	580
12"	Turbine	1	215.00	215
16"	Turbine	2	310.00	620
Subtotal, Nonresidential		5,009	5.651	28,304
Single-Family Units		77,076	1.000	77,076
Multi-Family Units		24,763	0.377	9,336
Total Water EDUs				114,716

Source: Residential units and nonresidential meters (excluding hydrant and fire flow meters) from City of Chandler, Public Works & Utilities Department, September 25, 2017; multi-family EDU multiplier from Table 70; EDU multipliers by meter size from Table 71 (even compound/turbine split assumed for 3" and 4" meters, 6" and 8" assumed to be all turbine meters).

The number of service units should increase proportionately with the increase in water demand. As shown in Table 73, average daily water demand and service units are projected to increase by 22,360 over the next ten years, and by 46,858 from 2018 to buildout.

Table 73. Water Demand and Service Units, 2018-Buildout

	2017	2018	2028	Buildout
Water Avg. Daily Demand (gpd)	59,000,000	60,100,000	71,600,000	84,200,000
Water EDUs	114,716	116,855	139,215	163,713
New EDUs, 2018-2028			22,360	
New EDUs, 2018-Buildout				46,858

Source: 2017 and buildout average day water demand from City of Chandler, February 13, 2018 (2028 is midpoint from 2017 to buildout, 2018 is interpolated between 2017 and 2028); 2017 water EDUs from Table 72; 2018, 2028 and buildout EDUs projected to increase proportionately to water demand.

Cost per Service Unit

As described earlier in the Methodology section of the Legal Framework chapter, the updated system development fees are based on the lowest of three costs per service units: existing level of service, ten-year cost and buildout cost.

Existing Level of Service

The existing level of service for the water system development fees is quantified, in large part, by the capacity provided by existing water facilities and the current cost to construct that capacity. Water production facilities (surface water treatment plants and wells) must be sized for maximum day demand. System-wide maximum day water demand (in millions of gallons or mgd) and water production capacity are summarized in Table 74 for both existing and buildout conditions.

Table 74. Water Demand and Capacity, 2018-Buildout

	2018	Buildout
Annual Average Day Demand (mgd)	60.10	84.20
x Peaking Factor	1.33	1.33
Maximum Day Demand (mgd)	79.93	111.99
Total Production Capacity (mgd)	137.00	137.00

Source: Average day demand projections and peaking factor from City of Chandler Public Works & Utilities Department, February 13, 2018; existing/buildout capacity from Table 75.

Chandler's water production capacity consists of the City-owned Surface Water Treatment Plant, the City-owned capacity in the San Tan Vista Water Treatment Plant co-owned with the Town of Gilbert, and the firm capacity of the City's groundwater wells (firm capacity is capacity with the largest well in each pressure zone out of service). Existing water production capacities available to meet maximum day demands are detailed in Table 75. The City has sufficient existing capacity to accommodate projected buildout demand.

Table 75. Existing Water Production Capacity

Water Production Facility	Capacity (mgd)
Surface Water Treatment Plant	60.0
San Tan Vista WTP, Phases I & II	24.0
Subtotal, Treatment Plants	84.0
Alamosa Well No. 1	1.8
Amberwood Well	1.5
Arrowhead Well	2.7
Brooks Crossing Well*	3.3
Bush Way Well	2.0
Colt Well	2.7
Desert Breeze Well	4.2
East Knox	0.7
Frye Well	2.2
Hahn Well (owned by SRP)	2.3
Hightown Well	2.7
Knox Well	2.2
Lindsay Well*	3.2
Monterey Well*	5.0
Orchid Lane	1.7
Pennington Well	2.5
Roosevelt Well	2.2
Rural Road Well	4.2
Shawnee Well	1.9
Warner Well (owned by SRP)	3.0
Airport Well	2.3
Alamosa Well No. 2	2.2
Alamosa Well No. 3	1.0
Basha Well No. 2	1.5
Basha Well No. 3	1.6
McQueen Well	2.9
Price South Well No. 2	1.0
Subtotal, Wells	64.5
Subtotal, Well Firm Capacity*	53.0
Total Firm Capacity	137.0

* firm capacity excludes largest well in each pressure zone and Brooks Crossing, which is dedicated for industrial use

Source: City of Chandler Public Works & Utilities Department, February 13, 2018 (total firm capacity is sum of treatment plant capacity and firm well capacity).

A water system must have sufficient storage capacity to meet peak day as well as peak hour requirements. According to the City's most recent water master plan, Chandler currently has sufficient storage capacity to accommodate build-out needs. The existing storage capacity is summarized in Table 76.

Table 76. Existing Water Storage Capacity

	Gallons (millions)
Apache Tank	2.0
Arrowhead Tank	2.0
Brooks Crossing Tank	n/a
Bush Way Tank	2.0
Colt Tank	2.0
Frye Tank	4.0
Hahn Tank	2.0
Monterey Tank	2.0
Price South Tank	3.0
Roosevelt Tank	4.0
Rural Tank	2.0
McQueen Tank	1.0
Dobson South Tank	2.0
SWTP Finished Water Reservoirs	4.0
Basha Road Tank	2.0
Gilbert Road Tank	2.0
Hunt Highway Tank	2.0
Airport Tank	2.0
Lindsay Road Tank	2.0
Alamosa Tank	2.0
Total	44.0

Source: City of Chandler Public Works & Utilities Department, February 13, 2018.

Another essential component of a water system is booster pumps, which are used to inject water from treatment plants, direct-pumping wells and storage tanks into the transmission/distribution system at the appropriate pressure. The City's existing booster pump station capacities are summarized in Table 77.

Table 77. Existing Booster Pump Station Capacity

Booster Pump Station	Existing Firm Capacity (mgd)
Airport	2.1
Alamosa	6.0
Apache	3.7
Arrowhead	4.4
Basha Road	6.1
Brooks Crossing*	n/a
Bush Way	5.1
Colt	3.8
Dobson South	4.5
Frye	3.7
Gilbert Road	5.8
Hahn	3.9
Hunt Highway	3.8
Lindsay Road	5.7
McQueen	1.7
Monterey	3.1
Price South	3.5
Roosevelt	2.7
Rural	7.3
SWTP Pump Station No. 1	54.0
SWTP Pump Station No. 2	18.0
Direct-Pumping Wells	12.4
Total	161.3

* committed for industrial use and not counted in total
Source: City of Chandler Public Works & Utilities Department, February 13, 2018.

A final component of a water system is the transmission and distribution lines that convey the potable water to the customer. Water impact fees typically charge only for transmission lines, since distribution lines are often constructed by developers without credit against their water impact fees. The City's water master plan does not clearly distinguish between transmission and distribution lines. For this study, transmission lines are defined as any waterline of 16 inches in diameter or greater. The current inventory of transmission lines is provided in Table 78.

Table 78. Existing Water Transmission Lines

Pipe Size (in.)	Linear Feet
16	551,638
20	8,010
24	127,745
30	41,513
36	54,287
42	11,576
48	14,438

Source: City of Chandler Public Works & Utilities Department, February 13, 2018.

Prior to the 2014 update, a separate water resources system development fee was assessed only on new water customers located on lands lacking water rights that can be provided to the City as a condition of water service. These are Salt River Project (SRP) Off-Project and Non-Member lands. In the 2014 update, the cost of water supplies was included in the water system development fee assessed to all new water customers. This change was based on analysis presented in the 2014 study demonstrating that SRP On-Project lands have no additional water rights to offset their additional water demands.

Current and buildout water supplies are summarized in Table 79. This analysis shows that the ratio of water supplies to water demand will fall from now to buildout, indicating that the City currently has some excess water supply capacity.

Table 79. Water Supplies, 2018-Buildout

Surface Water Supplies Available (ac-ft/yr)	85,182
Groundwater Safe Yield Pumping (ac-ft/yr)	4,040
Total Water Supply Available (ac-ft/yr)	89,222
x Conversion Factor	0.0008927
Total Water Supply Available (mgd)	79.65
÷ Current Average Day Water Demand (mgd)	60.10
Current Ratio of Water Supply to Average Day Demand	1.33
New Water Supplies Planned to be Acquired (mgd), 2018-Buildout	9.60
÷ New Average Day Water Demand (mgd), 2018-Buildout	25.20
Ratio of New Water Supplies to New Average Day Demand	0.38
Buildout Water Supplies (mgd)	89.25
÷ Buildout Average Day Water Demand (mgd)	84.20
Buildout Ratio of Water Supplies to Average Day Demand	1.06

Source: Current and buildout water supplies from City of Chandler Public Works & Utilities Department, February 13, 2018; current and buildout average day water demand from Table 74.

The City plans to make two water supply acquisitions over the next several years. Based on these costs, the current marginal cost of additional water supplies is estimated to be $5.69 per gallon per day, as shown in Table 80. Note that the White Mountain settlement cost includes an $8 million contribution by Intel Corporation.

Table 80. Water Supplies Cost per Gallon per Day

	Cost	Gallons/Day	Cost/gpd
Gila River Indian Community CAP Purchase, FY 2018-2020	$42,860,000	5,500,000	$7.79
White Mountain Apache Tribe Water Settlement, FY 2020	$11,723,000	4,100,000	$2.86
Water Supplies Cost per Gallon per Day	$54,583,000	9,600,000	$5.69

Source: Planned water supply cost and capacity from City of Chandler, Public Works & Utilities Department, February 13, 2018.

As shown above, there is some excess capacity in current water supplies. The percentage of existing water supplies that are utilized by current customers, based on the projected buildout ratio of water supplies to average day water demand, is estimated at about 80% in Table 81 below.

Table 81. Percent of Water Supplies Currently Utilized

Current Average Day Water Demand (mgd)	60.10
x Buildout Ratio of Water Supplies to Daily Demand	1.06
Current Water Supplies Utilized (mgd)	63.70
÷ Existing Water Supplies (mgd)	79.65
Percent of Existing Water Supplies Utilized at Buildout Ratio	79.97%

Source: Current demand, buildout ratio and existing supplies from Table 79.

The replacement cost of Chandler's existing water system is estimated based on current capacities and the current unit costs to construct water facilities and to acquire additional water supplies, as shown in Table 82.

Table 82. Replacement Cost of Existing Water Facilities

System Component	Unit	Existing Units	Unit Cost	Replacement Cost
Water Supplies	gallons/day	79,650,000	$5.69	$453,208,500
Treatment Plant Capacity	gallons/day	84,000,000	$3.04	$255,360,000
Well Capacity	gallons/day	64,500,000	$1.42	$91,590,000
Storage Capacity	gallons	44,000,000	$1.36	$59,840,000
Booster Pump Station Capacity	gallons/day	161,300,000	$0.57	$91,941,000
16" Transmission Lines	linear feet	551,638	$272	$150,045,536
20" Transmission Lines	linear feet	8,010	$340	$2,723,400
24" Transmission Lines	linear feet	127,745	$408	$52,119,960
30" Transmission Lines	linear feet	41,513	$510	$21,171,630
36" Transmission Lines	linear feet	54,287	$612	$33,223,644
42" Transmission Lines	linear feet	11,576	$714	$8,265,264
48" Transmission Lines	linear feet	14,438	$816	$11,781,408
Total Existing System Replacement Cost				$1,231,270,342

Source: Existing water supplies from Table 79; unit cost for water supplies from Table 80; existing treatment plant and well firm capacity from Table 75; storage capacity from Table 76; booster pump station capacity from Table 77; transmission lines from Table 78; unit costs other than water supplies from Public Works & Utilities Department, May 4, 2018.

The existing level of service for water facilities is calculated in Table 83 by dividing the replacement cost of existing facilities utilized by existing customers by the number of existing service units. The result is $7,037 per equivalent dwelling unit (EDU).

Table 83. Water Existing Level of Service

Water System Component	Replacement Cost	Percent Utilized	Cost Utilized	Existing EDUs	Cost/ EDU
Water Supplies	$453,208,500	79.97%	$362,430,837		
Treatment Plant and Well Facilities	$346,950,000	43.87%	$152,206,965		
Storage, Pumping, Transmission Facilities	$431,111,842	71.38%	$307,727,633		
Total	$1,231,270,342		$822,365,435	116,855	$7,037

Source: Replacement costs from Table 82; percent of water supply from Table 81; percent of treatment plant and well facilities is ratio of existing demand to existing capacity from Table 74; percent of storage, pumping and transmission facilities is ratio of existing to buildout water demand from Table 74; existing (2018) service units from Table 73.

A final consideration in the existing level of service calculation is to verify that no deductions for outstanding debt/interfund loans on existing facilities are warranted. This is confirmed by the data presented in Table 84. Outstanding debt and interfund loan obligations total only about 27% of the cost of facilities available for future customers. Consequently, all the cost of facilities serving existing customers can reasonably be considered to have been fully paid for.

Table 84. Water Excess Capacity Cost and Outstanding Obligations

Total Replacement Cost of Existing Facilites	$1,231,270,342
– Cost of Existing Utilized Capacity	-$822,365,435
Cost of Excess Capacity	$408,904,907
Outstanding Debt/Loans	$111,810,479
÷ Cost of Existing Excess Capacity	$408,904,907
Debt as a Percent of Excess Capacity	27%

Source: Total cost and cost of utilized capacity from Table 83; outstanding debt and interfund loans from Table 125.

Ten-Year Cost per Service Unit

Over the next ten years, the City plans to construct additional wells and acquire additional water supplies. Updates of the City's water master plan will also need to be completed. The City will need to repay outstanding debt and interfund loans on several past capacity projects with excess capacity, pay encumbrances on current projects, and pay for a minimum of two updates of the system development fees that will be required over the next ten years. The results are shown in Table 85 and indicate a ten-year cost per service unit of $7,113 per EDU.

Table 85. Water Ten-Year Cost per Service Unit

WA034, Well Construction	$12,620,000
WA672, Water Purchases	$26,000,000
WA029, Water Master Plan	$600,000
Total Planned Improvement Cost	$39,220,000
Encumbrances on Current Projects	$38,720,751
Debt/Interfund Loan Obligations	$111,810,479
Required System Development Fee Studies	$65,900
– Fund Balance	-$30,759,683
Total Revenue Needs	$159,057,447
÷ New Service Units (EDUs), 2018-2028	22,360
Ten-Year Cost per Service Unit (EDU)	$7,113

Source: Planned projects and costs from City of Chandler, 2018-2027 *Capital Improvement Program*; debt/interfund loans, encumbrances, and account balance (sum of water and water resources) from Table 124; study cost from Table 127; new service units from Table 73.

Buildout Cost per Service Unit

No additional improvements to the water system are planned beyond the next ten years. The buildout cost per service unit represents costs that will be incurred by the City to buildout to construct planned improvements, pay encumbrances on current projects, repay outstanding debt and interfund loans associated with existing capacity available to serve new development, and pay for updated studies. Dividing buildout costs by new service units to buildout results in a buildout cost per service unit of $3,397 per EDU, as shown in Table 86.

Table 86. Water Buildout Cost per Service Unit

WA034, Well Construction	$12,620,000
WA672, Water Purchases	$26,000,000
WA029, Water Master Plan	$600,000
Total Planned Improvement Cost	$39,220,000
Encumbrances on Current Projects	$38,720,751
Debt/Interfund Loan Obligations	$111,810,479
Required System Development Fee Studies	$197,700
– Fund Balance	-$30,759,683
Total Revenue Needs	$159,189,247
÷ New Service Units (EDUs), 2018-Buildout	46,858
Buildout Cost per Service Unit (EDU)	$3,397

Source: Planned projects and costs from City of Chandler, 2018-2027 *Capital Improvement Program*; debt/interfund loans, encumbrances, and account balance (sum of water and water resources) from Table 124; study cost from Table 127; new service units from Table 73.

Cost per Service Unit Summary

The three costs per service unit calculated above are summarized in Table 87. The updated system development fees are based on the buildout cost per service unit, which is the lowest of the three.

Table 87. Water Cost per Service Unit

Existing Cost per Service Unit	$7,037
Ten-Year Cost per Service Unit	$7,113
Buildout Cost per Service Unit	$3,397
Lowest Cost per Service Unit	$3,397

Source: Existing from Table 83; ten-year from Table 85; buildout from Table 86.

Net Cost per Service Unit

As noted in the Legal Framework chapter, impact fees should be reduced (or "offset") to account for other types of revenues that will be generated by new development and used to fund capacity-expanding improvements of the same type as those to be funded by the impact fees. Cases in which such an offset is warranted include funding of existing deficiencies, outstanding debt/interfund loans on existing facilities, and dedicated revenue sources to fund growth-related improvements.

The water system development fees calculated in this report are based on the buildout cost per service unit, which is lower than the existing level of service, so there are no existing deficiencies. All the outstanding debt/interfund loans for capacity improvements is attributable to capacity that is available for future customers. Other than system development fees and water utility rates, the City has no dedicated source of revenue to fund growth-related water improvements. The City has not received any grant funding for water improvements in recent years and does not anticipate any grants over the next ten years. Consequently, no additional offsets are warranted, and the net cost per service unit is the same as the cost per service unit calculated above.

Updated System Development Fees

The updated water system development fees that may be adopted by the City based on this study are determined by multiplying the number of service units generated by a dwelling unit or nonresidential meter by the net cost per service unit calculated above. The resulting updated fee schedule is presented in Table 88.

Table 88. Water Net Cost Schedule

Housing/Meter Type	EDUs per Unit/Meter	Net Cost/ EDU	Net Cost per Unit/Meter
Single-Family Unit	1.000	$3,397	$3,397
Multi-Family Unit	0.377	$3,397	$1,281
Nonresidential Meter:			
3/4" Disc	1.500	$3,397	$5,096
1" Disc	2.500	$3,397	$8,493
1 1/2" Disc	5.000	$3,397	$16,985
2" Disc/Turbine	8.000	$3,397	$27,176
3" Compound	16.000	$3,397	$54,352
3" Turbine	17.500	$3,397	$59,448
4" Compound	25.000	$3,397	$84,925
4" Turbine	30.000	$3,397	$101,910
6" Compound	50.000	$3,397	$169,850
6" Turbine	62.500	$3,397	$212,313
8" Compound	80.000	$3,397	$271,760
8" Turbine	90.000	$3,397	$305,730

Source: Single-family EDUs per unit is by definition 1.000; multi-family EDUs per unit from Table 70; nonresidential EDUs per meter from Table 71; net cost per EDU is the lowest cost per EDU from Table 87.

The updated water fees are compared to current fees in Table 89 below. The updated fees are 40% lower than current fees.

Table 89. Current and Updated Water System Development Fees

Housing/Meter Type	Current Fee	Updated Fee	Percent Change
Single-Family Unit	$5,680	$3,397	-40%
Multi-Family Unit	$2,147	$1,281	-40%
Nonresidential Meter:			
3/4" Disc	$8,520	$5,096	-40%
1" Disc	$14,200	$8,493	-40%
1 1/2" Disc	$28,400	$16,985	-40%
2" Disc/Turbine	$45,440	$27,176	-40%
3" Compound	$90,880	$54,352	-40%
3" Turbine	$99,400	$59,448	-40%
4" Compound	$142,000	$84,925	-40%
4" Turbine	$170,400	$101,910	-40%
6" Compound	$284,000	$169,850	-40%
6" Turbine	$355,000	$212,313	-40%
8" Compound	$454,400	$271,760	-40%
8" Turbine	$511,200	$305,730	-40%

Source: Current water fees from Table 3; updated fees from Table 88.

Capital Plan

The City has approximately $190 million in anticipated growth-related water costs over the next ten years, as summarized in Table 90.

Table 90. Water Capital Plan, 2018-2028

WA034, Well Construction	$12,620,000
WA672, Water Purchases	$26,000,000
WA029, Water Master Plan	$600,000
Subtotal, Planned Projects	$39,220,000
Encumbrance/Carry-Forward for Joint Water Treatment Plant	$33,167,622
Encumbrance/Carry-Forward for Well Construction	$89,012
Encumbrance/Carry-Forward for Master Plan Update	$4,975,583
Ocotillo Water Reclamation Facility Expansion (Water Resource)	$488,534
Subtotal, Encumbrances/Carry-Forwards for Current Projects	$38,720,751
Outstanding Pledged Debt/Interfund Loans	$111,810,479
Required System Development Fee Studies	$65,900
Total Planned Expenditures	$189,817,130

Source: Planned projects and costs from City of Chandler, 2018-2027 *Capital Improvement Program*; encumbrances from Table 126; debt/interfund loans, from Table 125; study cost from Table 127.

New water customers projected by the City's water demand forecasts would generate the revenues shown in Table 91 below. Anticipated water system development fee revenues plus the current fund balance would be sufficient to cover all of the future City costs to buildout, and would cover 56% of costs anticipated to be incurred the next ten years. The City may need to defer some debt/interfund loan repayments beyond ten years.

Table 91. Potential Water System Development Fee Revenue, 2018-Buildout

	2018-2028	2018-Buildout
New Water Service Units (EDUs)	22,360	46,858
x Net Cost per Service Unit (EDU)	$3,397	$3,397
Potential Revenue	$75,956,920	$159,176,626
Current Fund Balance	$30,759,683	$30,759,683
Total System Development Fee Funds Available	$106,716,603	$189,936,309
÷ Planned Expenditures	$189,817,130	$189,948,930
Percent of Costs Covered by Water Fees	56%	100%

Source: New service units from Table 73; net cost per service unit is the lowest cost per EDU from Table 87; planned expenditures from Table 90 (2018-2028) and Table 86 (2018-buildout)); current fund balance from Table 124 in Appendix D.

WASTEWATER

This chapter updates the City's wastewater system development fees in compliance with the Arizona impact fee enabling act for municipalities.

Service Units

To calculate wastewater impact fees, the demand associated with different types of customers must be expressed in a common unit of measurement, called a "service unit." The service unit for the City's water and wastewater system development fees is an "equivalent dwelling unit" (EDU). An EDU is a single-family dwelling unit or its equivalent in terms of wastewater demand.

Residential development is charged per dwelling unit. A single-family unit is, by definition, one EDU. Multi-family development is assessed based on the average wastewater demand of a multi-family unit compared to a single-family unit. While wastewater flow is not metered directly, it can be estimated based on average water demand per unit during the winter months, when outdoor water use is limited and most water used is returned to the wastewater system. Based on billing data for the last five years, a multi-family unit represents 0.482 of a wastewater EDU, as shown in Table 92.

Table 92. Wastewater Demand per Multi-Family Unit

Average Daily Winter Water Consumption (gpd) per Multi-Family Unit	144
÷ Average Daily Winter Water Consumption (gpd) per Single-Family Unit	299
Multi-Family EDUs/Unit	0.482

Source: City of Chandler water billing data for the winter months, average of fiscal years 2012/13 through 2016/17, based on data provided by City on February 15 and March 2, 2018.

The number of wastewater service units associated with a nonresidential customer is determined by the capacity of the water meter relative to the capacity of the smallest meter size. The water meter capacity ratios presented earlier in the Water chapter (see Table 71) will also be used to determine relative wastewater demand for nonresidential customers. The number of existing wastewater service units are estimated based on the number of current City wastewater customers and the service unit multipliers described above. As shown in Table 93, the City's current wastewater customer base amounts to 101,447 service units (EDUs).

Table 93. Existing Wastewater Service Units

Land Use	Units or Meters	EDU Multiplier	EDUs
Single-Family Units	75,186	1.000	75,186
Multi-Family Units	24,763	0.482	11,936
Nonresidential Accounts	2,535	5.651	14,325
Total Wastewater EDUs			101,447

Source: Residential units and nonresidential accounts (excluding landscape and hydrant accounts) from City of Chandler wastewater billing data for fiscal year 2017, September 25, 2017; multi-family EDU multiplier from Table 92; EDUs per nonresidential account from Table 72 (average for all nonresidential meters).

The number of wastewater service units should increase proportionately with the increase in wastewater demand. As shown in Table 94, average daily wastewater demand and service units are projected to increase by 25,724 over the next ten years, and then by another 28,260 from 2028 to buildout, for a total of 53,984 new service units from 2018 to buildout.

Table 94. Wastewater Demand and Service Units, 2018-Buildout

	2017	2018	2028	Buildout
Wastewater Avg. Daily Demand (gpd)	28,000,000	28,700,000	35,800,000	43,600,000
Wastewater EDUs	101,447	103,983	129,707	157,967
New EDUs, 2018-2028			25,724	
New EDUs, 2018-Buildout				53,984

Source: 2017 and buildout average day wastewater demand from City of Chandler, Public Works & Utilities Department, June 4, 2018; 2028 based on midpoint from 2017 to buildout, 2018 is interpolated between 2017 and 2028; 2017 wastewater EDUs from Table 93; 2028 and buildout EDUs projected to increase proportionately to water demand.

Cost per Service Unit

As described earlier in the Methodology section of the Legal Framework chapter, the updated system development fees are based on the lowest of three costs per service units: existing level of service, ten-year cost and buildout cost.

Existing Level of Service

The existing level of service for the wastewater system development fees is quantified, in large part, by the capacity provided by existing wastewater facilities and the current cost to construct that capacity.

Chandler's wastewater treatment facilities include the Ocotillo and Airport Water Reclamation Facilities and the Lone Butte Wastewater Treatment Plant. The capacity of existing and planned treatment facilities is summarized in Table 95. Because the Lone Butte plant will be decommissioned, it is not included in determining the existing level of service.

Table 95. Wastewater Treatment Capacity, 2018-Buildout

Wastewater Facility	Current	Planned
Ocotillo Water Reclamation Facility Capacity (mgd)	15.5	20.5
Airport Water Reclamation Facility Capacity (mgd)	22.0	22.0
Lone Butte Wastewater Treatment Plant Capacity (mgd)	8.8	0.0
Total Treatment Capacity (mgd)	46.3	42.5
Total Capacity Excluding Lone Butte (mgd)	37.5	42.5

Source: Treatment plant capacity from City of Chandler Public Works & Utilities Department, February 13, 2018.

The wastewater collection system consists of lift stations, force mains and gravity lines. Existing lift station capacities are summarized in Table 96.

Table 96. Existing Lift Station Capacity

Lift Station	Firm Capacity (mgd)
Manganaro	10.0
Kyrene	5.8
Sunbird	0.7
Old Pecos	2.7
Riggs	3.0
Golf Course	1.6
Ocotillo (to Airport WRF)	28.3
Total	52.1

Source: City of Chandler Public Works & Utilities Department, February 13, 2018.

Another component of a wastewater system is the gravity mains and force mains that convey the wastewater to the treatment plants. Wastewater impact fees typically charge only for major system lines, since local lines are often constructed by developers without credit against their wastewater impact fees. The City's wastewater master plan does not clearly distinguish between system lines and local lines. For this study, system lines are defined as gravity mains of 18 inches in diameter or greater, and force mains of 12 inches or greater. These are summarized in Table 97.

Table 97. Existing Wastewater System Lines

Pipe Diameter (inches)	Linear Feet
18	130,034
21	36,129
24	66,748
27	55,228
30	66,191
33	7,326
36	16,030
39	5,274
42	13,475
48	20,061
60	220
66	13,635
Total, Gravity Lines	430,351
12	6,245
16	12,192
18	10,913
20	35,899
24	22,532
42	23,902
Total, Force Mains	111,683

Source: City of Chandler Public Works & Utilities Department, February 13, 2018.

The replacement cost of Chandler's existing wastewater system is estimated based on current capacities and the current unit costs to construct wastewater facilities, as shown in Table 98.

Table 98. Replacement Cost of Existing Wastewater Facilities

System Component	Unit	Existing Units	Unit Cost	Replacement Cost
Treatment Plants*	gallons/day	37,500,000	$20.41	$765,375,000
Lift Stations	gallons/day	52,100,000	$1.51	$78,671,000
18" Gravity Mains	linear feet	130,034	$408	$53,053,872
21" Gravity Mains	linear feet	36,129	$476	$17,197,404
24" Gravity Mains	linear feet	66,748	$544	$36,310,912
27" Gravity Mains	linear feet	55,228	$612	$33,799,536
30" Gravity Mains	linear feet	66,191	$680	$45,009,880
33" Gravity Mains	linear feet	7,326	$748	$5,479,848
36" Gravity Mains	linear feet	16,030	$816	$13,080,480
39" Gravity Mains	linear feet	5,274	$885	$4,667,490
42" Gravity Mains	linear feet	13,475	$953	$12,841,675
48" Gravity Mains	linear feet	20,061	$1,066	$21,385,026
60" Gravity Mains	linear feet	220	$1,361	$299,420
66" Gravity Mains	linear feet	13,635	$1,497	$20,411,595
12" Force Mains	linear feet	6,245	$245	$1,530,025
16" Force Mains	linear feet	12,192	$327	$3,986,784
18" Force Mains	linear feet	10,913	$367	$4,005,071
20" Force Mains	linear feet	35,899	$408	$14,646,792
24" Force Mains	linear feet	22,532	$490	$11,040,680
42" Force Mains	linear feet	23,902	$858	$20,507,916
Total Replacement Cost of Existing Wastewater Facilities				$1,163,300,406

* excludes Lone Butte plant, which is planned to be decommissioned

Source: Treatment plant capacity (excluding Lone Butte) from Table 95; lift station capacity from Table 96; linear feet of lines from Table 97; unit costs from City of Chandler Municipal Utilities Department, July 23, 2013 increased by a factor of 1.134 per Public Works & Utilities Department, May 4, 2018.

The existing level of service for wastewater facilities is calculated in Table 99 below. The replacement cost of existing treatment plants, excluding Lone Butte, can all be attributed to existing development, since without the Lone Butte plant, which will be decommissioned, there is no excess treatment capacity. The cost of the existing collection system is reduced to account for the fact that it is sufficient to serve buildout development, not just current customers. The total cost is divided by the number of existing service units to determine the existing level of service, which results in an existing cost per service unit of $9,631 per EDU.

Table 99. Wastewater Existing Level of Service

Replacement Cost of Existing Treatment Plant Capacity	$765,375,000
x Percent of Capacity Currently Utilized	100.00%
Cost of Treatment Plant Capacity Utilized	$765,375,000
Replacement Cost of Collection System	$377,417,490
x Percent of Capacity Currently Utilized	58.72%
Cost of Collection System Utilized	$221,619,550
Total Replacement Costs Utilized by Existing Customers*	$986,994,550
Fund Balance and Accounts Receivable	$14,510,440
Existing Capital Investment	$1,001,504,990
÷ Existing Service Units (EDUs)	103,983
Existing Cost per Service Unit (EDU)	$9,631

* sum of replacement costs of treatment plant and collection system utilized

Source: Treatment plant and collection system costs from Table 98; percent of treatment capacity utilized is ratio of 2018 average day demand from Table 94 to current capacity from Table 95; percent of collection system currently utilized is ratio of existing to buildout demand from Table 95; fund balance and accounts receivable from Table 124; existing (2018) service units from Table 94.

A final consideration in the existing level of service calculation is to verify that no deductions for outstanding debt/interfund loans on existing facilities are warranted. This is confirmed by the data presented in Table 100. The cost of existing facilities that is available for future customers is approximately $176 million. Outstanding debt and interfund loan obligations total about $148 million. Consequently, all the cost of facilities serving existing customers can reasonably be considered to have been fully paid for.

Table 100. Existing Wastewater Facility Cost and Outstanding Obligations

Total Cost of Existing Facilities	$1,163,300,406
– Cost of Existing Facilities Serving Current Customers	-$986,994,550
Cost of Existing Facilities Available for Future Customers	$176,305,856
Debt/Interfund Loan Balances on Existing Facilities	$148,124,609
÷ Cost of Existing Facilities Available for Future Customers	$176,305,856
Future Obligations as Percent of Cost of Available Existing Facilities	84.0%

Source: Total cost of existing facilities from Table 98; cost of facilities serving existing customers from Table 99; outstanding debt/interfund loans from Table 125.

Ten-Year Cost per Service Unit

Over the next ten years, the City plans to complete a 5 mgd expansion to its wastewater treatment plant capacity. The City will also pay for a master plan update. The City will also need to repay debt and interfund loans on existing facilities with excess capacity, pay encumbrances on current projects, and pay for a minimum of two updates of the system development fees that will be required over the next ten years. The calculations are shown in Table 101 on the following page and result in a ten-year cost per service unit of $8,442 per EDU.

Table 101. Wastewater Ten-Year Cost per Service Unit

WW661, Ocotillo Water Reclamation Facility Expansion (5 mgd)	$67,758,500
WW021, Wastewater Master Plan Update	$1,200,000
Debt/Interfund Loan Obligations	$148,124,609
Encumbrances for Current Projects	$14,566,110
Required System Development Fee Studies	$32,950
– Fund Balance and Accounts Receivable	-$14,510,440
Total Revenue Needs	$217,171,729
÷ New Service Units (EDUs), 2018-2028	25,724
Ten-Year Cost per Service Unit (EDU)	$8,442

Source: Planned projects and costs City of Chandler, 2018-2027 *Capital Improvement Program*; debt/interfund loans from Table 125; encumbrances from Table 126; study cost from Table 127; fund balance/ accounts receivable from Table 124; new 2018-2028 service units from Table 94.

Buildout Cost per Service Unit

No additional improvements are planned after 2028. The buildout cost includes costs that will be incurred by the City to buildout to construct planned improvements, repay outstanding debt and interfund loans associated with existing capacity to serve new development, and to pay for updated studies. Dividing the total buildout cost by new service units to buildout results in a buildout cost per service unit of $4,024 per EDU, as shown in Table 102.

Table 102. Wastewater Buildout Cost per Service Unit

WW661, Ocotillo Water Reclamation Facility Expansion (5 mgd)	$67,758,500
WW021, Wastewater Master Plan Update	$1,200,000
Debt/Interfund Loan Obligations	$148,124,609
Encumbrances for Current Projects	$14,566,110
Required System Development Fee Studies	$98,850
– Fund Balance and Accounts Receivable	-$14,510,440
Total Revenue Needs	$217,237,629
÷ New Service Units (EDUs), 2018-Buildout	53,984
Buildout Cost per Service Unit (EDU)	$4,024

Source: Planned projects and costs from City of Chandler, 2018-2027 *Capital Improvement Program*; debt/interfund loans from Table 125; encumbrances from Table 126; study cost from Table 127; fund balance/ from Table 124; new 2018-buildout service units from Table 94.

Cost per Service Unit Summary

The three costs per service unit calculated above are summarized in Table 103. The updated system development fees are based on the buildout cost per service unit, which is the lowest of the three.

Table 103. Wastewater Cost per Service Unit

Existing Cost per Service Unit	$9,631
Ten-Year Cost per Service Unit	$8,442
Buildout Cost per Service Unit	$4,024
Lowest Cost per Service Unit	$4,024

Source: Existing from Table 99; ten-year from Table 101; buildout from Table 102.

Net Cost per Service Unit

As noted in the Legal Framework chapter of this report, impact fees should be reduced (or "offset") to account for other types of revenues that will be generated by new development and used to fund capacity-expanding improvements of the same type as those to be funded by the impact fees. Cases in which such an offset is warranted include funding of existing deficiencies, outstanding debt payments on existing facilities, and dedicated revenue sources to fund growth-related improvements.

All the outstanding debt for past capacity improvements can reasonably be attributed to capacity that is available for future customers. Other than system development fees and wastewater utility rates, the City has no dedicated source of revenue to fund growth-related wastewater improvements. The City has not received any grant funding for wastewater improvements in recent years and does not anticipate any grants over the next ten years. Consequently, no additional offsets are warranted, and the net cost per service unit is the same as the cost per service unit calculated above.

Updated System Development Fees

The updated wastewater system development fees that may be adopted by the City based on this study are the products of the numbers of service units generated by a unit of development and the net cost per service unit calculated above. The resulting updated fee schedule is presented in Table 104.

Table 104. Wastewater Net Cost Schedule

Housing/Meter Type	EDUs per Unit/Meter	Net Cost/ EDU	Net Cost per Unit/Meter
Single-Family Unit	1.000	$4,024	$4,024
Multi-Family Unit	0.482	$4,024	$1,940
Nonresidential Meter:			
3/4" Disc	1.500	$4,024	$6,036
1" Disc	2.500	$4,024	$10,060
1 1/2" Disc	5.000	$4,024	$20,120
2" Disc/Turbine	8.000	$4,024	$32,192
3" Compound	16.000	$4,024	$64,384
3" Turbine	17.500	$4,024	$70,420
4" Compound	25.000	$4,024	$100,600
4" Turbine	30.000	$4,024	$120,720
6" Compound	50.000	$4,024	$201,200
6" Turbine	62.500	$4,024	$251,500
8" Compound	80.000	$4,024	$321,920
8" Turbine	90.000	$4,024	$362,160

Source: Single-family EDUs per unit is by definition one; multi-family EDUs per unit from Table 92; nonresidential EDUs per meter from Table 71; net cost per EDU is the lowest cost per EDU from Table 103.

The updated wastewater fees are compared to current fees in Table 105 below. The updated fees are about 31% lower than current fees.

Table 105. Current and Updated Wastewater System Development Fees

Housing/Meter Type	Current Fee	Updated Fee	Percent Change
Single-Family Unit	$5,804	$4,024	-31%
Multi-Family Unit	$2,751	$1,940	-29%
Nonresidential Meter:			
3/4" Disc	$8,706	$6,036	-31%
1" Disc	$14,510	$10,060	-31%
1 1/2" Disc	$29,020	$20,120	-31%
2" Disc/Turbine	$46,432	$32,192	-31%
3" Compound	$92,864	$64,384	-31%
3" Turbine	$101,570	$70,420	-31%
4" Compound	$145,100	$100,600	-31%
4" Turbine	$174,120	$120,720	-31%
6" Compound	$290,200	$201,200	-31%
6" Turbine	$362,750	$251,500	-31%
8" Compound	$464,320	$321,920	-31%
8" Turbine	$522,360	$362,160	-31%

Source: Current fees from Table 3; updated fees from Table 104.

Capital Plan

Assuming that growth occurs as projected in the land use assumptions, the City anticipates approximately $232 million in growth-related wastewater costs over the next ten years, as shown in Table 106.

Table 106. Wastewater Capital Plan, 2018-2028

WW661, Ocotillo Water Reclamation Facility Expansion (5 mgd)	$67,758,500
WW021, Wastewater Master Plan Update	$1,200,000
Outstanding Pledged Debt/Interfund Loans	$148,124,609
Encumbrances for Ocotillo Water Reclamation Facility	$14,088,063
Encumbrances for Wastewater Master Plan Update	$178,023
Encumbrances for Water Reclamation Facility Expansion	$300,024
Required System Development Fee Studies	$32,950
Total Planned Expenditures	$231,682,169

Source: Planned projects and costs City of Chandler, 2018-2027 *Capital Improvement Program*; debt/interfund loans from Table 125; encumbrances from Table 126; study cost from Table 127.

With potential updated wastewater system development fee revenue, plus the current fund balance, the City would have about $118 million in system development fee funds available over the next ten years, as shown in Table 107 below. This is only 51% of planned 10-year expenditures. However, the timing of expenditures is flexible, as the City can defer repayment of interfund loans until sufficient system development fees become available. Assuming the City continues to collect wastewater system development fees until it reaches buildout, future fees plus the current fund balance should be sufficient to cover all future costs.

Table 107. Potential Wastewater System Development Fee Revenue, 2018-Buildout

	2018-2028	2018-Buildout
New Service Units (EDUs)	25,724	53,984
x Net Cost per Service Unit (EDU)	$4,024	$4,024
Potential Revenue	$103,513,376	$217,231,616
Current Fund Balance and Accounts Receivable	$14,510,440	$14,510,440
Total System Development Fee Funds Available, 2018-2028	$118,023,816	$231,742,056
÷ Planned Expenditures	$231,682,169	$231,748,069
Percent of Costs Covered by Wastewater Fees	51%	100%

Source: New service units from Table 94; net cost per service unit is the lowest cost per EDU from Table 103; current fund balance and accounts receivable from Table 124 in Appendix D; 2018-2028 expenditures from Table 106; 2018-buildout expenditures from Table 102.

RECLAIMED WATER

This chapter updates the City's reclaimed water system development fees in compliance with the Arizona impact fee enabling act for municipalities. Reclaimed water is wastewater that is treated and purified to be safely used for irrigating golf courses, common areas, and roadside landscaping. Chandler's water reclamation facilities use a state-of-the-art treatment process that cleans and disinfects the wastewater before it is added to the reclaimed water distribution system. The reclaimed water system benefits all City water and wastewater utility customers by providing an efficient method of disposing of wastewater and conserving limited water resources. The ability to expand the City's wastewater treatment capacity is limited by the ability to reuse or recharge the effluent. Because the reclaimed water system is most closely linked to the wastewater system, reclaimed water system development fees are assessed on new wastewater customers.

Service Units

To calculate system development fees, the demand associated with different types of development must be expressed in a common unit of measurement, called a "service unit." The service unit for the reclaimed water fee is an "equivalent dwelling unit" (EDU). An EDU is a single-family dwelling unit or its equivalent in terms of reclaimed water demand. Because the reclaimed water system development fees are assessed on new wastewater customers, the wastewater service unit multipliers and projections calculated in the previous wastewater chapter are appropriate for the reclaimed water fees as well.

Cost per Service Unit

As described earlier in the Methodology section of the Legal Framework chapter, the updated system development fees are based on the lowest of three costs per service unit: existing level of service, ten-year cost, and buildout cost.

Existing Level of Service

The existing level of service for the reclaimed water system development fees is quantified, in large part, by the capacity provided by existing reclaimed water facilities and the current cost to construct that capacity. Chandler's reclaimed water facilities include pump stations, recharge and recovery wells and reclaimed water transmission lines. The City's existing pump station capacities are summarized in Table 108.

Table 108. Existing Reclaimed Water Pump Stations

Reclaimed Water Pump Station	Capacity (mgd)
GRIC Pump Station at Ocotillo WRF	5.0
Effluent Pump Station at Ocotillo WRF	20.0
Intel Effluent Pump Station	2.0
Recharge Pump Station at Ocotillo WRF	10.0
Reclaimed Water Pump Station at Airport WRF	30.0
Reclaimed Water Pump Station at Airport WRF Reservoirs	20.0
Total, Pump Stations	87.0

Source: City of Chandler Public Works & Utilities Department, February 13, 2018.

A key component of the reclaimed water system is the system of aquifer storage and recovery (ASR) wells. The City's existing reclaimed well capacities are summarized in Table 109.

Table 109. Existing Reclaimed Water Wells

Recharge Well	Recharge Capacity (mgd)
Tumbleweed Park ASR Well No. 1	2.3
Tumbleweed Park ASR Well No. 2	1.7
Tumbleweed Park ASR Well No. 3	1.7
Tumbleweed Park ASR Well No. 4	1.9
Tumbleweed Park ASR Well No. 5	0.9
Tumbleweed Park ASR Well No. 6	1.3
Tumbleweed Park ASR Well No. 7	1.6
Tumbleweed Park ASR Well No. 8	1.4
Tumbleweed Park ASR Well No. 9	1.4
Tumbleweed Park ASR Well No. 10	1.4
Total Capacity, Tumbleweed Park	15.6
Ocotillo ASR Well No. 1	1.2
Ocotillo ASR Well No. 2	1.2
Ocotillo ASR Well No. 3	1.2
Ocotillo ASR Well No. 4	1.2
Ocotillo ASR Well No. 5	1.4
Ocotillo ASR Well No. 6	1.4
Ocotillo ASR Well No. 7	1.7
Ocotillo ASR Well No. 8	1.7
Ocotillo ASR Well No. 9	1.7
Ocotillo ASR Well No. 10	1.6
Total Capacity, Ocotillo	14.3
Veterans Oasis Recharge Basin	2.0
Total System Capacity	31.9

Source: City of Chandler Public Works & Utilities Department, February 13, 2018.

Another component of a reclaimed water system is the network of transmission mains that distribute the reclaimed water to reclaimed water users. The existing major lines are summarized in Table 110.

Table 110. Existing Reclaimed Water System Lines

Pipe Size (in.)	Linear Feet
12	229,142
16	2,902
18	1,508
24	109,005
36	22,091

Source: City of Chandler Public Works & Utilities Department, February 13, 2018.

The total replacement cost of Chandler's existing reclaimed water system is estimated based on current capacities and the current unit costs to construct reclaimed water facilities. Outstanding debt/interfund loans in excess of the current reclaimed water system development fee fund balance are deducted to determine the net replacement cost that has been fully paid for by existing wastewater customers. The net replacement cost is divided by the number of existing wastewater service units to determine the existing cost per service unit of $1,979 per EDU, as shown in Table 111.

Table 111. Reclaimed Water Existing Level of Service

System Component	Unit	Existing Units	Unit Cost	Replacement Cost
Pump Station Capacity	gallons/day	87,000,000	$0.57	$49,590,000
ASR Well Capacity	gallons/day	31,900,000	$2.27	$72,413,000
12" Transmission Lines	linear feet	229,142	$204	$46,744,968
16" Transmission Lines	linear feet	2,902	$272	$789,344
18" Transmission Lines	linear feet	1,508	$306	$461,448
24" Transmission Lines	linear feet	109,005	$408	$44,474,040
36" Transmission Lines	linear feet	22,091	$612	$13,519,692
Total Existing System Replacement Cost				$227,992,492
– Debt/Interfund Loan Obligations				-$25,255,543
Fund Balance				$3,056,709
Net Existing System Replacement Cost				$205,793,658
÷ Existing Service Units (EDUs)				103,983
Existing Cost per Service Unit (EDU)				$1,979

Source: Pump station capacity from Table 108; well capacity from Table 109; transmission lines from Table 110; unit costs from City of Chandler Municipal Utilities Department, July 23, 2013 increased by a factor of 1.134 per Public Works & Utilities Department, May 4, 2018; outstanding debt/interfund loans from Table 125; fund balance from Table 124; existing (2018) service units from Table 94.

Ten-Year Cost per Service Unit

Over the next ten years, the City plans to construct the remaining ASR wells and reclaimed water transmission mains that will be required by buildout. The City will also need to repay debt/interfund loans on existing facilities with excess capacity, pay encumbrances on current projects, and pay for a minimum of two updates of the system development fees that will be required over the next ten years. The results are shown in Table 112 and indicate a ten-year cost per service unit of $1,753 per EDU.

Table 112. Reclaimed Water Ten-Year Cost per Service Unit

WW189, Effluent Reuse - Storage & Recovery Wells	$12,550,000
WW192, Effluent Reuse - Transmission Mains	$2,355,000
Total Planned Improvement Cost	$14,905,000
Debt/Interfund Loan Obligations	$25,255,543
Encumbrances for Current Projects	$7,969,649
Required System Development Fee Studies	$32,950
– Fund Balance	-$3,056,709
Total Revenue Needs	$45,106,433
÷ New Service Units (EDUs), 2018-2028	25,724
Ten-Year Cost per Service Unit (EDU)	$1,753

Source: Planned projects and costs from City of Chandler, 2018-2027 *Capital Improvement Program*; debt/interfund loans from Table 125; encumbrances from Table 126; study cost from Table 127; fund balance from Table 124; new 2018-buildout service units from Table 94.

Buildout Cost per Service Unit

The City has not identified a need for any additional growth-related improvements beyond the next ten years. The total buildout cost includes future costs that will be incurred by the City to construct planned improvements, repay outstanding debt/interfund loans associated with existing capacity to serve new development, and pay for updated studies. Dividing buildout costs by new service units to buildout results in a buildout cost per service unit of $837 per EDU, as shown in Table 113.

Table 113. Reclaimed Water Buildout Cost per Service Unit

WW189, Effluent Reuse - Storage & Recovery Wells	$12,550,000
WW192, Effluent Reuse - Transmission Mains	$2,355,000
Total Planned Improvement Cost	$14,905,000
Debt/Interfund Loan Obligations	$25,255,543
Encumbrances for Current Projects	$7,969,649
Required System Development Fee Studies	$98,850
– Fund Balance	-$3,056,709
Total Revenue Needs	$45,172,333
÷ New Service Units (EDUs), 2018-Buildout	53,984
Buildout Cost per Service Unit (EDU)	$837

Source: Planned projects and costs from City of Chandler, 2018-2027 *Capital Improvement Program*; debt/interfund loans from Table 125; encumbrances from Table 126; study cost from Table 127; fund balance from Table 124; new service units from Table 94.

Cost per Service Unit Summary

The three costs per service unit calculated above are summarized in Table 114. The updated system development fees are based on the buildout cost per service unit, which is the lowest of the three.

Table 114. Reclaimed Water Cost per Service Unit

Existing Cost per Service Unit	$1,979
Ten-Year Cost per Service Unit	$1,753
Buildout Cost per Service Unit	$837
Lowest Cost per Service Unit	$837

Source: Existing from Table 111; ten-year from Table 112; buildout from Table 113.

Net Cost per Service Unit

As noted in the Legal Framework chapter of this report, impact fees should be reduced (or "offset") in order to account for other types of revenues that will be generated by new development and used to fund capacity-expanding improvements of the same type as those to be funded by the impact fees. Cases in which such an offset is warranted include funding of existing deficiencies, outstanding debt payments on existing facilities, and dedicated revenue sources to fund growth-related improvements.

The reclaimed water system development fees calculated in this report are based on the buildout cost per service unit, which is lower than the existing level of service, so there are no existing deficiencies. Outstanding debt and interfund loans on existing facilities have been excluded from the existing level of service calculation. Other than system development fees and utility rates, the City has no dedicated source of revenue to fund growth-related reclaimed water improvements. The City has not received any grant funding for reclaimed water improvements in recent years and does not anticipate any grants over the next ten years. Consequently, no additional offsets are warranted, and the net cost per service unit is the same as the cost per service unit calculated above.

Updated System Development Fees

The updated reclaimed water system development fees that may be adopted by the City based on this study are the products of the numbers of service units generated by a unit of development and the net cost per service unit calculated above. The resulting updated fee schedule is presented in Table 115.

Table 115. Reclaimed Water Net Cost Schedule

Housing/Meter Type	EDUs per Unit/Meter	Net Cost/ EDU	Net Cost per Unit/Meter
Single-Family Unit	1.000	$837	$837
Multi-Family Unit	0.482	$837	$403
Nonresidential Meter:			
3/4" Disc	1.500	$837	$1,256
1" Disc	2.500	$837	$2,093
1 1/2" Disc	5.000	$837	$4,185
2" Disc/Turbine	8.000	$837	$6,696
3" Compound	16.000	$837	$13,392
3" Turbine	17.500	$837	$14,648
4" Compound	25.000	$837	$20,925
4" Turbine	30.000	$837	$25,110
6" Compound	50.000	$837	$41,850
6" Turbine	62.500	$837	$52,313
8" Compound	80.000	$837	$66,960
8" Turbine	90.000	$837	$75,330

Source: EDUs per unit or meter are the same as for wastewater from Table 104; net cost per EDU is the lowest cost per EDU from Table 114.

The updated reclaimed water fees are compared to current fees in Table 116 below. The updated fees are essentially unchanged from current fees.

Table 116. Current and Updated Reclaimed Water System Development Fees

Housing/Meter Type		Current Fee	Updated Fee	Percent Change
Single-Family Unit		$838	$837	0%
Multi-Family Unit		$397	$403	2%
Nonresidential Meter:				
3/4"	Disc	$1,257	$1,256	0%
1"	Disc	$2,095	$2,093	0%
1 1/2"	Disc	$4,190	$4,185	0%
2"	Disc/Turbine	$6,704	$6,696	0%
3"	Compound	$13,408	$13,392	0%
3"	Turbine	$14,665	$14,648	0%
4"	Compound	$20,950	$20,925	0%
4"	Turbine	$25,140	$25,110	0%
6"	Compound	$41,900	$41,850	0%
6"	Turbine	$52,375	$52,313	0%
8"	Compound	$67,040	$66,960	0%
8"	Turbine	$75,420	$75,330	0%

Source: Current fees from Table 3; updated fees from Table 115.

Capital Plan

Assuming that growth occurs as projected in the land use assumptions, the City anticipates approximately $48.2 million in growth-related reclaimed water costs over the next ten years, as summarized in Table 117.

Table 117. Reclaimed Water Capital Plan, 2018-2028

WW189, Effluent Reuse - Storage & Recovery Wells	$12,550,000
WW192, Effluent Reuse - Transmission Mains	$2,355,000
Encumbrances for Effluent Reuse-Storage and Recovery Wells	$7,306,247
Encumbrances for Effluent Reuse-Transmission Mains	$663,402
Debt/Interfund Loan Obligations	$25,255,543
Required System Development Fee Studies	$32,950
Total Planned Expenditures	$48,163,142

Source: Planned projects and costs from City of Chandler, 2018-2027 *Capital Improvement Program*; debt/interfund loans from Table 125; encumbrances from Table 126; study cost from Table 127.

With potential updated reclaimed water system development fee revenue, plus the current fund balance, the City would have about $24.6 million in system development fee funds available over the next ten years, as shown in Table 118. This is only 51% of planned 10-year expenditures. However, the timing of expenditures is flexible, as the City can defer repayment of interfund loans until sufficient system development fees become available. Assuming the City continues to collect reclaimed water system development fees until it reaches buildout, future fee revenues plus the current fund balance should be enough to cover all future costs.

Table 118. Potential Reclaimed Water System Development Fee Revenue, 2018-Buildout

	2018-2028	2018-Buildout
New Service Units (EDUs)	25,724	53,984
x Net Cost per Service Unit (EDU)	$837	$837
Potential Revenue	$21,530,988	$45,184,608
Current Fund Balance	$3,056,709	$3,056,709
Total System Development Fee Funds Available	$24,587,697	$48,241,317
÷ Planned Expenditures	$48,163,142	$48,229,042
Percent of Costs Covered by Reclaimed Water Fees	51%	100%

Source: New service units from Table 94; net cost per service unit is the lowest cost per EDU from Table 114; planned expenditures from Table 117 (2018-2028) and Table 113 (2018-buildout – sum of revenue needs and fund balance); current fund balance from Table 124 in Appendix D.

APPENDIX A: ARTERIAL STREETS

Table 119. Existing Arterial Street Inventory, Arterial Street Service Area

Street	From	To	Miles	Lns	Lane-Miles	Pk Hr Count	Capa-city	VMT	VMC
McClintock Rd	Frye	Loop 202	0.50	4	2.00	731	2,700	366	1,350
Price	Loop 202	Germann	1.15	6	6.90	3,460	4,100	3,979	4,715
Price	Germann	Queen Creek	1.00	6	6.00	2,312	4,100	2,312	4,100
Price	Queen Creek	Dobson	0.50	6	3.00	1,360	4,100	680	2,050
Dobson	Frye	Pecos	0.50	6	3.00	2,601	4,100	1,301	2,050
Dobson	Pecos	Germann	1.06	6	6.36	2,083	4,100	2,208	4,346
Dobson	Germann	Queen Creek	1.10	6	6.60	1,666	4,100	1,833	4,510
Dobson	Queen Creek	Price	0.42	4	1.68	1,046	2,700	439	1,134
Dobson	Price	Ocotillo	1.00	4	4.00	1,675	2,700	1,675	2,700
Dobson	Ocotillo	End	0.80	4	3.20	1,675	2,700	1,340	2,160
Alma School	Frye	Pecos	0.50	4	2.00	2,465	2,700	1,233	1,350
Alma School	Pecos	Loop 202	0.30	4	1.20	2,916	2,700	875	810
Alma School	Loop 202	Willis	0.25	6	1.50	3,545	4,100	886	1,025
Alma School	Willis	Germann	0.50	4	2.00	3,545	2,700	1,773	1,350
Alma School	Germann	Queen Creek	0.98	4	3.92	2,941	2,700	2,882	2,646
Alma School	Queen Creek	Ocotillo	1.12	4	4.48	2,576	2,700	2,885	3,024
Alma School	Ocotillo	Chandler Heights	1.13	4	4.52	2,168	2,700	2,450	3,051
Arizona	Pecos	Loop 202	0.30	6	1.80	3,035	4,100	911	1,230
Arizona	Loop 202	Germann	0.73	6	4.38	3,859	4,100	2,817	2,993
Arizona	Germann	Queen Creek	1.00	6	6.00	3,298	4,100	3,298	4,100
Arizona	Queen Creek	Ocotillo	1.00	6	6.00	2,975	4,100	2,975	4,100
Arizona	Ocotillo	Chandler Heights	1.00	6	6.00	2,406	4,100	2,406	4,100
Arizona	Chandler Heights	Riggs	1.00	4	4.00	1,751	2,700	1,751	2,700
Arizona	Riggs	Hunt Highway	1.00	4	4.00	1,751	2,700	1,751	2,700
McQueen	Ray	Chandler	1.00	4	4.00	2,406	2,700	2,406	2,700
McQueen	Chandler	Pecos	1.00	4	4.00	2,151	2,700	2,151	2,700
McQueen	Pecos	Loop 202	0.62	6	3.72	2,431	4,100	1,507	2,542
McQueen	Loop 202	Germann	0.40	6	2.40	2,559	4,100	1,024	1,640
McQueen	Germann	Queen Creek	1.00	6	6.00	2,907	4,100	2,907	4,100
McQueen	Queen Creek	Ocotillo	1.00	6	6.00	2,312	4,100	2,312	4,100
McQueen	Ocotillo	Chandler Heights	1.00	4	4.00	1,573	2,700	1,573	2,700
McQueen	Chandler Heights	Riggs	1.00	4	4.00	1,131	2,700	1,131	2,700
McQueen	Riggs	City Limit	0.75	4	3.00	357	2,700	268	2,025
Cooper	Ray	Chandler	1.00	6	6.00	2,057	4,100	2,057	4,100
Cooper	Chandler	Pecos	0.98	6	5.88	1,794	4,100	1,758	4,018
Cooper	Pecos	Loop 202	0.62	6	3.72	2,006	4,100	1,244	2,542
Cooper	Loop 202	Germann	0.40	6	2.40	2,006	4,100	802	1,640
Cooper	Queen Creek	Ocotillo	1.00	2	2.00	876	1,300	876	1,300
Cooper	Ocotillo	Chandler Heights	1.00	2	2.00	714	1,300	714	1,300
Cooper	Chandler Heights	Riggs	1.00	2	2.00	510	1,300	510	1,300
Cooper	Riggs	Hunt Highway	1.00	4	4.00	255	2,700	255	2,700
Gilbert	Pecos	Loop 202	0.60	6	3.60	2,788	4,100	1,673	2,460
Gilbert	Loop 202	Germann	0.40	6	2.40	3,332	4,100	1,333	1,640

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Table 119. Existing Arterial Street Inventory (continued)

Street	From	To	Miles	Lns	Lane-Miles	Pk Hr Count	Capa-city	VMT	VMC
Gilbert	Germann	Queen Creek	1.00	6	6.00	2,950	4,100	2,950	4,100
Gilbert	Queen Creek	Ocotillo	1.00	6	6.00	1,879	4,100	1,879	4,100
Gilbert	Ocotillo	Chandler Heights	1.00	4	4.00	2,287	2,700	2,287	2,700
Gilbert	Chandler Heights	Riggs	1.00	4	4.00	1,335	2,700	1,335	2,700
Gilbert	Riggs	Hunt Highway	1.00	4	4.00	604	2,700	604	2,700
Lindsay	Ocotillo	Chandler Heights	1.00	2	2.00	884	1,300	884	1,300
Lindsay	Chandler Heights	Riggs	1.00	2	2.00	833	1,300	833	1,300
Lindsay	Riggs	Hunt Highway	1.00	2	2.00	332	1,300	332	1,300
Ray	McQueen	Cooper	1.00	4	4.00	2,312	2,700	2,312	2,700
Chandler	McQueen	Cooper	0.99	6	5.94	1,862	4,100	1,843	4,059
Chandler	Cooper	Gilbert	1.00	6	6.00	1,590	4,100	1,590	4,100
Pecos	Ellis	Dobson	0.50	2	1.00	1,131	1,300	566	650
Pecos	Dobson	Alma School	1.00	6	6.00	1,131	4,100	1,131	4,100
Pecos	Alma School	Arizona	1.00	6	6.00	1,394	4,100	1,394	4,100
Pecos	Arizona	McQueen	1.02	6	6.12	1,343	4,100	1,370	4,182
Pecos	McQueen	Cooper	1.00	6	6.00	1,369	4,100	1,369	4,100
Pecos	Cooper	Gilbert	1.00	6	6.00	1,012	4,100	1,012	4,100
Germann	City Limits	Price	0.25	2	0.50	927	1,300	232	325
Germann	Price	Dobson	0.75	4	3.00	927	2,700	695	2,025
Germann	Dobson	Alma School	1.00	6	6.00	1,284	4,100	1,284	4,100
Germann	Alma School	Arizona	1.00	6	6.00	1,437	4,100	1,437	4,100
Germann	Arizona	McQueen	1.00	4	4.00	1,046	2,700	1,046	2,700
Germann	McQueen	Cooper	1.00	4	4.00	1,088	2,700	1,088	2,700
Germann	Cooper	Gilbert	1.10	6	6.60	1,709	4,100	1,880	4,510
Queen Creek	City Limits	Price	0.27	6	1.62	500	4,100	135	1,107
Queen Creek	Price	Dobson	0.45	6	2.70	1,428	4,100	643	1,845
Queen Creek	Dobson	Alma School	1.30	6	7.80	1,700	4,100	2,210	5,330
Queen Creek	Alma School	Arizona	1.00	6	6.00	1,658	4,100	1,658	4,100
Queen Creek	Arizona	McQueen	1.00	6	6.00	1,190	4,100	1,190	4,100
Queen Creek	McQueen	Cooper	1.00	2	2.00	1,488	1,300	1,488	1,300
Queen Creek	Cooper	Gilbert	1.00	2	2.00	1,224	1,300	1,224	1,300
Queen Creek	Gilbert	Lindsay	1.00	6	6.00	1,275	4,100	1,275	4,100
Ocotillo	Dobson	Alma School	0.80	4	3.20	1,352	2,700	1,082	2,160
Ocotillo	Alma School	Arizona	1.40	4	5.60	1,352	2,700	1,893	3,780
Ocotillo	Arizona	McQueen	1.00	4	4.00	1,590	2,700	1,590	2,700
Ocotillo	McQueen	Cooper	1.00	4	4.00	1,428	2,700	1,428	2,700
Ocotillo	Cooper	Redwood	0.25	4	1.00	893	2,700	223	675
Ocotillo	Redwood	Gilbert	0.75	4	3.00	893	2,700	670	2,025
Ocotillo	Gilbert	Lindsay	1.00	2	2.00	510	1,300	510	1,300
Ocotillo	Lindsay	148th St.	0.50	2	1.00	510	1,300	255	650
Chandler Heights	Alma School	Arizona	1.00	4	4.00	1,037	2,700	1,037	2,700
Chandler Heights	Arizona	McQueen	1.00	2	2.00	969	1,300	969	1,300
Chandler Heights	McQueen	Cooper	1.00	2	2.00	867	1,300	867	1,300
Chandler Heights	Cooper	Gilbert	0.96	2	1.92	918	1,300	881	1,248
Chandler Heights	Gilbert	Lindsay	1.00	4	4.00	927	2,700	927	2,700
Chandler Heights	Lindsay	Val Vista	1.00	2	2.00	765	1,300	765	1,300

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Table 119. Existing Arterial Street Inventory (continued)

Street	From	To	Miles	Lns	Lane-Miles	Pk Hr Count	Capa-city	VMT	VMC
Riggs	Arizona	McQueen	1.00	6	6.00	2,023	4,100	2,023	4,100
Riggs	McQueen	Cooper	1.00	6	6.00	1,913	4,100	1,913	4,100
Riggs	Cooper	Gilbert	1.00	6	6.00	1,777	4,100	1,777	4,100
Riggs	Gilbert	Lindsay	1.00	6	6.00	1,785	4,100	1,785	4,100
Riggs	Lindsay	Val Vista	1.00	6	6.00	1,539	4,100	1,539	4,100
Total			81.90		376.66			134,837	255,472

Source: Street descriptions, miles, number of lanes and counts from City of Chandler Capital Projects Division, September 25, 2017; capacity is maximum hourly volumes at LOS D from Table 16; VMT is peak hour vehicle-miles of travel, which is product of segment miles and peak hour volume; VMC is vehicle-miles of capacity, which is product of miles and capacity.

Table 120. Buildout Arterial Street Inventory, Arterial Street Service Area

Street	From	To	Miles	Lns	Lane-Miles	Pk Hr Count	Capa-city	VMT	VMC
McClintock Rd	Frye	Loop 202	0.50	4	2.00	2,040	2,700	1,020	1,350
Price	Loop 202	Germann	1.15	6	6.90	4,590	4,100	5,279	4,715
Price	Germann	Queen Creek	1.00	6	6.00	4,080	4,100	4,080	4,100
Price	Queen Creek	Dobson	0.50	6	3.00	2,635	4,100	1,318	2,050
Dobson	Frye	Pecos	0.50	6	3.00	3,060	4,100	1,530	2,050
Dobson	Pecos	Germann	1.06	6	6.36	2,975	4,100	3,154	4,346
Dobson	Germann	Queen Creek	1.10	6	6.60	1,955	4,100	2,151	4,510
Dobson	Queen Creek	Price	0.42	4	1.68	1,615	2,700	678	1,134
Dobson	Price	Ocotillo	1.00	4	4.00	2,295	2,700	2,295	2,700
Dobson	Ocotillo	End	0.80	4	3.20	1,870	2,700	1,496	2,160
Alma School	Frye	Pecos	0.50	6	3.00	3,740	4,100	1,870	2,050
Alma School	Pecos	Loop 202	0.30	6	1.80	4,420	4,100	1,326	1,230
Alma School	Loop 202	Willis	0.25	6	1.50	4,590	4,100	1,148	1,025
Alma School	Willis	Germann	0.50	6	3.00	4,590	4,100	2,295	2,050
Alma School	Germann	Queen Creek	0.98	6	5.88	5,100	4,100	4,998	4,018
Alma School	Queen Creek	Ocotillo	1.12	6	6.72	2,890	4,100	3,237	4,592
Alma School	Ocotillo	Chandler Heights	1.13	4	4.52	2,040	2,700	2,305	3,051
Arizona	Pecos	Loop 202	0.30	6	1.80	2,975	4,100	893	1,230
Arizona	Loop 202	Germann	0.73	6	4.38	3,230	4,100	2,358	2,993
Arizona	Germann	Queen Creek	1.00	6	6.00	2,805	4,100	2,805	4,100
Arizona	Queen Creek	Ocotillo	1.00	6	6.00	2,465	4,100	2,465	4,100
Arizona	Ocotillo	Chandler Heights	1.00	6	6.00	1,785	4,100	1,785	4,100
Arizona	Chandler Heights	Riggs	1.00	4	4.00	1,700	2,700	1,700	2,700
Arizona	Riggs	Hunt Highway	1.00	4	4.00	1,700	2,700	1,700	2,700
McQueen	Ray	Chandler	1.00	6	6.00	3,570	4,100	3,570	4,100
McQueen	Chandler	Pecos	1.00	6	6.00	3,315	4,100	3,315	4,100
McQueen	Pecos	Loop 202	0.62	6	3.72	3,060	4,100	1,897	2,542
McQueen	Loop 202	Germann	0.40	6	2.40	3,230	4,100	1,292	1,640
McQueen	Germann	Queen Creek	1.00	6	6.00	3,485	4,100	3,485	4,100
McQueen	Queen Creek	Ocotillo	1.00	6	6.00	3,485	4,100	3,485	4,100
McQueen	Ocotillo	Chandler Heights	1.00	4	4.00	3,060	2,700	3,060	2,700
McQueen	Chandler Heights	Riggs	1.00	4	4.00	2,040	2,700	2,040	2,700
McQueen	Riggs	City Limit	0.75	4	3.00	765	2,700	574	2,025
Cooper	Ray	Chandler	1.00	6	6.00	2,720	4,100	2,720	4,100
Cooper	Chandler	Pecos	0.98	6	5.88	2,805	4,100	2,749	4,018
Cooper	Pecos	Loop 202	0.62	6	3.72	2,210	4,100	1,370	2,542
Cooper	Loop 202	Germann	0.40	6	2.40	3,825	4,100	1,530	1,640
Cooper	Queen Creek	Ocotillo	1.00	4	4.00	935	2,700	935	2,700
Cooper	Ocotillo	Chandler Heights	1.00	4	4.00	850	2,700	850	2,700
Cooper	Chandler Heights	Riggs	1.00	4	4.00	935	2,700	935	2,700
Cooper	Riggs	Hunt Highway	1.00	4	4.00	510	2,700	510	2,700
Gilbert	Pecos	Loop 202	0.60	6	3.60	3,570	4,100	2,142	2,460
Gilbert	Loop 202	Germann	0.40	6	2.40	4,590	4,100	1,836	1,640

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Table 120. Buildout Arterial Street Inventory (continued)

Street	From	To	Miles	Lns	Lane-Miles	Pk Hr Count	Capa-city	VMT	VMC
Gilbert	Germann	Queen Creek	1.00	6	6.00	5,015	4,100	5,015	4,100
Gilbert	Queen Creek	Ocotillo	1.00	6	6.00	3,400	4,100	3,400	4,100
Gilbert	Ocotillo	Chandler Heights	1.00	4	4.00	3,145	2,700	3,145	2,700
Gilbert	Chandler Heights	Riggs	1.00	4	4.00	2,210	2,700	2,210	2,700
Gilbert	Riggs	Hunt Highway	1.00	4	4.00	850	2,700	850	2,700
Lindsay	Ocotillo	Chandler Heights	1.00	4	4.00	850	2,700	850	2,700
Lindsay	Chandler Heights	Riggs	1.00	4	4.00	850	2,700	850	2,700
Lindsay	Riggs	Hunt Highway	1.00	4	4.00	765	2,700	765	2,700
Ray	McQueen	Cooper	1.00	6	6.00	2,975	4,100	2,975	4,100
Chandler	McQueen	Cooper	0.99	6	5.94	3,145	4,100	3,114	4,059
Chandler	Cooper	Gilbert	1.00	6	6.00	3,315	4,100	3,315	4,100
Pecos	Ellis	Dobson	0.50	4	2.00	1,615	2,700	808	1,350
Pecos	Dobson	Alma School	1.00	6	6.00	2,380	4,100	2,380	4,100
Pecos	Alma School	Arizona	1.00	6	6.00	2,210	4,100	2,210	4,100
Pecos	Arizona	McQueen	1.02	6	6.12	1,955	4,100	1,994	4,182
Pecos	McQueen	Cooper	1.00	6	6.00	2,635	4,100	2,635	4,100
Pecos	Cooper	Gilbert	1.00	6	6.00	2,635	4,100	2,635	4,100
Germann	City Limits	Price	0.25	4	1.00	1,700	2,700	425	675
Germann	Price	Dobson	0.75	4	3.00	1,700	2,700	1,275	2,025
Germann	Dobson	Alma School	1.00	6	6.00	2,550	4,100	2,550	4,100
Germann	Alma School	Arizona	1.00	6	6.00	2,550	4,100	2,550	4,100
Germann	Arizona	McQueen	1.00	6	6.00	1,700	4,100	1,700	4,100
Germann	McQueen	Cooper	1.00	6	6.00	2,125	4,100	2,125	4,100
Germann	Cooper	Gilbert	1.10	6	6.60	3,655	4,100	4,021	4,510
Queen Creek	City Limits	Price	0.27	6	1.62	1,785	4,100	482	1,107
Queen Creek	Price	Dobson	0.45	6	2.70	1,785	4,100	803	1,845
Queen Creek	Dobson	Alma School	1.30	6	7.80	2,295	4,100	2,984	5,330
Queen Creek	Alma School	Arizona	1.00	6	6.00	2,975	4,100	2,975	4,100
Queen Creek	Arizona	McQueen	1.00	6	6.00	2,720	4,100	2,720	4,100
Queen Creek	McQueen	Cooper	1.00	6	6.00	2,975	4,100	2,975	4,100
Queen Creek	Cooper	Gilbert	1.00	6	6.00	2,295	4,100	2,295	4,100
Queen Creek	Gilbert	Lindsay	1.00	6	6.00	2,890	4,100	2,890	4,100
Ocotillo	Dobson	Alma School	0.80	4	3.20	1,785	2,700	1,428	2,160
Ocotillo	Alma School	Arizona	1.40	4	5.60	1,700	2,700	2,380	3,780
Ocotillo	Arizona	McQueen	1.00	4	4.00	1,530	2,700	1,530	2,700
Ocotillo	McQueen	Cooper	1.00	4	4.00	1,785	2,700	1,785	2,700
Ocotillo	Cooper	Redwood	0.25	4	1.00	1,700	2,700	425	675
Ocotillo	Redwood	Gilbert	0.75	4	3.00	1,700	2,700	1,275	2,025
Ocotillo	Gilbert	Lindsay	1.00	4	4.00	1,700	2,700	1,700	2,700
Ocotillo	Lindsay	148th St.	0.50	4	2.00	1,700	2,700	850	1,350
Chandler Heights	Alma School	Arizona	1.00	4	4.00	1,275	2,700	1,275	2,700
Chandler Heights	Arizona	McQueen	1.00	4	4.00	1,955	2,700	1,955	2,700
Chandler Heights	McQueen	Cooper	1.00	4	4.00	2,550	2,700	2,550	2,700
Chandler Heights	Cooper	Gilbert	0.96	4	3.84	2,295	2,700	2,203	2,592
Chandler Heights	Gilbert	Lindsay	1.00	4	4.00	1,870	2,700	1,870	2,700
Chandler Heights	Lindsay	Val Vista	1.00	4	4.00	1,955	2,700	1,955	2,700

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Table 120. Buildout Arterial Street Inventory (continued)

Street	From	To	Miles	Lns	Lane-Miles	Pk Hr Count	Capa-city	VMT	VMC
Riggs	Arizona	McQueen	1.00	6	6.00	3,060	4,100	3,060	4,100
Riggs	McQueen	Cooper	1.00	6	6.00	3,060	4,100	3,060	4,100
Riggs	Cooper	Gilbert	1.00	6	6.00	3,060	4,100	3,060	4,100
Riggs	Gilbert	Lindsay	1.00	6	6.00	3,740	4,100	3,740	4,100
Riggs	Lindsay	Val Vista	1.00	6	6.00	3,995	4,100	3,995	4,100
Total			81.90		425.88			204,198	289,926

Source: Street descriptions, miles, number of lanes and projected volumes from City of Chandler Capital Projects Division, September 25, 2017; capacity is maximum hourly volumes at LOS D from Table 16; VMT is vehicle-miles of travel, which is the product of segment miles and peak hour volume; VMC is vehicle-miles of capacity, which is the product of miles and capacity.

APPENDIX B: EXISTING PARK INVENTORY

Table 121. Existing Park Inventory

Park Name	Park Type	Service Area	Total Acres Dev'd	Total Acres Undev.	Eligible Acres Dev'd	Eligible Acres Undev.	Eligible Dev'd Ac Nhood	Eligible Dev'd Ac Comm
Desert Breeze	Comm	NW	49.84	0.00	30.00	0.00	0.00	30.00
Harter	Nhood	NW	8.60	0.00	8.60	0.00	8.60	0.00
Mountain View	Nhood	NW	19.00	0.00	19.00	0.00	19.00	0.00
Nozomi Park	Comm	NW	20.00	0.00	20.00	0.00	0.00	20.00
Pine Shadows	Nhood	NW	5.42	0.00	5.42	0.00	5.42	0.00
Price	Nhood	NW	12.10	0.00	12.10	0.00	12.10	0.00
Pueblo Alto	Nhood	NW	0.25	0.00	0.25	0.00	0.25	0.00
Sundance	Nhood	NW	3.51	0.00	3.51	0.00	3.51	0.00
Sunset	Nhood	NW	5.06	0.00	5.06	0.00	5.06	0.00
Windmills West	Nhood	NW	6.50	0.00	6.50	0.00	6.50	0.00
Subtotal, Northwest			130.28	0.00	110.44	0.00	60.44	50.00
Amberwood	Nhood	NE	18.60	0.00	18.60	0.00	18.60	0.00
Apache	Nhood	NE	9.47	0.00	9.47	0.00	9.47	0.00
Arbuckle	Nhood	NE	9.51	0.00	9.51	0.00	9.51	0.00
Armstrong	Nhood	NE	3.21	0.00	3.21	0.00	3.21	0.00
Arrowhead Meadows	Comm	NE	30.81	0.00	30.00	0.00	0.00	30.00
Boys & Girls Club	Nhood	NE	2.18	0.00	2.18	0.00	2.18	0.00
Brooks Crossing	Nhood	NE	8.10	0.00	8.10	0.00	8.10	0.00
Desert Oasis Aquatic	Nhood	NE	0.72	0.00	0.72	0.00	0.72	0.00
East Mini	Nhood	NE	0.25	0.00	0.25	0.00	0.25	0.00
Espee	Comm	NE	33.00	0.00	30.00	0.00	0.00	30.00
Folley	Comm	NE	23.92	0.00	23.92	0.00	0.00	23.92
Gazelle Meadows	Nhood	NE	8.99	0.00	8.99	0.00	8.99	0.00
Harmony Hollow	Nhood	NE	6.92	0.00	6.92	0.00	6.92	0.00
Harris	Nhood	NE	0.81	0.00	0.81	0.00	0.81	0.00
Homestead N Park Site	Nhood	NE	0.00	7.60	0.00	7.60	0.00	0.00
Homestead S Park Site	Nhood	NE	0.00	4.85	0.00	4.85	0.00	0.00
Hoopes	Nhood	NE	12.80	0.00	12.80	0.00	12.80	0.00
Jackrabbit	Nhood	NE	4.57	0.00	4.57	0.00	4.57	0.00
Los Altos	Nhood	NE	0.75	0.00	0.75	0.00	0.75	0.00
Maggio Ranch	Nhood	NE	5.60	0.00	5.60	0.00	5.60	0.00
Navarrete	Nhood	NE	5.00	0.00	5.00	0.00	5.00	0.00
Park Manors	Nhood	NE	0.25	0.00	0.25	0.00	0.25	0.00
Pequeno	Nhood	NE	4.73	0.00	4.73	0.00	4.73	0.00
Pima	Comm	NE	31.75	0.00	30.00	0.00	0.00	30.00
Provinces	Nhood	NE	6.25	0.00	6.25	0.00	6.25	0.00
San Marcos	Nhood	NE	14.74	0.00	14.74	0.00	14.74	0.00
San Tan	Nhood	NE	14.74	0.00	14.74	0.00	14.74	0.00
Shawnee	Nhood	NE	17.51	0.00	17.51	0.00	17.51	0.00
Stonegate	Nhood	NE	8.37	0.00	8.37	0.00	8.37	0.00
Summit Point	Nhood	NE	0.29	0.00	0.29	0.00	0.29	0.00
Tibshraeny Family	Nhood	NE	13.00	0.00	13.00	0.00	13.00	0.00
Winn	Nhood	NE	1.00	0.00	1.00	0.00	1.00	0.00
Subtotal, Northeast			297.84	12.45	292.28	12.45	178.36	113.92

continued on next page

Table 121. Existing Park Inventory (continued)

Park Name	Park Type	Service Area	Total Acres		Eligible Acres		Eligible Dev'd Ac	
			Dev'd	Undev.	Dev'd	Undev.	Nhood	Comm
Blue Heron	Nhood	SE	3.91	0.00	3.91	0.00	3.91	0.00
Centennial	Nhood	SE	10.88	0.00	10.88	0.00	10.88	0.00
Chuckwalla	Nhood	SE	4.45	0.00	4.45	0.00	4.45	0.00
Chuparosa	Comm	SE	28.00	0.00	28.00	0.00	0.00	28.00
Citrus Vista	Nhood	SE	10.02	0.00	10.02	0.00	10.02	0.00
Crossbow Park	Nhood	SE	7.94	0.00	7.94	0.00	7.94	0.00
Dobson	Nhood	SE	12.44	0.00	12.44	0.00	12.44	0.00
Fox Crossing	Nhood	SE	4.95	0.00	4.95	0.00	4.95	0.00
La Paloma	Nhood	SE	13.07	0.00	13.07	0.00	13.07	0.00
Lantana Ranch Park Site	Comm	SE	0.00	52.77	0.00	30.00	0.00	0.00
Layton Lakes Park Site	Nhood	SE	0.00	7.11	0.00	7.11	0.00	0.00
Los Arboles	Nhood	SE	11.35	0.00	11.35	0.00	11.35	0.00
Mesquite Groves Park Site	Comm	SE	6.00	98.40	6.00	24.00	0.00	6.00
Pecos Ranch	Nhood	SE	10.23	0.00	10.23	0.00	10.23	0.00
Pinelake	Nhood	SE	5.21	0.00	5.21	0.00	5.21	0.00
Quail Haven	Nhood	SE	9.75	0.00	9.75	0.00	9.75	0.00
Roadrunner	Nhood	SE	10.97	0.00	10.97	0.00	10.97	0.00
Ryan	Nhood	SE	13.89	0.00	13.89	0.00	13.89	0.00
Snedigar Sportsplex	Comm	SE	90.83	0.00	30.00	0.00	0.00	30.00
Tumbleweed	Comm	SE	118.00	88.19	30.00	0.00	0.00	30.00
Valencia	Nhood	SE	9.34	0.00	9.34	0.00	0.00	9.34
Veterans Oasis	Comm	SE	113.00	0.00	30.00	0.00	0.00	30.00
Subtotal, Southeast			494.23	246.47	262.40	61.11	129.06	133.34
City-Wide Total			922.35	258.92	665.12	73.56	367.86	297.26

Source: City of Chandler Community Services Department, October 10, 2017.

APPENDIX C: FUNCTIONAL POPULATION

The two most common methodologies used in calculating public safety service units and impact fees are the "calls-for-service" approach and the "functional population" approach. This update continues to use the "functional population" approach to calculate and assess the fire and police system development fees. This approach is a generally-accepted methodology for these impact fee types and is based on the observation that demand for public safety facilities tends to be proportional to the presence of people at a particular site.

Functional population is analogous to the concept of "full-time equivalent" employees. It represents the number of "full-time equivalent" people present at the site of a land use, and it is used for the purpose of determining the impact of a particular development on the need for facilities. For residential development, functional population is simply average household size times the percent of time people spend at home. For nonresidential development, functional population is based on a formula that factors in trip generation rates, average vehicle occupancy, employee density and average number of hours spent by employees and visitors at a land use.

Residential Functional Population

Determining residential functional population multipliers is considerably simpler than the nonresidential component. It is estimated that people, on average, spend 16 hours, or 67 percent, of each 24-hour day at their place of residence and the other 33 percent away from home. The functional population per unit for residential uses is shown in Table 122.

Table 122. Functional Population per Unit for Residential Uses

Housing Type	Unit	Average HH Size	Occupancy Factor	Func. Pop. per Unit
Single-Family	Dwelling	2.98	0.67	2.00
Multi-Family	Dwelling	2.21	0.67	1.48

Source: Average household size from Table 9.

Nonresidential Functional Population

The functional population methodology for nonresidential land uses is based on trip generation data utilized in developing the transportation demand schedule prepared for the updated arterial street system development fees. Functional population per 1,000 square feet is derived by dividing the total number of hours spent by employees and visitors during a weekday by 24 hours. Employees are estimated to spend 8 hours per day at their place of employment, and visitors are estimated to spend one hour per visit. The formula used to derive the nonresidential functional population estimates is summarized in Figure 9 below.

Figure 9. Nonresidential Functional Population Formula

FUNCPOP/UNIT = (employee hours/1000 sf + visitor hours/1000 sf) ÷ 24 hours/day

Where:

Employee hours/1000 sf = employees/1000 sf x 8 hours/day

Visitor hours/1000 sf = visitors/1000 sf x 1 hour/visit

Visitors/1000 sf = weekday ADT/1000 sf x avg. vehicle occupancy – employees/1000 sf

Weekday ADT/1000 sf = one-way avg. daily trips (total trip ends ÷ 2)

Using this formula and information on trip generation rates, vehicle occupancy rates from the National Household Travel Survey and other sources and assumptions, nonresidential functional population estimates per 1,000 square feet of gross floor area are calculated in Table 123.

Table 123. Functional Population per Unit for Nonresidential Uses

Land Use	Unit	Trip Rate	Persons/ Trip	Employee/ Unit	Visitors/ Unit	Func. Pop./ Unit
Retail/Commercial	1,000 sq. ft.	18.87	1.91	1.90	34.14	2.06
Office	1,000 sq. ft.	4.87	1.84	4.88	4.08	1.80
Industrial/Warehouse	1,000 sq. ft.	1.28	1.27	0.91	0.72	0.33
Public/Institutional	1,000 sq. ft.	3.32	2.54	0.54	7.89	0.51

Source: Trip rates are one-half of daily trip ends on a weekday from Institute of Transportation Engineers, Trip Generation, 10th edition, 2017 (retail/commercial based on shopping center, office based on general office, industrial/warehouse based on average for industrial park and warehousing; public/institutional based on nursing home); persons/trip is average vehicle occupancy from Federal Highway Administration, *National Household Travel Survey*, 2017; employees/unit from Table 12; visitors/unit is trips times persons/trip minus employees/unit; functional population/unit calculated based on formula in Figure 9.

APPENDIX D: FINANCIAL DATA

This appendix provides financial data on the City's system development fees used in the fee calculations.

Table 124 shows current cash balances in the system development fee accounts as of June 30, 2017, accounts receivable, current obligations for the system development fund to repay outstanding debt/interfund loans, and encumbrances/carry-forward costs associated with construction projects underway. The "net balance" column represents the surplus or deficit of the current cash balance once current obligations are satisfied.

Table 124. System Development Fee Fund Balances and Obligations

	Fund Balance	Accounts Receivable	Debt/Inter-Fund Loans	Encumb./ Carry-Fwd	Net Balance
NW Parks	$1,725,789	$0	-$1,927,598	$0	-$201,809
NE Parks	$7,281,593	$0	-$6,504,981	$0	$776,612
SE Parks	$16,925,559	$0	-$4,977,419	-$1,333,413	$10,614,727
Subtotal, Parks	$25,932,941	$0	-$13,409,998	-$1,333,413	$11,189,530
Arterial Streets	$48,973,433	$0	-$40,570,432	-$9,397,718	-$994,717
Library	$846,711	$0	-$1,290,000	$0	-$443,289
Public Building	$93,694	$0	-$2,789,427	$0	-$2,695,733
Police	$1,317,946	$0	-$5,158,425	$0	-$3,840,479
Fire	$4,434,991	$0	-$7,123,657	-$48,741	-$2,737,407
Water	$30,139,936	$0	-$111,810,479	-$38,232,217	-$119,902,760
Water Resources	$619,747	$0	$0	-$488,534	$131,213
Reclaimed Water	$3,056,709	$0	-$25,255,543	-$7,969,649	-$30,168,483
Wastewater	$6,810,440	$7,700,000	-$148,124,609	-$14,566,110	-$148,180,279
Total	$122,226,548	$7,700,000	-$355,532,570	-$72,036,382	-$297,642,404

Notes: Data as of June 30, 2017; park fund balances include allocated share of fund balances in Neighborhood Parks and Parks funds based on service area for which they are programmed per Management Services Department, July 16, 2018 telephone conversation.
Source: Cash balances (includes unspent debt proceeds and unspent interfund loans), accounts receivable, and debt/interfund loans from City of Chandler Management Services Department, *Annual System Development Fee Report*, September 8, 2017; encumbrances/carry-forwards from Table 126.

Interfund loans to the system development fee accounts represent money advanced by the general fund, general obligation bond funds, or the water or wastewater operating or bond funds to advance-fund certain fee-eligible projects when sufficient system development fee funds had not been accumulated. These interfund loans need to be repaid with either current system development fee cash balances or future fee revenues. The cost to repay these loans is appropriately included in calculating the ten-year and buildout costs per service unit, because they are not included in calculating the existing level of service.

Table 125. System Development Fee Debt/Interfund Loans

Fund Recipient	Year	Loan From	Orig. Loan	Outstanding
Arterial Streets SDF Fund 415	FY 2006	General Fund	$7,870,000	$2,814,300
Arterial Streets SDF Fund 415	FY 2009	Gen. Fund-Bonds	$37,756,132	$37,756,132
Total, Arterial Streets SDF Fund				$40,570,432
Parks, Northwest	n/a	Gen. Fund-Bonds	n/a	$1,927,598
Parks, Northeast	n/a	Gen. Fund-Bonds	n/a	$6,504,981
Parks, Southeast	n/a	Gen. Fund-Bonds	n/a	$4,977,419
Parks SDF Fund 424*	FY 2007	Gen. Fund-Bonds	$17,865,000	$13,409,998
Library SDF Fund 431	FY 2011	Gen. Fund-Bonds	$1,290,000	$1,290,000
Public Building SDF Fund 440	FY 2010	General Fund	$4,204,427	$2,789,427
Fire SDF Fund 475	FY 2006/10	General Fund	$7,123,657	$7,123,657
Police SDF Fund 465	FY 2006/07	General Fund	$6,158,425	$5,158,425
Water SDF Fund 603	FY 2008	Water Operating	$15,929,877	$15,929,877
Water SDF Fund 603	FY 2007/09/14	Water Bonds	$95,880,602	$95,880,602
Total, Water SDF Fund				$111,810,479
Wastewater SDF Fund 614	FY 2003/04	Wastewater Oper.	$9,000,000	$7,200,000
Wastewater SDF Fund 614	FY 2009/14/16	Wastewater Bonds	$140,924,609	$140,924,609
Total, Wastewater SDF Fund				$148,124,609
Reclaimed Water SDF Fund 610	FY 2000	Water Operating	$6,500,000	$3,900,000
Reclaimed Water SDF Fund 610	FY 2007	Wastewater SDF	$7,700,000	$7,700,000
Reclaimed Water SDF Fund 610	FY 2009	Wastewater Bonds	$13,655,543	$13,655,543
Total, Reclaimed Water SDF Fund				$25,255,543

* this obligation was incurred when there was a city-wide park impact fee fund, and is allocated among the three service areas based on each area's share of buildout park EDUs from Table 31

Source: City of Chandler Management Services Department, *Annual System Development Fee Report*, September 8, 2017 and loan payment tracking spreadsheet, June 8, 2018 (data as of June 30, 2017).

In addition to debt/interfund loans, another future cost to be paid from system development fees are the costs of encumbrances and capital carry-forward balances, which represents unpaid costs of improvements currently underway for fee-eligible improvements. These costs, detailed for each fee fund in Table 126, are not included in the amounts programmed in the ten-year Capital Improvements Plan.

Table 126. Encumbrances and Carry-Forward Balances

Improvement Project	Encumbrances	Carry-Forwards	Total
Cooper - Queen Creek to Riggs	$72,139	$3,684,050	$3,756,189
McQueen Rd - Queen Creek to Riggs	$54,525	-$3	$54,522
Queen Creek - McQueen to Lindsay	$756,819	$581,613	$1,338,432
Chandler Hts - Arizona to McQueen	$10,899	$1,545,975	$1,556,874
Ocotillo Rd -Cooper to 148th St	$105,332	$2,586,369	$2,691,701
Total, Arterial Street	$999,714	$8,398,004	$9,397,718
Citrus Vista Park Site	$390	-$390	$0
Layton Lakes Park Site	$11,490	$1,321,923	$1,333,413
Total, Parks SE Service Area	$11,880	$1,321,533	$1,333,413
Southeast Fire Station	$27,817	$20,924	$48,741
Total, Fire	$27,817	$20,924	$48,741
Joint Water Treatment Plant	$33,167,622	$0	$33,167,622
Water Master Plan Update	$89,012	$0	$89,012
Well Construction	$951,536	$4,024,047	$4,975,583
Total, Water	$34,208,170	$4,024,047	$38,232,217
Ocotillo Water Reclamation Facility	$14,088,063	$0	$14,088,063
Wastewater Master Plan Update	$178,023	$0	$178,023
Water Reclamation Facility Expansion	$0	$300,024	$300,024
Total, Wastewater	$14,266,086	$300,024	$14,566,110
Effluent Reuse-Storage and Recovery Wells	$192,831	$7,113,416	$7,306,247
Effluent Reuse-Transmission Mains	$64,993	$598,409	$663,402
Total, Reclaimed Water	$257,824	$7,711,825	$7,969,649
Ocotillo Water Reclamation Facility Expansio	$488,534	$0	$488,534
Total, Water Resource	$488,534	$0	$488,534
Grand Total	$50,260,025	$21,776,357	$72,036,382

Source: City of Chandler Management Services Department, February 28, 2018.

The cost of studies to update the fees every five years, as required by SB 1525, is a cost that is attributable entirely to new development. The future update costs are based on the actual cost of the current update. Given SB 1525's requirement that the fees be updated at least every five years, a minimum of two updates will be required over the next ten years. While the timing of buildout is uncertain, it is likely to occur in the next 30 years, indicating a need for six update studies. The update study costs are summarized in Table 127.

Table 127. Update Study Costs

Fee Type	Current Study Cost	Cost of 2 Studies, 2018-2028	Cost of 6 Studies, 2018-Buildout
Arterial Streets	$16,475	$32,950	$98,850
Parks	$16,475	$32,950	$98,850
Fire	$16,475	$32,950	$98,850
Police	$16,475	$32,950	$98,850
Water/Water Resources	$32,950	$65,900	$197,700
Wastewater	$16,475	$32,950	$98,850
Reclaimed Water	$16,475	$32,950	$98,850
Total	$131,800	$263,600	$790,800

Source: Current study cost is consultant cost for this update, allocated evenly among fee types; cost of the two studies required over the next ten years is twice the study cost; cost of 6 studies needed 2018-buildout is six times study cost.

APPENDIX E: REVENUE FORECAST

SB 1525 requires that the infrastructure improvements plan include (Section 9-463.05.E.7):

> *A forecast of revenues generated by new service units other than development fees, which shall include estimated state-shared revenue, highway users revenue, federal revenue, ad valorem property taxes, construction contracting or similar excise taxes and the capital recovery portion of utility fees attributable to development based on the approved land use assumptions, and a plan to include these contributions in determining the extent of the burden imposed by the development as required in subsection B, paragraph 12 of this section.*

The maximum revenues from these sources that may be attributed to new development over the next ten years are summarized in Table 129 on the following page. In general, the forecasts are based on the total of new revenue projected to be received, some of which is growth-related and the remainder of which is due to inflation, increases from existing development or increases in cost recovery fees. However, with the City's practice of using ongoing revenues for ongoing expenditures, most of this revenue will be used for ongoing operations and maintenance purposes. None of the City's General Fund or Highway User Revenue Funds are used for growth-related capital improvements.

Only revenue generated by new development that is dedicated to growth-related capital improvements needs to be considered in determining the extent of the burden imposed by new development. As discussed in greater detail in the Legal Framework chapter, offsets against impact fees are warranted in the following cases: (1) new development will be paying taxes or fees used to retire debt on existing facilities serving existing development; (2) new development will be paying taxes or fees used to fund an existing deficiency, or (3) new development will be paying taxes or fees that are dedicated to be used for growth-related improvements.

In this study, offsets against the fees have been accounted for in the following manner:

(1) **Outstanding debt**. Only "eligible" debt for past capacity-expanding improvements that are currently authorized to be funded with impact fees needs to be considered. For all the facility types, the eligible debt is attributable to existing excess capacity available for future development. Consequently, the amount of outstanding eligible debt principal has been excluded from the calculation of the existing level of service, and has been included in the calculation of ten-year and buildout costs per service unit.

(2) **Existing deficiencies**. Impact fees are typically calculated based on a system-wide analysis. Consequently, existing deficiencies from an impact fee perspective are different from those that might be identified using a facility-specific standard. For example, road impact fees are typically based on ratio of capacity to demand in the major road system as a whole, rather than on levels of congestion on individual road segments. As long as a road fee is not based on the cost to ensure that every road segment functions at a desired level of service, individual road segments can be currently deficient with respect to that standard without constituting existing deficiencies from an impact fee perspective. In this study, the existing level of service is calculated as the replacement cost per service unit of existing, fully-paid for facilities serving existing development. The updated fees are, in every case, based on a cost per service unit that is equal to or lower than the existing level of service. Consequently, the requirement of

SB 1525 that fees be based on the existing level of service has been met, and there are no existing deficiencies that need to be addressed.

(3) **Dedicated future funding.** The only dedicated source of revenue for capital funding of growth-related capacity improvements that has been identified in this study is Federal/State and regional transportation funds that are programmed for capacity-expanding arterial street improvements in Chandler over the next ten years. This has been addressed by excluding that anticipated funding from the calculation of the cost per service unit on which the updated arterial street fees are based (see Arterial Streets chapter).

Table 128. Total Revenue Forecast, FY 2017-2026

Description	2016/2017	2017/2018	2018/2019	2019/2020	2020/2021
Construction Contracting TPT	$7,978,552	$8,257,168	$8,503,752	$8,674,496	$8,848,440
Other Transaction/Privilege Tax	$91,753,353	$94,957,432	$97,793,148	$99,756,704	$101,757,060
Franchise Fees	$3,065,000	$3,126,300	$3,189,000	$3,253,000	$3,318,300
State Shared Sales Tax	$20,500,000	$21,200,000	$21,630,000	$22,070,000	$22,520,000
Vehicle License Tax	$8,650,000	$8,910,000	$9,090,000	$9,280,000	$9,470,000
Urban Revenue Sharing	$27,270,000	$28,200,000	$29,050,000	$29,640,000	$30,240,000
Primary Property Tax	$7,406,520	$7,710,000	$8,020,000	$8,350,000	$8,690,000
Total	$166,623,425	$172,360,900	$177,275,900	$181,024,200	$184,843,800

Description	2021/2022	2022/2023	2023/2024	2024/2025	2025/2026	Total
Construction Contracting TPT	$9,025,664	$9,206,968	$9,391,472	$9,395,336	$9,399,280	$88,681,128
Other Transaction/Privilege Tax	$103,795,136	$105,880,132	$108,001,928	$108,046,364	$108,091,720	$1,019,832,977
Franchise Fees	$3,385,000	$3,452,900	$3,522,100	$3,592,800	$3,664,700	$33,569,100
State Shared Sales Tax	$23,200,000	$23,900,000	$24,620,000	$24,620,000	$24,620,000	$228,880,000
Vehicle License Tax	$9,760,000	$10,060,000	$10,370,000	$10,370,000	$10,370,000	$96,330,000
Urban Revenue Sharing	$31,150,000	$32,090,000	$33,060,000	$33,060,000	$33,060,000	$306,820,000
Primary Property Tax	$9,040,000	$9,410,000	$9,790,000	$9,790,000	$9,790,000	$87,996,520
Total	$189,355,800	$194,000,000	$198,755,500	$198,874,500	$198,995,700	$1,862,109,725

Source: City of Chandler Management Services Department, February 20, 2018.

Table 129. Revenue Attributable to New Development, FY 2017-2026

Description	Growth %	2016/2017	2017/2018	2018/2019	2019/2020	2020/2021
Construction Contracting TPT	50.0%	$3,989,276	$4,128,584	$4,251,876	$4,337,248	$4,424,220
Other Transaction/Privilege Tax	1.0%	$917,534	$949,574	$977,931	$997,567	$1,017,571
Franchise Fees	1.0%	$30,650	$31,263	$31,890	$32,530	$33,183
State Shared Sales Tax	1.0%	$205,000	$212,000	$216,300	$220,700	$225,200
Vehicle License Tax	1.0%	$86,500	$89,100	$90,900	$92,800	$94,700
Urban Revenue Sharing	1.0%	$272,700	$282,000	$290,500	$296,400	$302,400
Primary Property Tax	1.0%	$74,065	$77,100	$80,200	$83,500	$86,900
Total		$5,575,725	$5,769,621	$5,939,597	$6,060,745	$6,184,174

Description	2021/2022	2022/2023	2023/2024	2024/2025	2025/2026	Total
Construction Contracting TPT	$4,512,832	$4,603,484	$4,695,736	$4,697,668	$4,699,640	$44,340,564
Other Transaction Privilege Tax	$1,037,951	$1,058,801	$1,080,019	$1,080,464	$1,080,917	$10,198,329
Franchise Fees	$33,850	$34,529	$35,221	$35,928	$36,647	$335,691
State Shared Sales Tax	$232,000	$239,000	$246,200	$246,200	$246,200	$2,288,800
Vehicle License Tax	$97,600	$100,600	$103,700	$103,700	$103,700	$963,300
Urban Revenue Sharing	$311,500	$320,900	$330,600	$330,600	$330,600	$3,068,200
Primary Property Tax	$90,400	$94,100	$97,900	$97,900	$97,900	$879,965
Total	$6,316,133	$6,451,414	$6,589,376	$6,592,460	$6,595,604	$62,074,849

Source: Total revenue from Table 128 times growth percent; 50% of construction contracting TPT attributed to new development (rest is remodeling) per City, May 9, 2018; other revenues attributed to new development based on annual growth in public safety EDUs derived from Table 48.