Final
Infrastructure Improvements Plan and Development Fee Report

Prepared for:

Avondale, Arizona

January 7, 2019

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EXECUTIVE SUMMARY

The City of Avondale, Arizona, contracted with TischlerBise to document land use assumptions, prepare the Infrastructure Improvements Plan (hereinafter referred to as the "IIP"), and update development fees within the Avondale Service Area pursuant to Arizona Revised Statutes ("ARS") § 9-436.05 (hereafter referred to as the "Enabling Legislation"). Municipalities in Arizona may assess development fees to offset infrastructure costs to a municipality for necessary public services. The development fees must be based on an Infrastructure Improvements Plan and Land Use Assumptions. The IIP for each type of infrastructure is in the middle section of this document. The proposed development fees are displayed in the Development Fee Report in the next section.

Development fees are one-time payments used to construct system improvements needed to accommodate new development. The fee represents future development's proportionate share of infrastructure costs. Development fees may be used for infrastructure improvements or debt service for growth related infrastructure. In contrast to general taxes, development fees may not be used for operations, maintenance, replacement, or correcting existing deficiencies.

This update of Avondale's Infrastructure Improvements Plan and associated update to its development fees includes the following necessary public services:

1. Fire Facilities
2. Library Facilities
3. Parks and Recreational Facilities
4. Police Facilities
5. Street Facilities
6. Wastewater Facilities
7. Water Facilities

Avondale retired debt related to its Civic Center. Since that was the only component in the General Government Facilities development fee, TischlerBise excluded General Government Facilities from this update. This plan includes all necessary elements required to be in full compliance with SB 1525.

ARIZONA DEVELOPMENT FEE ENABLING LEGISLATION

The Enabling Legislation governs how development fees are calculated for municipalities in Arizona.

Necessary Public Services

Under the requirements of the Enabling Legislation, development fees may only be used for construction, acquisition or expansion of public facilities that are necessary public services. "Necessary public service" means any of the following categories of facilities that have a life expectancy of three or more years and that are owned and operated on behalf of the municipality: water, wastewater, storm water, library, street, fire, police, and neighborhood parks and recreational. Additionally, a necessary public service includes any facility that was financed before June 1, 2011 and that meets the following requirements:

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 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.

Infrastructure Improvements Plan

Development fees must be calculated pursuant to an IIP. For each necessary public service that is the subject of a development fee, by law, the IIP shall include the following seven elements:

1. A description of the existing necessary public services in the service area and the costs to update, improve, expand, correct or replace those necessary public services to meet existing needs and usage and stricter safety, efficiency, environmental or regulatory standards, which shall be prepared by qualified professionals licensed in this state, as applicable.
2. An analysis of the total capacity, the level of current usage and commitments for usage of capacity of the existing necessary public services, which shall be prepared by qualified professionals licensed in this state, as applicable.
3. A description of all or the parts of the necessary public services or facility expansions and their costs necessitated by and attributable to development in the service area based on the approved Land Use Assumptions, including a forecast of the costs of infrastructure, improvements, real property, financing, engineering and architectural services, which shall be prepared by qualified professionals licensed in this state, as applicable.
4. A table establishing the specific level or quantity of use, consumption, generation or discharge of a service unit for each category of necessary public services or facility expansions and an equivalency or conversion table establishing the ratio of a service unit to various types of land uses, including residential, commercial, and industrial.
5. The total number of projected service units necessitated by and attributable to new development in the service area based on the approved Land Use Assumptions and calculated pursuant to generally accepted engineering and planning criteria.
6. The projected demand for necessary public services or facility expansions required by new service units for a period not to exceed ten years.

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.

Qualified Professionals

The IIP must be developed by qualified professionals using generally accepted engineering and planning practices. A qualified professional is defined as "a professional engineer, surveyor, financial analyst or planner providing services within the scope of the person's license, education, or experience." TischlerBise is a fiscal, economic, and planning consulting firm specializing in the cost of growth services. Our services include development fees, fiscal impact analysis, infrastructure financing analyses, user fee/cost of service studies, capital improvement plans, and fiscal software. TischlerBise has prepared over 800 development fee studies over the past 30 years for local governments across the United States.

Conceptual Development Fee Calculation

In contrast to project-level improvements, development fees fund growth-related infrastructure that will benefit multiple development projects, or the entire service area (usually referred to as system improvements). The first step is to determine an appropriate demand indicator for the particular type of infrastructure. The demand indicator measures the number of service units for each unit of development. For example, an appropriate indicator of the demand for parks is population growth and the increase in population can be estimated from the average number of persons per housing unit. The second step in the development fee formula is to determine infrastructure improvement units per service unit, typically called level-of-service (LOS) standards. In keeping with the park example, a common LOS standard is improved park acres per thousand people. The third step in the development fee formula is the cost of various infrastructure units. To complete the park example, this part of the formula would establish a cost per acre for land acquisition and/ or park improvements.

Evaluation of Credits/Offsets

Regardless of the methodology, a consideration of credits/offsets is integral to the development of a legally defensible development fee. There are two types of credits/offsets that should be addressed in development fee studies and ordinances. The first is a revenue credit/offset due to possible double payment situations, which could occur when other revenues may contribute to the capital costs of infrastructure covered by the development fee. This type of credit/offset is integrated into the fee calculation, thus reducing the fee amount. The second is a site-specific credit or developer reimbursement for dedication of land or construction of system improvements. This type of credit is addressed in the administration and implementation of the development fee program. For ease of administration, TischlerBise normally recommends developer reimbursements for system improvements.

DEVELOPMENT FEE REPORT

METHODOLOGY

Development fees for the necessary public services made necessary by new development must be based on the same level of service ("LOS") provided to existing development in the service area. There are three basic methodologies used to calculate development fees. They examine the past, present, and future status of infrastructure. The objective of evaluating these different methodologies is to determine the best measure of the demand created by new development for additional infrastructure capacity. Each method has advantages and disadvantages in a particular situation and can be used simultaneously for different cost components.

Reduced to its simplest terms, the process of calculating development fees involves two main steps: (1) determining the cost of development-related capital improvements and (2) allocating those costs equitably to various types of development. In practice, though, the calculation of development fees can become quite complicated because of the many variables involved in defining the relationship between development and the need for facilities within the designated service area. The following paragraphs discuss basic methods for calculating development fees and how those methods can be applied.

- **Cost Recovery** (past improvements) - The rationale for recoupment, often called cost recovery, is that new development is paying for its share of the useful life and remaining capacity of facilities already built, or land already purchased, from which new growth will benefit. This methodology is often used for utility systems that must provide adequate capacity before new development can take place.
- **Incremental Expansion** (concurrent improvements) - The incremental expansion method documents current LOS standards for each type of public facility, using both quantitative and qualitative measures. This approach assumes there are no existing infrastructure deficiencies or surplus capacity in infrastructure. New development is only paying its proportionate share for growth-related infrastructure. Revenue will be used to expand or provide additional facilities, as needed, to accommodate new development. An incremental expansion cost method is best suited for public facilities that will be expanded in regular increments to keep pace with development.
- **Plan-Based** (future improvements) - The plan-based method allocates costs for a specified set of improvements to a specified amount of development. Improvements are typically identified in a long-range facility plan and development potential is identified by a land use plan. There are two basic options for determining the cost per demand unit: (1) total cost of a public facility can be divided by total demand units (average cost), or (2) the growth-share of the public facility cost can be divided by the net increase in demand units over the planning timeframe (marginal cost).

DEVELOPMENT FEE COMPONENTS

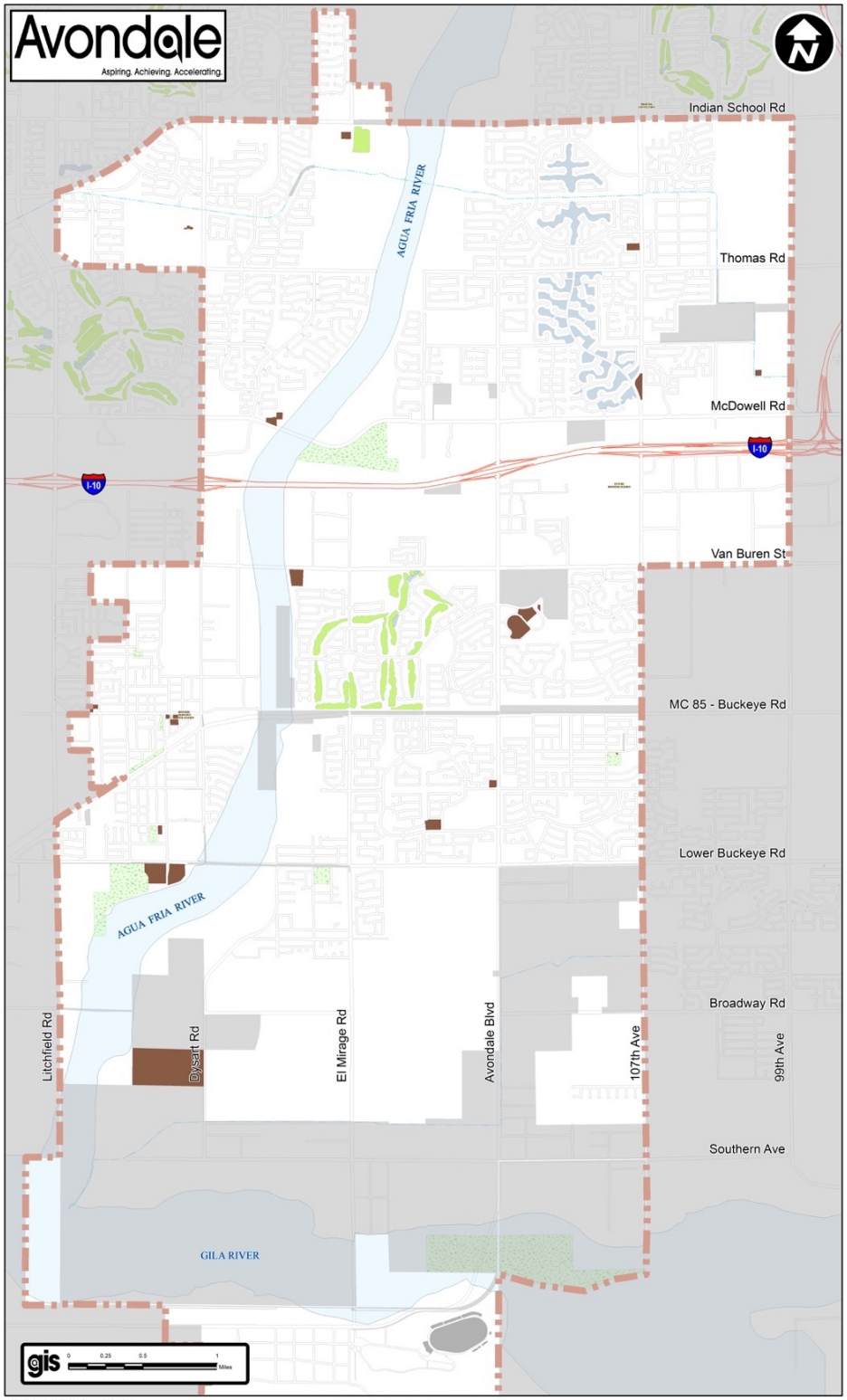
Figure 1 summarizes service areas, methodology, and infrastructure cost components for each development fee. Because Avondale plans to provide a uniform level of service for all types of infrastructure included in this infrastructure improvements plan, the service area for all fee components is the City of Avondale.

Figure 1: Proposed Development Fee Service Areas, Methods, and Cost Components

Facility Type	Service Area	Incremental Expansion	Plan-Based	Cost Recovery	Cost Allocation
Fire	Citywide	Stations, Apparatus and Equipment	Development Fee Study	N/A	Population, Nonres. Trips
Library	Citywide	N/A	Development Fee Study	Library Debt	Population, Jobs
Parks and Recreational	Citywide	Developed Park Land, Park Amenities	Development Fee Study	N/A	Population, Jobs
Police	Citywide	Stations, Vehicles and Equipment, Comm. Equipment	Property and Evidence Facility, Development Fee Study	N/A	Population, Nonres. Trips
Street	Citywide	Signalized Intersections	Arterial Improvements, Development Fee Study	N/A	VMT
Wastewater	Citywide	N/A	Development Fee Study	Treatment, Collection System	Gallons
Water	Citywide	N/A	Water Facilities, Water Recharge, Development Fee Study	Water Facilities	Gallons

SERVICE AREA

The map below illustrates the area within Avondale's service area.



AVONDALE PLANNING AREA

PROPOSED DEVELOPMENT FEES

Development fees for residential development will be assessed per dwelling unit, based on the type of unit. Nonresidential development fees will be assessed per square foot of floor area (non-utility) or per meter (utility). Fees shown below represent the maximum allowable fees – development fees fund 100 percent of growth-related infrastructure.

Avondale may adopt fees that are less than the amounts shown; however, a reduction in development fee revenue will necessitate an increase in other revenues, a decrease in planned capital improvements and/or a decrease in Avondale's LOS standards. All costs in the Development Fee Report are in current dollars with no assumed inflation rate over time. If cost estimates change significantly over time, development fees should be recalibrated.

Figure 2: Proposed Non-Utility Development Fees

Residential Development	Development Fees per Unit					
Development Type	Fire	Library	Parks and Recreational	Police	Street	Total
Single Unit	$775	$119	$1,497	$832	$3,171	$6,394
2+ Unit	$519	$80	$1,002	$557	$1,649	$3,807

Nonresidential Development	Development Fees per Square Foot					
Development Type	Fire	Library	Parks and Recreational	Police	Street	Total
Industrial	$0.05	$0.01	$0.08	$0.06	$0.25	$0.45
Commercial	$0.78	$0.09	$0.54	$0.83	$3.31	$5.55
Office / Institutional	$0.31	$0.11	$0.68	$0.32	$1.43	$2.85

Figure 3: Proposed Utility Development Fees

Residential Development	Development Fees per Unit		
Development Type	Wastewater	Water	Total
Residential	$5,808	$3,822	$9,630

Nonresidential Development	Development Fees per Meter		
Meter Size (inches)	Wastewater	Water	Total
0.75	$5,808	$3,822	$9,630
1.00	$9,700	$6,383	$16,083
1.50	$19,342	$12,728	$32,070
2.00	$30,959	$20,372	$51,331
3.00	$61,976	$40,782	$102,758
4.00	$96,826	$63,715	$160,541
6.00	$193,595	$127,392	$320,987

CURRENT DEVELOPMENT FEES

Avondale's current development fees are displayed below in Figure 4 and Figure 5.

Figure 4: Current Non-Utility Development Fees

Residential Development	Development Fees per Unit						
Unit Type	Fire	General Government	Library	Parks and Recreational	Police	Street	Total
Single Unit	$607	$357	$179	$796	$499	$2,945	$5,383
2+ Unit	$501	$295	$148	$658	$412	$2,058	$4,072

Nonresidential Development	Development Fees per Square Foot						
Land Use Type	Fire	General Government	Library	Parks and Recreational	Police	Street	Total
Industrial	$0.10	$0.06	$0.03	$0.13	$0.08	$1.00	$1.40
Commercial	$0.62	$0.37	$0.18	$0.82	$0.51	$3.66	$6.16
Office / Institutional	$0.18	$0.10	$0.05	$0.24	$0.15	$1.58	$2.30

Figure 5: Current Utility Development Fees

Residential Development	Development Fees per Unit		
Development Type	Wastewater	Water	Total
Residential	$7,673	$4,651	$12,324

Nonresidential Development	Development Fees per Meter		
Meter Size (inches)	Wastewater	Water	Total
0.75	$7,673	$4,651	$12,324
1.00	$12,814	$7,767	$20,581
1.50	$25,551	$15,488	$41,039
2.00	$40,898	$24,790	$65,688
3.00	$81,873	$49,627	$131,500
4.00	$127,812	$77,533	$205,345
6.00	$255,748	$155,021	$410,769

Difference Between Proposed and Current Development Fees

The differences between the proposed and current development fees are displayed below in Figure 6 and Figure 7.

Figure 6: Difference Between Proposed and Current Non-Utility Development Fees

Residential Development	Development Fees per Unit						
Unit Type	Fire	General Government	Library	Parks and Recreational	Police	Street	Total
Single Unit	$168	($357)	($60)	$701	$333	$226	$1,011
2+ Unit	$18	($295)	($68)	$344	$145	($409)	($265)

Nonresidential Development	Development Fees per Square Foot						
Land Use Type	Fire	General Government	Library	Parks and Recreational	Police	Street	Total
Industrial	($0.05)	($0.06)	($0.02)	($0.05)	($0.02)	($0.75)	($0.95)
Commercial	$0.16	($0.37)	($0.09)	($0.28)	$0.32	($0.35)	($0.61)
Office / Institutional	$0.13	($0.10)	$0.06	$0.44	$0.17	($0.15)	$0.55

Figure 7: Difference Between Proposed and Current Utility Development Fees

Residential Development	Development Fees per Unit		
Development Type	Wastewater	Water	Total
Residential	($1,865)	($829)	($2,694)

Nonresidential Development	Development Fees per Meter		
Meter Size (inches)	Wastewater	Water	Total
0.75	($1,865)	($829)	($2,694)
1.00	($3,114)	($1,384)	($4,498)
1.50	($6,209)	($2,760)	($8,969)
2.00	($9,939)	($4,418)	($14,357)
3.00	($19,897)	($8,845)	($28,742)
4.00	($30,986)	($13,818)	($44,804)
6.00	($62,153)	($27,629)	($89,782)

FIRE FACILITIES IIP

ARS § 9-463.05 (T)(7)(f) defines the facilities and assets that can be included in the Fire Facilities IIP:

> *"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 police and firefighters from more than one station or substation."*

The Fire Facilities IIP includes components for fire stations, apparatus and equipment, and the cost of preparing the Fire Facilities IIP and related Development Fee Report. The incremental expansion methodology, based on the current level of service, is used to calculate both the stations and the apparatus and equipment components of the Fire Facilities IIP and Development Fees. A plan-based methodology is used for the Development Fee Report.

Service Area

Avondale's Fire Department strives to provide a uniform response time citywide, and its fire stations operate as an integrated network. Depending on the number and type of calls, apparatus can be dispatched citywide from any of the stations. As a result, the service area for the Fire Facilities IIP is citywide.

Proportionate Share

ARS § 9-463.05 (B)(3) states that the development fee shall not exceed a proportionate share of the cost of necessary public services needed to accommodate new development. The Fire Facilities IIP and related Development Fee Report will allocate the cost of public services between residential and nonresidential based on functional population.

For certain infrastructure facilities TischlerBise often uses "functional population" to establish the relative demand for infrastructure from both residential and nonresidential development. As shown in Figure 8, functional population accounts for people living and working in a jurisdiction. Residents who do not work are assigned 20 hours per day to residential development and four hours per day to nonresidential development (annualized averages). Residents who work in Avondale are assigned 14 hours to residential development and 10 hours to nonresidential development. Residents who work outside Avondale are assigned 14 hours to residential development. Inflow commuters are assigned 10 hours to nonresidential development. Based on 2015 functional population data, the resulting proportionate share is 82 percent residential and 18 percent nonresidential.

Figure 8: Functional Population

	Demand Units in 2015		Demand Hours/Day	Person Hours	Proportionate Share
Residential					
Estimated Residents	80,329				
Residents Not Working	43,885		20	877,700	
Employed Residents	36,444				
Employed in Service Area		1,596	14	22,344	
Employed outside Service Area		34,848	14	487,872	
		Residential Subtotal		1,387,916	82%
Nonresidential					
Non-working Residents	43,885		4	175,540	
Jobs in Service Area	13,656				
Residents Employed in Service Area		1,596	10	15,960	
Non-Resident Workers (inflow Commuters)		12,060	10	120,600	
		Nonresidential Subtotal		312,100	18%
			TOTAL	1,700,016	100%

Source: Maricopa Association of Governments 2015 Population Estimate; U.S. Census Bureau, OnTheMap 6.1.1 Application, 2015.

RATIO OF SERVICE UNIT TO DEVELOPMENT UNIT

ARS § 9-463.05(E)(4) requires:

> *"A table establishing the specific level or quantity of use, consumption, generation or discharge of a service unit for each category of necessary public services or facility expansions and an equivalency or conversion table establishing the ratio of a service unit to various types of land uses, including residential, commercial and industrial."*

Figure 9 displays the demand indicators for residential and nonresidential land uses. For residential development the table displays the persons per housing unit. For nonresidential development the table displays the number of vehicle trips generated per thousand square feet of floor area.

Figure 9: Fire Facilities Ratio of Service Unit to Development Unit

Residential Development	per Unit
Development Type	Persons per Housing Unit[1]
Single Unit	3.18
2+ Unit	2.13

Nonresidential Development	per 1,000 Sq Ft
Development Type	Avg Wkdy Veh Trips[2]
Industrial	0.87
Commercial	12.46
Office / Institutional	4.87

1. See Land Use Assumptions
2. Average Weekday Vehicle Trip Ends X Trip Rate Adjustment.

Analysis of Capacity, Usage, and Costs of Existing Public Services

ARS § 9-463.05(E)(1) requires:

> *"A description of the existing necessary public services in the service area and the costs to upgrade, update, improve, expand, correct or replace those necessary public services to meet existing needs and usage and stricter safety, efficiency, environmental or regulatory standards, which shall be prepared by qualified professionals licensed in this state, as applicable."*

ARS § 9-463.05(E)(2) requires:

> *"An analysis of the total capacity, the level of current usage and commitments for usage of capacity of the existing necessary public services, which shall be prepared by qualified professionals licensed in this state, as applicable."*

Fire Stations – Incremental Expansion

The City of Avondale plans to expand its current inventory of fire stations. Shown below in Figure 10, Avondale's existing fire stations include 44,054 square feet.

Figure 10: Existing Fire Stations

Description	Square Feet
Fire Station 171	6,620
Fire Station 172	16,974
Fire Station 173	12,000
NW Public Safety Facility (Fire Share)	8,460
Total	44,054

Fire Stations Level of Service

To allocate the proportionate share of demand for fire stations to residential and nonresidential development, this analysis uses functional population. Avondale's existing level of service for residential development is 0.4263 square feet per person (44,054 square feet X 82 percent residential share / 84,736 persons). The nonresidential level of service is 0.1101 square feet per vehicle trip (44,054 square feet X 18 percent nonresidential share / 72,025 vehicle trips). Based on estimates for the planned Lakin Ranch Fire Station, the cost per square foot is $377 ($4.0 million / 10,600 square feet). The cost per person is $160.87 (0.4263 square feet per person X $377 per square foot) and the cost per vehicle trip is $41.55 (0.1101 square feet per vehicle trip X $377 per square foot).

Figure 11: Existing Level of Service

Cost Allocation Factors	
Cost per Square Foot	$377

Level-of-Service Standards	
Existing Square Feet	44,054
Residential	
Residential Share	82%
2018 Population	84,736
Square Feet per Person	0.4263
Cost per Person	**$160.87**
Nonresidential	
Nonresidential Share	18%
2018 Vehicle Trips	72,025
Square Feet per Vehicle Trip	0.1101
Cost per Vehicle Trip	**$41.55**

Planned Cost of Lakin Ranch Fire Station

Description	Square Feet	Cost per SF	Total Cost
Lakin Ranch Fire Station	10,600	$377	$4,000,000

Fire Apparatus and Equipment – Incremental Expansion

Development fees will be used to expand Avondale's inventory of fire apparatus and equipment. Figure 12 lists the current apparatus used by Avondale's Fire Department. The current inventory includes 129 units of apparatus and equipment with a total replacement cost of approximately $8.4 million. The replacement cost per unit is $65,178 ($8,408,000 / 129 units).

Figure 12: Existing Fire Apparatus and Equipment

Description	Number of Units	Cost per Unit	Replacement Cost
Engines	6	$500,000	$3,000,000
Light and Air Truck	1	$500,000	$500,000
Heavy Rescue	2	$700,000	$1,400,000
Ladder	1	$1,500,000	$1,500,000
Brush Truck	1	$350,000	$350,000
Command Vehicle	4	$70,000	$280,000
Sedan / SUV	10	$35,000	$350,000
Safety Trailer	1	$35,000	$35,000
Light Pickup Truck	2	$30,000	$60,000
Large Van	1	$70,000	$70,000
Medium Pickup Truck	2	$50,000	$100,000
Utility Van	1	$40,000	$40,000
Trailer / Light Tower	2	$10,000	$20,000
Trailer - Flatbed	1	$10,000	$10,000
ATV - EMS rescue	1	$12,000	$12,000
ATV - Brush Truck	1	$12,000	$12,000
Golf Carts	2	$10,000	$20,000
Portable Radios	64	$7,500	$480,000
Mobile Radios	26	$6,500	$169,000
Total	129	$65,178	$8,408,000

Fire Apparatus and Equipment Level of Service

As previously discussed, functional population is used to allocate the proportionate share of demand to residential and nonresidential development. Avondale's existing LOS for residential development is 0.00125 apparatus per person (129 apparatus X 82 percent residential share / 84,736 persons). The nonresidential level of service is 0.00032 apparatus per vehicle trip (129 apparatus X 18 percent nonresidential share / 72,025 vehicle trips). The cost per person is $81.36 (0.00125 units per person X $65,178 per unit) and the cost per vehicle trip is $21.01 (0.00032 units per vehicle trip X $65,178 per unit).

Figure 13: Existing Level of Service

Cost Allocation Factors	
Cost per Apparatus	$65,178

Level-of-Service Standards	
Existing Apparatus	129
Residential	
Residential Share	82%
2018 Population	84,736
Apparatus per Person	0.00125
Cost per Person	**$81.36**
Nonresidential	
Nonresidential Share	18%
2018 Vehicle Trips	72,025
Apparatus per Vehicle Trip	0.00032
Cost per Vehicle Trip	**$21.01**

IIP and Development Fee Report – Plan-Based

The cost to prepare the Fire Facilities IIP and development fees totals $14,323. Avondale plans to update its report every five years. Based on this cost, proportionate share, and five-year projections of new residential and nonresidential development from the *Land Use Assumptions* document, the cost is $1.49 per person and $0.29 per vehicle trip.

Figure 14: IIP and Development Fee Report

Necessary Public Service	Cost	Assessed Against	Proportionate Share	Demand Unit	2018	2023	Change	Cost per Demand Unit
Fire	$14,323	Residential	82%	Population	84,736	92,626	7,890	$1.49
		Nonresidential	18%	Vehicle Trips	72,025	81,026	9,001	$0.29
Library	$15,118	Residential	82%	Population	84,736	92,626	7,890	$1.57
		Nonresidential	18%	Jobs	17,086	19,298	2,212	$1.23
Parks and Recreational	$14,323	Residential	91%	Population	84,736	92,626	7,890	$1.65
		Nonresidential	9%	Jobs	17,086	19,298	2,212	$0.58
Police	$14,323	Residential	82%	Population	84,736	92,626	7,890	$1.49
		Nonresidential	18%	Vehicle Trips	72,025	81,026	9,001	$0.29
Street	$25,065	Residential	100%	VMT	498,794	545,990	47,196	$0.53
		Nonresidential						
Wastewater	$21,484	Residential	100%	Gallons	5,926,764	6,547,057	620,293	$0.03
		Nonresidential						
Water	$28,644	Residential	100%	Gallons	11,289,122	12,534,726	1,245,605	$0.02
		Nonresidential						
Total	$133,280							

Projected Service Units and Projected Demand for Services

ARS § 9-463.05(E)(5) requires:

> *"The total number of projected service units necessitated by and attributable to new development in the service area based on the approved land use assumptions and calculated pursuant to generally accepted engineering and planning criteria."*

The *Land Use Assumptions* document projects an additional 14,490 persons and 19,428 nonresidential trips over the next 10 years, as shown in Figure 15.

ARS § 9-463.05(E)(6) requires:

> *"The projected demand for necessary public services or facility expansions required by new service units for a period not to exceed ten years."*

Fire Stations

Shown in Figure 15, Avondale's population is projected to increase by 14,090 persons by 2028, and nonresidential vehicle trips are projected to increase by 19,428 during the same period. Using the 2018 LOS, future development will demand 8,316 additional square feet of fire stations. Based on the average cost of $377 per square foot, the growth-related expenditure on fire stations is $3.14 million (8,316 square feet X $377 per square foot).

Figure 15: Projected Demand for Fire Stations

Type of Infrastructure	Level of Service	Demand Unit	Cost per Sq. Ft.
Fire Stations	0.4263 Square Feet	per Person	$377
	0.1101 Square Feet	per Vehicle Trip	

Demand for Fire Stations					
Year	Population	Vehicle Trips	Residential	Nonresidential	Total Square Feet
2018	84,736	72,025	36,124	7,930	44,054
2019	86,392	73,721	36,830	8,116	44,947
2020	88,048	75,465	37,536	8,309	45,845
2021	89,704	77,262	38,242	8,506	46,749
2022	91,360	79,118	38,948	8,711	47,659
2023	92,626	81,026	39,488	8,921	48,409
2024	93,910	82,986	40,035	9,137	49,172
2025	95,212	85,011	40,590	9,359	49,950
2026	96,532	87,094	41,153	9,589	50,742
2027	97,870	89,241	41,724	9,825	51,549
2028	99,226	91,453	42,302	10,069	52,370
10-Yr Increase	14,490	19,428	6,177	2,139	8,316

Fire Apparatus and Equipment

Shown in Figure 16, population is projected to increase by 14,090 persons by 2028, and nonresidential vehicle trips are projected to increase by 9,163 during the same period. Using the 2018 LOS, future development will demand 24.4 additional units of apparatus and equipment. Based on the average cost of $65,178 per unit, the growth-related expenditure on apparatus and equipment is $1.59 million (24.4 units X $65,178).

Figure 16: Projected Demand for Apparatus and Equipment

Type of Infrastructure	Level of Service	Demand Unit	Cost per Unit
Apparatus and Equipment	0.00125 Units	per Person	$65,178
	0.00032 Units	per Vehicle Trip	

Need for Fire Apparatus and Equipment					
Year	Population	Vehicle Trips	Residential	Nonresidential	Total Units
2018	84,736	72,025	105.8	23.2	129.0
2019	86,392	73,721	107.9	23.8	131.6
2020	88,048	75,465	109.9	24.3	134.2
2021	89,704	77,262	112.0	24.9	136.9
2022	91,360	79,118	114.1	25.5	139.6
2023	92,626	81,026	115.6	26.1	141.8
2024	93,910	82,986	117.2	26.8	144.0
2025	95,212	85,011	118.9	27.4	146.3
2026	96,532	87,094	120.5	28.1	148.6
2027	97,870	89,241	122.2	28.8	151.0
2028	99,226	91,453	123.9	29.5	153.4
10-Yr Increase	14,490	19,428	18.1	6.3	24.4

Growth-Related Expenditures	$1,178,906	$408,182	$1,587,088

FIRE FACILITIES DEVELOPMENT FEES

Revenue Credit/Offset

A revenue credit/offset is not necessary for Fire Facilities development fees, because costs generated by projected development exceed revenues generated by projected development. Appendix A contains the forecast of revenues required by Arizona's Enabling Legislation (ARS § 9-463.05(E)(7)).

Proposed Fire Facilities Development Fees

Infrastructure components and cost factors for Fire Facilities are summarized in the upper portion of Figure 17. The cost per service unit is $243.72 per person and $62.85 per vehicle trip. Figure 17 displays the ratio of a service unit to various types of land uses for residential and nonresidential development.

Fire Facilities development fees for residential development are assessed according to the number of persons per housing unit. The single-family fee of $775 is calculated using a cost per service unit of $243.72 per person multiplied by a demand unit of 3.18 persons per housing unit.

Nonresidential development fees are calculated using vehicle trips as the service unit. The fee of $0.78 per square foot of commercial development is derived from a cost per service unit of $62.85 per vehicle trip multiplied by a demand unit of 37.75 average weekday vehicle trip ends per 1,000 square feet, multiplied by a trip rate adjustment factor of 33 percent, divided by 1,000 square feet.

Figure 17: Schedule of Fire Development Fees

Fee Component	Cost per Person	Cost per Vehicle Trip
Fire Stations	$160.87	$41.55
Apparatus and Equipment	$81.36	$21.01
Development Fee Report	$1.49	$0.29
Total	$243.72	$62.85

Residential Development	Development Fees per Unit			
Development Type	Persons per Housing Unit[1]	Proposed Fees	Current Fees	Increase / Decrease
Single Unit	3.18	**$775**	$607	$168
2+ Unit	2.13	**$519**	$501	$18

Nonresidential Development	Development Fees per Square Foot				
Development Type	Avg Wkdy Veh Trip Ends[1]	Trip Rate Adjustment	Proposed Fees	Current Fees	Increase / Decrease
Industrial	1.74	50%	**$0.05**	$0.10	($0.05)
Commercial	37.75	33%	**$0.78**	$0.62	$0.16
Office / Institutional	9.74	50%	**$0.31**	$0.18	$0.13

1. See Land Use Assumptions

PROJECTED FIRE FACILITIES DEVELOPMENT FEE REVENUE

Appendix A contains the forecast of revenues required by Arizona's Enabling Legislation (ARS § 9-463.05(E)(7)).

Projected Fire Facilities Development Fee Revenue

Projected fee revenue shown in Figure 18 is based on the development projections in the *Land Use Assumptions* document and the updated Fire Facilities development fees. If development occurs faster than projected, the demand for infrastructure will increase along with development fee revenue. If development occurs slower than projected, the demand for infrastructure will decrease and development fee revenue will decrease at a similar rate. Anticipated development fee revenue of approximately $4.74 million over the next 10 years is approximately equal to the projected growth-related cost of fire infrastructure ($4.74 million).

Figure 18: Projected Fire Facilities Development Fee Revenue

Fee Component	Growth Share	Existing Share	Total
Fire Stations	$3,138,239	$0	$3,138,239
Apparatus and Equipment	$1,587,088	$0	$1,587,088
Development Fee Report	$14,323	$0	$14,323
Total	$4,739,650	$0	$4,739,650

Year		Single Unit $775 per unit	2+ Unit $519 per unit	Industrial $0.05 per sq. ft.	Commercial $0.78 per sq. ft.	Office / Inst $0.31 per sq. ft.
		Hsg Unit	Hsg Unit	KSF	KSF	KSF
Base	2018	23,423	5,816	2,739	3,987	4,103
Year 1	2019	23,783	6,056	2,800	4,101	4,146
Year 2	2020	24,143	6,296	2,864	4,220	4,190
Year 3	2021	24,503	6,536	2,930	4,342	4,235
Year 4	2022	24,863	6,776	2,997	4,468	4,281
Year 5	2023	25,209	6,854	3,064	4,599	4,327
Year 6	2024	25,559	6,934	3,134	4,733	4,375
Year 7	2025	25,914	7,015	3,206	4,871	4,422
Year 8	2026	26,275	7,096	3,279	5,014	4,471
Year 9	2027	26,640	7,179	3,354	5,162	4,521
Year 10	2028	27,010	7,263	3,432	5,315	4,571
10-Year Increase		3,587	1,447	694	1,328	468
Projected Revenue		$2,771,272	$750,025	$37,832	$1,037,152	$143,033

Projected Fee Revenue	**$4,739,314**
Total Expenditures	**$4,739,650**

LIBRARY FACILITIES IIP

ARS § 9-463.05 (T)(7)(d) defines the facilities and assets that can be included in the Library Facilities IIP:

> *"library facilities of up to ten thousand square feet that provide a direct benefit to development, not including equipment, vehicles or appurtenances."*

The Library Facilities IIP includes components for facilities and the cost of preparing the Library Facilities IIP and Development Fees. The cost recovery method is used to repay debt issued to build Avondale's library, and a plan-based methodology is used for the Development Fee Report.

Service Area

Avondale provides a uniform level of service and equal access to library facilities within the city limits. As a result, the service area for the Library Facilities IIP is citywide.

Proportionate Share

ARS § 9-463.05 (B)(3) states that the development fee shall not exceed a proportionate share of the cost of necessary public services needed to accommodate new development. The Library Facilities IIP and development fees will allocate the cost of public services between residential and nonresidential based on functional population. As previously shown in Figure 8, residential development generates 82 percent of demand and nonresidential development generates the remaining 18 percent of demand.

Ratio of Service Unit to Development Unit

ARS § 9-463.05(E)(4) requires:

> *"A table establishing the specific level or quantity of use, consumption, generation or discharge of a service unit for each category of necessary public services or facility expansions and an equivalency or conversion table establishing the ratio of a service unit to various types of land uses, including residential, commercial and industrial."*

Figure 19 displays the demand indicators for residential and nonresidential land uses. For residential development the table displays the persons per housing unit. For nonresidential development the table displays the number of employees per thousand square feet of floor area.

Figure 19: Library Facilities Ratio of Service Unit to Development Unit

Residential Development	per Unit
Development Type	Persons per Housing Unit[1]
Single Unit	3.18
2+ Unit	2.13

Nonresidential Development	per 1,000 Sq Ft
Development Type	Jobs per 1,000 Sq Ft[1]
Industrial	0.34
Commercial	2.34
Office / Institutional	2.97

1. See Land Use Assumptions

Analysis of Capacity, Usage, and Costs of Existing Public Services

ARS § 9-463.05(E)(1) requires:

> *"A description of the existing necessary public services in the service area and the costs to upgrade, update, improve, expand, correct or replace those necessary public services to meet existing needs and usage and stricter safety, efficiency, environmental or regulatory standards, which shall be prepared by qualified professionals licensed in this state, as applicable."*

ARS § 9-463.05(E)(2) requires:

> *"An analysis of the total capacity, the level of current usage and commitments for usage of capacity of the existing necessary public services, which shall be prepared by qualified professionals licensed in this state, as applicable."*

Library Facilities – Cost Recovery

The City of Avondale has two libraries with a combined floor area of 43,200 square feet. Civic Center Library has excess capacity to serve future development through 2027, and Avondale plans to recover future development's share of debt issued in 2006 to construct the library.

Figure 20: Existing Libraries

Description	Square Feet
Civic Center Library	30,500
Sam Garcia Library	12,700
Total	43,200

Level of Service

Avondale plans to retire the Civic Center Library debt in 2027. This library is projected to serve both existing and future development; therefore, costs are allocated to total projected residential and nonresidential development in 2027. Avondale's population in 2027 is projected to be 97,870 persons of whom 84,736 are from existing development with the remaining 13,134 persons coming from future development. Total employment in 2027 is projected to be 21,292 jobs. Existing employment is estimated to equal 17,086, and the projected employment increase equals 4,206 jobs from future development. Based on total debt of $4.3 million, the cost per person is $36.00 ($4,296,721 X 82 percent residential share / 97,870 population) and the cost per job is $36.32 ($4,296,721 X 18 percent nonresidential share / 21,292 jobs).

Figure 21: Planned Level of Service

Facility	Total Debt	Year of Final Debt Payment	Type of Development	Demand Unit	Proportionate Share	2027 Development
Civic Center Library	$4,296,721	2027	Residential	person	82%	97,870
			Nonresidential	job	18%	21,292

Cost per Person	**$36.00**
Cost per Job	**$36.32**

Development Fee Report – Plan-Based

The cost to prepare the Library Facilities IIP and related Development Fee Report totals $15,118. Avondale plans to update its report every five years. Based on this cost, proportionate share, and five-year projections of new development from the *Land Use Assumptions* document, the cost per person is $1.57 and the cost per job is $1.23.

Figure 22: IIP and Development Fee Report

Necessary Public Service	Cost	Assessed Against	Proportionate Share	Demand Unit	2018	2023	Change	Cost per Demand Unit
Fire	$14,323	Residential	82%	Population	84,736	92,626	7,890	$1.49
		Nonresidential	18%	Vehicle Trips	72,025	81,026	9,001	$0.29
Library	$15,118	Residential	82%	Population	84,736	92,626	7,890	$1.57
		Nonresidential	18%	Jobs	17,086	19,298	2,212	$1.23
Parks and Recreational	$14,323	Residential	91%	Population	84,736	92,626	7,890	$1.65
		Nonresidential	9%	Jobs	17,086	19,298	2,212	$0.58
Police	$14,323	Residential	82%	Population	84,736	92,626	7,890	$1.49
		Nonresidential	18%	Vehicle Trips	72,025	81,026	9,001	$0.29
Street	$25,065	Residential						
		Nonresidential	100%	VMT	498,794	545,990	47,196	$0.53
Wastewater	$21,484	Residential						
		Nonresidential	100%	Gallons	5,926,764	6,547,057	620,293	$0.03
Water	$28,644	Residential						
		Nonresidential	100%	Gallons	11,289,122	12,534,726	1,245,605	$0.02
Total	$133,280							

Projected Demand for Services and Costs

ARS § 9-463.05(E)(5) requires:

> *"The total number of projected service units necessitated by and attributable to new development in the service area based on the approved land use assumptions and calculated pursuant to generally accepted engineering and planning criteria."*

As shown in the *Land Use Assumptions* document, population is expected to increase by an additional 13,134 persons and employment is expected to increase by 4,206 jobs over the next nine years.

ARS § 9-463.05(E)(6) requires:

> *"The projected demand for necessary public services or facility expansions required by new service units for a period not to exceed ten years."*

LIBRARY FACILITIES DEVELOPMENT FEES

Revenue Credit/Offset

A revenue credit/offset is not necessary for Library Facilities development fees, because costs generated by projected development exceed revenues generated by projected development. Appendix A contains the forecast of revenues required by Arizona's Enabling Legislation (ARS § 9-463.05(E)(7)).

Projected Library Facilities Development Fees

Infrastructure components and cost factors for Library Facilities are summarized in the upper portion of Figure 23. The cost per service unit for Library Facilities is $37.57 per person and $37.55 per job. Figure 23 displays the ratio of a service unit to various types of land uses for residential and nonresidential development.

Library Facilities development fees for residential development are assessed according to the number of persons per housing unit. The single-family fee of $119 is calculated using a cost per service unit of $37.57 per person multiplied by a demand unit of 3.18 persons per housing unit.

Nonresidential development fees are calculated using jobs as the service unit. The fee of $0.09 per square foot of commercial development is derived from a cost per service unit of $37.55 per job multiplied by a demand unit of 2.34 jobs per 1,000 square feet, divided by 1,000 square feet.

Figure 23: Schedule of Library Facilities Development Fees

Fee Component	Cost per Person	Cost per Job
Library Debt	$36.00	$36.32
Development Fee Report	$1.57	$1.23
Total	$37.57	$37.55

Residential Development	Development Fees per Unit			
Development Type	Persons per Housing Unit[1]	Proposed Fees	Current Fees	Increase / Decrease
Single Unit	3.18	**$119**	$179	($60)
2+ Unit	2.13	**$80**	$148	($68)

Nonresidential Development	Development Fees per Square Foot			
Development Type	Jobs per 1,000 Sq Ft[1]	Proposed Fees	Current Fees	Increase / Decrease
Industrial	0.34	**$0.01**	$0.03	($0.02)
Commercial	2.34	**$0.09**	$0.18	($0.09)
Office / Institutional	2.97	**$0.11**	$0.05	$0.06

1. See Land Use Assumptions

PROJECTED LIBRARY FACILITIES DEVELOPMENT FEE REVENUE

Appendix A contains the forecast of revenues required by Arizona's enabling legislation (ARS § 9-463.05(E)(7)).

In accordance with state law, this report includes an IIP for Library Facilities needed to accommodate new development. Projected fee revenue shown in Figure 24 is based on the development projections in the *Land Use Assumptions* document and the updated development fees for Library Facilities. If development occurs at a more rapid rate than projected, the demand for infrastructure will increase and development fee revenue will increase at a corresponding rate. If development occurs at a slower rate than is projected, the demand for infrastructure will also decrease, along with development fee revenue. Anticipated development fee revenue of $640,703 is approximately equal to the projected growth-related cost of library facilities ($640,704). Existing development's share of $3.67 million will need to be funded with other sources of revenue.

Figure 24: Projected Library Facilities Development Fee Revenue

Fee Component	Growth Share	Existing Share	Total
Library Debt	$625,586	$3,671,135	$4,296,721
Development Fee Report	$15,118	$0	$15,118
Total	$640,704	$3,671,135	$4,311,839

Year		Single Unit $119 per unit	2+ Unit $80 per unit	Industrial $0.01 per sq. ft.	Commercial $0.09 per sq. ft.	Office / Inst $0.11 per sq. ft.
		Hsg Unit	Hsg Unit	KSF	KSF	KSF
Base	2018	23,423	5,816	2,739	3,987	4,103
Year 1	2019	23,783	6,056	2,800	4,101	4,146
Year 2	2020	24,143	6,296	2,864	4,220	4,190
Year 3	2021	24,503	6,536	2,930	4,342	4,235
Year 4	2022	24,863	6,776	2,997	4,468	4,281
Year 5	2023	25,209	6,854	3,064	4,599	4,327
Year 6	2024	25,559	6,934	3,134	4,733	4,375
Year 7	2025	25,914	7,015	3,206	4,871	4,422
Year 8	2026	26,275	7,096	3,279	5,014	4,471
Year 9	2027	26,640	7,179	3,354	5,162	4,521
9-Year Increase		3,217	1,363	615	1,176	418
Projected Revenue		$377,163	$107,973	$7,837	$101,810	$45,921

Projected Fee Revenue	**$640,703**
Total Expenditures	**$4,311,839**
Existing Development Share	**$3,671,137**

PARKS AND RECREATIONAL FACILITIES IIP

ARS § 9-463.05 (T)(7)(g) defines the facilities and assets that can be included in the Parks and Recreational Facilities IIP:

> *"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."*

The Parks and Recreational Facilities IIP includes components for land, amenities, and the cost of preparing the Parks and Recreational Facilities IIP and related Development Fee Report. The incremental expansion methodology, based on the current level of service, is used to calculate the land and amenity components. A plan-based methodology is used for the development fee study.

Service Area

Avondale plans to provide a uniform level of service and equal access to parks and recreational facilities within the city limits. The parks and recreation programs are structured and provided to make full use of Avondale's total inventory of facilities. As a result, the service area for the Parks and Recreational Facilities IIP is citywide.

Proportionate Share

ARS § 9-463.05 (B)(3) states that the development fee shall not exceed a proportionate share of the cost of necessary public services needed to accommodate new development. The Parks and Recreational Facilities IIP and development fees will allocate the cost of public services between residential and nonresidential based on daytime population. According to the U.S. Census Bureau's OnTheMap web application, there were 12,060 inflow commuters traveling to Avondale for work in 2015. The proportionate share is based on cumulative impact days per year with residents potentially impacting parks and recreational facilities 365 days per year. Inflow commuters potentially impact park and recreational facilities 250 days per year, assuming 5 workdays per week multiplied by 50 weeks per year. For parks and recreational facilities, residential development generates 91 percent of demand and nonresidential development generates the remaining nine percent of demand.

Figure 25: Daytime Population

		Cumulative Impact Days per Year			Cost Allocation for Parks	
Residents	Inflow Commuters	Residential[1]	Nonresidential[2]	Total	Residential	Nonresidential
80,329	12,060	29,320,085	3,015,000	32,335,085	91%	9%

1. Days per Year = 365

2. Days per Year = 250 (5 Days per Week x 50 Weeks per Year)

Source: Arizona Department of Administration 2014 Population Estimate; U.S. Census Bureau, OnTheMap 6.1.1 Application, 2015.

Ratio of Service Unit to Development Unit

ARS § 9-463.05(E)(4) requires:

> *"A table establishing the specific level or quantity of use, consumption, generation or discharge of a service unit for each category of necessary public services or facility expansions and an equivalency or conversion table establishing the ratio of a service unit to various types of land uses, including residential, commercial and industrial."*

Figure 26 displays the demand indicators for residential and nonresidential land uses. For residential development the table displays the persons per housing unit. For nonresidential development the table displays the number of employees per thousand square feet of floor area.

Figure 26: Parks and Recreational Facilities Ratio of Service Unit to Development Unit

Residential Development	per Unit
Development Type	Persons per Housing Unit[1]
Single Unit	3.18
2+ Unit	2.13

Nonresidential Development	per 1,000 Sq Ft
Development Type	Jobs per 1,000 Sq Ft[1]
Industrial	0.34
Commercial	2.34
Office / Institutional	2.97

1. See Land Use Assumptions

Analysis of Capacity, Usage, and Costs of Existing Public Services

ARS § 9-463.05(E)(1) requires:

> *"A description of the existing necessary public services in the service area and the costs to upgrade, update, improve, expand, correct or replace those necessary public services to meet existing needs and usage and stricter safety, efficiency, environmental or regulatory standards, which shall be prepared by qualified professionals licensed in this state, as applicable."*

ARS § 9-463.05(E)(2) requires:

> *"An analysis of the total capacity, the level of current usage and commitments for usage of capacity of the existing necessary public services, which shall be prepared by qualified professionals licensed in this state, as applicable."*

Developed Park Land – Incremental Expansion

Avondale plans to develop a 30-acre park at Lakin Ranch over the next 10 years. Shown below in Figure 27, Avondale's existing parks include 85.1 acres of developed land. The definition of necessary public services for parks and recreational facilities includes parks or facilities on real property up to 30 acres in area, or parks and facilities larger than 30 acres if the facilities provide a direct benefit to the development. Two of Avondale's parks, Friendship Community Park and Festival Fields, are larger than 30 acres, however, the LOS analysis uses only 30 acres for both parks.

Figure 27: Existing Developed Park Land

Description	Developed Acres
Fred Campbell Neighborhood Park	1.5
Dennis DeConcini Neighborhood Park	2.0
Las Ligas Neighborhood Park	8.1
Mountain View Neighborhood Park	3.6
Dessie Lorenz Neighborhood Park	4.6
Donnie Hale Neighborhood Park	5.3
Friendship Community Park	30.0
Festival Fields	30.0
Total	85.1

Developed Park Land Level of Service

To allocate the proportionate share of demand for developed park land to residential and nonresidential development, this analysis uses daytime population shown in Figure 25. Avondale's existing LOS for residential development is approximately 0.00091 developed acres per person (85.1 acres X 91 percent residential share / 84,736 persons). For nonresidential development, the existing LOS is approximately 0.00045 developed acres per job (85.1 acres X 9 percent nonresidential share / 17,086 jobs).

The cost to develop an acre of park land is $175,000 and includes two components: infrastructure improvements and site improvements. Infrastructure improvements include earthwork, utilities, drainage, electrical distribution, and irrigation and cost $125,000 per acre. Site improvements include area lighting, lighted walking paths, and furnishings (benches, trash receptacles, drinking fountains, pet waste dispensers, signage, etc.) at a cost of $50,000 per acre. Avondale plans to use land donated by developers, so the cost per acre does not include the cost to acquire land.

The cost per person for developed park land is $159.93 (0.00091 developed acres per person X $175,000 per developed acre) and the cost per job is $78.45 (0.00045 developed acres per job X $175,000 per developed acre).

Figure 28: Existing Level of Service

Cost Allocation Factors	
Cost per Acre - Infrastructure[1]	$125,000
Cost per Acre - Site Improvements[1]	$50,000
Developed Cost per Acre	$175,000

Level-of-Service Standards	
Existing Developed Acres	85.1
Residential	
Residential Share	91%
2018 Population	84,736
Developed Acres per Person	0.00091
Cost per Person	**$159.93**
Nonresidential	
Nonresidential Share	9%
2018 Jobs	17,086
Developed Acres per Job	0.00045
Cost per Job	**$78.45**

1. Parks and Recreation Department, City of Avondale.

Park Amenities – Incremental Expansion

Avondale will use development fees to expand its inventory of park amenities. The current inventory of park amenities, shown below in Figure 29, includes 83 amenities with a total replacement cost of $28.78 million—approximately $346,729 per amenity.

Figure 29: Existing Park Amenities

Description	Units	Unit Cost	Replacement Cost
Softball Field - Adult	8	$825,000	$6,600,000
Softball Field - Youth	3	$625,000	$1,875,000
Soccer Field	11	$530,000	$5,830,000
Multi-Use Field	2	$475,000	$950,000
Tennis Court	2	$108,000	$216,000
Basketball Court	9	$120,000	$1,080,000
Volleyball Court	1	$24,000	$24,000
Playground (2 - 5 years old)	3	$125,000	$375,000
Playground (5 - 12 years old)	8	$230,000	$1,840,000
Ramada	19	$84,000	$1,596,000
Restroom	6	$420,000	$2,520,000
Parking Lots	8	$525,938	$4,207,500
Dog Park	1	$650,000	$650,000
Football Field	1	$535,000	$535,000
Splash Pad	1	$480,000	$480,000
Total	83	$346,729	$28,778,500

Park Amenities Level of Service

As previously discussed, daytime population is used to allocate the proportionate share of demand to residential and nonresidential development. Avondale's existing level of service for residential development is 0.00089 amenities per person (83 amenities X 91 percent residential share / 84,736 persons). The nonresidential level of service is 0.00044 amenities per job (83 amenities X 9 percent nonresidential share / 17,086 jobs). The cost per person is $309.06 (0.00089 amenities per person X $346,729 per amenity) and the cost per job is $151.59 (0.00044 amenities per job X $346,729 per amenity).

Figure 30: Existing Level of Service

Cost Allocation Factors	
Cost per Amenity	$346,729

Level-of-Service Standards	
Existing Amenities	83
Residential	
Residential Share	91%
2018 Population	84,736
Amenities per Person	0.00089
Cost per Person	**$309.06**
Nonresidential	
Nonresidential Share	9%
2018 Jobs	17,086
Amenities per Job	0.00044
Cost per Job	**$151.59**

Development Fee Report – Plan-Based

The cost to prepare the Parks and Recreational Facilities IIP and development fees totals $14,323. Avondale plans to update its report every five years. Based on this cost, proportionate share, and five-year projections of new development from the *Land Use Assumptions* document, the cost per person is $1.65 and the cost per job is $0.58.

Figure 31: IIP and Development Fee Report

Necessary Public Service	Cost	Assessed Against	Proportionate Share	Demand Unit	2018	2023	Change	Cost per Demand Unit
Fire	$14,323	Residential	82%	Population	84,736	92,626	7,890	$1.49
		Nonresidential	18%	Vehicle Trips	72,025	81,026	9,001	$0.29
Library	$15,118	Residential	82%	Population	84,736	92,626	7,890	$1.57
		Nonresidential	18%	Jobs	17,086	19,298	2,212	$1.23
Parks and Recreational	$14,323	Residential	91%	Population	84,736	92,626	7,890	$1.65
		Nonresidential	9%	Jobs	17,086	19,298	2,212	$0.58
Police	$14,323	Residential	82%	Population	84,736	92,626	7,890	$1.49
		Nonresidential	18%	Vehicle Trips	72,025	81,026	9,001	$0.29
Street	$25,065	Residential Nonresidential	100%	VMT	498,794	545,990	47,196	$0.53
Wastewater	$21,484	Residential Nonresidential	100%	Gallons	5,926,764	6,547,057	620,293	$0.03
Water	$28,644	Residential Nonresidential	100%	Gallons	11,289,122	12,534,726	1,245,605	$0.02
Total	$133,280							

PROJECTED DEMAND FOR SERVICES AND COSTS

ARS § 9-463.05(E)(5) requires:

> *"The total number of projected service units necessitated by and attributable to new development in the service area based on the approved land use assumptions and calculated pursuant to generally accepted engineering and planning criteria."*

As shown in the *Land Use Assumptions* document, Avondale's population is expected to increase by an additional 14,490 persons and employment is expected to increase by 4,739 jobs over the next 10 years.

ARS § 9-463.05(E)(6) requires:

> *"The projected demand for necessary public services or facility expansions required by new service units for a period not to exceed ten years."*

Developed Park Land

Avondale plans to maintain its current developed park land level of service over the next 10 years. Based on a projected population increase of 14,490 persons, Avondale's future residential development demands 13.2 additional acres of developed park land (14,490 additional persons X 0.00091 developed acres per person). Future nonresidential development demands 2.1 additional acres of developed park land (4,739 additional jobs X 0.00045 developed acres per job) over the next 10 years. Future development demands approximately 15.3 additional acres of developed park land over the next 10 years at a cost of approximately $2.7 million.

Figure 32: Projected Demand for Developed Park Land

Type of Infrastructure	Level of Service	Demand Unit	Cost per Acre
Developed Park Land	0.00091 Developed Acres	per Person	$175,000
	0.00045 Developed Acres	per Job	

Need for Developed Park Land					
Year	Population	Jobs	Residential Acres	Nonresidential Acres	Total Acres
2018	84,736	17,086	77.4	7.7	85.1
2019	86,392	17,505	79.0	7.8	86.8
2020	88,048	17,935	80.5	8.0	88.5
2021	89,704	18,377	82.0	8.2	90.2
2022	91,360	18,832	83.5	8.4	91.9
2023	92,626	19,298	84.7	8.7	93.3
2024	93,910	19,776	85.8	8.9	94.7
2025	95,212	20,268	87.0	9.1	96.1
2026	96,532	20,773	88.2	9.3	97.5
2027	97,870	21,292	89.4	9.5	99.0
2028	99,226	21,825	90.7	9.8	100.5
10-Yr Increase	14,490	4,739	13.2	2.1	15.3

Growth-Related Expenditures	$2,317,386	$371,775	$2,689,161

Park Amenities

Avondale also plans to maintain its current park amenities level of service over the next 10 years. Based on a projected population increase of 14,490 persons, Avondale's future residential development demands 13 additional park amenities (14,490 additional persons X 0.00089 park amenities per person). Future nonresidential development demands two additional park amenities (4,739 additional jobs X 0.00044 park amenities per job) over the next 10 years. Future development demands approximately 15 additional park amenities over the next 10 years at a cost of approximately $5.20 million.

Figure 33: Projected Demand for Park Amenities

Type of Infrastructure	Level of Service	Demand Unit	Cost per Unit
Park Amenities	0.00089 Units	per Person	$346,729
	0.00044 Units	per Job	

Need for Park Amenities					
Year	Population	Jobs	Residential Units	Nonresidential Units	Total Units
2018	84,736	17,086	76	7	83
2019	86,392	17,505	77	8	85
2020	88,048	17,935	78	8	86
2021	89,704	18,377	80	8	88
2022	91,360	18,832	81	8	90
2023	92,626	19,298	83	8	91
2024	93,910	19,776	84	9	92
2025	95,212	20,268	85	9	94
2026	96,532	20,773	86	9	95
2027	97,870	21,292	87	9	97
2028	99,226	21,825	88	10	98
10-Yr Increase	14,490	4,739	13	2	15

Growth-Related Expenditures	$4,478,279	$718,385	$5,196,664

PARKS AND RECREATIONAL FACILITIES DEVELOPMENT FEES

Revenue Credit/Offset

A revenue credit/offset is not necessary for parks and recreational facilities development fees, because costs generated by projected development exceed revenues generated by projected development. Appendix A contains the forecast of revenues required by Arizona's Enabling Legislation (ARS § 9-463.05(E)(7)).

Proposed Parks and Recreational Facilities Development Fees

Infrastructure components and cost factors for Parks and Recreational Facilities are summarized in the upper portion of Figure 34. The cost per service unit for Parks and Recreational Facilities is $470.64 per person and $230.62 per job. Figure 34 displays the ratio of a service unit to various types of land uses for residential and nonresidential development.

Parks and Recreational Facilities development fees for residential development are assessed according to the number of persons per housing unit. For example, the single-family fee of $1,497 is calculated using a cost per service unit of $470.64 per person multiplied by a demand unit of 3.18 persons per housing unit. Nonresidential development fees are calculated using jobs as the service unit. The fee of $0.54 per square foot of commercial development is derived from a cost per service unit of $230.62 per job multiplied by a demand unit of 2.34 jobs per 1,000 square feet, divided by 1,000 square feet.

Figure 34: Schedule of Parks and Recreational Facilities Development Fees

Fee Component	Cost per Person	Cost per Job
Developed Park Land	$159.93	$78.45
Park Amenities	$309.06	$151.59
Development Fee Report	$1.65	$0.58
Total	$470.64	$230.62

Residential Development	Development Fees per Unit			
Development Type	Persons per Housing Unit[1]	Proposed Fees	Current Fees	Increase / Decrease
Single Unit	3.18	**$1,497**	$796	$701
2+ Units	2.13	**$1,002**	$658	$344

Nonresidential Development	Development Fees per Square Foot			
Development Type	Jobs per 1,000 Sq Ft[1]	Proposed Fees	Current Fees	Increase / Decrease
Industrial	0.34	**$0.08**	$0.13	($0.05)
Commercial	2.34	**$0.54**	$0.82	($0.28)
Office / Institutional	2.97	**$0.68**	$0.24	$0.44

1. See Land Use Assumptions

PROJECTED PARKS AND RECREATIONAL FACILITIES DEVELOPMENT FEE REVENUE

Appendix A contains the forecast of revenues required by Arizona's Enabling Legislation (ARS § 9-463.05(E)(7)).

In accordance with state law, this report includes an IIP for Parks and Recreational Facilities needed to accommodate new development. Projected fee revenue shown in Figure 35 is based on the development projections in the *Land Use Assumptions* document and the updated development fees for Parks and Recreational Facilities. If development occurs at a more rapid rate than projected, the demand for infrastructure will increase and development fee revenue will increase at a corresponding rate. If development occurs at a slower rate than is projected, the demand for infrastructure will also decrease, along with development fee revenue. Anticipated development fee revenue of $7.9 million is approximately equal to the projected growth-related cost of parks and recreational facilities ($7.9 million).

Figure 35: Projected Parks and Recreational Facilities Development Fee Revenue

Fee Component	Growth Share	Existing Share	Total
Developed Park Land	$2,689,161	$0	$2,689,161
Park Amenities	$5,196,664	$0	$5,196,664
Development Fee Report	$14,323	$0	$14,323
Total	$7,900,148	$0	$7,900,148

		Single Unit $1,497 per unit	2+ Unit $1,002 per unit	Industrial $0.08 per sq. ft.	Commercial $0.54 per sq. ft.	Office / Inst $0.68 per sq. ft.
Year		Hsg Unit	Hsg Unit	KSF	KSF	KSF
Base	2018	23,423	5,816	2,739	3,987	4,103
Year 1	2019	23,783	6,056	2,800	4,101	4,146
Year 2	2020	24,143	6,296	2,864	4,220	4,190
Year 3	2021	24,503	6,536	2,930	4,342	4,235
Year 4	2022	24,863	6,776	2,997	4,468	4,281
Year 5	2023	25,209	6,854	3,064	4,599	4,327
Year 6	2024	25,559	6,934	3,134	4,733	4,375
Year 7	2025	25,914	7,015	3,206	4,871	4,422
Year 8	2026	26,275	7,096	3,279	5,014	4,471
Year 9	2027	26,640	7,179	3,354	5,162	4,521
Year 10	2028	27,010	7,263	3,432	5,315	4,571
10-Year Increase		3,587	1,447	694	1,328	468
Projected Revenue		$5,358,546	$1,449,418	$55,039	$716,667	$320,375

Projected Fee Revenue	**$7,900,044**
Total Expenditures	**$7,900,148**

POLICE FACILITIES IIP

ARS § 9-463.05 (T)(7)(f) defines the facilities and assets that can be included in the Police Facilities IIP:

> *"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."*

The Police Facilities IIP includes components for police stations, vehicles and equipment, communications equipment, a property and evidence facility, and the cost of preparing the Police Facilities IIP and Development Fees. The incremental expansion methodology, based on the current level of service, is used to calculate the components for stations, vehicles and equipment, and communications equipment. A plan-based methodology is used for the property and evidence facility and the development fee study.

Service Area

Avondale's Police Department strives to provide a uniform response time citywide. As a result, the service area for the Police Facilities IIP is citywide.

Proportionate Share

ARS § 9-463.05 (B)(3) states that the development fee shall not exceed a proportionate share of the cost of necessary public services needed to accommodate new development. The Police Facilities IIP and development fees are assessed on both residential and nonresidential development based on functional population shown in Figure 8. Based on 2015 functional population data, residential development accounts for approximately 82 percent of demand for police services and nonresidential development is responsible for the remaining 18 percent.

RATIO OF SERVICE UNIT TO DEVELOPMENT UNIT

ARS § 9-463.05(E)(4) requires:

> *"A table establishing the specific level or quantity of use, consumption, generation or discharge of a service unit for each category of necessary public services or facility expansions and an equivalency or conversion table establishing the ratio of a service unit to various types of land uses, including residential, commercial and industrial."*

Figure 36 displays the demand indicators for residential and nonresidential land uses. For residential development the table displays the persons per housing unit. For nonresidential development the table displays the number of vehicle trips generated per thousand square feet of floor area.

Figure 36: Police Facilities Ratio of Service Unit to Development Unit

Residential Development	per Unit
Development Type	Persons per Housing Unit[1]
Single Unit	3.18
2+ Unit	2.13

Nonresidential Development	per 1,000 Sq Ft
Development Type	Avg Wkdy Veh Trips[2]
Industrial	0.87
Commercial	12.46
Office / Institutional	4.87

1. See Land Use Assumptions
2. Average Weekday Vehicle Trip Ends X Trip Rate Adjustment.

Analysis of Capacity, Usage, and Costs of Existing Public Services

ARS § 9-463.05(E)(1) requires:

> *"A description of the existing necessary public services in the service area and the costs to upgrade, update, improve, expand, correct or replace those necessary public services to meet existing needs and usage and stricter safety, efficiency, environmental or regulatory standards, which shall be prepared by qualified professionals licensed in this state, as applicable."*

ARS § 9-463.05(E)(2) requires:

> *"An analysis of the total capacity, the level of current usage and commitments for usage of capacity of the existing necessary public services, which shall be prepared by qualified professionals licensed in this state, as applicable."*

Police Stations – Incremental Expansion

Avondale plans to use development fees to expand its current inventory of police stations. Shown below in Figure 37, Avondale's existing police stations include 41,738 square feet.

Figure 37: Existing Police Stations

Description	Square Feet
Main Police Station	24,758
Police Substation	6,480
Cashion Police Substation	3,000
NW Public Safety Facility (Police Share)	7,500
Total	41,738

Police Stations Level of Service

Functional population provides the proportionate share of demand for police stations from residential and nonresidential development. Avondale's existing level of service for residential development is 0.4039 square feet per person (41,738 square feet X 82 percent residential share / 84,736 persons). The nonresidential level of service is 0.1043 square feet per vehicle trip (41,738 square feet X 18 percent / 72,025 vehicle trips). Using estimates for the planned Lakin Ranch substation, the cost per square foot is $353 ($3.0 million / 8,500 square feet). The cost per person is $142.55 (0.4039 square feet per person X $353 per square foot) and the cost per vehicle trip is $36.81 (0.1043 square feet per vehicle trip X $353 per square foot).

Figure 38: Existing Level of Service

Cost Allocation Factors	
Cost per Square Foot	$353

Level-of-Service Standards	
Existing Square Feet	41,738
Residential	
Residential Share	82%
2018 Population	84,736
Square Feet per Person	0.4039
Cost per Person	**$142.55**
Nonresidential	
Nonresidential Share	18%
2018 Vehicle Trips	72,025
Square Feet per Vehicle Trip	0.1043
Cost per Vehicle Trip	**$36.81**

Description	Square Feet	Cost per SF	Total Cost
Lakin Ranch Substation	8,500	$353	$3,000,000

Property and Evidence Facility – Plan-Based

Avondale plans to construct a 12,500-square-foot property and evidence facility within the next 10 years at a total cost of $5,000,000 ($400 per square foot). This planned facility will serve both existing and future development; therefore, costs are allocated to total projected residential and nonresidential development in 2028. Avondale's population in 2028 is projected to be 99,226 persons of whom 84,736 are from existing development with the remaining 14,490 persons coming from future development. Total nonresidential trips in 2028 are projected to equal 91,453 trips on an average weekday. Existing nonresidential vehicle trips are estimated to equal 72,025, and the projected trip increase equals 19,428 vehicle trips from future development.

The planned LOS to be provided to residential development in 2028 is 0.1033 square feet per person (12,500 square feet X 82 percent residential share / 99,226 persons). Nonresidential development's planned LOS in 2028 is 0.0246 square feet per vehicle trip (12,500 square feet X 18 percent nonresidential share / 91,453 vehicle trips). Based on the planned cost of $400 per square foot, the cost per person is $41.32 ($400 per square foot X 0.1033 square feet per person) and the cost per vehicle trip is $9.84 ($400 per square foot X 0.0246 square feet per vehicle trip).

Figure 39: Planned Property and Evidence Facility

Description	Square Feet	Total Cost
Property & Evidence Facility	12,500	$5,000,000

Cost Allocation Factors	
Cost per Square Foot	$400

Level-of-Service Standards	
Planned Square Feet	12,500
Residential	
Residential Share	82%
2028 Population	99,226
Square Feet per Person	0.1033
Cost per Person	**$41.32**
Nonresidential	
Nonresidential Share	18%
2018 Vehicle Trips	91,453
Square Feet per Vehicle Trip	0.0246
Cost per Vehicle Trip	**$9.84**

Police Vehicles and Equipment – Incremental Expansion

Development fees will be used to expand Avondale's inventory of police vehicles and equipment. Figure 40 lists the current vehicles and equipment used by Avondale's Police Department – 115 units representing a replacement cost of approximately $5.86 million.

Figure 40: Existing Police Vehicles and Equipment

Description	Units	Unit Cost	Replacement Cost
Patrol Vehicles	62	$43,389	$2,690,119
Non-Patrol Vehicles	24	$25,038	$600,920
Motorcycles	6	$28,974	$173,846
Trucks	9	$29,753	$267,775
Large Vans	3	$58,752	$176,255
Small Vans	3	$24,688	$74,064
Armored Truck	1	$350,000	$350,000
Command Vehicle	1	$800,000	$800,000
Trailers	5	$3,212	$16,062
Computer Hardware	1	$710,000	$710,000
Total	115	$50,948	$5,859,041

Police Vehicles and Equipment Level of Service

Functional population is used to allocate the proportionate share of demand to residential and nonresidential development. Avondale's existing level of service for residential development is 0.00111 units per person (115 units X 82 percent residential share / 84,736 persons). The nonresidential level of service is 0.00029 units per vehicle trip (115 units X 18 percent nonresidential share / 72,025 vehicle trips). The cost per person is $56.70 ($50,948 per unit X 0.00111 units per person) and the cost per vehicle trip is $14.64 ($50,948 per unit X 0.00029 units per vehicle trip).

Figure 41: Existing Level of Service

Cost Allocation Factors	
Cost per Unit	$50,948

Level-of-Service Standards	
Existing Vehicles and Equipment	115
Residential	
Residential Share	82%
2018 Population	84,736
Units per Person	0.00111
Cost per Person	**$56.70**
Nonresidential	
Nonresidential Share	18%
2018 Vehicle Trips	72,025
Units per Vehicle Trip	0.00029
Cost per Vehicle Trip	**$14.64**

Communications Equipment – Incremental Expansion

Development fees will be used to expand Avondale's inventory of communications equipment. Figure 42 lists the current communications equipment used by Avondale's Police Department. Avondale currently has 265 units of communications equipment representing a replacement cost of $2.02 million – $7,630 per unit ($2,022,055 replacement cost / 265 units).

Figure 42: Existing Communications Equipment

Description	Units	Unit Cost	Replacement Cost
Consoles	4	$152,960	$611,841
Database Manager	1	$85,000	$85,000
Radios	260	$5,097	$1,325,214
Total	265	$7,630	$2,022,055

Communications Equipment Level of Service

Communications equipment costs are allocated according to functional population – 82 percent to residential development and 18 percent to nonresidential development. Avondale's existing level of service for residential development is 0.00256 units per person (265 units X 82 percent residential share / 84,736 persons). The nonresidential level of service is 0.00066 units per vehicle trip (265 units X 18 percent nonresidential share / 72,025 vehicle trips). The cost per person is $19.57 ($7,630 per unit X 0.00256 units per person) and the cost per vehicle trip is $5.05 ($7,630 per unit X 0.00066 units per vehicle trip).

Figure 43: Existing Level of Service

Cost Allocation Factors	
Cost per Unit	$7,630

Level-of-Service Standards	
Existing Units	265
Residential	
Residential Share	82%
2018 Population	84,736
Units per Person	0.00256
Cost per Person	**$19.57**
Nonresidential	
Nonresidential Share	18%
2018 Vehicle Trips	72,025
Units per Vehicle Trip	0.00066
Cost per Vehicle Trip	**$5.05**

Development Fee Report – Plan-Based

The cost to prepare the Police Facilities IIP and related Development Fee Report totals $14,323. Avondale plans to update its report every five years. Based on this cost, proportionate share, and five-year projections of new residential and nonresidential development from the *Land Use Assumptions* document, the cost per person is $1.49 and the cost per vehicle trip is $0.29.

Figure 44: IIP and Development Fee Report

Necessary Public Service	Cost	Assessed Against	Proportionate Share	Demand Unit	2018	2023	Change	Cost per Demand Unit
Fire	$14,323	Residential	82%	Population	84,736	92,626	7,890	$1.49
		Nonresidential	18%	Vehicle Trips	72,025	81,026	9,001	$0.29
Library	$15,118	Residential	82%	Population	84,736	92,626	7,890	$1.57
		Nonresidential	18%	Jobs	17,086	19,298	2,212	$1.23
Parks and Recreational	$14,323	Residential	91%	Population	84,736	92,626	7,890	$1.65
		Nonresidential	9%	Jobs	17,086	19,298	2,212	$0.58
Police	$14,323	Residential	82%	Population	84,736	92,626	7,890	$1.49
		Nonresidential	18%	Vehicle Trips	72,025	81,026	9,001	$0.29
Street	$25,065	Residential	100%	VMT	498,794	545,990	47,196	$0.53
		Nonresidential						
Wastewater	$21,484	Residential	100%	Gallons	5,926,764	6,547,057	620,293	$0.03
		Nonresidential						
Water	$28,644	Residential	100%	Gallons	11,289,122	12,534,726	1,245,605	$0.02
		Nonresidential						
Total	$133,280							

Projected Service Units and Projected Demand for Services

ARS § 9-463.05(E)(5) requires:

> *"The total number of projected service units necessitated by and attributable to new development in the service area based on the approved land use assumptions and calculated pursuant to generally accepted engineering and planning criteria."*

As shown in the *Land Use Assumptions* document, Avondale expects an additional 14,490 persons and 19,428 nonresidential trips over the next 10 years.

ARS § 9-463.05(E)(6) requires:

> *"The projected demand for necessary public services or facility expansions required by new service units for a period not to exceed ten years."*

Police Stations

Over the next 10 years, Avondale's population is projected to increase by 14,490 persons and nonresidential vehicle trips are projected to increase by 19,428. Using the 2018 LOS standards shown at the top of Figure 45, future residential development generates demand for 5,853 additional square feet of police stations (0.4039 square feet per person X 14,490 additional persons), and future nonresidential development generates demand for 2,027 additional square feet of police stations (0.1043 square feet per vehicle trip X 19,428 additional vehicle trips). The 10-year demand for additional police stations equals 7,879 square feet at a cost of approximately $2.78 million. This is approximately 93 percent of the planned Lakin Ranch substation (8,500 square feet and $3.0 million).

Figure 45: Projected Demand for Police Stations

Type of Infrastructure	Level of Service	Demand Unit	Cost per Sq. Ft.
Police Stations	0.4039 Square Feet	per Person	$353
	0.1043 Square Feet	per Vehicle Trip	

Need for Police Stations					
Year	Population	Vehicle Trips	Residential	Nonresidential	Total Square Feet
2018	84,736	72,025	34,225	7,513	41,738
2019	86,392	73,721	34,894	7,690	42,584
2020	88,048	75,465	35,563	7,872	43,435
2021	89,704	77,262	36,232	8,059	44,291
2022	91,360	79,118	36,901	8,253	45,153
2023	92,626	81,026	37,412	8,452	45,864
2024	93,910	82,986	37,931	8,656	46,587
2025	95,212	85,011	38,457	8,867	47,324
2026	96,532	87,094	38,990	9,085	48,074
2027	97,870	89,241	39,530	9,309	48,839
2028	99,226	91,453	40,078	9,539	49,617
10-Yr Increase	14,490	19,428	5,853	2,027	7,879
Growth-Related Expenditures			**$2,065,550**	**$715,145**	**$2,780,695**

Vehicles and Equipment

Shown in Figure 46, population is projected to increase by 14,490 persons by 2028, and nonresidential trips will increase by 19,428 trips during the same period. Using the 2018 LOS standards shown in Figure 46, future residential development generates demand for approximately 16 additional units (0.00111 units per person X 14,490 additional persons), and future nonresidential development generates demand for approximately six additional units (0.00029 units per vehicle trip X 19,428 additional vehicle trips). The 10-year demand for additional police vehicles and equipment equals 22 units at a cost of approximately $1.11 million.

Figure 46: Projected Demand for Police Vehicles and Equipment

Type of Infrastructure	Level of Service	Demand Unit	Cost per Unit
Vehicles and Equipment	0.00111 Units	per Person	$50,948
	0.00029 Units	per Vehicle Trip	

Need for Police Vehicles and Equipment					
Year	Population	Vehicle Trips	Residential	Nonresidential	Total Units
2018	84,736	72,025	94	21	115
2019	86,392	73,721	96	21	117
2020	88,048	75,465	98	22	120
2021	89,704	77,262	100	22	122
2022	91,360	79,118	102	23	124
2023	92,626	81,026	103	23	126
2024	93,910	82,986	105	24	128
2025	95,212	85,011	106	24	130
2026	96,532	87,094	107	25	132
2027	97,870	89,241	109	26	135
2028	99,226	91,453	110	26	137
10-Yr Increase	14,490	19,428	16	6	22

Growth-Related Expenditures	$821,583	$284,426	$1,106,009

Communications Equipment

As shown in Figure 47, population and nonresidential trips drive the need for communications equipment. Based on the development projections in the *Land Use Assumptions* document, Avondale will need approximately 50 additional units of communications equipment over the next 10 years [(0.00256 units per person X 14,490 additional persons) + (0.00066 units per vehicle trip X 19,428 additional vehicle trips). The 10-year, growth-related capital cost associated with these additional units of communications equipment is $381,680.

Figure 47: Projected Demand for Communications Equipment

Type of Infrastructure	Level of Service	Demand Unit	Cost per Unit
Communications Equipment	0.00256 Units	per Person	$7,630
	0.00066 Units	per Vehicle Trip	

Need for Police Communications Equipment					
Year	Population	Vehicle Trips	Residential	Nonresidential	Total Units
2018	84,736	72,025	217	48	265
2019	86,392	73,721	222	49	270
2020	88,048	75,465	226	50	276
2021	89,704	77,262	230	51	281
2022	91,360	79,118	234	52	287
2023	92,626	81,026	238	54	291
2024	93,910	82,986	241	55	296
2025	95,212	85,011	244	56	300
2026	96,532	87,094	248	58	305
2027	97,870	89,241	251	59	310
2028	99,226	91,453	254	61	315
10-Yr Increase	14,490	19,428	37	13	50
Growth-Related Expenditures			**$283,569**	**$98,111**	**$381,680**

POLICE FACILITIES DEVELOPMENT FEES

Revenue Credit/Offset

A revenue credit/offset is not necessary for Police Facilities development fees, because costs generated by projected development exceed revenues generated by projected development. Appendix A contains the forecast of revenues required by Arizona's Enabling Legislation (ARS § 9-463.05(E)(7)).

Proposed Police Facilities Development Fees

Figure 48 displays the ratio of a service unit to various types of land uses for residential and nonresidential development. Police Facilities development fees for residential development are assessed according to the number of persons per housing unit. Nonresidential development fees are calculated using vehicle trips as the service unit. The multipliers for each land use, which include average weekday vehicle trips ends per thousand square feet and a trip adjustment factor, are shown below. The cost per service unit for Police Facilities is $261.63 per person and $66.63 per vehicle trip.

Trip generation rates are from the reference book Trip Generation published by the Institute of Transportation Engineers (ITE 10th Edition 2017). A vehicle trip end represents a vehicle either entering or exiting a development (as if a traffic counter were placed across a driveway). To calculate development fees, trip generation rates require an adjustment factor to avoid double counting each trip at both the origin and destination points. Therefore, the basic trip adjustment factor is 50 percent.

For commercial development, the trip adjustment factor is less than 50 percent because retail development and some services attract vehicles as they pass by on arterial and collector roads. For example, when someone stops at a convenience store on the way home from work, the convenience store is not the primary destination. For the average shopping center, the ITE data indicate 34 percent of the vehicles that enter are passing by on their way to some other primary destination. The remaining 66 percent of attraction trips have the commercial site as their primary destination. Because attraction trips are half of all trips, the trip adjustment factor is 66 percent multiplied by 50 percent, or approximately 33 percent of the trip ends. These factors are shown to derive inbound vehicle trips for each type of nonresidential land use.

Development fees for residential development are determined by type of housing unit. For example, the single-family fee of $832 is calculated using a cost per service unit of $261.63 per person multiplied by the demand unit of 3.18 persons per housing unit. Nonresidential development fees are stated per square foot of floor area unless otherwise noted. The fee of $0.83 per square foot of commercial development is derived from a cost per service unit of $66.63 per vehicle trip multiplied by a demand unit of 37.75 average weekday vehicle trip ends per 1,000 square feet, multiplied by a trip rate adjustment factor of 33 percent, divided by 1,000 square feet.

Figure 48: Schedule of Police Facilities Development Fees

Fee Component	Cost per Person	Cost per Vehicle Trip
Police Stations	$142.55	$36.81
Property and Evidence Facility	$41.32	$9.84
Vehicles and Equipment	$56.70	$14.64
Communications Equipment	$19.57	$5.05
Development Fee Report	$1.49	$0.29
Total	$261.63	$66.63

Residential Development	Development Fees per Unit			
Development Type	Persons per Housing Unit[1]	Proposed Fees	Current Fees	Increase / Decrease
Single Unit	3.18	**$832**	$499	$333
2+ Unit	2.13	**$557**	$412	$145

Nonresidential Development	Development Fees per Square Foot				
Development Type	Avg Wkdy Veh Trip Ends[1]	Trip Rate Adjustment	Proposed Fees	Current Fees	Increase / Decrease
Industrial	1.74	50%	**$0.06**	$0.08	($0.02)
Commercial	37.75	33%	**$0.83**	$0.51	$0.32
Office / Institutional	9.74	50%	**$0.32**	$0.15	$0.17

1. See Land Use Assumptions

PROJECTED POLICE FACILITIES DEVELOPMENT FEE REVENUE

Appendix A contains revenue forecasts required by Arizona's Enabling Legislation (ARS § 9-463.05(E)(7)).

Projected Police Facilities Development Fee Revenue

Projected fee revenue shown in Figure 49 is based on the development projections in the *Land Use Assumptions* document and the updated Police Facilities development fees. If development occurs faster than projected, the demand for infrastructure will increase along with development fee revenue. If development occurs slower than projected, the demand for infrastructure will decrease and development fee revenue will decrease at a similar rate. Anticipated development fee revenue of approximately $5.07 million over the next 10 years is approximately equal to the projected growth-related cost of police facilities ($5.07 million). Existing development's share equals approximately $4.21 million and must be paid with other sources of revenue.

Figure 49: Projected Revenue from Police Facilities Development Fees

Fee Component	Growth Share	Existing Share	Total
Police Stations	$2,780,695	$0	$2,780,695
Property and Evidence Facility	$789,917	$4,210,083	$5,000,000
Vehicles and Equipment	$1,106,009	$0	$1,106,009
Communications Equipment	$381,680	$0	$381,680
Development Fee Report	$14,323	$0	$14,323
Total	$5,072,624	$4,210,083	$9,282,707

		Single Unit $832 per unit	2+ Unit $557 per unit	Industrial $0.06 per sq. ft.	Commercial $0.83 per sq. ft.	Office / Inst $0.32 per sq. ft.
Year		Hsg Unit	Hsg Unit	KSF	KSF	KSF
Base	2018	23,423	5,816	2,739	3,987	4,103
Year 1	2019	23,783	6,056	2,800	4,101	4,146
Year 2	2020	24,143	6,296	2,864	4,220	4,190
Year 3	2021	24,503	6,536	2,930	4,342	4,235
Year 4	2022	24,863	6,776	2,997	4,468	4,281
Year 5	2023	25,209	6,854	3,064	4,599	4,327
Year 6	2024	25,559	6,934	3,134	4,733	4,375
Year 7	2025	25,914	7,015	3,206	4,871	4,422
Year 8	2026	26,275	7,096	3,279	5,014	4,471
Year 9	2027	26,640	7,179	3,354	5,162	4,521
Year 10	2028	27,010	7,263	3,432	5,315	4,571
10-Year Increase		3,587	1,447	694	1,328	468
Projected Revenue		$2,975,549	$805,236	$40,112	$1,099,686	$151,656

Projected Fee Revenue	**$5,072,239**
Total Expenditures	**$9,282,707**
Existing Development Share	**$4,210,468**

STREET FACILITIES IIP

ARS § 9-463.05 (T)(7)(e) defines the facilities and assets that can be included in the Street Facilities IIP:

> *"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."*

The Street Facilities IIP includes components for arterial improvements, signalized intersections, and the cost of professional services for preparing the Street Facilities IIP and related Development Fee Report. The plan-based methodology is used for arterial improvements and the related Development Fee Report. The incremental expansion methodology is used for signalized intersections.

Service Area

Avondale's arterial street network is designed to efficiently move traffic throughout the city; therefore, the service area for the Street Facilities IIP and Development Fees is citywide.

Proportionate Share

ARS § 9-463.05 (B)(3) states that the development fee shall not exceed a proportionate share of the cost of necessary public services needed to provide necessary public services to the development. Trip generation rates and trip adjustment factors are used to determine the proportionate impact of residential, commercial, office, and industrial land uses Avondale's street network.

Ratio of Service Unit to Development Unit

ARS § 9-463.05(E)(4) requires:

> *"A table establishing the specific level or quantity of use, consumption, generation or discharge of a service unit for each category of necessary public services or facility expansions and an equivalency or conversion table establishing the ratio of a service unit to various types of land uses, including residential, commercial and industrial."*

Figure 50 displays the demand indicators for residential and nonresidential land uses. For residential development the table displays VMT generated per housing unit. For nonresidential development the table displays VMT generated per thousand square feet of floor area.

Figure 50: Street Facilities Ratio of Service Unit to Development Unit

Residential Development	per Unit				
Development Type	Avg Wkdy Veh Trip Ends[1]	Trip Rate Adjustment	Trip Length Adjustment	Average Miles per Trip	VMT
Single Unit	10.00	65%	121%	1.940	15.258
2+ Unit	5.20	65%	121%	1.940	7.934

Nonresidential Development	per 1,000 Square Feet				
Development Type	Avg Wkdy Veh Trip Ends[1]	Trip Rate Adjustment	Trip Length Adjustment	Average Miles per Trip	VMT
Industrial	1.74	50%	73%	1.940	1.232
Commercial	37.75	33%	66%	1.940	15.951
Office / Institutional	9.74	50%	73%	1.940	6.897

1. TischlerBise Land Use Assumptions

Analysis of Capacity, Usage, and Costs of Existing Public Services

ARS § 9-463.05(E)(1) requires:

> *"A description of the existing necessary public services in the service area and the costs to upgrade, update, improve, expand, correct or replace those necessary public services to meet existing needs and usage and stricter safety, efficiency, environmental or regulatory standards, which shall be prepared by qualified professionals licensed in this state, as applicable."*

The existing public services included in the Street Facilities IIP are 212.8 lane miles of arterials and 47 signalized intersections.

ARS § 9-463.05(E)(2) requires:

> *"An analysis of the total capacity, the level of current usage and commitments for usage of capacity of the existing necessary public services, which shall be prepared by qualified professionals licensed in this state, as applicable."*

The daily lane capacity used in this analysis is 9,800, which is the roadway capacity of a two-lane arterial, found in the 2017 Maricopa Association of Governments Regional Transportation Model.

LEVEL OF SERVICE AND RATIO OF SERVICE UNIT TO LAND USE

Service Units

Avondale will use average weekday vehicle trip ends as the service units for documenting existing level-of-service standards and allocating the costs of future improvements. Components used to determine the service units and input variables are discussed, including trip generation rates, adjustments for commuting patterns and pass-by trips, and trip length weighting factors.

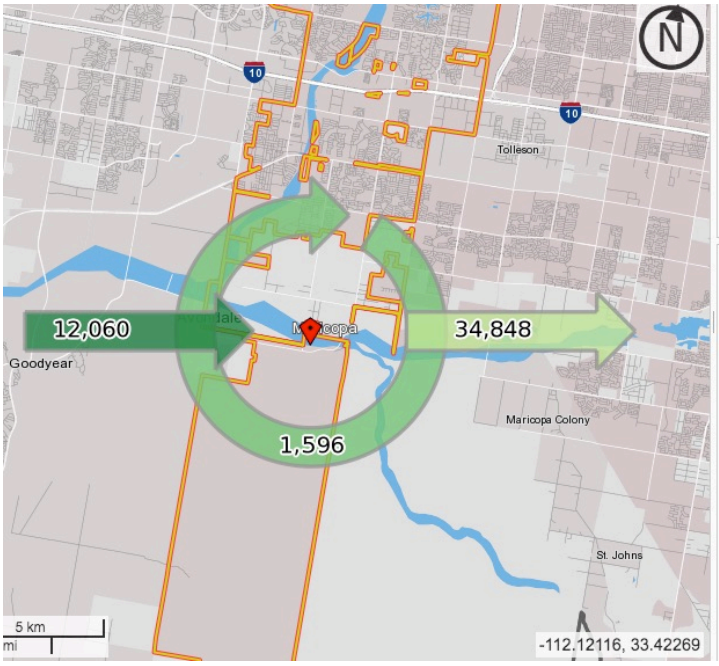
Trip Rate Adjustments

Avondale's Street Facilities Development Fees use average weekday trip generation rates from the reference book *Trip Generation* published by the Institute of Transportation Engineers (ITE 2017). A vehicle trip end represents a vehicle either entering or exiting a development (as if a traffic counter were placed across a driveway). To calculate Street Facilities Development Fees, trip generation rates require an adjustment factor to avoid double counting each trip at both the origin and destination points. Therefore, the basic trip adjustment factor is 50 percent. As discussed further below, the development fee methodology includes additional adjustments to make the fees proportionate to the infrastructure demand for particular types of development.

Adjustment for Commuting Patterns

Residential development has a trip adjustment factor of 65 percent to account for commuters leaving Avondale for work. According to the 2009 National Household Travel Survey, weekday work trips are typically 31 percent of production trips (i.e., all out-bound trips, which are 50 percent of all trip ends). As shown in Figure 51, the Census Bureau's web application OnTheMap indicates 95.6 percent of resident workers traveled outside Avondale for work in 2015. In combination, these factors (0.31 x 0.50 x 0.956 = 0.15) support the additional 15 percent allocation of trips to residential development.

Figure 51: Inflow / Outflow Analysis



Inflow/Outflow Job Counts (All Jobs)
2015

	Count	Share
Employed in the Selection Area	13,656	100.0%
Employed in the Selection Area but Living Outside	12,060	88.3%
Employed and Living in the Selection Area	1,596	11.7%
Living in the Selection Area	36,444	100.0%
Living in the Selection Area but Employed Outside	34,848	95.6%
Living and Employed in the Selection Area	1,596	4.4%

Adjustment for Pass-By Trips

For commercial development, the trip adjustment factor is less than 50 percent because retail development attracts vehicles as they pass by on arterial and collector roads. For example, when someone stops at a convenience store on the way home from work, the convenience store is not the primary destination. For the average shopping center, ITE data indicate 34 percent of the vehicles that enter are passing by on their way to some other primary destination. The remaining 66 percent of attraction trips have the commercial site as their primary destination. Because attraction trips are half of all trips, the trip adjustment factor is 66 percent multiplied by 50 percent, or approximately 33 percent of the trip ends.

Trip Length Weighting Factor by Type of Land Use

The Street Facilities Development Fees methodology includes a percentage adjustment, or weighting factor, to account for trip length variation by type of land use. As documented in Table 6 of the 2009 National Household Travel Survey, vehicle trips from residential development are approximately 121 percent of the average trip length. The residential trip length adjustment factor includes data on home-based work trips, social, and recreational purposes. Conversely, shopping trips associated with commercial development are roughly 66 percent of the average trip length while other nonresidential development typically accounts for trips that are 73 percent of the average for all trips.

PROJECTED SERVICE UNITS, DEMAND, AND COSTS FOR SERVICES

TischlerBise created an aggregate travel model to convert development units within Avondale to project vehicle trips and vehicle miles of travel. Figure 52 summarizes the input variables used in the aggregate travel demand model.

Figure 52: Input Variables for Travel Demand Model

Development Type	ITE Code	Weekday VTE	Dev Unit	Trip Adj	Trip Length Wt Factor
Single Family	210	10.00	HU	65%	121%
Multi-Family	220	5.20	HU	65%	121%
Industrial	150	1.74	KSF	50%	73%
Commercial / Retail	820	37.75	KSF	33%	66%
Office / Institutional	710	9.74	KSF	50%	73%

Avg Trip Length (miles)	8.11
Vehicle Capacity Per Lane	9,800

ARS § 9-463.05(E)(5) requires:

> *"The total number of projected service units necessitated by and attributable to new development in the service area based on the approved land use assumptions and calculated pursuant to generally accepted engineering and planning criteria."*

Projected development in Avondale over the next 10 years, and the corresponding need for additional lane miles of arterials and signalized intersections, are shown in Figure 53. Trip generation rates and trip adjustment factors convert projected development into average weekday vehicle trips. As shown in Figure 53, new development in Avondale will generate 47,633 additional trips.

ARS § 9-463.05(E)(6) requires:

> *"The projected demand for necessary public services or facility expansions required by new service units for a period not to exceed ten years."*

The travel demand model inputs are used to derive level of service in Vehicle Miles of Travel and future needs of lane miles and signalized intersections. A Vehicle Mile of Travel (VMT) is a measurement unit equal to one vehicle traveling one mile. In the aggregate, VMT is the product of vehicle trips multiplied by the average trip length. Based on estimates shown in Figure 53, existing infrastructure standards using the average trip length of 8.11 miles in Avondale are 1.02 lane miles per 10,000 VMT (212.83 arterial lane miles / (2,085,166 VMT / 10,000)).

As shown on the lower right side of Figure 53, future development generates an additional 382,407 VMT over the next 10 years. To maintain the existing infrastructure standards, Avondale needs 39.0 additional lane miles of arterials and 8.6 additional signalized intersections to accommodate projected development over the next 10 years.

Figure 53: Projected Travel Demand

Development Type	ITE Code	Weekday VTE	Dev Unit	Trip Adj	Trip Length Wt Factor
Single Family	210	10.00	HU	65%	121%
Multi-Family	220	5.20	HU	65%	121%
Industrial	150	1.74	KSF	50%	73%
Commercial / Retail	820	37.75	KSF	33%	66%
Office / Institutional	710	9.74	KSF	50%	73%

Avg Trip Length (miles)	8.11
Vehicle Capacity Per Lane	9,800

		Base	1	2	3	4	10	10-Year
		2018	2019	2020	2021	2022	2028	Increase
Development	Single Family Units	23,423	23,783	24,143	24,503	24,863	27,010	3,587
	Multi-Family Units	5,816	6,056	6,296	6,536	6,776	7,263	1,447
	Industrial / Flex KSF	2,739	2,800	2,864	2,930	2,997	3,432	694
	Commercial / Retail KSF	3,987	4,101	4,220	4,342	4,468	5,315	1,328
	Office / Institutional KSF	4,103	4,146	4,190	4,235	4,281	4,571	468
Avg Wkday Vehicle Trips	Single Family Trips	152,250	154,590	156,930	159,270	161,610	175,563	23,313
	Multi-Family Trips	19,658	20,469	21,280	22,092	22,903	24,550	4,892
	Residential Trips	171,908	175,059	178,210	181,362	184,513	200,113	28,205
	Industrial / Flex Trips	2,383	2,436	2,491	2,549	2,607	2,986	603
	Commercial / Retail Trips	49,663	51,094	52,568	54,089	55,663	66,206	16,543
	Office / Institutional Trips	19,979	20,191	20,406	20,624	20,848	22,261	2,282
	Nonresidential Trips	72,025	73,721	75,465	77,262	79,118	91,453	19,428
	Total Vehicle Trips	243,933	248,780	253,675	258,624	263,631	291,566	47,633
VMT	Vehicle Miles of Travel	2,085,166	2,125,316	2,165,725	2,206,431	2,247,447	2,467,573	382,407
	Annual Increase		40,150	40,409	40,706	41,016	38,405	
Demand	Arterial Lane Miles	212.8	216.9	221.0	225.1	229.3	251.8	39.0
	Annual Increase		4.1	4.1	4.1	4.2	3.9	3.9
	Signalized Intersections	47.0	47.9	48.8	49.7	50.7	55.6	8.6
	Annual Increase		0.9	0.9	0.9	1.0	0.8	0.9
								15.5%

Avondale plans to construct 9.3 lane miles of arterials over the next 10 years to serve future development. Since Avondale plans to build fewer than 39 lane miles, the average trip length of 8.11 miles is adjusted until the 10-year demand for arterial lane miles equals 9.3 lane miles. This results in an average trip length of 1.94 miles on the planned arterial improvements. The 10-year increase in VMT on the planned arterial improvements equals 91,476 VMT.

Figure 54: Revised Travel Demand

		Base	1	2	3	4	5	10	10-Year
		2018	2019	2020	2021	2022	2023	2028	Increase
Development	Single Family Units	23,423	23,783	24,143	24,503	24,863	25,209	27,010	3,587
	Multi-Family Units	5,816	6,056	6,296	6,536	6,776	6,854	7,263	1,447
	Industrial KSF	2,739	2,800	2,864	2,930	2,997	3,064	3,432	694
	Commercial KSF	3,987	4,101	4,220	4,342	4,468	4,599	5,315	1,328
	Office / Institutional KSF	4,103	4,146	4,190	4,235	4,281	4,327	4,571	468
Avg Wkday Vehicle Trips	Single Family Trips	152,250	154,590	156,930	159,270	161,610	163,856	175,563	23,313
	Multi-Family Trips	19,658	20,469	21,280	22,092	22,903	23,168	24,550	4,892
	Residential Trips	171,908	175,059	178,210	181,362	184,513	187,024	200,113	28,205
	Industrial Trips	2,383	2,436	2,491	2,549	2,607	2,666	2,986	603
	Commercial Trips	49,663	51,094	52,568	54,089	55,663	57,286	66,206	16,543
	Office / Institutional Trips	19,979	20,191	20,406	20,624	20,848	21,074	22,261	2,282
	Nonresidential Trips	72,025	73,721	75,465	77,262	79,118	81,026	91,453	19,428
	Total Vehicle Trips	243,933	248,780	253,675	258,624	263,631	268,050	291,566	47,633
VMT	Vehicle Miles of Travel	498,794	508,399	518,065	527,802	537,614	545,990	590,270	91,476
	Annual Increase		9,605	9,666	9,737	9,812	8,376	9,187	
Demand	Arterial Lane Miles	50.9	51.9	52.9	53.9	54.9	55.7	60.2	9.3
	Annual Increase		1.0	1.0	1.0	1.0	0.8	0.9	0.9
	Signalized Intersections	47.0	47.9	48.8	49.7	50.7	51.4	55.6	8.6
	Annual Increase		0.9	0.9	0.9	1.0	0.7	0.8	0.9

ARS § 9-463.05(E)(3) requires:

> *"A description of all or the parts of the necessary public services or facility expansions and their costs necessitated by and attributable to development in the service area based on the approved land use assumptions, including a forecast of the costs of infrastructure, improvements, real property, financing, engineering and architectural services, which shall be prepared by qualified professionals licensed in this state, as applicable."*

Arterial Improvements – Plan-Based

Avondale plans to construct 9.82 lane miles of arterials over the next 10 years. Shown below in Figure 55, Avondale's staff identified the share of each project attributable to future development. This results in a growth share of 9.4 lane miles. Based on the construction of 9.4 lane miles, the growth-related cost of arterial improvements equals $14.54 million. The cost per VMT for arterial improvements is $158.93 ($14,538,600 / 91,476 additional VMT).

Figure 55: Planned Arterial Improvements

		Total		Growth		
Number	Description	Lane Miles	Cost	Share	Lane Miles	Cost
ST1021	Dysart Road Extension - Whyman Ave to Lower Buckeye Rd	1.40	$1,810,000	100%	1.4	$1,810,000
ST1125	Avondale Blvd - McDowell Rd to Thomas Rd	1.00	$1,708,000	100%	1.0	$1,708,000
ST1146	Van Buren St (North Half) - Fairway Dr to 121st Ave	0.50	$974,500	100%	0.5	$974,500
ST1166	Avondale Blvd - Lower Buckeye Rd to Miami Ave	0.34	$561,600	50%	0.2	$280,800
ST1172	El Mirage - Lower Buckeye Rd to Calle Hermosa	0.40	$937,000	50%	0.2	$468,500
ST1224	107th Avenue/McDowell Rd Widening and Well Relocation	0.50	$2,735,000	100%	0.5	$2,735,000
ST1334	Van Buren - 107th Ave to Avondale Blvd	2.00	$1,863,000	100%	2.0	$1,863,000
ST1336	Fairway Drive - Van Buren St to Garfield	1.80	$3,029,000	100%	1.8	$3,029,000
ST1382	McDowell Road & 107th Avenue - Dual Left-turn Lanes	0.48	$500,000	80%	0.4	$400,000
ST1459	El Mirage Rd & Buckeye Rd - Install NBR Turn Lane	0.10	$320,000	75%	0.1	$240,000
ST1600	Dysart Rd Widening - Whyman Ave to Buckeye Rd	1.30	$1,029,800	100%	1.3	$1,029,800
Total		9.82	$15,467,900	94%	9.3	$14,538,600

Growth Cost	$14,538,600
10-Year VMT Increase	91,476
Cost per VMT	$158.93

Signalized Intersections – Incremental Expansion

Avondale's current level of service for signalized intersections is 0.94 signalized intersections per 10,000 VMT (47 intersections / (498,794 VMT / 10,000)), and Avondale plans to maintain this level of service over the next 10 years. As shown in Figure 54, Avondale needs to construct 8.6 additional signalized intersections to maintain this standard over the next 10 years ((91,476 additional VMT / 10,000) X 0.94 signalized intersections per 10,000 VMT). Shown below in Figure 56, Avondale's staff identified 12 potential intersection improvements with an average cost per intersection of $514,583 ($6,175,000 / 12 intersections). Avondale may use development fees to fund any of the 8.6 intersection projects included in Figure 56. The cost per VMT for signalized intersections is $48.38 ($514,583 per intersection X 8.6 additional intersections / 91,476 additional VMT).

Figure 56: Planned Signalized Intersections

Number	Description	Total
ST1127	Traffic Signal at 107th and Pierce	$475,000
ST1170	Traffic Signal at Avondale & Lower Buckeye	$600,000
ST1171	Traffic Signal at El Mirage & Lower Buckeye	$575,000
ST1180	Traffic Signal - 107th Ave and Dealer Dr	$475,000
ST1181	Traffic Signal - 107th Ave and Roosevelt St	$475,000
ST1187	Traffic Signal - 119th Ave and McDowell Rd	$475,000
ST1188	Traffic Signal - 119th Ave and Lower Buckeye Rd	$475,000
ST1195	Traffic Signal - Central Ave and Lower Buckeye Rd	$475,000
ST1248	Traffic Signal - Dysart Rd and Lower Buckeye Rd	$475,000
ST1381	Traffic Signal - Maricopa St & Avondale Blvd	$470,000
ST1383	Traffic Signal - Broadway Rd & Avondale Blvd	$730,000
ST1437	Traffic Signal - Thomas Rd & 137th Ave	$475,000
Total Development Fee Eligible Projects		$6,175,000

Cost per Intersection	**$514,583**
2018-2028 VMT Increase	**91,476**
Cost per VMT	**$48.38**

Development Fee Report – Plan-Based

The cost to prepare the Street Facilities IIP and related Development Fee Report totals $25,065. Avondale plans to update its report every five years. Based on this cost, proportionate share, and five-year projections of new development from the *Land Use Assumptions* document, the cost per VMT is $0.53.

Figure 57: IIP and Development Fee Report

Necessary Public Service	Cost	Assessed Against	Proportionate Share	Demand Unit	2018	2023	Change	Cost per Demand Unit
Fire	$14,323	Residential	82%	Population	84,736	92,626	7,890	$1.49
		Nonresidential	18%	Vehicle Trips	72,025	81,026	9,001	$0.29
Library	$15,118	Residential	82%	Population	84,736	92,626	7,890	$1.57
		Nonresidential	18%	Jobs	17,086	19,298	2,212	$1.23
Parks and Recreational	$14,323	Residential	91%	Population	84,736	92,626	7,890	$1.65
		Nonresidential	9%	Jobs	17,086	19,298	2,212	$0.58
Police	$14,323	Residential	82%	Population	84,736	92,626	7,890	$1.49
		Nonresidential	18%	Vehicle Trips	72,025	81,026	9,001	$0.29
Street	$25,065	Residential Nonresidential	100%	VMT	498,794	545,990	47,196	$0.53
Wastewater	$21,484	Residential Nonresidential	100%	Gallons	5,926,764	6,547,057	620,293	$0.03
Water	$28,644	Residential Nonresidential	100%	Gallons	11,289,122	12,534,726	1,245,605	$0.02
Total	$133,280							

STREET FACILITIES DEVELOPMENT FEES

Revenue Credit/Offset

A revenue credit/offset is not necessary for the Street Facilities development fees, because costs generated by projected development exceed revenues generated by projected development. Appendix A contains the forecast of revenues required by Arizona's Enabling Legislation (ARS § 9-463.05(E)(7)).

Proposed Street Facilities Development Fees

Infrastructure standards and cost factors for Street Facilities are summarized in the upper portion of Figure 58. The cost per service unit is $207.84 per vehicle mile of travel. Figure 58 displays the ratio of a service unit to various types of land uses for residential and nonresidential development.

Street Facilities development fees for residential development are assessed according to VMT generated per unit. The single-family fee of $3,171 is calculated using a cost per service unit of $207.84 per VMT multiplied by 10.0 average weekday vehicle trip ends, multiplied by 65 percent trip adjustment factor, multiplied by 1.94 miles per trip, multiplied by 121 percent trip length adjustment.

Nonresidential development fees are calculated using VMT as the service unit. The fee of $3.31 per square foot of commercial development is derived from a cost per service unit of $207.84 per VMT multiplied by 37.75 average weekday vehicle trip ends, multiplied by 33 percent trip adjustment factor, multiplied by 1.94 miles per trip, multiplied by 66 percent trip length adjustment, divided by 1,000 square feet.

Figure 58: Schedule of Street Facilities Development Fees

Fee Component	Cost per VMT
Arterial Improvements	$158.93
Signalized Intersections	$48.38
Development Fee Report	$0.53
Total	$207.84

Average Miles per Trip	1.940

Residential Development	Development Fees per Unit					
Development Type	Avg Wkdy Veh Trip Ends[1]	Trip Rate Adjustment	Trip Length Adjustment	Proposed Fees	Current Fees	Increase / Decrease
Single Unit	10.00	65%	121%	**$3,171**	$2,945	$226
2+ Unit	5.20	65%	121%	**$1,649**	$2,058	($409)

Nonresidential Development	Development Fees per Square Foot					
Development Type	Avg Wkdy Veh Trip Ends[1]	Trip Rate Adjustment	Trip Length Adjustment	Proposed Fees	Current Fees	Increase / Decrease
Industrial	1.74	50%	73%	**$0.25**	$1.00	($0.75)
Commercial	37.75	33%	66%	**$3.31**	$3.66	($0.35)
Office / Institutional	9.74	50%	73%	**$1.43**	$1.58	($0.15)

1. TischlerBise Land Use Assumptions

PROJECTED STREET FACILITIES DEVELOPMENT FEE REVENUE

Appendix A contains the forecast of revenues required by Arizona's Enabling Legislation (ARS § 9-463.05(E)(7)).

Projected Street Facilities Development Fee Revenue

Projected fee revenue shown in Figure 59 is based on the development projections in the *Land Use Assumptions* document and the updated Street Facilities development fees. If development occurs at a faster rate than projected, the demand for infrastructure will increase along with development fee revenue. If development occurs at a slower rate than projected, the demand for infrastructure will decrease and development fee revenue will decrease at a similar rate. Anticipated development fee revenue of approximately $18.98 million over the next 10 years is approximately equal to the projected growth-related cost of street facilities ($18.99 million). Existing development share of planned improvements must be funded with other sources of revenue.

Figure 59: Projected Street Facilities Development Fee Revenue

Fee Component	Growth Share	Existing Share	Total
Arterial Improvements	$14,538,600	$929,300	$15,467,900
Signalized Intersections	$4,425,414	$0	$4,425,414
Development Fee Report	$25,065	$0	$25,065
Total	$18,989,079	$929,300	$19,918,379

Year		Single Unit $3,171 per unit	2+ Unit $1,649 per unit	Industrial $0.25 per SF	Commercial $3.31 per SF	Office / Inst $1.43 per SF
		Hsg Unit	Hsg Unit	KSF	KSF	KSF
Base	2018	23,423	5,816	2,739	3,987	4,103
Year 1	2019	23,783	6,056	2,800	4,101	4,146
Year 2	2020	24,143	6,296	2,864	4,220	4,190
Year 3	2021	24,503	6,536	2,930	4,342	4,235
Year 4	2022	24,863	6,776	2,997	4,468	4,281
Year 5	2023	25,209	6,854	3,064	4,599	4,327
Year 6	2024	25,559	6,934	3,134	4,733	4,375
Year 7	2025	25,914	7,015	3,206	4,871	4,422
Year 8	2026	26,275	7,096	3,279	5,014	4,471
Year 9	2027	26,640	7,179	3,354	5,162	4,521
Year 10	2028	27,010	7,263	3,432	5,315	4,571
10-Year Increase		3,587	1,447	694	1,328	468
Projected Revenue		$11,359,765	$2,384,929	$173,154	$4,389,527	$668,964

Projected Fee Revenue	**$18,976,340**
Total Expenditures	**$19,918,379**
Existing Development Share	**$942,039**

WASTEWATER FACILITIES IIP

ARS § 9-463.05 (T)(7)(b) defines facilities and assets that can be included in the Wastewater Facilities IIP:

> *"Wastewater facilities, including collection, interception, transportation, treatment and disposal of wastewater, and any appurtenances for those facilities"*

The Wastewater Facilities IIP includes components for treatment, collection, and the cost of preparing the Wastewater Facilities IIP and development fees. The cost recovery methodology is used for the treatment and collection components, and the plan-based methodology is used for the Development Fee Report.

Service Area

The service area for the Wastewater Facilities IIP is citywide.

Proportionate Share

ARS § 9-463.05 (B)(3) states that the development fee shall not exceed a proportionate share of the cost of necessary public services needed to provide necessary public services to the development. The Wastewater Facilities IIP is based, and development fees are assessed, on both residential and nonresidential development. City staff provided wastewater flows to differentiate demand for wastewater facilities from residential and nonresidential development. In 2017, residential wastewater customers accounted for approximately 97 percent of total customers and 76 percent of average day flows. Nonresidential customers accounted for approximately 3 percent of total customers and 24 percent of average day flows.

RATIO OF SERVICE UNIT TO DEVELOPMENT UNIT

ARS § 9-463.05(E)(4) requires:

> *"A table establishing the specific level or quantity of use, consumption, generation or discharge of a service unit for each category of necessary public services or facility expansions and an equivalency or conversion table establishing the ratio of a service unit to various types of land uses, including residential, commercial and industrial."*

Residential Wastewater Facilities development fees are assessed on a per unit basis, based on average day gallons per connection. Development fees assume a residential unit in a multi-unit structure with a single meter would be served by a 0.75-inch meter. If not, then the corresponding meter size and capacity ratio shown below would be used to establish a ratio of service unit to land use.

For nonresidential Wastewater Facilities development fees, capacity ratios by meter size are the appropriate demand indicator for Wastewater Facilities. Capacity ratios equate 0.75-inch meters to the average day gallons per average single-family residential unit. Utilizing average day gallons is the most efficient way to show a direct relationship between development units, usage, and system capacity. The nonresidential Wastewater Facilities development fees are calculated by multiplying the number of gallons per unit by the capacity ratio for the corresponding size and type of water meter, which are provided by the American Water Works Association (2017) and shown below in Figure 60.

Figure 60: Wastewater Facilities Ratio of Service Unit to Development Unit

Demand Indicators	
Residential Gallons per Average Day	207

Meter Size (inches)		Capacity Ratio
0.75	Displacement	1.00
1.00	Displacement	1.67
1.50	Displacement	3.33
2.00	Compound	5.33
3.00	Compound	10.67
4.00	Compound	16.67
6.00	Compound	33.33

Source: AWWA Manual of Water Supply Practices M-1, 7th Edition.

Analysis of Capacity, Usage, and Costs of Existing Public Services

ARS § 9-463.05(E)(1) requires:

> *"A description of the existing necessary public services in the service area and the costs to upgrade, update, improve, expand, correct or replace those necessary public services to meet existing needs and usage and stricter safety, efficiency, environmental or regulatory standards, which shall be prepared by qualified professionals licensed in this state, as applicable."*

ARS § 9-463.05(E)(2) requires:

> *"An analysis of the total capacity, the level of current usage and commitments for usage of capacity of the existing necessary public services, which shall be prepared by qualified professionals licensed in this state, as applicable."*

Avondale has one wastewater treatment plant with excess capacity to serve growth. The current capacity of the Charles M. Wolf plant is 9.00 million gallons per day (MGD), but Avondale can only use 80 percent (7.20 MGD) of the total capacity under existing Arizona law. According to the City of Avondale Utilities Department, current usage is approximately 5.93 MGD, leaving 1.27 MGD of excess capacity to serve growth.

Figure 61: Wastewater Plant Capacity

Description	Total Capacity	Eligible Capacity	Current Demand	Available Capacity
Charles M. Wolf Wastewater Treatment Plant, 2018	9.00	7.20	5.93	1.27
Total	9.00	7.20	5.93	1.27

Average Day Flows

The following factors are used to differentiate the demand for wastewater infrastructure between residential and nonresidential development. The existing level of service for wastewater infrastructure is based on average flows in 2016 and 2017. The current level of service for residential development for wastewater service is 207 average day gallons per connection. For nonresidential connections, wastewater flows average 2,092 average day gallons per connection. Each nonresidential connection averages approximately 25 jobs, and the projected increase in jobs drives the demand for wastewater capacity from nonresidential development.

Figure 62: Wastewater Flow Factors

Unit Type	2016 Average Gallons per Day[1]	2016 Connections[1]	Gallons per Connection per Day
Residential	4,281,122	21,089	203
Nonresidential	1,318,878	640	2,061
Total	5,600,000	21,728	

Unit Type	2017 Average Gallons per Day[1]	2017 Connections[1]	Gallons per Connection per Day
Residential	4,434,019	21,347	208
Nonresidential	1,365,981	652	2,094
Total	5,800,000	21,999	

Unit Type	Average Gallons per Day[1]	Connections[1]	Gallons per Connection per Day
Residential	4,357,571	21,083	207
Nonresidential	1,342,429	642	2,092
Total	5,700,000	21,724	

1. 2017 Integrated Utility Master Plan Update, City of Avondale, Arizona.

2. Gallons per day per capita based on average persons per housing unit of 2.98.

PROJECTED SERVICE UNITS AND PROJECTED DEMAND FOR SERVICES

ARS § 9-463.05(E)(5) requires:

> *"The total number of projected service units necessitated by and attributable to new development in the service area based on the approved land use assumptions and calculated pursuant to generally accepted engineering and planning criteria."*

ARS § 9-463.05(E)(6) requires:

> *"The projected demand for necessary public services or facility expansions required by new service units for a period not to exceed ten years."*

Over the next 10 years, it is projected there will be an increase of 3,964 connections. Accordingly, the projected wastewater flows increase by 1,171,341 gallons during the same period.

Figure 63: Projected Wastewater Flows

Year		Avg. Gallons per Day	Total Connections	Annual Increase		Cumulative Increase	
				Connections	Avg. Gallons per Day	Connections	Avg. Gallons per Day
	2016	5,600,000	21,728				
	2017	5,800,000	21,999				
Base	2018	5,926,764	22,466				
1	2019	6,054,352	22,932	467	127,588	467	127,588
2	2020	6,182,847	23,399	467	128,495	934	256,083
3	2021	6,312,331	23,867	468	129,484	1,401	385,567
4	2022	6,442,887	24,335	468	130,556	1,869	516,123
5	2023	6,547,057	24,672	336	104,170	2,206	620,293
6	2024	6,653,147	25,013	341	106,090	2,547	726,383
7	2025	6,761,321	25,360	347	108,174	2,894	834,557
8	2026	6,871,498	25,711	352	110,177	3,245	944,734
9	2027	6,983,759	26,068	357	112,261	3,602	1,056,995
10	2028	7,098,105	26,429	362	114,346	3,964	1,171,341

Source: TischlerBise, using Average Day Demand factors and projected development shown in the *Land Use Assumptions* .

Wastewater Treatment

The cost per gallon of capacity for the Wastewater Facilities development fee includes the most recent wastewater treatment plant expansion. This expansion added 3.0 MGD of capacity, of which 80 percent (2.40 MGD) was available for use under existing Arizona law. Avondale's wastewater treatment plant expansion had a total cost of $48,930,315 and added 2.40 MGD of usable capacity. Dividing the total cost by the usable capacity of the expansion results in a cost per gallon of capacity of $20.39 ($48,930,315 total cost / 2.40 MGD).

Development fee contributions to date include Avondale's existing wastewater development fee balance of $717,972 and allocated development fees totaling $29,479,223. Based on a cost per gallon of $20.39, development fee contributions to date represent capacity paid with development fees of 1,481,153 ($30,197,195 development fee contributions / $20.39 per gallon). This leaves 918,847 gallons of treatment capacity available to serve future development (2,400,000 usable capacity – 1,481,153 capacity paid with development fees).

Based on a cost per gallon of capacity of $20.39, the cost of the wastewater treatment plant expansion attributable to future development is $18,733,120 ($20.39 per gallon X 918,847 gallons of treatment capacity available to serve future development). As shown in Figure 63, wastewater flows are projected to increase by 1.17 MGD over the next 10 years, however, less than 1.00 MGD is available. This results in $18.73 million in fee revenue generated over approximately eight years to repay future development's share of the wastewater treatment plant expansion ($20.39 per gallon of capacity X 918,847 gallons of available capacity). Avondale should collect the wastewater treatment component of the wastewater development fee until it recovers all eligible costs associated with the expansion.

Figure 64: Wastewater Treatment Cost Allocation Factors

Wastewater Treatment Facility	Cost of Capacity
Charles M. Wolf WWTP, Phase I Expansion	$48,930,315
÷ Additional Capacity (gpd)	2,400,000
Cost per Gallon of Capacity	**$20.39**
Existing Fund Balance[1]	$717,972
Allocated Development Fees[1]	$29,479,223
Development Fee Contributions to Date	$30,197,195
Capacity Paid with Development Fees to Date	1,481,153
Remaining Capacity Eligible for Development Fees	918,847
Remaining Cost to be Recovered	$18,733,120
Projected Eight-Year Increase in Wastewater Flows[2]	918,847
Projected Eight-Year Cost Recovery	$18,733,120
Remaining Cost	$0

1. City of Avondale, Finance and Budget Department.
2. Projected wastewater flows use unpaid capacity within 8 years.

Wastewater Collection

The cost per gallon of capacity for the Wastewater Facilities development fee includes the value of the wastewater collection system. Avondale's staff provided the value of existing wastewater collection lines, lift stations, land, and equipment. This excludes the value of any collection system improvements provided by developers, and results in a collection system value of $91,694,951. Avondale's collection system has a capacity of 12.0 MGD, and Avondale expects its collection system to meet wastewater flows at buildout.

Dividing this collection system value by the total collection system capacity results in a cost per gallon of capacity of $7.64 ($91,694,951 collection system value / 12.0 MGD). At present the wastewater collection system has 12.0 MGD of capacity, of which 6.07 MGD remains as unused capacity available to serve future development (12.0 MGD total capacity – 5.93 MGD current flows). Based on a cost per gallon of capacity of $7.64 and 6.07 MGD of available capacity, the value of the wastewater collection system attributable to future development is $46,374,800. As shown in Figure 63, wastewater flows are projected to increase by 1.17 MGD over the next 10 years. This results in $8.95 million in fee revenue generated over the next 10 years to repay future development's share of the wastewater collection system ($7.64 per gallon of capacity X 1,171,341 additional gallons of wastewater flows).

Figure 65: Wastewater Collection Cost Allocation Factors

Wastewater Collection Facilities	Cost of Capacity
Wastewater Collection Lines	$88,200,404
Lift Stations	$247,603
Land	$2,443,202
Equipment	$803,742
Total Wastewater Collection Sytem Value	$91,694,951
÷ Total Capacity (gpd)	12,000,000
Cost per Gallon of Capacity	**$7.64**
x Available Capacity (gpd)	6,070,000
Cost to be Recovered	$46,374,800
Projected 10-Year Increase in Wastewater Flows	1,171,341
Projected 10-Year Cost Recovery	$8,949,047
Remaining Cost (Year 11+)	$37,425,753

IIP and Development Fee Report – Plan-Based

The cost to prepare the Wastewater Facilities IIP and related Development Fee Report totals $21,484. Avondale plans to update its report every five years. Based on this cost, proportionate share, and five-year projections of new residential and nonresidential development from the *Land Use Assumptions* document, the cost per gallon is $0.03.

Figure 66: IIP and Development Fee Report

Necessary Public Service	Cost	Assessed Against	Proportionate Share	Demand Unit	2018	2023	Change	Cost per Demand Unit
Fire	$14,323	Residential	82%	Population	84,736	92,626	7,890	$1.49
		Nonresidential	18%	Vehicle Trips	72,025	81,026	9,001	$0.29
Library	$15,118	Residential	82%	Population	84,736	92,626	7,890	$1.57
		Nonresidential	18%	Jobs	17,086	19,298	2,212	$1.23
Parks and Recreational	$14,323	Residential	91%	Population	84,736	92,626	7,890	$1.65
		Nonresidential	9%	Jobs	17,086	19,298	2,212	$0.58
Police	$14,323	Residential	82%	Population	84,736	92,626	7,890	$1.49
		Nonresidential	18%	Vehicle Trips	72,025	81,026	9,001	$0.29
Street	$25,065	Residential	100%	VMT	498,794	545,990	47,196	$0.53
		Nonresidential						
Wastewater	$21,484	Residential	100%	Gallons	5,926,764	6,547,057	620,293	$0.03
		Nonresidential						
Water	$28,644	Residential	100%	Gallons	11,289,122	12,534,726	1,245,605	$0.02
		Nonresidential						
Total	$133,280							

WASTEWATER FACILITIES DEVELOPMENT FEES

Revenue Credit/Offset

A revenue credit/offset is not necessary for the Wastewater Facilities development fees, because costs generated by projected development exceed revenues generated by projected development. Appendix A contains the forecast of revenues required by Arizona's Enabling Legislation (ARS § 9-463.05(E)(7)).

Proposed Wastewater Facilities Development Fees

Infrastructure components and cost factors for Wastewater Facilities are summarized in the upper portion of Figure 67. The cost per service unit is $28.06 per gallon. Figure 67 displays the ratio of a service unit to various types of land uses for residential and nonresidential development.

Residential Wastewater Facilities development fees are assessed on a per unit basis, based on average day flows – approximately 207 gallons. Development fees assume a residential unit in a multi-unit structure with a single meter would be served by a 3/4" meter. If not, then the corresponding meter size and capacity ratio shown below would be used to establish a ratio of service unit to land use. The single-family fee of $5,808, is calculated using a cost per service unit of $28.06 per gallon multiplied by average day flows per residential unit of approximately 207 gallons.

For nonresidential Wastewater Facilities development fees, capacity ratios by meter size are the appropriate demand indicator for Wastewater Facilities. Capacity ratios equate 5/8" and 3/4" meters to the average day flows per residential unit. Utilizing average day flows is the most efficient way to show a direct relationship between development units, usage, and system capacity. The nonresidential Wastewater Facilities development fees are calculated by multiplying the average day flows per residential unit by the capacity ratio for the corresponding size and type of water meter, which are provided by the American Water Works Association (2017) and shown in Figure 67. The fee for a one-inch meter, $9,700, is calculated using a cost per service unit of $28.06 per gallon multiplied by average day flows per residential unit of approximately 207 gallons, multiplied by the capacity ratio of 1.67.

Figure 67: Schedule of Wastewater Facilities Development Fees

Demand Indicators	
Residential Gallons per Average Day	207
Cost Factors per Gallon of Capacity	
Treatment Facility Cost Recovery	$20.39
Collection Facilities Cost Recovery	$7.64
Development Fee Report	$0.03
Capital Cost per Gallon of Capacity	**$28.06**

Residential Development	Development Fees per Unit		
Development Type	Proposed Fees	Current Fees	Increase / Decrease
Residential	**$5,808**	$7,673	($1,865)

Nonresidential Development			Development Fees per Meter		
Meter Size (inches)		Capacity Ratio[1]	Proposed Fees	Current Fees	Increase / Decrease
0.75	Displacement	1.00	**$5,808**	$7,673	($1,865)
1.00	Displacement	1.67	**$9,700**	$12,814	($3,114)
1.50	Displacement	3.33	**$19,342**	$25,551	($6,209)
2.00	Compound	5.33	**$30,959**	$40,898	($9,939)
3.00	Compound	10.67	**$61,976**	$81,873	($19,897)
4.00	Compound	16.67	**$96,826**	$127,812	($30,986)
6.00	Compound	33.33	**$193,595**	$255,748	($62,153)

1. AWWA Manual of Water Supply Practices M-1, 7th Edition.

PROJECTED WASTEWATER FACILITIES DEVELOPMENT FEE REVENUE

Appendix A contains the forecast of revenues required by Arizona's Enabling Legislation (ARS § 9-463.05(E)(7)).

Projected Wastewater Facilities Development Fee Revenue

Projected fee revenue shown in Figure 68 is based on the development projections in the *Land Use Assumptions* document and the updated Wastewater Facilities development fees. If development occurs at a faster rate than projected, the demand for infrastructure will increase along with development fee revenue. If development occurs at a slower rate than projected, the demand for infrastructure will decrease and development fee revenue will decrease at a similar rate. Anticipated development fee revenue of approximately $27.70 million over the next 10 years is approximately equal to the projected growth-related cost of wastewater facilities ($27.70 million).

Figure 68: Projected Wastewater Facilities Development Fee Revenue

Fee Component	Growth Share
Treatment Facility	$18,733,120
Collection Facilities	$8,949,047
Development Fee Report	$21,484
Total	$27,703,651

		$28.06 per gallon
Year		Gallons
Base	2018	5,926,764
Year 1	2019	6,054,352
Year 2	2020	6,182,847
Year 3	2021	6,312,331
Year 4	2022	6,442,887
Year 5	2023	6,547,057
Year 6	2024	6,653,147
Year 7	2025	6,761,321
Year 8	2026	6,871,498
Year 9	2027	6,983,759
Year 10	2028	7,098,105
10-Year Increase		1,171,341
Projected Revenue		$27,702,952

WATER FACILITIES IIP

ARS § 9-463.05 (T)(7)(a) defines facilities and assets that can be included in the Water Facilities IIP:

> *"Water facilities, including the supply, transportation, treatment, purification and distribution of water, and any appurtenances for those facilities."*

The Water Facilities IIP includes components for existing water facilities, planned water facilities, planned water recharge, and the cost of preparing the Water Facilities IIP and development fees. The cost recovery methodology is used for the existing water facilities component. The plan-based methodology is used for the planned water facilities, planned water recharge, and the Development Fee Report.

Service Area

The service area for the Water Facilities IIP is citywide.

Proportionate Share

ARS § 9-463.05 (B)(3) states that the development fee shall not exceed a proportionate share of the cost of necessary public services needed to provide necessary public services to the development. The water fees assessed pursuant to the Water Facilities IIP and related Development Fee Report are assessed on both residential and nonresidential development. City staff provided water demand to differentiate demand for water facilities from residential and nonresidential development. In 2017, residential water customers accounted for approximately 95 percent of total customers and 64 percent of average day demand. Nonresidential customers accounted for approximately five percent of total customers and 36 percent of average day demand.

RATIO OF SERVICE UNIT TO DEVELOPMENT UNIT

ARS § 9-463.05(E)(4) requires:

> *"A table establishing the specific level or quantity of use, consumption, generation or discharge of a service unit for each category of necessary public services or facility expansions and an equivalency or conversion table establishing the ratio of a service unit to various types of land uses, including residential, commercial and industrial."*

Residential Water Facilities development fees are assessed on a per unit basis, based on average day gallons per connection. Development fees assume a residential unit in a multi-unit structure with a single meter would be served by a 0.75-inch meter. If not, then the corresponding meter size and capacity ratio shown below would be used to establish a ratio of service unit to land use.

For nonresidential Water Facilities development fees, capacity ratios by meter size are the appropriate demand indicator for water facilities. Capacity ratios equate 0.75-inch meters to the average day gallons per average single-family residential unit. Utilizing average day gallons is the most efficient way to show a direct relationship between development units, usage, and system capacity. The nonresidential Water Facilities development fees are calculated by multiplying the number of gallons per residential unit by the capacity ratio for the corresponding size and type of water meter, which are provided by the American Water Works Association (2017) and shown below in Figure 69.

Figure 69: Water Facilities Ratio of Service Unit to Development Unit

Demand Indicators	
Residential Gallons per Average Day	322

Meter Size (inches)		Capacity Ratio
0.75	Displacement	1.00
1.00	Displacement	1.67
1.50	Displacement	3.33
2.00	Compound	5.33
3.00	Compound	10.67
4.00	Compound	16.67
6.00	Compound	33.33

Source: AWWA Manual of Water Supply Practices M-1, 7th Edition.

Analysis of Capacity, Usage, and Costs of Existing Public Services

ARS § 9-463.05(E)(1) requires:

> *"A description of the existing necessary public services in the service area and the costs to upgrade, update, improve, expand, correct or replace those necessary public services to meet existing needs and usage and stricter safety, efficiency, environmental or regulatory standards, which shall be prepared by qualified professionals licensed in this state, as applicable."*

ARS § 9-463.05(E)(2) requires:

> *"An analysis of the total capacity, the level of current usage and commitments for usage of capacity of the existing necessary public services, which shall be prepared by qualified professionals licensed in this state, as applicable."*

Existing Capacity and Usage

Avondale has 15 wells with a total capacity of 30.66 MGD and a firm capacity of 18.6 MGD. Production facilities for the water system should have sufficient capacity to meet the demands of the maximum day of the year. For systems served with groundwater wells, it is standard practice to evaluate production capabilities based on firm capacity, or the capacity with the largest well out of service in each pressure zone. Avondale's firm water supply is 18.6 MGD which is 1.89 MGD less than the maximum daily demand of 20.49 MGD. Therefore, maximum day demands are currently being supplied by running wells more than 18 hours per day and running all wells on a daily basis. This analysis assumes there is no excess capacity in Avondale's water production facilities, however, there is excess capacity in Avondale's water distribution, storage, and treatment facilities.

According to the City of Avondale Utilities Department, current max day consumption is approximately 20.49 MGD, leaving 10.18 MGD of excess capacity in Avondale's water distribution, storage, and treatment facilities to serve future development (30.66 MGD – 20.49 MGD). In addition, Avondale has a 10-year capital improvement plan to increase the capacity of its water facilities by 6.80 MGD.

Figure 70: Well Capacity

Water Source	Total Capacity (MGD)	Usage (MGD)	Remaining
Existing Wells	30.66	20.49	10.18
Planned Wells	6.80	0.00	6.80
Total	**37.46**	**20.49**	**16.98**

Average Day Demand

The following factors are used to differentiate the demand for water infrastructure between residential and nonresidential development. The existing level of service for water infrastructure is based on average demand in 2015, 2016, and 2017. The current level of service for residential development for water service is approximately 322 gallons per connection per day. For nonresidential connections, water demand averages 3,220 gallons per connection per day. Each nonresidential connection averages approximately 13 jobs, and the projected increase in jobs drives the demand for water capacity from nonresidential development.

Figure 71: Water Demand Factors

Unit Type	2015 Average Gallons per Day[1]	2015 Connections[1]	Gallons per Connection per Day
Residential	6,908,937	21,580	320
Nonresidential	3,855,485	1,212	3,181
Total	10,764,422	22,792	

Unit Type	2016 Average Gallons per Day[1]	2016 Connections[1]	Gallons per Connection per Day
Residential	7,150,890	21,866	327
Nonresidential	4,050,849	1,226	3,304
Total	11,201,740	23,092	

Unit Type	2017 Average Gallons per Day[1]	2017 Connections[1]	Gallons per Connection per Day
Residential	7,069,079	22,134	319
Nonresidential	3,970,219	1,250	3,176
Total	11,039,299	23,384	

Unit Type	Weighted Average Gallons per Day[1]	Connections[1]	Gallons per Connection per Day
Residential	7,042,969	21,860	322
Nonresidential	3,958,851	1,229	3,220
Total	11,001,820	23,089	

1. 2017 Integrated Utility Master Plan Update, City of Avondale, Arizona.

2. Gallons per day per capita based on average persons per housing unit of 2.98.

PROJECTED SERVICE UNITS AND PROJECTED DEMAND FOR SERVICES

ARS § 9-463.05(E)(5) requires:

> *"The total number of projected service units necessitated by and attributable to new development in the service area based on the approved land use assumptions and calculated pursuant to generally accepted engineering and planning criteria."*

ARS § 9-463.05(E)(6) requires:

> *"The projected demand for necessary public services or facility expansions required by new service units for a period not to exceed ten years."*

Over the next 10 years, it is projected there will be an increase of 4,274 connections. Accordingly, the projected water demand increases by 2,413,902 gallons during the same period.

Figure 72: Projected Water Demand

Year		Avg. Gallons per Day	Total Connections	Annual Increase		Cumulative Increase	
				Connections	Avg. Gallons per Day	Connections	Avg. Gallons per Day
	2016	11,201,740	23,092				
	2017	11,039,299	23,384				
Base	2018	11,289,122	23,882				
1	2019	11,541,376	24,380	498	252,254	498	252,254
2	2020	11,796,305	24,879	499	254,929	998	507,183
3	2021	12,054,151	25,379	500	257,846	1,498	765,029
4	2022	12,315,158	25,881	501	261,007	1,999	1,026,036
5	2023	12,534,726	26,246	365	219,569	2,364	1,245,605
6	2024	12,758,716	26,616	371	223,990	2,734	1,469,595
7	2025	12,987,614	26,992	376	228,898	3,111	1,698,493
8	2026	13,221,176	27,374	382	233,562	3,493	1,932,055
9	2027	13,459,646	27,762	388	238,470	3,880	2,170,525
10	2028	13,703,024	28,156	393	243,377	4,274	2,413,902

Source: TischlerBise, using Average Day Demand factors and projected development shown in the *Land Use Assumptions* .

Existing Water Facilities

The cost per gallon of capacity for the Water Facilities development fee includes the value of existing water facilities capacity available to serve future development—this excludes the value of existing water production facilities where no excess capacity is available to future development. Avondale's staff provided the value of existing water distribution lines, pumping stations, reservoirs, land, and equipment. This excludes the value of any water facilities provided by developers, and results in a water facilities system value of $158,503,483. Currently, the existing water facilities have 30.66 MGD of capacity, of which 10.18 MGD, or 33.2 percent, remains as unused capacity available to serve future development. Applying the share of available capacity to the water facilities system value results in an available capacity value of $52,596,379 (33.2 percent available capacity X $158,503,483 water facilities system value).

Avondale's water development fee fund includes a fund balance of $467,788, and this balance is deducted from the total value of the water facilities system resulting in a value of $52,128,591. Dividing this by the available capacity of the water facilities system results in a cost per gallon of capacity of $5.12 ($52,128,591 / 10.18 MGD). As shown in Figure 72, water demand is projected to increase by 2.41 MGD over the next 10 years. This results in $12.36 million in fee revenue generated over the next 10 years to repay future development's share of the water facilities system ($5.12 per gallon of capacity X 2,413,902 additional gallons of water demand).

Figure 73: Existing Water Facilities Cost Allocation Factors

Existing Water Facilities	System Value
Water Distribution Lines	$136,266,525
Pumping Stations	$900,768
Reservoir	$7,200,058
Land	$13,071,859
Equipment	$1,064,273
Total Water Facilities Sytem Value	$158,503,483
x Available Capacity	33.2%
Value of Available Capacity	$52,596,379
Less: Existing Fund Balance	*$467,788*
Cost to be Recovered	$52,128,591
÷ Available Capacity (gpd)	10,175,533
Cost per Gallon of Capacity	**$5.12**
Projected 10-Year Increase in Water Demand	2,413,902
Projected 10-Year Cost Recovery	$12,359,178
Remaining Cost (Year 11+)	$39,769,413

Planned Water Facilities

Avondale plans to construct four new wells with 6.80 MGD of capacity to serve future development. Shown below in Figure 74 are planned water facility improvements including wells, waterlines, booster stations, and treatment needed to serve future development. Avondale's staff identified growth-related water facilities with a total cost of $40,588,000. When allocated to the planned capacity of 6.80 MGD, the cost per gallon of capacity is $5.97.

As shown in Figure 72, water demand is projected to increase by 2.41 MGD over the next 10 years. This results in $14.41 million in fee revenue generated over the next 10 years to fund future development's share of planned water facilities ($5.97 per gallon of capacity X 2,413,902 additional gallons of water demand).

Figure 74: Planned Water Facilities Cost Allocation Factors

Description	CIP No.	Total Cost	Growth Share	Growth Cost
99th Avenue Waterline, Thomas-McDowell	WA1133	$800,000	100%	$800,000
Future Well	WA1318	$2,700,000	100%	$2,700,000
Dysart Rd Waterline, Roeser Align-Southern	WA1302	$1,000,000	100%	$1,000,000
Dysart Rd Waterline, Whyman-Lower Buckeye	WA1231	$400,000	100%	$400,000
Future Well, North of I-10	WA1131	$4,400,000	100%	$4,400,000
Future Well, North of Van Buren	WA1142	$2,900,000	100%	$2,900,000
McDowell Rd Waterline, 117th-Avondale	WA1135	$300,000	100%	$300,000
Well #27 Corporate/El Mirage	WA1214	$2,500,000	100%	$2,500,000
Wellhead Treatment	WA1068	$1,500,000	100%	$1,500,000
Nitrate Removal System for Coldwater Booster Station	WA1340	$5,545,000	100%	$5,545,000
McDowell Rd 16-Inch Waterline - Avondale to 99th Ave	WA1468	$2,650,000	100%	$2,650,000
Phoenix Water Connection to Garden Lakes Booster	WA1469	$6,860,000	100%	$6,860,000
107th and Roosevelt Treatment Site - Land Purchase	WA1470	$600,000	100%	$600,000
Garden Lakes Site - 2nd Reservoir & Booster Improvements	WA1471	$8,358,000	100%	$8,358,000
Northside Booster Well Site - Land Purchase & DCR	WA1472	$75,000	100%	$75,000
Total		$40,588,000		$40,588,000

Growth-Related Cost	$40,588,000
÷ Additional Gallons of Capacity	6,800,000
Cost per Gallon of Capacity	**$5.97**
Projected 10-Year Increase in Water Demand	2,413,902
Projected 10-Year Share of Cost	$14,408,155
Remaining Cost (Year 11+)	$26,179,845

Planned Water Recharge

Avondale's available and unused capacity to recharge water at the New River-Agua Fria Underground Storage Project ("NAUSP") is the basis for the water recharge component. Because the NAUSP is currently unused, the entire 2.14 MGD capacity of the NAUSP is available for new service units. The obligation is valued at $1,620,139; with a capacity of 2.14 MGD, the water recharge component cost is $0.76 per gallon.

As shown in Figure 72, water demand is projected to increase by 2.41 MGD over the next 10 years, however, NAUSP adds only 2.14 MGD of recharge capacity. To more closely match revenue projections with added capacity, Figure 75 includes projected demand of 2.17 MGD over the next nine years. This results in $1.65 million in fee revenue generated over the next nine years ($0.76 per gallon of capacity X 2,170,525 additional gallons of water demand). Avondale may expand its McDowell Road Facility to meet demand from future development not met by the NAUSP, but the McDowell Road Facility is not included in this update of Avondale's Water IIP.

Figure 75: Planned Water Recharge Cost Allocation Factors

Planned Water Recharge	Planned Cost
New River-Agua Fria River USP	$1,620,139
÷ Water Recharge Capacity (gpd)	2,140,000
Cost per Gallon of Capacity	**$0.76**

Projected Nine-Year Increase in Water Demand	2,170,525
Projected Nine-Year Share of Cost	$1,649,599

IIP and Development Fee Report – Plan-Based

The cost to prepare the Water Facilities IIP and development fees totals $28,644. Avondale plans to update its report every five years. Based on this cost, proportionate share, and five-year projections of new residential and nonresidential development from the *Land Use Assumptions* document, the cost per gallon is $0.02.

Figure 76: IIP and Development Fee Report

Necessary Public Service	Cost	Assessed Against	Proportionate Share	Demand Unit	2018	2023	Change	Cost per Demand Unit
Fire	$14,323	Residential	82%	Population	84,736	92,626	7,890	$1.49
		Nonresidential	18%	Vehicle Trips	72,025	81,026	9,001	$0.29
Library	$15,118	Residential	82%	Population	84,736	92,626	7,890	$1.57
		Nonresidential	18%	Jobs	17,086	19,298	2,212	$1.23
Parks and Recreational	$14,323	Residential	91%	Population	84,736	92,626	7,890	$1.65
		Nonresidential	9%	Jobs	17,086	19,298	2,212	$0.58
Police	$14,323	Residential	82%	Population	84,736	92,626	7,890	$1.49
		Nonresidential	18%	Vehicle Trips	72,025	81,026	9,001	$0.29
Street	$25,065	Residential	100%	VMT	498,794	545,990	47,196	$0.53
		Nonresidential						
Wastewater	$21,484	Residential	100%	Gallons	5,926,764	6,547,057	620,293	$0.03
		Nonresidential						
Water	$28,644	Residential	100%	Gallons	11,289,122	12,534,726	1,245,605	$0.02
		Nonresidential						
Total	$133,280							

WATER FACILITIES DEVELOPMENT FEES

Revenue Credit/Offset

A revenue credit/offset is not necessary for the Water Facilities development fees, because costs generated by projected development exceed revenues generated by projected development. Appendix A contains the forecast of revenues required by Arizona's Enabling Legislation (ARS § 9-463.05(E)(7)).

Proposed Water Facilities Development Fees

Infrastructure components and cost factors for Water Facilities are summarized in the upper portion of Figure 77. The cost per service unit is $11.87 per gallon. Figure 77 displays the ratio of a service unit to various types of land uses for residential and nonresidential development.

Residential Water Facilities development fees are assessed on a per unit basis, based on average day demand – approximately 322 gallons. Development fees assume a residential unit in a multi-unit structure with a single meter would be served by a 3/4" meter. If not, then the corresponding meter size and capacity ratio shown below would be used to establish a ratio of service unit to land use. The single-family fee of $3,822, is calculated using a cost per service unit of $11.87 per gallon multiplied by average day demand per residential unit of approximately 322 gallons.

For nonresidential Water Facilities development fees, capacity ratios by meter size are the appropriate demand indicator for Water Facilities. Capacity ratios equate 5/8" and 3/4" meters to the average day demand per residential unit. Utilizing average day demand is the most efficient way to show a direct relationship between development units, usage, and system capacity. The nonresidential Water Facilities development fees are calculated by multiplying the average day demand per residential unit by the capacity ratio for the corresponding size and type of water meter, which are provided by the American Water Works Association (2017) and shown below in Figure 77. The fee for a one-inch meter, $6,383, is calculated using a cost per service unit of $11.87 per gallon multiplied by average day demand per residential unit of approximately 322 gallons, multiplied by the capacity ratio of 1.67.

Figure 77: Schedule of Water Facilities Development Fees

Demand Indicators	
Residential Gallons per Average Day	322
Cost Factors per Gallon of Capacity	
Existing Water Facilities	$5.12
Planned Water Facilities	$5.97
Planned Water Recharge	$0.76
Development Fee Report	$0.02
Capital Cost per Gallon of Capacity	**$11.87**

Residential Development	Development Fees per Unit		
Development Type	Proposed Fees	Current Fees	Increase / Decrease
Residential	**$3,822**	$4,651	($829)

Nonresidential Development			Development Fees per Meter		
Meter Size (inches)		Capacity Ratio[1]	Proposed Fees	Current Fees	Increase / Decrease
0.75	Displacement	1.00	**$3,822**	$4,651	($829)
1.00	Displacement	1.67	**$6,383**	$7,767	($1,384)
1.50	Displacement	3.33	**$12,728**	$15,488	($2,760)
2.00	Compound	5.33	**$20,372**	$24,790	($4,418)
3.00	Compound	10.67	**$40,782**	$49,627	($8,845)
4.00	Compound	16.67	**$63,715**	$77,533	($13,818)
6.00	Compound	33.33	**$127,392**	$155,021	($27,629)

1. AWWA Manual of Water Supply Practices M-1, 7th Edition.

PROJECTED WATER FACILITIES DEVELOPMENT FEE REVENUE

Appendix A contains the forecast of revenues required by Arizona's Enabling Legislation (ARS § 9-463.05(E)(7)).

Projected Water Facilities Development Fee Revenue

Projected fee revenue shown in Figure 78 is based on the development projections in the *Land Use Assumptions* document and the updated Water Facilities development fees. If development occurs at a faster rate than projected, the demand for infrastructure will increase along with development fee revenue. If development occurs at a slower rate than projected, the demand for infrastructure will decrease and development fee revenue will decrease at a similar rate. Anticipated development fee revenue of approximately $28.44 million over the next 10 years is approximately equal to the projected growth-related cost of water facilities ($28.45 million).

Figure 78: Projected Water Facilities Development Fee Revenue

Fee Component	Growth Share
Existing Water Facilities	$12,359,178
Planned Water Facilities	$14,408,155
Planned Water Recharge	$1,649,599
Development Fee Report	$28,644
Total	$28,445,577

		$11.87 per gallon
Year		Gallons
Base	2018	11,289,122
Year 1	2019	11,541,376
Year 2	2020	11,796,305
Year 3	2021	12,054,151
Year 4	2022	12,315,158
Year 5	2023	12,534,726
Year 6	2024	12,758,716
Year 7	2025	12,987,614
Year 8	2026	13,221,176
Year 9	2027	13,459,646
Year 10	2028	13,703,024
10-Year Increase		2,413,902
Projected Revenue		$28,444,685

APPENDIX A: FORECAST OF REVENUES OTHER THAN FEES

ARS § 9-463.05(E)(7) requires:

> *"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."*

ARS § 9-463.05(B)(12) states,

> *"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."*

REVENUE PROJECTIONS

Avondale does not have a higher than normal construction excise tax rate; therefore, the required offset described above is not applicable. The required forecast of non-development fee revenue from identified sources that can be attributed to future development over the next 10 years is summarized below. These funds are available for capital investments; however, the City of Avondale directs these revenues to non-development fee eligible capital needs including maintenance, repair, and replacement.

Only revenue generated by future development that is dedicated to growth-related capital improvements needs to be considered in determining the extent of the burden imposed by future development. Offsets against development fees are warranted in the following cases: (1) future development will be paying taxes or fees used to retire debt on existing facilities serving existing development; (2) future development will be paying taxes or fees used to fund an existing deficiency, or (3) future development will be paying taxes or fees that are dedicated to be used for growth-related improvements. The analysis provided in this report did not identify the need for offsets against the fees. Projected revenues generated by future development are shown below.

Figure A1: Revenue Projections of Future Development

Revenue Source	Projected FY 2019	FY2020	FY2021	FY2022	FY2023	FY2024
Non-Utility						
City Sales Tax - Residential	$28,908,617	$581,292	$592,750	$604,208	$612,305	$620,746
City Sales tax - Nonresidential	$28,908,617	$594,031	$606,307	$618,900	$631,757	$644,982
Property Tax - Residential	$2,837,933	$57,065	$58,190	$59,315	$60,109	$60,938
Property Tax - Nonresidential	$2,837,933	$58,315	$59,521	$60,757	$62,019	$63,317
State Shared Revenue - Sales Tax	$7,321,019	$140,333	$142,972	$145,611	$147,629	$149,696
State Urban Revenue Sharing	$10,175,079	$195,040	$198,709	$202,377	$205,181	$208,054
Highway User Fees - HURF	$5,208,380	$104,730	$106,794	$108,858	$110,317	$111,838
Total Non-Utility	$86,197,578	$1,730,805	$1,765,243	$1,800,027	$1,829,318	$1,859,572
Utilty						
Water Fees	$15,370,000	$60,266	$61,454	$62,642	$63,482	$64,357
Sewer Fees	$9,985,200	$40,156	$40,948	$41,739	$42,299	$42,882
Total Utility	$25,355,200	$100,423	$102,402	$104,382	$105,781	$107,239

Revenue Source	FY2025	FY2026	FY2027	FY2028	FY2029	10-Year Increase
Non-Utility						
City Sales Tax - Residential	$629,187	$637,628	$646,069	$654,510	$662,950	$6,241,646
City Sales tax - Nonresidential	$658,629	$672,539	$686,924	$701,730	$714,849	$6,530,648
Property Tax - Residential	$61,767	$62,595	$63,424	$64,253	$65,081	$612,737
Property Tax - Nonresidential	$64,657	$66,023	$67,435	$68,888	$70,176	$641,108
State Shared Revenue - Sales Tax	$151,792	$153,917	$156,071	$158,163	$160,282	$1,506,465
State Urban Revenue Sharing	$210,967	$213,920	$216,915	$219,822	$222,767	$2,093,753
Highway User Fees - HURF	$113,359	$114,880	$116,400	$117,921	$119,442	$1,124,539
Total Non-Utility	$1,890,357	$1,921,501	$1,953,238	$1,985,286	$2,015,549	$18,750,896
Utilty						
Water Fees	$65,232	$66,107	$66,982	$67,857	$68,733	$647,113
Sewer Fees	$43,465	$44,048	$44,631	$45,222	$45,805	$431,196
Total Utility	$108,697	$110,155	$111,613	$113,079	$114,538	$1,078,309

Source: City of Avondale, Finance & Budget Department.

APPENDIX B: PROFESSIONAL SERVICES

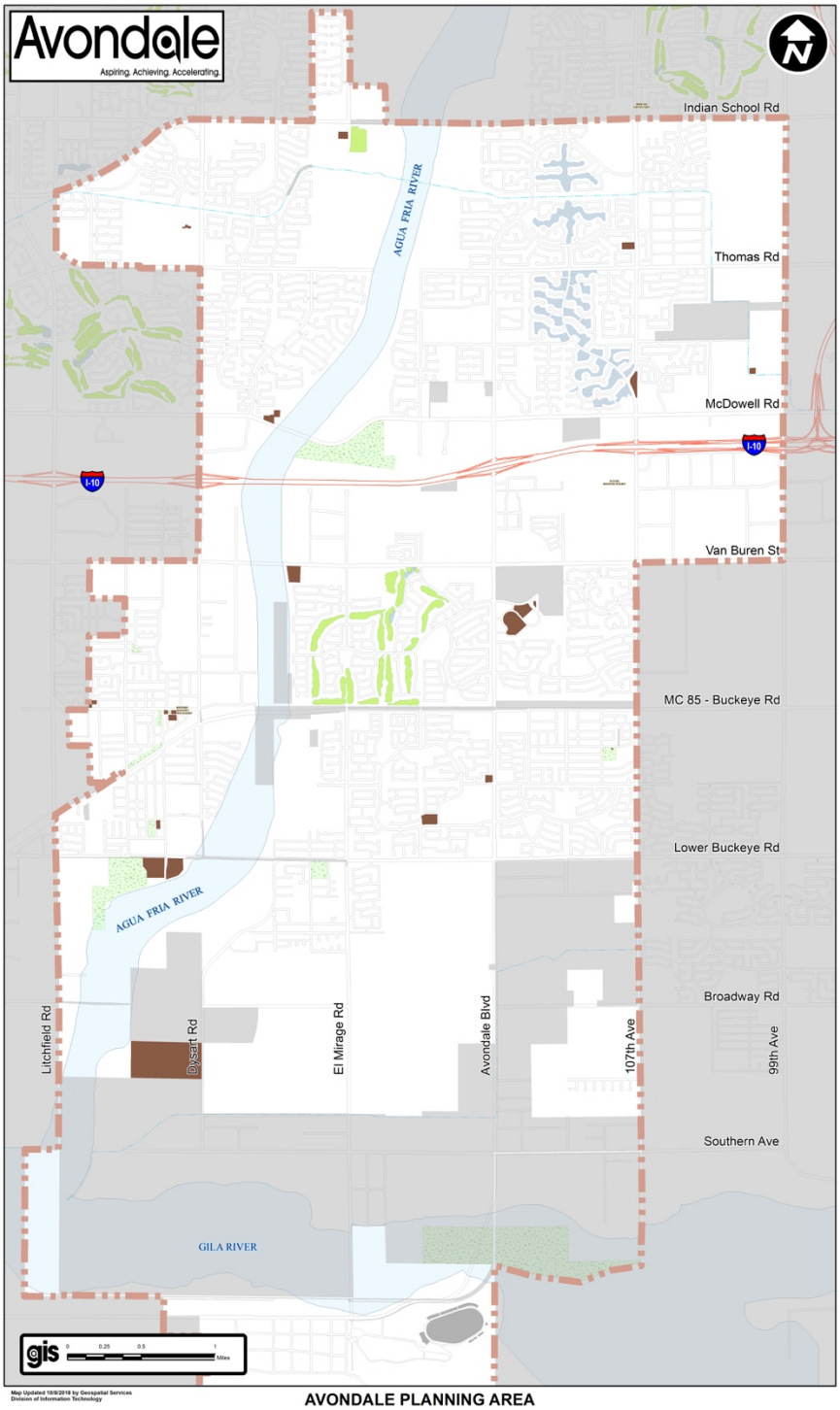
As stated in Arizona's development fee enabling legislation, "a municipality may assess development fees to offset costs to the municipality associated with providing necessary public services to a development, including the costs of infrastructure, improvements, real property, engineering and architectural services, financing and professional services required for the preparation or revision of a development fee pursuant to this section, including the relevant portion of the infrastructure improvements plan" (see ARS § 9-463.05.A). Because development fees must be updated at least every five years, the cost of professional services is allocated to the projected increase in service units, over five years (see Figure B1). Qualified professionals must develop the IIP, using generally accepted engineering and planning practices. A qualified professional is defined as "a professional engineer, surveyor, financial analyst or planner providing services within the scope of the person's license, education or experience".

Figure B1: Cost of Professional Services

Necessary Public Service	Cost	Assessed Against	Proportionate Share	Demand Unit	2018	2023	Change	Cost per Demand Unit
Fire	$14,323	Residential	82%	Population	84,736	92,626	7,890	$1.49
		Nonresidential	18%	Vehicle Trips	72,025	81,026	9,001	$0.29
Library	$15,118	Residential	82%	Population	84,736	92,626	7,890	$1.57
		Nonresidential	18%	Jobs	17,086	19,298	2,212	$1.23
Parks and Recreational	$14,323	Residential	91%	Population	84,736	92,626	7,890	$1.65
		Nonresidential	9%	Jobs	17,086	19,298	2,212	$0.58
Police	$14,323	Residential	82%	Population	84,736	92,626	7,890	$1.49
		Nonresidential	18%	Vehicle Trips	72,025	81,026	9,001	$0.29
Street	$25,065	Residential Nonresidential	100%	VMT	498,794	545,990	47,196	$0.53
Wastewater	$21,484	Residential Nonresidential	100%	Gallons	5,926,764	6,547,057	620,293	$0.03
Water	$28,644	Residential Nonresidential	100%	Gallons	11,289,122	12,534,726	1,245,605	$0.02
Total	$133,280							

APPENDIX C: LAND USE ASSUMPTIONS

The estimates and projections of residential and nonresidential development in this *Land Use Assumptions* document are for areas within the boundaries of the City of Avondale. The map below illustrates the area within the City of Avondale Service Area boundaries.



AVONDALE PLANNING AREA

Arizona's Development Fee Act requires the preparation of Land Use Assumptions, which are defined in Arizona Revised Statutes § 9-463.05(T)(6) 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."*

The City of Avondale, Arizona retained TischlerBise to analyze the impacts of development on its capital facilities and to calculate development impact fees based on that analysis. TischlerBise prepared current demographic estimates and future development projections for both residential and nonresidential development that will be used in the Infrastructure Improvements Plan (IIP) and calculation of the development fees. Current demographic data estimates for 2018 are used in calculating levels of service (LOS) provided to existing development in the City of Avondale. Although long-range projections are necessary for planning infrastructure systems, a shorter time frame of five to ten years is critical for the development fee analysis.

Arizona's Development Fee Act requires fees to be updated at least every five years and limits the IIP to a maximum of 10 years. Therefore, the use of a very long-range "build-out" analysis is no longer acceptable for deriving development fees in Arizona municipalities.

SUMMARY OF GROWTH INDICATORS

Key land use assumptions for the City of Avondale development fee study are population, housing units, and employment projections. Based on discussions with staff, TischlerBise estimates housing units by combining building permit data with Maricopa Association of Governments (MAG) 2015-2030 projections. TischlerBise derives population estimates by converting annual housing unit increases to population using persons per housing unit factors. For nonresidential development, the base year employment estimate is calculated based on MAG 2015 and 2020 estimates. The MAG 2015-2030 average annual growth rates are applied to the base year employment estimate to project future employment by industry sector. The employment estimate is converted into floor area based on average square feet per job multipliers. Four nonresidential development prototypes are discussed further below (see Figure C5 and related text). The projections contained in this document provide the foundation for the Development Fee Report. These metrics are the service units and demand indicators used in the Development Fee Report.

Development projections and growth rates are summarized in Figure C11. These projections will be used to estimate development fee revenue and to indicate the anticipated need for growth-related infrastructure. However, development fees methodologies are designed to reduce sensitivity to development projections in the determination of the proportionate-share fee amounts. If actual development is slower than projected, fee revenue will decline, but so will the need for growth-related infrastructure. In contrast, if development is faster than anticipated, Avondale will receive an increase in fee revenue, but will also need to accelerate infrastructure improvements to keep pace with the actual rate of development.

During the next five years, land use assumptions indicate an average increase of 565 housing units per year, and an average increase of approximately 232,000 nonresidential square feet per year.

RESIDENTIAL DEVELOPMENT

Current estimates and future projections of residential development are detailed in this section including population and housing units by type.

Recent Residential Construction

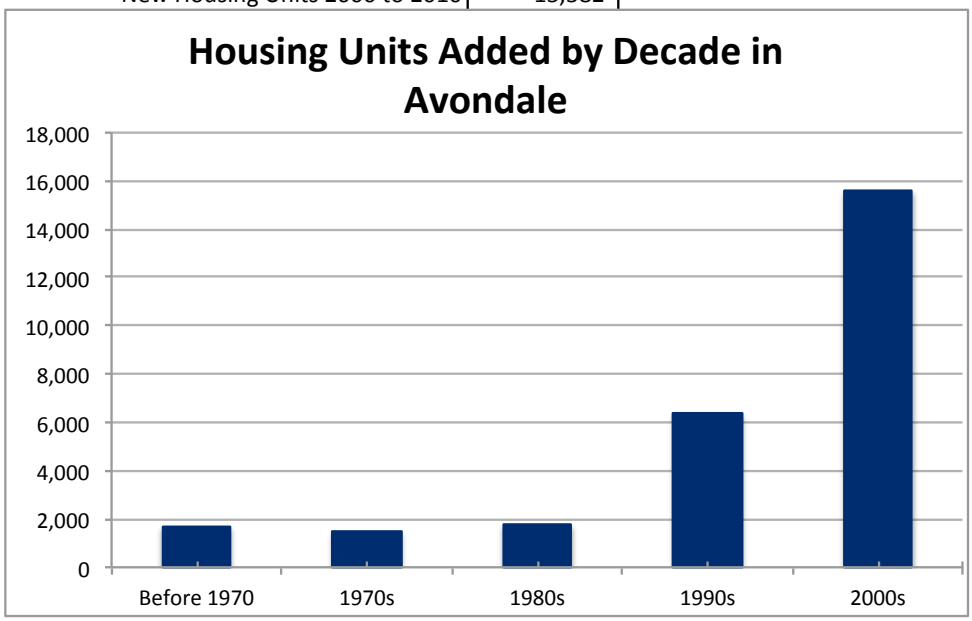
Development fees require an analysis of current levels of service. For residential development, current levels of service are determined using estimates of population and housing units.

Shown below, Figure C2 indicates the estimated number of housing units added by decade according to data obtained from the U.S. Census Bureau. Avondale experienced strong growth in the 1990s and 2000s. From 2000 to 2010, Avondale's housing inventory increased by an average of 1,558 units per year.

Figure C2: Housing Units by Decade

Census 2010 Population	76,238
Census 2010 Housing Units	27,001
Census 2000 Housing Units	11,419
New Housing Units 2000 to 2010	15,582

Avondale added an average of 1,558 housing units per year from 2000 to 2010.



Source: U.S. Census Bureau, Census 2010 Summary File 1, Census 2000 Summary File 1, 2011-2015 5-Year American Community Survey (for 1990s and earlier, adjusted to yield total units in 2000).

Household Size

According to the U.S. Census Bureau, a household is a housing unit occupied by year-round residents. Development fees often use per capita standards and persons per housing unit (PPHU) or persons per household (PPH) to derive proportionate share fee amounts. When PPHU is used in the fee calculations, infrastructure standards are derived using year-round population. When PPH is used in the fee calculations, the development fee methodology assumes a higher percentage of housing units will be occupied, thus requiring seasonal or peak population to be used when deriving infrastructure standards. TischlerBise recommends that development fees for residential development in Avondale be imposed according to the number of year-round residents per housing unit. This methodology assumes some portion of the housing stock will be vacant during the course of a year. According to the U.S. Census Bureau American Community Survey, Avondale's vacancy rate was 11 percent in 2015.

PPHU calculations require data on population and the types of units by structure. The 2010 census did not obtain detailed information using a "long-form" questionnaire. Instead, the U.S. Census Bureau switched to a continuous monthly mailing of surveys, known as the American Community Survey (ACS), which has limitations due to sample-size constraints. For example, data on detached housing units are now combined with attached single units (commonly known as townhouses). For development fees in Avondale, detached stick-built units and attached units (commonly known as townhouses, which share a common sidewall, but are constructed on an individual parcel of land) are included in the "Single-Family Unit" category. The second residential category includes duplexes and all other structures with two or more units on an individual parcel of land. This category is referred to as "Multi-Family Unit." (Note: housing unit estimates from ACS will not equal decennial census counts of units. These data are used only to derive the custom PPHU factors for each type of unit).

Figure C3 below shows the 2011-2015 five-year ACS estimates for Avondale. Single-family units averaged 3.18 persons per housing unit (68,254 persons / 19,267 housing units) and multi-family units averaged 2.13 persons per housing unit (10,445 persons / 4,249 housing units). In 2015, Avondale's housing stock averaged 2.98 persons per housing unit.

Figure C3: Persons per Housing Unit

Units in Structure	*Persons*	*Households*	*Persons per Household*	*Housing Units*	*Persons per Housing Unit*	*Housing Mix*	*Vacancy Rate*
Single-Family Unit[1]	68,254	19,267	3.54	21,492	3.18	81.5%	10%
Multi-Family Unit[2]	10,445	4,249	2.46	4,894	2.13	18.5%	13%
TOTAL	78,699	23,516	3.35	26,386	2.98		11%

Source: TischlerBise analysis and calculation based on U.S. Census Bureau, 2011-2015 American Community Survey, 5-Year Estimates.

1. Includes detached, attached (townhouse), and manufactured units.

2. Includes duplexes, structures with two or more units, and all other units.

Population Estimates

To accurately determine current and future population in Avondale, TischlerBise compared population estimates and growth rates from ACS data, Arizona Department of Administration (ADOA) data, the Avondale General Plan, and Maricopa Association of Governments (MAG) data. MAG released population projections through 2050 for jurisdictions in 2016, along with annual updates of housing unit and population estimates. TischlerBise uses MAG's 2016 Socioeconomic Projections in conjunction with Avondale staff-provided building permit data to derive the base year estimates of population and housing units. Staff-provided building permit data is used to estimate the increase in housing units in 2016 and 2017: 355 single-family units and 66 multi-family units were added in 2016; 198 single-family units and 400 multi-family units were added in 2017. This results in a base year housing unit estimate of 28,639. TischlerBise converts estimated housing units to population using persons per housing unit factors detailed in Figure C3 – 3.18 persons per single-family housing unit and 2.13 persons per multi-family housing unit – which results in a base year population of 83,080 persons.

Population Projections

Based on recent building permit trends and discussions with Avondale staff, TischlerBise projects an average annual increase of 600 housing units (360 single-family and 240 multi-family units) between 2018 and 2022. TischlerBise projects housing growth beyond 2022 using MAG's 2015-2030 household compound average annual growth rate of 1.34%. The housing units are distributed by type based on the housing mix detailed in Figure A2. Therefore, between 2023 and 2027, 81.5% of projected new units are single-family and 18.5% are multi-family. To project future population between 2017 and 2027, the annual housing unit increase is converted using the persons per housing unit factors of 3.18 for single-family units and 2.13 for multi-family units. For this study, it is assumed that the household size will remain constant. TischlerBise projects a 10-year increase of 14,490 persons, or an average of 1,449 persons annually, and a corresponding 10-year increase of 5,034 housing units, or an average of 503 units annually. Based on projections provided by Avondale's Development and Engineering Services Department, anticipated buildout will occur in 2050 at an annual growth rate of 1.2 percent. Using the 2028 projected population of 99,226, the projected population in 2050 (buildout) will be approximately 129,000.

Population and housing unit projections are used to illustrate the possible future pace of service demands, revenues, and expenditures. To the extent these factors change, the projected need for infrastructure will also change. If development occurs at a more rapid rate than projected, the demand for infrastructure will increase at a corresponding rate. If development occurs at a slower rate than is projected, the demand for infrastructure will also decrease.

Figure C4: Residential Development Projections

	2018	2019	2020	2021	2022	2023	2028	10-Year
Cumulative Increase	*Base*	*1*	*2*	*3*	*4*	*5*	*10*	*Increase*
Population	84,736	86,392	88,048	89,704	91,360	92,626	99,226	14,490
Housing Units	29,239	29,839	30,439	31,039	31,639	32,063	34,273	5,034

NONRESIDENTIAL DEVELOPMENT

Current estimates and future projections of nonresidential development are detailed in this section including jobs and nonresidential floor area.

Employment Estimates

In addition to data on residential development, the calculation of development impact fees requires data on employment (number of jobs) and nonresidential square footage in Avondale. TischlerBise uses the term "jobs" to refer to employment by place of work. TischlerBise analyzed recent employment trends, reviewed data published by MAG, the U.S. Census Bureau, and Esri Business Analyst, and had discussions with City staff.

TischlerBise uses a four step process to calculate base year job and nonresidential footage estimates, and projections for 10 years past the base year. First, 2017 employment estimates are derived using 2015 and 2020 MAG employment estimates. Second, job estimates are organized by type: Industrial, Commercial/Retail, and Office / Institutional. Third, the MAG 2015-2030 annual employment growth rate is applied to the 2015 MAG employment estimate to project future citywide jobs. The last step allocates jobs by type based on the 2017 share of total jobs. This process is detailed below in Figure C5.

Figure C5: Estimated Employment and Distribution by Industry Type

Nonresidential Category	*2017 Jobs [1]*	*Percent of Total Jobs*	*Sq. Ft. per Job*	*2017 Estimated Floor Area [2]*	*Jobs per 1,000 Sq. Ft. [2]*
Industrial	837	5.0%	3,199	2,677,901	0.31
Commercial / Retail	8,153	48.9%	475	3,875,162	2.10
Office / Institutional	7,687	46.1%	528	4,059,752	1.89
TOTAL	**16,677**	**100%**		**10,612,815**	

1. TischlerBise calculation based on Maricopa Association of Governments 2015 and 2020 estimates.
2. Costar, 2017 (industrial, comercial, and office). Insitutional based on jobs and ITE 10th Edition (2017) multiplier.

Nonresidential Square Footage Estimates

TischlerBise uses 2017 Institute of Transportation Engineers (ITE) data as a proxy for future institutional nonresidential floor area (Figure C6). The prototype for institutional development is an elementary school (ITE 520), with an average of 1,076 square feet per job. Costar does not gather data on institutional development, so floor area estimates for institutional development are estimated based on current jobs and ITE building area ratios discussed below. TischlerBise uses Costar square footage estimates for industrial, commercial / retail, and office and other services floor area. As shown in Figure C5, existing industrial development averages 3,199 square feet per job, existing commercial / retail development averages 475 square feet per job, and existing office / institutional development averages 528 square feet per job. TischlerBise estimates Avondale has approximately 10.585 million square feet of nonresidential space.

Figure C6: The Institute of Transportation Engineers, Employee and Building Area Ratios

ITE Code	Land Use / Size	Demand Unit	Wkdy Trip Ends Per Dmd Unit[1]	Wkdy Trip Ends Per Employee[1]	Emp Per Dmd Unit	Sq Ft Per Emp
110	Light Industrial	1,000 Sq Ft	4.96	3.05	1.63	615
130	Industrial Park	1,000 Sq Ft	3.37	2.91	1.16	864
140	Manufacturing	1,000 Sq Ft	3.93	2.47	1.59	628
150	**Warehousing**	**1,000 Sq Ft**	**1.74**	**5.05**	**0.34**	**2,902**
520	Elementary School	1,000 Sq Ft	19.52	21.00	0.93	1,076
610	Hospital	1,000 Sq Ft	10.72	3.79	2.83	354
710	**General Office (average size)**	**1,000 Sq Ft**	**9.74**	**3.28**	**2.97**	**337**
720	Medical-Dental Office	1,000 Sq Ft	34.80	8.70	4.00	250
730	Government Office	1,000 Sq Ft	22.59	7.45	3.03	330
760	Research & Dev Center	1,000 Sq Ft	11.26	3.29	3.42	292
820	**Shopping Center (average size)**	**1,000 Sq Ft**	**37.75**	**16.11**	**2.34**	**427**

1. Trip Generation, Institute of Transportation Engineers, 10th Edition (2017).

Employment and Nonresidential Floor Area Projections

Future employment growth and nonresidential development in Avondale are based on MAG data. To project employment, TischlerBise applies MAG 2015-2030 annual employment growth rates to the 2015 MAG employment estimate of 15,892 total jobs.

To project growth in nonresidential square footage, TischlerBise applies the previously discussed square feet per employee factors to the projected increase in employment. The results of these calculations are shown in Figure C7. Over the next 10 years, Avondale is projected to gain 4,739 jobs and add an estimated 2.49 million square feet of nonresidential development.

Figure C7: Nonresidential Development Projections

	2015	2018	2019	2020	2021	2022	2023	2028	10-Year
Cumulative Increase		*Base*	*1*	*2*	*3*	*4*	*5*	*10*	*Increase*
Jobs									
Industrial	797	858	879	901	924	947	970	1,097	**239**
Commercial / Retail	7,656	8,414	8,683	8,960	9,246	9,542	9,847	11,524	**3,110**
Office / Institutional	7,439	7,814	7,943	8,074	8,207	8,343	8,481	9,204	**1,390**
Total Jobs	**15,892**	**17,086**	**17,505**	**17,935**	**18,377**	**18,832**	**19,298**	**21,825**	**4,739**
Nonresidential Floor Area (x 1,000)									
Industrial KSF		2,739	2,800	2,864	2,930	2,997	3,064	3,432	**694**
Commercial / Retail KSF		3,987	4,101	4,220	4,342	4,468	4,599	5,315	**1,328**
Office / Institutional KSF		4,103	4,146	4,190	4,235	4,281	4,327	4,571	**468**
Total Nonresidential KSF		**10,828**	**11,047**	**11,274**	**11,507**	**11,746**	**11,990**	**13,318**	**2,490**

AVERAGE WEEKDAY VEHICLE TRIPS

Average Weekday Vehicle Trips are used as a measure of demand by land use. Vehicle trips are estimated using average weekday vehicle trip ends from the reference book, *Trip Generation, 10th Edition*, published by the ITE in 2017. A vehicle trip end represents a vehicle entering or exiting a development (as if a traffic counter were placed across a driveway).

Trip Rate Adjustments

To calculate road development fees, trip generation rates require an adjustment factor to avoid double counting each trip at both the origin and destination points. Therefore, the basic trip adjustment factor is 50 percent. As discussed further below, the development impact fee methodology includes additional adjustments to make the fees proportionate to the infrastructure demand for particular types of development.

Commuter Trip Adjustment

Residential development has a larger trip adjustment factor of 65 percent to account for commuters leaving Avondale for work. According to the 2009 National Household Travel Survey (see Table 30) weekday work trips are typically 31 percent of production trips (i.e., all out-bound trips, which are 50 percent of all trip ends). As shown in Figure C8, the U.S. Census Bureau's OnTheMap web application indicates that 96 percent of resident workers traveled outside of Avondale for work in 2015. In combination, these factors (0.31 x 0.50 x 0.96 = 0.148) support the additional 15 percent allocation of trips to residential development.

Figure C8: Commuter Trip Adjustment

Trip Adjustment Factor for Commuters [1]	
Employed Residents	36,444
Residents Working in Avondale	1,596
Residents Working Outside Avondale (Commuters)	34,848
Percent Commuting out of Avondale	**96%**
Additional Production Trips[2]	**15%**
Residential Trip Adjustment Factor	**65%**

1. U.S. Census Bureau, OnTheMap Application (version 6.1.1) and LEHD Origin-Destination Employment Statistics, 2015.

2. According to the National Household Travel Survey (2009), published in December 2011 (see Table 30), home-based work trips are typically 30.99 percent of "production" trips, in other words, out-bound trips (which are 50 percent of all trip ends). Also, LED OnTheMap data from 2015 indicate that 96 percent of Avondale's workers travel outside the city for work. In combination, these factors (0.3099 x 0.50 x 0.96 = 0.14816) account for 15 percent of additional production trips. The total adjustment factor for residential includes attraction trips (50 percent of trip ends) plus the journey-to-work commuting adjustment (15 percent of production trips) for a total of 65 percent.*
**http://nhts.ornl.gov/publications.shtml ; Summary of Travel Trends - Table "Daily Travel Statistics by Weekday vs. Weekend"*

Adjustment for Pass-By Trips

For commercial development, the trip adjustment factor is less than 50 percent because retail development attracts vehicles as they pass by on arterial and collector roads. For example, when someone stops at a convenience store on the way home from work, the convenience store is not the primary destination. For the average shopping center, ITE data indicate 34 percent of the vehicles that enter are passing by on their way to some other primary destination. The remaining 66 percent of attraction trips have the commercial site as their primary destination. Because attraction trips are half of all trips, the trip adjustment factor is 66 percent multiplied by 50 percent, or approximately 33 percent of the trip ends.

Estimated Residential Vehicle Trip Rates

As an alternative to simply using the national average trip generation rate for residential development, the ITE publishes regression curve formulas that may be used to derive custom trip generation rates, using local demographic data. Key independent variables needed for the analysis (i.e. vehicles available, housing units, households, and persons) are available from American Community Survey data. Shown in Figure C9, custom trip generation rates for Avondale vary slightly from the national averages. For example, single-family residential development is expected to generate 10.00 average weekday vehicle trip ends per dwelling – compared to the national average of 9.44 (ITE 210). Multi-family residential development is expected to generate 5.20 average weekday vehicle trip ends per dwelling, which is lower than the national average of 5.44 (ITE 221).

Figure C9: Average Weekday Vehicle Trip Ends by Housing Type

		Households by Structure Type[2]			
	Vehicles Available[1]	Single-Family	Multi-Family	Total	Vehicles per HH by Tenure
Owner-occupied	26,252	12,646	28	12,674	2.07
Renter-occupied	17,212	6,621	4,221	10,842	1.59
TOTAL	**43,464**	**19,267**	**4,249**	**23,516**	**1.85**

	Persons in Households[3]	*Trip Ends[4]*	*Vehicles by Type of Unit*	*Trip Ends[5]*	*Average Trip Ends*	*Housing Units[6]*	*Trip Ends per Unit*	
							Avondale	*ITE[7]*
Single-Family	68,254	190,047	36,705	239,232	214,640	21,492	10.00	9.44
Multi-Family	10,445	23,838	6,759	26,924	25,381	4,894	5.20	5.44
TOTAL	**78,699**	**213,885**	**43,464**	**266,156**	**240,020**	**26,386**	**9.10**	

1. Vehicles available by tenure from Table B25046, American Community Survey, 2011-2015 5-Year Estimates.
2. Households by tenure and units in structure from Table B25032, American Community Survey, 2011-2015 5-Year Estimates.
3. Total population in households from Table25033, American Community Survey, 2011-2015 5-Year Estimates.
4. Vehicle trips ends based on persons using formulas from Trip Generation (ITE 2017). For single-family housing (ITE 210), the fitted curve equation is EXP(0.89*LN(persons)+1.72). To approximate the average population of the ITE studies, persons were divided by 122 and the equation result multiplied by 122. For multi-family housing (ITE 221), the fitted curve equation is (2.29*persons)-81.02.
5. Vehicle trip ends based on vehicles available using formulas from Trip Generation (ITE 2017). For single-family housing (ITE 210), the fitted curve equation is EXP(0.99*LN(vehicles)+1.93). To approximate the average number of vehicles in the ITE studies, vehicles available were divided by 143 and the equation result multiplied by 143. For multi-family housing (ITE 221), the fitted curve equation is (3.94*vehicles)+293.58.
6. Housing units from Table B25024, American Community Survey, 2011-2015 5-Year Estimates.
7. Trip Generation, Institute of Transportation Engineers, 10th Edition (2017).

Functional Population

TischlerBise recommends functional population to allocate the cost of certain facilities to residential and nonresidential development. As shown in Figure C10, functional population accounts for people living and working in a jurisdiction. OnTheMap is a web-based mapping and reporting application that shows where workers are employed and where they live. It describes geographic patterns of jobs by their employment locations and residential locations as well as the connections between the two locations. OnTheMap was developed through a unique partnership between the U.S. Census Bureau and its Local Employment Dynamics (LED) partner states.

Residents who do not work are assigned 20 hours per day to residential development and four hours per day to nonresidential development (annualized averages). Residents who work in Avondale are assigned 14 hours to residential development and 10 hours to nonresidential development. Residents who work outside Avondale are assigned 14 hours to residential development. Inflow commuters are assigned 10 hours to nonresidential development. Based on 2015 functional population data for Avondale, the cost allocation for residential development is 82 percent while nonresidential development accounts for 18 percent of the demand for municipal facilities.

Figure C10: Functional Population

Demand Units in 2015			*Demand Hours/Day*	*Person Hours*	*Proportionate Share*
Residential					
Estimated Residents	80,329				
Residents Not Working		43,885	20	877,700	
Employed Residents		36,444			
Employed in Service Area		1,596	14	22,344	
Employed outside Service Area		34,848	14	487,872	
		Residential Subtotal		1,387,916	**82%**
Nonresidential					
Non-working Residents		43,885	4	175,540	
Jobs in Service Area		13,656			
Residents Employed in Service Area		1,596	10	15,960	
Non-Resident Workers (inflow Commuters)		12,060	10	120,600	
		Nonresidential Subtotal		312,100	**18%**
			TOTAL	1,700,016	**100%**

Source: Maricopa Association of Governments 2015 Population Estimate; U.S. Census Bureau, OnTheMap 6.1.1 Application, 2015.

DEVELOPMENT PROJECTIONS

Provided below is a summary of cumulative development projections used in the development impact fee study. Base year estimates for 2018 are used in the development impact fee calculations. Development projections are used to illustrate a possible future pace of demand for service units and cash flows resulting from revenues and expenditures associated with those demands.

Figure C11: Development Projections Summary

	2015	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	10-Year
Cumulative Increase		Base	1	2	3	4	5	6	7	8	9	10	Increase
Population	**80,329**	**84,736**	**86,392**	**88,048**	**89,704**	**91,360**	**92,626**	**93,910**	**95,212**	**96,532**	**97,870**	**99,226**	**14,490**
Housing Units	**27,620**	**29,239**	**29,839**	**30,439**	**31,039**	**31,639**	**32,063**	**32,493**	**32,929**	**33,371**	**33,819**	**34,273**	**5,034**
Jobs													
Industrial	797	858	879	901	924	947	970	994	1,019	1,044	1,070	1,097	**239**
Commercial / Retail	7,656	8,414	8,683	8,960	9,246	9,542	9,847	10,161	10,486	10,821	11,167	11,524	**3,110**
Office / Institutional	7,439	7,814	7,943	8,074	8,207	8,343	8,481	8,621	8,763	8,908	9,055	9,204	**1,390**
Total Jobs	**15,892**	**17,086**	**17,505**	**17,935**	**18,377**	**18,832**	**19,298**	**19,776**	**20,268**	**20,773**	**21,292**	**21,825**	**4,739**
Nonresidential Floor Area (x 1,000)													
Industrial KSF		2,739	2,800	2,864	2,930	2,997	3,064	3,134	3,206	3,279	3,354	3,432	**694**
Commercial / Retail KSF		3,987	4,101	4,220	4,342	4,468	4,599	4,733	4,871	5,014	5,162	5,315	**1,328**
Office / Institutional KSF		4,103	4,146	4,190	4,235	4,281	4,327	4,375	4,422	4,471	4,521	4,571	**468**
Total Nonresidential KSF		**10,828**	**11,047**	**11,274**	**11,507**	**11,746**	**11,990**	**12,241**	**12,500**	**12,764**	**13,037**	**13,318**	**2,490**

APPENDIX D: LAND USE DEFINITIONS

RESIDENTIAL DEVELOPMENT

As discussed below, residential development categories are based on data from the U.S. Census Bureau, American Community Survey. Avondale will collect development fees from all new residential units. One-time development fees are determined by site capacity (i.e. number of residential units).

Single-Unit:

1. **Single-family detached** is a one-unit structure detached from any other house, that is, with open space on all four sides. Such structures are considered detached even if they have an adjoining shed or garage. A one-family house that contains a business is considered detached as long as the building has open space on all four sides.
2. **Single-family attached (townhouse)** is a one-unit structure that has one or more walls extending from ground to roof separating it from adjoining structures. In row houses (sometimes called townhouses), double houses, or houses attached to nonresidential structures, each house is a separate, attached structure if the dividing or common wall goes from ground to roof.
3. **Mobile home** includes both occupied and vacant mobile homes, to which no permanent rooms have been added. Mobile homes used only for business purposes or for extra sleeping space and mobile homes for sale on a dealer's lot, at the factory, or in storage are not counted in the housing inventory.

2+ Units:

1. **2+ units (duplexes and apartments)** are units in structures containing two or more housing units, further categorized as units in structures with "2, 3 or 4, 5 to 9, 10 to 19, 20 to 49, and 50 or more apartments."
2. **Boat, RV, Van, Etc.** includes any living quarters occupied as a housing unit that does not fit the other categories (e.g., houseboats, railroad cars, campers, and vans). Recreational vehicles, boats, vans, railroad cars, and the like are included only if they are occupied as a current place of residence.

NONRESIDENTIAL DEVELOPMENT

The proposed general nonresidential development categories (defined below) can be used for all new construction within Avondale. Nonresidential development categories represent general groups of land uses that share similar average weekday vehicle trip generation rates and employment densities (i.e., jobs per thousand square feet of floor area).

Commercial / Retail: Establishments primarily selling merchandise, eating/drinking places, and entertainment uses. By way of example, *Commercial / Retail* includes shopping centers, supermarkets, pharmacies, restaurants, bars, nightclubs, automobile dealerships, and movie theaters, hotels, and motels.

Industrial: Establishments primarily engaged in the production, transportation, or storage of goods. By way of example, *Industrial* includes manufacturing plants, distribution warehouses, trucking companies, utility substations, power generation facilities, and telecommunications buildings.

Office / Institutional: Establishments providing management, administrative, professional, or business services; personal and health care services. By way of example, *Office and Other Services* includes banks, business offices, assisted living facilities, nursing homes, hospitals, medical offices, and veterinarian clinics. Establishments including public and quasi-public buildings providing educational, social assistance, or religious services. By way of example, *Institutional* includes schools, universities, churches, daycare facilities, government buildings, and prisons.