DRAFT – CITY OF AVONDALE LAND USE ASSUMPTIONS, INFRASTRUCTURE IMPROVEMENTS PLAN, AND DEVELOPMENT FEES

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TABLE OF CONTENTS

EXECUTIVE SUMMARY 9
Arizona Development Fee Enabling Legislation 9
Necessary Public Services 10
Infrastructure Improvements Plan 11
Offsets 12
Qualified Professionals 12
DEVELOPMENT FEES 13
Calculation Methodologies 13
Figure 1: Current and Recommended Service Units 13
Reporting Results 14
Maximum Supportable Development Fees 14
Figure 2: Maximum Supportable City of Avondale Development Fees 14
Comparison to Current Development Fees 15
Figure 3: City of Avondale Current Development Fees 15
Figure 4: Changes Between City of Avondale Current and Proposed Development Fees 16
GENERAL GOVERNMENT FACILITIES – INFRASTRUCTURE IMPROVEMENTS PLAN 17
Overview 17
Service Area 17
Proportionate Share 18
Figure 5: Functional Population for City of Avondale, 2013 18
IIP for General Government Facilities 18
Analysis of Capacity, Usage, and Costs of existing public services 19
Level of Service – General Government 19
Figure 6: Level of Service – General Government Facilities 19
Cost per Service unit 20
Figure 7: City of Avondale 2003 General Government Debt Service Schedule 20
Figure 8: Cost Recovery – General Government Facilities 20
Excluded Costs 20
Current Use and Available Capacity 20
Ratio of Service Unit to Development Unit 21
Figure 9: Functional Population for Residential Development by Type 21
Figure 10: Functional Population per Unit for Nonresidential Uses 21
Projected Service Units and Projected Demand for Services 22
Figure 11: Projected Demand for General Government Facilities 22
General Government Facilities Improvements Plan 22
Maximum Supportable General Government Facilities Development Fees 23
IIP and Development Fee Study 23
Revenue Credit 23
Figure 12: Maximum Supportable General Government Facilities Development Fees 24
Forecast of Revenues 25
General Government Cash Flow 25
Figure 13: General Government Facilities Cash Flow Summary 25
LIBRARY FACILITIES – INFRASTRUCTURE IMPROVEMENTS PLAN 27

Overview 27
Service Area 27
Proportionate Share 27
Figure 14: Functional Population for City of Avondale, 2013 28
IIP for Library Facilities 28
Analysis of Capacity, Usage, and Costs of Existing Public Services 28
Level of Service 29
Figure 15: Level of Service – Library Facilities 29
Cost per Service unit 30
Figure 16: City of Avondale Library Debt Service Schedule 30
Figure 17: Cost Recovery – Library Facilities 30
Excluded Costs 30
Current Use and Available Capacity 30
Ratio of Service Unit to Development Unit 31
Figure 18: Functional Population for Residential Development by Type 31
Figure 19: Functional Population per Unit for Nonresidential Uses 31
Projected Service Units and Infrastructure Demand 32
Figure 20: Projected Demand for Library Facilities 32
Library Facilities Improvements Plan 33
Maximum Supportable Library Facilities Development Fees 33
IIP and Development Fee Study 33
Revenue Credit 33
Figure 21: Maximum Supportable Library Facilities Development Fees 34
Forecast of Revenues 35
Library Facilities Cash Flow 35
Figure 22: Library Facilities Cash Flow Summary 35
PARKS AND RECREATIONAL FACILITIES – INFRASTRUCTURE IMPROVEMENTS PLAN 37
Overview 37
Service Area 37
Proportionate Share 37
Figure 23: Functional Population for City of Avondale, 2013 38
IIP for Parks and Recreational Facilities 38
Analysis of Capacity, Usage, and Costs of Existing Public Services 38
Parkland 38
Figure 24: Incremental Expansion - Parkland 39
Park Amenities 40
Figure 25: Incremental Expansion - Park Amenities 40
Existing Parks and Recreational Facilities Debt Service 41
Figure 26: Debt Service – Parks and Recreational Facilities 41
Excluded Costs 41
Current Use and Available Capacity 41
Ratio of Service Unit to Development Unit 42
Figure 27: Functional Population for Residential Development by Type 42
Figure 28: Functional Population per Unit for Nonresidential Uses 42

Projected Demand for Services And Costs 42
Figure 29: Projected Demand for Parks and Recreational Facilities 43
Parks and Recreational Facilities Improvements Plan 44
Figure 30: Parks and Recreational Facilities Capital Plan 2013 - 2023 44
Maximum Supportable Parks and Recreational Facilities Development Fees 44
IIP and Development Fee Study....44
Revenue Credit 44
Figure 31: Maximum Supportable Parks and Recreational Facilities Development Fees 45
Forecast of Revenues....46
Parks and Recreational Facilities Cash Flow 46
Figure 32: Potential Parks and Recreational Facilities Cash Flow Summary 46
FIRE FACILITIES – INFRASTRUCTURE IMPROVEMENTS PLAN 47
Overview 47
Service Area....47
Proportionate Share....47
Figure 33: Functional Population for City of Avondale, 2013 48
IIP for Fire Facilities 48
Analysis of Capacity, Usage, and Costs of Existing Public Services....48
Fire Facilities....49
Figure 34: Fire Facilities Cost per Square Foot 49
Figure 35: Incremental Expansion - Fire Facilities 49
Fire Vehicles and Equipment....50
Figure 36: Incremental Expansion - Fire Vehicles and Equipment 50
Existing Fire Facilities Debt Service 50
Figure 37: Debt Service – Fire Facilities 51
Excluded Costs....51
Current Use and Available Capacity 51
Ratio of Service Unit to Development Unit 52
Figure 38: Functional Population for Residential Development by Type 52
Figure 39: Functional Population per Unit for Nonresidential Uses 52
Projected Service Units and Projected Demand for Services....52
Figure 40: Projected Demand for Fire Facilities.... 53
Fire Facilities Improvements Plan....53
Figure 41: Fire Facilities Improvements Plan 2013 - 2023.... 53
Maximum Supportable Fire Facilities Development Fees....54
IIP and Development Fee Study....54
Revenue Credit 54
Figure 42: Maximum Supportable Fire Facilities Development Fees 55
Forecast of Revenues....56
Fire Facilities Cash Flow 56
Figure 43: Fire Facilities Cash Flow Summary 56
POLICE FACILITIES – INFRASTRUCTURE IMPROVEMENTS PLAN 57
Overview 57
Service Area....57
Proportionate Share....57

Figure 44: Functional Population for City of Avondale, 2013 58
IIP for Police Facilities 58
Analysis of Capacity, Usage, and Costs of Existing Public Services 58
Police Facilities 59
Figure 45: Construction Cost for Police Facilities 59
Figure 46: Incremental Expansion - Police Facilities 59
Police Vehicles and Equipment 60
Figure 47: Incremental Expansion - Police Vehicles and Equipment 60
Police Communications Equipment 61
Figure 48: Incremental Expansion - Police Communications Equipment 61
Excluded Costs 61
Current Use and Available Capacity 61
Ratio of Service Unit to Development Unit 62
Figure 49: Functional Population for Residential Development by Type 62
Figure 50: Functional Population per Unit for Nonresidential Uses 62
Projected Service Units and Projected Demand for Services 62
Figure 51: Projected Demand for Police Facilities 63
Police Facilities Improvements Plan 64
Figure 52: Police Facilities Improvements Plan 2013 - 2023 64
Maximum Supportable Police Facilities Development Fees 64
IIP and Development Fee Study 64
Revenue Credit 64
Figure 53: Maximum Supportable Police Facilities Development Fees 65
Forecast of Revenues 66
Police Facilities Cash Flow 66
Figure 54: Police Facilities Cash Flow Summary 66
STREET FACILITIES – INFRASTRUCTURE IMPROVEMENTS PLAN 67
Overview 67
Service Area 67
Proportionate Share 67
IIP for Street Facilities 67
Analysis of Capacity, Usage, and Costs of Existing Public Services 67
Current Inventory 68
Figure 55: City of Avondale Street Facilities Inventory 68
Trip Generation Rates 68
Figure 56: The Institute of Transportation Engineers, Residential Trip Ends, 2012 69
Figure 57: The Institute of Transportation Engineers, Nonresidential Trip Ends, 2012 69
Adjustment for Journey-To-Work Commuting 70
Figure 58: Adjustment for Journey-To-Work Commuting [1] 70
Adjustments for Pass-By Trips 70
Trip Length Weighting Factor by Type of Land Use 70
Lane Capacity 71
Figure 59: Daily Per-Lane Capacity 71
Current Level of Service 71
Figure 60: Existing Level of Service on City Arterial Network 72
Ratio of Service Unit to Land Use 73

Figure 61: Ratio of Service Unit to Land Use – Planned Arterial Roadways 73
Figure 62: Ratio of Service Unit to Land Use – Signalized Intersections 74
Projected Service Units and Facilities Demand 75
Arterial Roadways 75
Figure 63: Plan-Based - Street Facilities Needs Analysis 76
Cost per Service Unit – Arterial Roadways 76
Figure 64: Cost per Development Unit - Arterials 77
Signalized Intersections 77
Figure 65: Plan-Based – Signalize Intersections Needs Analysis 78
Cost per Service Unit – Signalized Intersections 79
Figure 66: Cost per Development Unit – Signalize Intersections 79
Description of Necessary Expansions and Costs Attributable to Development 79
Current Use and Available Capacity 79
Arterial Roadways 79
Figure 67: Street Facilities – Arterial Roadways Improvements Plan 2013 - 2023 80
Signalized Intersections 80
Figure 68: Street Facilities - Signalized Intersection Improvements Plan 2013 – 2023 80
Excluded Costs 80
Figure 69: Street Facilities – Development Fee-Eligible Capital Improvements Plan 81
Maximum Supportable Street Facilities Development Fees 82
IIP and Development Fee Study 82
Revenue Credit 82
Figure 70: Maximum Supportable Street Facilities Development Fees 82
Forecast of Revenues 83
Street Facilities Cash Flow 83
Figure 71: Street Facilities Cash Flow Summary 83
WATER FACILITIES – INFRASTRUCTURE IMPROVEMENTS PLAN 85
Overview 85
Water Supply 85
Service Area 85
Proportionate Share 86
IIP for Water Facilities 86
Analysis of Costs, Capacity, and Usage of Existing Public Services 86
System Capacity 87
Ground Water Well Facilities 87
Figure 72: Ground Water Well Capacity 87
Water Resources 88
Figure 73: Water Recharge Capacity 88
Level of Service 88
Figure 74: Water Facilities Level of Service 88
Ratio of Service Unit to Land Use 89
Figure 75: Water Ratio of Service Unit to Land Use 89
Projected Service Units, Demand, and Costs for Services 90
Figure 76: Water Facilities Projected Demand 90
Ground Water Well Facilities 91
Existing System 91

Figure 77: Cost Recovery - Existing System ... 91
Planned Improvements ... 91
Figure 78: Plan Based – Capital Improvements Plan ... 91
Figure 79: Water Facilities Capital Plan, 2013-2023 ... 92
Debt Service ... 93
Figure 80: Water Facilities Debt Service ... 93
Figure 81: Water Facilities Debt Service Offset ... 93
Water Resources ... 94
Water Resource Recharge Obligation ... 94
Figure 82: Cost Recovery – Existing Water Resource Recharge Obligation ... 94
Excluded Costs ... 94
Current Use and Available Capacity ... 94
Maximum Supportable Water Facilities Development Fees ... 94
IIP and Development Fee Study ... 94
Revenue Credit ... 95
Figure 83: Maximum Supportable Water Facilities Development Fees ... 95
Forecast of Revenues ... 96
Water Facilities Cash Flow ... 96
Figure 84: Water Facilities Cash Flow Summary ... 96
WASTEWATER FACILITIES – INFRASTRUCTURE IMPROVEMENTS PLAN ... 97
Overview ... 97
Service Area ... 97
Proportionate Share ... 97
IIP for Wastewater Facilities ... 97
Analysis of Costs, Capacity, and Usage of Existing Public Services ... 97
Figure 85: Wastewater Plant Capacity ... 98
Figure 86: Wastewater Level of Service ... 98
Ratio of Service Unit to Development Unit ... 99
Figure 87: Wastewater Facilities Ratio of Service Unit to Land Use ... 99
Projected Service Units, Demand, and Costs for Services ... 100
Figure 88: Projected Wastewater Demand ... 100
Cost per Gallon of Capacity ... 101
Figure 89: Plan Based – Wastewater Treatment Facilities ... 101
Figure 90: Wastewater Capital Plan, 2013-2023 ... 102
Debt Service ... 103
Figure 91: Wastewater Facilities Debt Service ... 103
Figure 92: Wastewater Debt Services Offset ... 103
Excluded Costs ... 104
Current Use and Available Capacity ... 104
Maximum Supportable Wastewater Facilities Development Fees ... 104
IIP and Development Fee Study ... 104
Revenue Credit ... 105
Figure 93: Maximum Supportable Wastewater Development Fees ... 105
Forecast of Revenues ... 106
Wastewater Facilities Cash Flow ... 106
Figure 94: Wastewater Facilities Cash Flow Summary ... 106

APPENDIX A – COST OF PROFESSIONAL SERVICES 107
Figure A95: IIP and Development Fee Report 107
APPENDIX B – FORECAST OF REVENUES OTHER THAN DEVELOPMENT FEES 108
Revenue Projections 108
Figure B96: Revenue Characteristics of New Development 109
APPENDIX C - LAND USE ASSUMPTIONS 111
Service Areas 111
Figure C97: City Limits and Annexation Area 112
City Service Area 113
Figure C98: Base Service Area 114
Summary of Growth Indicators 115
Figure C99: Summary of Development Projections and Growth Rates 115
Residential Development 116
Recent Residential Construction 116
Figure C100: Residential Housing Units in the City of Avondale 116
Housing Units by Service Area 117
Figure C101: Housing Units by Development Fee Service Areas 117
Current Household Size 117
Figure C102: Average Household Size 118
Population Estimates and Projections 119
Figure C103: City of Avondale Population Estimates and Projections 119
Population and Housing Unit Projections 119
Figure C104: Population and Housing Unit Projections for the City of Avondale, 2013-2033 119
Nonresidential Development 120
Figure C105: Nonresidential Land Use Categories 120
Figure C106: Jobs and Floor Area Estimates 120
Figure C107: Nonresidential Development and Jobs Projections for the City of Avondale, 2013-2033 121
Functional Population 122
Residential Functional Population 122
Figure C108: Functional Population for Residential Development by Type 122
Nonresidential Functional Population 122
Figure C109: Nonresidential Functional Population Formula 123
Figure C110: Functional Population per Unit for Nonresidential Uses 123
Service units 123
Figure C111: Functional Population for City of Avondale, 2013 123

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EXECUTIVE SUMMARY

The City of Avondale engaged TischlerBise to assist the City with updating its Infrastructure Improvements Plan and development fees for several necessary public services pursuant to Arizona Revised Statutes § 9-463.05. Municipalities in Arizona may assess development fees to offset infrastructure costs to a municipality associated with providing necessary public services to new development. The development fees must be based on an Infrastructure Improvements Plan. Development fees cannot be used for, among other things: projects not included in the Infrastructure Improvements Plan, projects related to existing development, or costs related to operations and maintenance.

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

- General Government Facilities
- Library Facilities
- Parks and Recreational Facilities
- Fire Facilities
- Police Facilities
- Street Facilities
- Water Facilities
- Wastewater Facilities

This plan also includes all necessary elements required to be in full compliance with SB 1525.

ARIZONA DEVELOPMENT FEE ENABLING LEGISLATION

Arizona Revised Statutes § 9-463.05 (hereafter referred to as "development fee enabling legislation") governs how development fees are calculated for municipalities in Arizona. During the state legislative session of 2011, Senate Bill 1525 (SB 1525) was introduced which significantly amended the development fee enabling legislation. The changes included:

- Amending existing development fee programs to discontinue collection of certain fees by January 1, 2012.
- Abandoning existing development fee programs by August 1, 2014.
- Establishing a new development fee program structure revolving around a unified Land Use Assumptions document and Infrastructure Improvements Plan.
- Establishing a new adoption procedure for the Land Use Assumptions, Infrastructure Improvements Plan, and development fees.
- Establishing a new definition, including "necessary public services" which defines what categories and types of infrastructure may be funded with development fees.
- Establishing time limitations in development fee collections and expenditures.
- Modifying requirements for credits, "grandfathering" rules, and refunds.

Governor Brewer signed SB 1525 into law on April 26, 2011. This update of the City's Development Fee Study complies with all of the new requirements of SB 1525.

NECESSARY PUBLIC SERVICES

The City of Avondale currently collects development fees for the following infrastructure categories:

- General Government
- Libraries
- Parks and Recreation
- Fire
- Police
- Streets
- Water
- Wastewater

Under the new requirements of the development fee enabling legislation, development fees may be only 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 by or on behalf of the municipality:

- Water Facilities
- Wastewater Facilities
- Storm Water, Drainage, and Flood Control Facilities
- Library Facilities
- Streets Facilities
- Fire and Police Facilities
- Neighborhood Parks and Recreational Facilities
- 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 Infrastructure Improvements Plan (IIP). For each necessary public service that is the subject of a development fee, by law, the IIP shall include the following seven elements:

> *Element #1: 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.*
>
> *Element #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.*
>
> *Element #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 the this state, as applicable.*
>
> *Element #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.*
>
> *Element #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.*
>
> *Element #6: The projected demand for necessary public services or facility expansions required by new service units for a period not to exceed ten years.*
>
> *Element #7: A forecast of revenues generated by new service units other than development fees, which shall include estimated state-shared revenue, highway users revenue, federal revenue, ad valorem property taxes, construction contracting or similar excise taxes and the capital recovery portion of utility fees attributable to development based on the approved land use assumptions and a plan to include these contributions in determining the extent of the burden imposed by the development as required in subsection B, paragraph 12 of this section.*

OFFSETS

New development should not be required to pay twice for the cost of new facilities – once through development fees and again through other taxes or fees that are used to fund the same facilities. To avoid such potential double-payment, development fees may be reduced, and such a reduction is referred to as an "offset." Offsets are incorporated into the development fee calculation. While this has long been a part of development fee practice in Arizona, SB 1525 amended the state enabling act to add a mandate regarding construction contracting excise tax, as highlighted in the following provision (ARS § 9-463.05(B)(12):

> *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.***

In general, offsets are only required for funding that is dedicated for capacity-expanding improvements addressed by the IIP. A municipality is not required to use general fund revenue to pay for growth-related improvements.

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

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.

DEVELOPMENT FEES

CALCULATION METHODOLOGIES

Development fees for the necessary public services necessitated by new development must be based on the same level of service 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.

- **Cost recovery (past)** is used in instances when a community has oversized a facility or asset in anticipation of future development. This methodology is based on the rationale that new development is repaying the community for its share of the remaining unused capacity.
- **Incremental expansion method (present)** documents the current level of service for each type of public facility. The intent is to use revenue collected to expand or provide additional facilities, as needed to accommodate new development, based on the current cost to provide capital improvements.
- **Plan-based method (future)** utilizes a community's capital improvement plan and/or other adopted plans or engineering studies to guide capital improvements needed to serve new development.

A summary is provided in Figure 1 showing the methodologies, components and allocations used to calculate the IIP for each necessary public service.

Figure 1: Current and Recommended Service Units

	Methodology		
Necessary Public Service	Cost Recovery (Past)	Incremental Expansion (Present)	Plan Based (Future)
General Government	• Facilities	Not Applicable	Not Applicable
Library	• Facilities	Not Applicable	Not Applicable
Parks and Recreational	Not Applicable	• Parkland • Park Amenities	Not Applicable
Fire	Not Applicable	• Facilities • Vehicles and Equipment	Not Applicable
Police	Not Applicable	• Facilities • Vehicles and Equipment • Communications Equipment	Not Applicable
Street	Not Applicable	Not Applicable	• Arterial Roadways • Signalized Intersections
Water	• Existing Wells • Water Resource Recharge	Not Applicable	• Planned Wells
Wastewater	Not Applicable	Not Applicable	• Treatment Plant

Reporting Results

Calculations throughout this Development Fee Study are based on analysis conducted using Excel software. Formulas and results are discussed herein using one and two-digit places (in most cases), which represent rounded figures. However, the analysis itself uses figures carried to their ultimate decimal places; therefore the sums and products generated in the analysis may not equal the sum or product if the reader replicates the calculation with the factors shown in the report (due to the rounding of figures shown, not in the analysis).

MAXIMUM SUPPORTABLE DEVELOPMENT FEES

Based on the data, assumptions, and calculation methodologies in this Land Use Assumptions document and **Infrastructure Improvements Plan**, the preliminary development fees are listed in the figure below.

Figure 2: Maximum Supportable City of Avondale Development Fees

Land Use Category	General Government	Library	Parks & Recreation	Fire	Police	Street			PROPOSED Development Fee
Residential	~~~

Comparison to Current Development Fees

The City of Avondale currently collects development fees for the following infrastructure categories:

- General Government
- Parks and Recreation
- Police
- Water
- Libraries
- Fire
- Streets
- Wastewater

The City's current development fees, effective as of September 2012, are shown below.

Figure 3: City of Avondale Current Development Fees

Land Use Category	General Government	Library	Parks & Recreation	Fire	Police	Street			Current Fee
Residential	~~~

The changes between the maximum supportable fees discussed herein, and the current fees are shown in the figure below. Note: the red figures in parentheses represent decreases in fee amounts.

Figure 4: Changes Between City of Avondale Current and Proposed Development Fees

Land Use Category	Net Change: General Government	Library	Parks & Recreation	Police	Fire	Street			Total Difference
Residential	~~~

GENERAL GOVERNMENT FACILITIES – INFRASTRUCTURE IMPROVEMENTS PLAN

OVERVIEW

General Government Facilities are not included in the definition of necessary public service found in ARS § 9-463.05(T)(5)(a)-(g). However, fees for such facilities can continue to be collected to repay debt incurred before the implementation of SB 1525, as set forth in ARS § 9-463.05(T)(5)(h), which allows inclusion of 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.

The General Government Facilities IIP includes a cost recovery component for General Government facilities, that meet the requirements of ARS § 9-463.05(T)(5)(h), as well as the cost of preparing the General Government Facilities IIP and Development Fee Study. In December of 2012, the Avondale City Council reaffirmed the existing General Government pledged debt in Ordinance No. 1482-1211:

> *"The Development Fee Study included calculation of the debt service/financing costs for constructing and equipment City Hall facility and a City Court Facility, including the portions of those costs to be borne by the City's general fund (on behalf of existing residents) and by impact fees (on behalf of new residents). The resulting General Government Development Impact Fee (the "General Government DIF") was then included in the calculations of the repayment of principal and interest on bonds, notes or other debt service obligations issued to pay costs of construction of the City Hall and City Court. The General Government DIFs have been lawfully collected and applied to such debt service accordingly."*

Accordingly, previously issued debt for the General Government facilities meets the requirements for inclusion in the 2013 Development Fee Study.

SERVICE AREA

The General Government facilities are intended to serve the City at a consistent level of service, therefore the General Government Facilities development fees will be implemented in the Base Service Area, as defined in the Land Use Assumptions.

PROPORTIONATE SHARE

ARS § 9-463.05 (B)(3) states that development fees shall not exceed a proportionate share of the cost of necessary public services needed to provide necessary public services to the development. The General Government Facilities IIP and development fees utilize the "functional population" approach to calculate and assess the proportionate share of demand placed on General Government facilities by types of land use and service units. This approach is a generally accepted methodology for development fees, and is based on the observation that demand for facilities tends to be proportional to the presence of people at a particular site.

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

See the Functional Population section of Appendix C for additional information regarding the calculation of functional population by land use and development units (i.e., dwelling unit or 1,000 square feet of nonresidential floor area). A summary of the functional population factors per development unit, and total Base Service Area functional population by land use is shown in Figure 5.

Figure 5: Functional Population for City of Avondale, 2013

		Existing	2013 Functional Population	
Land Use	Unit	Units [1]	per Unit	Total
Single Unit	Dwelling	22,792	2.24	51,054
2+ Unit	Dwelling	4,548	1.85	8,414
Retail/Commercial	1,000 sq. ft.	3,486	2.32	8,088
Office	1,000 sq. ft.	3,919	0.68	2,665
Industrial	1,000 sq. ft.	1,723	0.38	655
Total Functional Population, 2013				70,876

Source: TischlerBise. (2014). Development Fee Land Use Assumptions.

IIP FOR GENERAL GOVERNMENT FACILITIES

For each necessary public service that is the subject of a development fee, ARS § 9-463.05(E) requires the IIP to include seven elements. The sections below detail each of these elements. (A forecast of new revenues generated by development can be found in **Appendix B – Forecast of Revenues Other Than Development Fees**.)

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."*

Level of Service – General Government

The City completed an expansion of its General Government facilities in 2003. The current inventory of facilities totals 82,000. The current inventory was built with excess capacity to serve future demand. The level of service for General Government facilities is a measure of square feet per service unit. The base year level of service, based on functional population service units, is calculated as follows: 82,000 square feet / 70,876 functional population = 1.16 square feet per service unit.

Figure 6: Level of Service – General Government Facilities

Facility	Square Feet
Civic Center - City Hall	70,000
Civic Center - Court Facility	12,000
TOTAL	82,000

Source: City of Avondale

Level of Service	2013	2016
Functional Population	70,876	77,163
Square Feet per Functional Population	**1.16**	**1.06**

Debt was issued in 2003 to help fund the expansion of General Government facilities. As new development utilizes its proportionate share of the available capacity of the facilities, the City plans to have new development pay a proportionate share of the debt incurred for construction. As shown above, if no new facilities are added, and development occurs at the rate shown in the approved Land Use Assumptions, the LOS for General Government facilities is projected to change from 1.16 square feet per service unit, to 1.06.

Cost per Service unit

Debt was issued in 2003 to pay for the expansion of General Government facilities. As shown below, development fee revenue was pledged to pay for 57.26 percent of the debt obligation incurred to expand the Civic Center facility. In fiscal year 2013, development fee revenue was insufficient to contribute the pledged portion; therefore, an inter-fund transfer of $1 million from the General Fund was made to retire the debt.

Figure 7: City of Avondale 2003 General Government Debt Service Schedule

	Total Bond Issue Debt Service			Percent	Pledged	Pledged Debt Service		
Fiscal Year	Principal	Interest	Total	Pledged	Purpose	Principal	Interest	Total
2013	$1,370,000	$95,475	$1,465,475	57.26%	Civic Center	$784,423	$54,666	$839,089
2014	$1,275,000	$55,950	$1,330,950	57.26%	Civic Center	$730,029	$32,035	$762,064
Total 2003 MDC	$2,645,000	$151,425	$2,796,425	$1	$0	$1,514,452	$86,701	$1,601,153

Debt Retired Fiscal Year	Payment from General Fund
2013	$1,000,000

Source: City of Avondale. (30Oct12.) Finance Department Debt Schedules.

TischlerBise projects the City of Avondale will add 6,287 in net new functional population between 2013 and 2016. Development fee revenue collected from new development during this period will refund the General Fund and serve as new development's buy in to the excess capacity of the existing facilities. The cost per service unit is calculated as follows: $1,000,000 reimbursement / 6,287 net increase in functional population = $159.06 cost per service unit.

Figure 8: Cost Recovery – General Government Facilities

Obligation		Fiscal Year of	Reimbursement to
Name of Debt	Year of Debt	Payment	General Fund [1]
Civic Center	2003	2013	$1,000,000

Source: City of Avondale, Finance Department

Increase 2013-2016 Service Units [2]	Cost per Service Unit
6,287 Functional Population	**$159.06**

[1] Debt remaining at the start of Fiscal Year 2013

[2] Development Fee Land Use Assumptions

Excluded Costs

Development fees in Avondale exclude costs to upgrade, update, improve, expand, correct or replace those necessary public services to meet existing needs and usage, stricter safety, efficiency, environmental or regulator standards. The City of Avondale Capital Improvement Plan includes the cost of these excluded items.

Current Use and Available Capacity

The General Government Facilities discussed above have surplus capacity to serve growth; therefore, a cost recovery methodology was used to calculate the growth share of remaining debt service.

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."*

Displayed below are the ratios of a service unit to various types of land uses for residential and nonresidential development. See the Functional Population section of Appendix C for additional information regarding the calculation of functional population by land use and development units (i.e., dwelling unit or 1,000 square feet of nonresidential floor area).

Figure 9: Functional Population for Residential Development by Type

Housing Type	Unit	Person per Household [1]	Occupancy Factor	Functional Population per Unit
Single Unit	Dwelling	3.35	0.67	2.24
2+ Unit	Dwelling	2.76	0.67	1.85

[1] U.S. Census Bureau, American Community Survey 2011 3-Year Estimates applied to 2010 Census Summary File 1 counts

Figure 10: Functional Population per Unit for Nonresidential Uses

Land Use	Unit	Trip Rate [1]	Persons/ Trip [2]	Employee/ Unit [3]	Visitors/ Unit	Functional Population per Unit
Retail/Commercial	1,000 sq. ft.	21.35	1.96	1.98	39.86	2.32
Office	1,000 sq. ft.	5.52	1.24	1.34	5.50	0.68
Industrial	1,000 sq. ft.	3.49	1.24	0.67	3.65	0.38

[1] Institute of Transportation Engineers. (2012).Trip Generation 9th Edition.
[2] Federal Highway Administration. (2009). Nationwide Household Travel Survey.
[3] TischlerBise. Development Fee Land Use Assumptions.
Service Area 2013 estimates of employees per all existing nonresidential floor area by industry type.

PROJECTED SERVICE UNITS AND PROJECTED DEMAND FOR SERVICES

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."*

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."*

TischlerBise projects the City of Avondale will gain 6,287 in new functional population service units over the remaining term of the General Government debt obligation. As existing and new development utilizes the available capacity of the General Government facilities at the planned LOS of 0.1.06 square feet per service unit, the available facilities will reach capacity in 2016.

Figure 11: Projected Demand for General Government Facilities

		General Government Facilities = 82,000 SF			
		Functional Population	Planned LOS	Demand for Facility SF	Remaining Capacity
Base Yr.	**2013**	70,876	1.06	75,319	6,681
1	**2014**	72,912	1.06	77,483	4,517
2	**2015**	75,007	1.06	79,709	2,291
3	**2016**	77,163	1.06	82,000	0

General Government Facilities Improvements Plan

The City of Avondale does not plan to use General Government development fees collected in the next five years to pay for any new expansion of General Government facilities.

MAXIMUM SUPPORTABLE GENERAL GOVERNMENT FACILITIES DEVELOPMENT FEES

The maximum supportable development fees for General Government Facilities are shown in Figure 12. The development fee is calculated by multiplying the *Functional Population per Unit* factors by the net capital cost per service unit.

IIP and Development Fee Study

Included in the General Government Facilities per service unit cost is the cost to prepare the General Government Facilities IIP and Development Fee Study. See **Appendix A – Cost of Professional Services** for the detailed calculations.

Revenue Credit

Included in the maximum supportable General Government Facilities development fees is a *Revenue Credit* of 0 percent. The unadjusted development fees per service unit would not generate more revenue over the remaining life of the debt obligation, based on the approved Land Use Assumptions, than the identified growth-related necessary expenditures of $1,007,493 (debt service plus the IIP and Development Fee Study cost). To ensure that no more fee revenue is collected than the City plans to spend, the potential gross cost per service unit is reduced by the revenue credit to calculate the net capital cost per service unit. **Based on the gross capital costs per service unit, the projected development fee revenue would not exceed the necessary public services. Therefore, no revenue credit is necessary.** See Figure 12 and Figure 13 for information regarding the revenue credit calculations.

Figure 12: Maximum Supportable General Government Facilities Development Fees

General Government Residential Capital Costs		*per Functional Population*
General Government Facilities		$159.06
IIP and Development Fee Study		$0.69
GROSS CAPITAL COST		$159.75
Revenue Credit	0%	($0.00)
NET CAPITAL COST		**$159.75**

General Government Development Fee Schedule		Development Fee per Housing Unit		
Unit Type	*Functional Pop. Per Unit*	*Proposed Fee*	*Current Fee*	*Increase (Decrease)*
2+ Unit	1.85	$295	$713	($418)
Single Unit	2.24	$357	$905	($548)

General Government Nonresidential Capital Costs		*per Functional Population*
General Government Facilities		$159.06
IIP and Development Fee Study		$0.69
GROSS CAPITAL COST		$159.75
Revenue Credit	0%	($0.00)
NET CAPITAL COST		**$159.75**

General Government Development Fee Schedule		Development Fee per Square Foot of Floor Area		
Nonresidential Land Use Type	*Functional Pop. Per Unit*	*Proposed Fee*	*Current Fee [1]*	*Increase (Decrease)*
	(per 1,000 SF)	*(Per Square Foot of Floor Area)*		
Commercial	2.32	$0.37	$0.88	($0.51)
Office/Institutional	0.68	$0.10	$1.03	($0.93)
Industrial/Flex	0.38	$0.06	$0.46	($0.40)

[1] The 2012 Commercial and Office fees were by size thresholds, averages are shown here.
An average of 2012 fees for Light Industrial, Warehousing, and Manufacturing are shown here.

FORECAST OF REVENUES

Appendix B – Forecast of Revenues Other Than Development Fees contains a forecast of revenue other than development fees required by Arizona's enabling legislation.

General Government Cash Flow

The cash flow summary shown below provides an indication of the development fee revenue and capital costs necessary to meet the demand for General Government facilities. **For the inter-fund loan from the General Fund, development fees will only be collected until such time that the level of service for existing facilities reaches the expected 1.06 square feet per service unit.** To the extent the rate of development either accelerates or slows down, there will be a corresponding change in the development fee revenue.

Figure 13: General Government Facilities Cash Flow Summary

Ten-Year Growth-Related Costs

General Government Facilities [1]	$1,000,000
IIP and Development Fee Study	$7,493
TOTAL	**$1,007,493**

[1] City of Avondale. (20Feb14). FY13 General Fund Trial Balance Report.

		per Housing Unit		*Per Square Foot of Floor Area*		
		Single Unit $357	*2+ Units* $295	*Commercial* $0.37	*Office* $0.10	*Industrial* $0.06
	Year	*Housing Units Added*		*Square Feet Added (1,000)*		
Base	2013	22,792	4,548	3,486	3,919	1,723
Year 1	2014	23,291	4,650	3,681	4,111	1,921
Year 2	2015	23,802	4,754	3,887	4,312	2,142
Year 3	2016	24,323	4,861	4,104	4,523	2,388
	Ten-Yr. Increase	1,531	313	618	604	665
Projected Fees *(Rounded)* =>		$546,567	$92,335	$228,660	$60,400	$39,900

Total Projected Revenues	**$967,862**
Cumulative Net Surplus/(Deficit)	($39,631)

Source: TischlerBise. (2014).

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LIBRARY FACILITIES – INFRASTRUCTURE IMPROVEMENTS PLAN

OVERVIEW

Library Facilities of the size constructed by Avondale are not included in the definition of necessary public service found in ARS § 9-463.05(T)(5)(a)-(g). However, fees for such facilities can continue to be collected to repay debt incurred before the implementation of SB 1525, as set forth in ARS § 9-463.05(T)(5)(h), which allows inclusion of 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.

The Library Facilities IIP includes a cost recovery component for Library facilities, as well as the cost of preparing the Library Facilities IIP and Development Fee Study. In December of 2012, the Avondale City Council reaffirmed the existing Library pledged debt in Ordinance No. 1482-1211:

> *"The Development Fee Study included calculation of the debt service/financing costs for the construction and equipping of a Civic Center Library facility, including the portions of those costs to be borne by the City's general fund (on behalf of existing residents) and by impact fees (on behalf of new residents). The resulting Libraries Development Impact Fee (the "Library DIF") was then included in the calculations of the repayment of principal and interest on bonds, notes or other debt service obligations issued to pay costs of construction of the Civic Center Library. The Library DIFs have been lawfully collected and applied to such debt service accordingly."*

Accordingly, previously issued debt for the Library facilities meets the requirements for inclusion in the 2013 Development Fee Study.

SERVICE AREA

The City of Avondale intends to provide Library facilities at a consistent level of service to the resident population, therefore the Library Facilities development fees will be implemented in the Base Service Area, as defined in the Land Use Assumptions.

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 Library Facilities IIP and development fees utilize the "functional population" approach to calculate and assess the proportionate share of demand placed on Library Facilities by types of land use and service units. This approach is a generally accepted methodology for development fees, and is based on the observation that demand for Facilities tends to be proportional to the presence of people at a particular site.

Functional population is analogous to the concept of "full-time equivalent" employees. It represents the number of "full-time equivalent" people present at the site of a land use, and it is used to determine the impact of a particular development on the need for capital Facilities. For residential development, functional population is a factor of average household size multiplied by the percent of time a person

spends at home. For nonresidential development, functional population is based on a formula that considers trip generation rates, average vehicle occupancy, employee density, and average number of hours spent by employees and visitors at a land use.

See the Functional Population section of Appendix C for additional information regarding the calculation of functional population by land use and development units (i.e., dwelling unit or 1,000 square feet of nonresidential floor area). A summary of the functional population factors per development unit, and total Base Service Area functional population by land use is shown below.

Figure 14: Functional Population for City of Avondale, 2013

		Existing	2013 Functional Population	
Land Use	Unit	Units [1]	per Unit	Total
Single Unit	Dwelling	22,792	2.24	51,054
2+ Unit	Dwelling	4,548	1.85	8,414
Retail/Commercial	1,000 sq. ft.	3,486	2.32	8,088
Office	1,000 sq. ft.	3,919	0.68	2,665
Industrial	1,000 sq. ft.	1,723	0.38	655
Total Functional Population, 2013				70,876

Source: TischlerBise. (2014). Development Fee Land Use Assumptions.

IIP FOR LIBRARY FACILITIES

For each necessary public service that is the subject of a development fee, ARS § 9-463.05(E) requires the IIP to include seven elements. The sections below detail each of these elements. (A forecast of new revenues generated by development can be found in **Appendix B – Forecast of Revenues Other Than Development Fees**.)

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."*

Level of Service

The City completed an expansion of its Library facilities in 2006. The current inventory of Library facilities totals 43,200 square feet. The current inventory was built with excess capacity to serve future demand. The level of service for Library facilities is a measure of square feet per service unit. The base year level of service for residential development is calculated as follows: 43,200 square feet / 70,876 persons = 0.61 square feet per service unit.

Figure 15: Level of Service – Library Facilities

Facility	Square Feet
Civic Center Library	30,500
Sam Garcia Library	12,700
TOTAL	43,200

Source: City of Avondale

Level of Service	2013	2027
Functional Population	70,876	105,374
Square Feet per Functional Population	**0.61**	**0.41**

Debt was issued in 2006 to help fund the expansion of Library facilities. As new development utilizes its proportionate share of the available capacity of the Library facilities, the City plans to have new development pay a proportionate share of the remaining debt, scheduled to be retired in 2027. As shown above, if no new Library facilities are added and development occurs at the rate shown in the Land Use Assumptions, the LOS for Library facilities will change over the remaining life of the debt service. The level of service is projected to change from 0.61 square feet service unit, to 0.41 over the remaining life of bonds used to fund the Library facilities expansion.

Cost per Service unit

Debt was issued in 2006 to pay for the expansion of Library facilities. As shown below, development fee revenue was pledged to pay for 14.86 percent of the debt obligation incurred to expand the facility. As of fiscal year 2013, development fee revenue has been pledged towards $2,748,155 of the remaining principal and interest.

Figure 16: City of Avondale Library Debt Service Schedule

	Total Bond Issue Debt Service			Percent	Pledged	Pledged Debt Service		
Fiscal Year	Principal	Interest	Total	Pledged	Purpose	Principal	Interest	Total
2015	$805,000	$637,188	$1,442,188	14.86%	Library	$119,662	$94,717	$214,379
2016	$835,000	$601,700	$1,436,700	14.86%	Library	$124,122	$89,442	$213,564
2017	$870,000	$564,725	$1,434,725	14.86%	Library	$129,324	$83,946	$213,270
2018	$910,000	$519,225	$1,429,225	14.86%	Library	$135,270	$77,182	$212,452
2019	$955,000	$476,250	$1,431,250	14.86%	Library	$141,959	$70,794	$212,753
2020	$1,000,000	$426,250	$1,426,250	14.86%	Library	$148,649	$63,361	$212,010
2021	$1,045,000	$374,000	$1,419,000	14.86%	Library	$155,338	$55,595	$210,933
2022	$1,100,000	$319,000	$1,419,000	14.86%	Library	$163,514	$47,419	$210,933
2023	$1,155,000	$261,250	$1,416,250	14.86%	Library	$171,689	$38,834	$210,523
2024	$1,210,000	$200,750	$1,410,750	14.86%	Library	$179,865	$29,841	$209,706
2025	$1,275,000	$137,000	$1,412,000	14.86%	Library	$189,527	$20,365	$209,892
2026	$1,335,000	$70,250	$1,405,250	14.86%	Library	$198,446	$10,443	$208,889
2027	$1,405,000	$0	$1,405,000	14.86%	Library	$208,851	$0	$208,851
Total 2006 MDC	$13,900,000	$4,587,588	$18,487,588		Total, Library	$2,066,216	$681,939	$2,748,155

Source: City of Avondale. (30Oct12.) Finance Department Debt Schedules.

TischlerBise projects the City of Avondale will add 34,498 net new service units between of 2013 and 2027. The cost per service unit for is calculated as follows: $2,748,155 remaining principal and interest / 34,498 net increase in functional population = $79.66 cost per service unit.

Figure 17: Cost Recovery – Library Facilities

Obligation		Year of Final	Remaining Principal
Name of Debt	Year of Debt	Payment	Interest [1]
Civic Center Library	2006	2027	$2,748,155

Source: City of Avondale, Finance Department

Increase 2013-2027 Service Units [2]	Cost per Service Unit
34,498 Functional Population	**$79.66**

[1] Debt remaining at the start of Fiscal Year 2015
[2] TischlerBise. (2014). Development Fee Land Use Assumptions

Excluded Costs

Development fees in Avondale exclude costs to upgrade, update, improve, expand, correct or replace those necessary public services to meet existing needs and usage, stricter safety, efficiency, environmental or regulator standards. The City of Avondale Capital Improvement Plan includes the cost of these excluded items.

Current Use and Available Capacity

The Library Facilities discussed above have surplus capacity to serve growth; therefore, a cost recovery methodology was used to calculate the growth share of remaining debt service.

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."*

Displayed below are the ratios of a service unit to various types of land uses for residential and nonresidential development. See the Functional Population section of Appendix C for additional information regarding the calculation of functional population by land use and development units (i.e., dwelling unit or 1,000 square feet of nonresidential floor area).

Figure 18: Functional Population for Residential Development by Type

Housing Type	Unit	Person per Household [1]	Occupancy Factor	Functional Population per Unit
Single Unit	Dwelling	3.35	0.67	2.24
2+ Unit	Dwelling	2.76	0.67	1.85

[1] U.S. Census Bureau, American Community Survey 2011 3-Year Estimates applied to 2010 Census Summary File 1 counts

Figure 19: Functional Population per Unit for Nonresidential Uses

Land Use	Unit	Trip Rate [1]	Persons/ Trip [2]	Employee/ Unit [3]	Visitors/ Unit	Functional Population per Unit
Retail/Commercial	1,000 sq. ft.	21.35	1.96	1.98	39.86	2.32
Office	1,000 sq. ft.	5.52	1.24	1.34	5.50	0.68
Industrial	1,000 sq. ft.	3.49	1.24	0.67	3.65	0.38

[1] Institute of Transportation Engineers. (2012).Trip Generation 9th Edition.
[2] Federal Highway Administration. (2009). Nationwide Household Travel Survey.
[3] TischlerBise. Development Fee Land Use Assumptions.
Service Area 2013 estimates of employees per all existing nonresidential floor area by industry type.

PROJECTED SERVICE UNITS AND INFRASTRUCTURE DEMAND

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."*

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."*

TischlerBise projects the City of Avondale will add an additional 34,498 service units over the 13 years of the remaining debt service for Library Facilities. As existing and new development utilizes the available capacity of the Library facility at a level of service of 0.41 square feet per person, the available Library facilities will reach capacity in 2027. See Figure 20 for additional details.

Figure 20: Projected Demand for Library Facilities

				Library Facilities = 43,200 SF	
		Functional Population	Planned LOS	Demand for Facility SF	Remaining Capacity
Base Yr.	**2013**	70,876	0.41	29,057	14,143
1	**2014**	72,912	0.41	29,892	13,308
2	**2015**	75,007	0.41	30,750	12,450
3	**2016**	77,163	0.41	31,634	11,566
4	**2017**	79,380	0.41	32,543	10,657
5	**2018**	81,661	0.41	33,478	9,722
6	**2019**	84,007	0.41	34,440	8,760
7	**2020**	86,421	0.41	35,430	7,770
8	**2021**	88,904	0.41	36,448	6,752
9	**2022**	91,458	0.41	37,495	5,705
10	**2023**	94,086	0.41	38,572	4,628
11	**2024**	96,789	0.41	39,680	3,520
12	**2025**	99,570	0.41	40,821	2,379
13	**2026**	102,431	0.41	41,993	1,207
14	**2027**	105,374	0.41	43,200	0

Source: TischlerBise. (2014).

Library Facilities Improvements Plan

The City of Avondale does not plan to use Library Facilities development fees collected in the next five years to pay for any new expansion of Library Facilities.

MAXIMUM SUPPORTABLE LIBRARY FACILITIES DEVELOPMENT FEES

The maximum supportable development fees for Library Facilities are shown in Figure 21. The development fee is calculated by multiplying the *Functional Population per Unit* by the net capital cost per service unit.

IIP and Development Fee Study

Included in the Library Facilities per service unit cost is the cost to prepare the Library Facilities IIP and Development Fee Study. See **Appendix A – Cost of Professional Services** for the detailed calculations.

Revenue Credit

Included in the maximum supportable Library Facilities development fees is a *Revenue Credit* of 0 percent. The unadjusted development fees per service unit would not generate more revenue over the next ten years, based on the approved Land Use Assumptions, than the identified growth-related necessary expenditures of $1,918,310 (10-years of the debt service plus the IIP and Development Fee Study cost). To ensure that no more fee revenue is collected than the City plans to spend, the potential gross cost per service unit is reduced by the revenue credit to calculate the net capital cost per service unit. Based on the gross capital costs per service unit, the projected development fee revenue would not exceed the necessary public services. Therefore, no revenue credit is necessary. See Figure 21 and Figure 22Figure 22 for information regarding the revenue credit calculations.

Figure 21: Maximum Supportable Library Facilities Development Fees

Library Residential Capital Costs		*per Functional Population*
Library Facilities		$79.66
IIP and Development Fee Study		$0.69
GROSS CAPITAL COST		$80.35
Revenue Credit	0%	($0.00)
NET CAPITAL COST		**$80.35**

Library Development Fee Schedule		Development Fee per Housing Unit		
Unit Type	*Functional Pop. Per Unit*	*Proposed Fee*	*Current Fee*	*Increase (Decrease)*
2+ Unit	1.85	$148	$272	($124)
Single Unit	2.24	$179	$345	($166)

Library Nonresidential Capital Costs		*per Functional Population*
Library Facilities		$79.66
IIP and Development Fee Study		$0.69
GROSS CAPITAL COST		$80.35
Revenue Credit	0%	($0.00)
NET CAPITAL COST		**$80.35**

Library Development Fee Schedule		Development Fee per Square Foot of Floor Area		
Nonresidential Land Use Type	*Functional Pop. Per Unit*	*Proposed Fee*	*Current Fee [1]*	*Increase (Decrease)*
	(per 1,000 SF)	*(Per Square Foot of Floor Area)*		
Commercial	2.32	$0.18	$0.00	$0.18
Office/Institutional	0.68	$0.05	$0.00	$0.05
Industrial/Flex	0.38	$0.03	$0.00	$0.03

[1] City of Avondale. The 2012 City development fees do not assess Library Facilities development fees on nonresidential development.

FORECAST OF REVENUES

Appendix B – Forecast of Revenues Other Than Development Fees contains a forecast of revenue other than development fees required by Arizona's enabling legislation.

Library Facilities Cash Flow

The cash flow summary shown below provides an indication of the 10-year projected necessary expenditures to meet the demand for growth-related Library Facilities, and projected development fee revenue based on the approved Land Use Assumptions. To the extent the rate of development either accelerates or slows down, there will be a corresponding change in the development fee revenue and capital costs. **The remaining debt service for which Library Facilities development fees are pledged is $2,748,155, to be paid in fiscal years 2015-2027. Shown below is 10-years of the remaining 13-year pledged debt service.**

Figure 22: Library Facilities Cash Flow Summary

Ten-Year Growth-Related Costs

Library Facilities [1]	$1,910,817
IIP and Development Fee Study	$7,493
TOTAL	**$1,918,310**

[1] City of Avondale. (30Oct12.) Finance Department Debt Schedules.
Represents only 10-years of the remaining 13-year pledged debt service

		per Housing Unit		*Per Square Foot of Floor Area*		
		Single Unit	*2+ Units*	*Commercial*	*Office*	*Industrial*
		$179	$148	$0.18	$0.05	$0.03
	Year	*Housing Units Added*		*Square Feet Added (1,000)*		
Base	2013	22,792	4,548	3,486	3,919	1,723
Year 1	2014	23,291	4,650	3,681	4,111	1,921
Year 2	2015	23,802	4,754	3,887	4,312	2,142
Year 3	2016	24,323	4,861	4,104	4,523	2,388
Year 4	2017	24,856	4,970	4,334	4,744	2,663
Year 5	2018	25,400	5,081	4,576	4,976	2,969
Year 6	2019	25,957	5,195	4,832	5,219	3,310
Year 7	2020	26,525	5,312	5,102	5,475	3,691
Year 8	2021	27,106	5,431	5,388	5,742	4,115
Year 9	2022	27,700	5,553	5,689	6,023	4,588
Year 10	2023	28,307	5,677	6,007	6,318	5,116
	Ten-Yr. Increase	5,515	1,129	2,521	2,399	3,393
Projected Fees *(Rounded)* =>		$987,185	$167,092	$453,780	$119,950	$101,790
	Total Projected Revenues		**$1,829,797**			
	Cumulative Net Surplus/(Deficit)		($45,511)			

Source: TischlerBise. (2014).

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PARKS AND RECREATIONAL FACILITIES – INFRASTRUCTURE IMPROVEMENTS PLAN

OVERVIEW

ARS § 9-463.05 (T)(5)(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 the incremental expansion of parkland, and park amenities, the cost of preparing the Parks and Recreational Facilities IIP, and an offset for future contributions to existing debt service.

SERVICE AREA

The Parks and Recreational Facilities are intended to service the resident population of the City at a consistent level of service, therefore the Parks and Recreational Facilities development fees will be implemented in the Base Service Area, as defined in the Land Use Assumptions.

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 Parks and Recreational Facilities IIP and development fees utilize the "functional population" approach to calculate and assess the proportionate share of demand placed on Parks and Recreational Facilities by types of land use and service units. This approach is a generally accepted methodology for development fees, and is based on the observation that demand for facilities tends to be proportional to the presence of people at a particular site.

Functional population is analogous to the concept of "full-time equivalent" employees. It represents the number of "full-time equivalent" people present at the site of a land use, and it is used to determine the impact of a particular development on the need for capital Facilities. For residential development, functional population is a factor of average household size multiplied by the percent of time a person spends at home. For nonresidential development, functional population is based on a formula that considers trip generation rates, average vehicle occupancy, employee density, and average number of hours spent by employees and visitors at a land use.

See the Functional Population section of Appendix C for additional information regarding the calculation of functional population by land use and development units (i.e., dwelling unit or 1,000 square feet of

nonresidential floor area). A summary of the functional population factors per development unit, and total Base Service Area functional population by land use is shown below.

Figure 23: Functional Population for City of Avondale, 2013

Land Use	Unit	Existing Units [1]	2013 Functional Population per Unit	2013 Functional Population Total
Single Unit	Dwelling	22,792	2.24	51,054
2+ Unit	Dwelling	4,548	1.85	8,414
Retail/Commercial	1,000 sq. ft.	3,486	2.32	8,088
Office	1,000 sq. ft.	3,919	0.68	2,665
Industrial	1,000 sq. ft.	1,723	0.38	655
Total Functional Population, 2013				70,876

Source: TischlerBise. (2014). Development Fee Land Use Assumptions.

IIP for Parks and Recreational Facilities

For each necessary public service that is the subject of a development fee, ARS § 9-463.05(E) requires that the IIP include seven elements. The sections below detail each of the required components of the Parks and Recreational Facilities IIP. (A forecast of new revenues generated by development can be found in **Appendix B – Forecast of Revenues Other Than Development Fees**.)

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."*

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."*

Parkland

The City of Avondale plans to maintain the level of service for developed parks that it provides to existing development. Thus, the incremental expansion methodology is used to calculate this component of the Parks and Recreational Facilities IIP and development fees.

All of the City's existing parks are located in the Base Service Area. The City's 2009 Parks, Recreation and Trails Master Plan details planning standards for neighborhood and community parks. According to the plan, neighborhood parks should be 5-10 acres and have a service area of about a one-half mile radius, while a community park has a recommended size of 30-80 acres and a service area of about a three-mile radius. The 30-acre park size authorized for development fees falls somewhere between a neighborhood and community park. Because Friendship Community Park and Festival Fields host amenities for use by the entire population of Avondale, their entire inventory provides direct benefit to new development occurring anywhere in the Base Service Area.

The inventory of existing eligible parkland facilities in the Base Service Area is provided in Figure 24. There are 175 acres of eligible parkland. The current level of service (LOS) is 2.50 acres per thousand service units, which is determined by dividing the total number of acres (175) by the 2013 functional population (70,876) and multiplying this total by 1,000.

The cost per service unit is calculated by multiplying the current level of service (2.47) by the cost factor for park acres ($88,800 per acre) and dividing this total by 1,000. This results in a current cost per service unit of $219.26.

Figure 24: Incremental Expansion - Parkland

Park	Total Acres	Eligible Acres
Sernas Plaza Mini-Park	1	0
Doc Rhodes Mini-Park	1	0
Fred Campbell Neighborhood Park	2	2
Dennis Deconcini Neighborhood Park	5	5
Las Ligas Neighborhood Park	8	8
Mountain View Neighborhood Park	6	6
Dessie Lorenz Neighborhood Park	5	5
Donnie Hale Neighborhood Park	8	8
Friendship Community Park	55	55
Avondale Community Center	1	1
Festival Fields	85	85
Total	**177**	**175**

Source: City of Avondale.

Level of Service (LOS) Standards		
Inventory of Parkland Acres	177	175
2013 Avondale Functional Population	70,876	70,876
LOS: Acres per Thousand Service Units	**2.50**	**2.47**

Cost Analysis	
LOS: Acres per Thousand Service Units	2.5
Land Cost per Acre	*$45,500*
Land Development Cost per Acre [1]	*$43,300*
Total Parkland Cost per Acre	**$88,800**
Parkland Cost per Service Unit	**$219.26**

Source: City of Avondale.

1. Includes landscaping and utilities.

Park Amenities

The inventory of existing eligible park amenities and level of service is provided in Figure 25. There are 70 amenities distributed within the 177 developed parkland acres, which equates to approximately 0.4 amenities per acre. The current level of service is 0.99 amenities per 1,000 service units, which is found by dividing the total number of amenities (70) by the 2013 Avondale functional population (70,876) and multiplying this total by 1,000.

The cost per service unit is calculated by multiplying the current level of service (0.99) by the cost factor for amenities ($157,126 per average amenity). The current park amenity cost per service unit is $155.18 per service unit, as shown below.

Figure 25: Incremental Expansion - Park Amenities

Amenity	Number of Units	Average Cost per Unit	Total Value
Softball Field	6	$40,000	$240,000
Youth Baseball Field	3	$40,000	$120,000
Soccer Field	10	$275,000	$2,750,000
Multi-Use Field	2	$275,000	$550,000
Tennis Court	2	$100,000	$200,000
Basketball Court	7	$100,000	$700,000
Volleyball Court	3	$20,000	$60,000
Walking Path	5	$274,560	$1,372,800
Play Equipment	8	$75,000	$600,000
Ramada	11	$30,000	$330,000
Restroom	5	$350,000	$1,750,000
Parking Lots	8	$290,750	$2,326,000
Total	**70**		**$10,998,800**
Average Cost per Amenity	**$157,126**		

Source: City of Avondale.

Level of Service (LOS) Standards

Inventory of Park Amenities	70
Total Park Acres	177
Amenities per Acre	0.4
2013 Avondale Functional Population	70,876
LOS: Amenities per Thousand Service Units	**0.99**

Cost Analysis

LOS: Amenities per Thousand Service Units	0.99
Average Cost per Amenity	**$157,126**
Amenity Cost per Service Unit	**$155.18**

Source: City of Avondale.

Existing Parks and Recreational Facilities Debt Service

The Parks and Recreational Facilities development fees calculated in this report are based on the existing level of service for the Base Service Area; there are no existing deficiencies. Other than development fees, the City has no dedicated source of revenue to fund growth-related park improvements. The City has not received any grant funding for park improvements in recent years, and does not anticipate any grants over the next ten years.

The City has funded park improvements with development fees and by issuing Municipal Development Corporation or general obligation bonds. The debt is retired with property tax or other general revenues of the City. **New development will generate a portion of the general revenue that will be used to retire the debt, and consequently an offset should be calculated to account for this future revenue contribution.**

While future debt service payments will include both principal and interest costs, the offset is calculated based on the outstanding principal only. No financing or interest costs have been included in determining the improvement costs, and it would be inconsistent to provide an offset for a cost component that is not included in the fee calculation. In addition, inclusion of interest costs would raise complicated issues about the time value of money. The simplest and most reasonable approach to calculating the offset is to determine the current amount of outstanding debt principal per existing park service unit (i.e., functional population). This represents the cost of existing Parks and Recreational Facilities that is being paid for through debt by existing development. **Deducting this same amount from the park cost per service unit puts new development on an equal footing with existing development.**

Figure 26: Debt Service – Parks and Recreational Facilities

Bond	Year of Obligation	Name	Principal Borrowed	Prin. Remaining 6/30/2014	Total Capacity
2003 MDC Bonds	2003	Friendship Park	$4,407,859	$561,061	$306,033
1998 GADA GO Bonds	1998	Parks	$2,000,000	$853,487	$853,487
		Total	**$6,407,859**	**$1,414,548**	**$1,159,520**

Source: City of Avondale, Finance Department

Cost Analysis	
Remaining Principal	$1,414,548
2013 Avondale Functional Population	70,876
Offset Cost per Service Unit	**$19.96**

Excluded Costs

Development fees in Avondale exclude costs to upgrade, update, improve, expand, correct or replace those necessary public services to meet existing needs and usage, stricter safety, efficiency, environmental or regulator standards. The City of Avondale Capital Improvement Plan includes the cost of these excluded items.

Current Use and Available Capacity

The current Parks and Recreational Facilities discussed above are fully utilized and there is no available capacity for future development.

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."*

Displayed below are the ratios of a service unit to various types of land uses for residential and nonresidential development. See the Functional Population section of Appendix C for additional information regarding the calculation of functional population by land use and development units (i.e., dwelling unit or 1,000 square feet of nonresidential floor area).

Figure 27: Functional Population for Residential Development by Type

Housing Type	Unit	Person per Household [1]	Occupancy Factor	Functional Population per Unit
Single Unit	Dwelling	3.35	0.67	2.24
2+ Unit	Dwelling	2.76	0.67	1.85

[1] U.S. Census Bureau, American Community Survey 2011 3-Year Estimates applied to 2010 Census Summary File 1 counts

Figure 28: Functional Population per Unit for Nonresidential Uses

Land Use	Unit	Trip Rate [1]	Persons/ Trip [2]	Employee/ Unit [3]	Visitors/ Unit	Functional Population per Unit
Retail/Commercial	1,000 sq. ft.	21.35	1.96	1.98	39.86	2.32
Office	1,000 sq. ft.	5.52	1.24	1.34	5.50	0.68
Industrial	1,000 sq. ft.	3.49	1.24	0.67	3.65	0.38

[1] Institute of Transportation Engineers. (2012).Trip Generation 9th Edition.
[2] Federal Highway Administration. (2009). Nationwide Household Travel Survey.
[3] TischlerBise. Development Fee Land Use Assumptions.
Service Area 2013 estimates of employees per all existing nonresidential floor area by industry type.

Projected Demand for Services And Costs

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."*

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."*

The Land Use Assumptions project an additional 23,210 service units over the next ten years. This projected demand is multiplied by the current levels-of-service for parkland acres and amenities to determine the total demand for new Facilities over the next ten years. New development will demand an additional 57 acres of parkland and 23 new park amenities. These totals, multiplied by their respective cost factors results in the projected demand for $5,088,936 of parkland investments, and $3,613,898 of amenities investments.

Figure 29: Projected Demand for Parks and Recreational Facilities

		Parkland (acres)	Amenities (units)
LOS	per 1,000 Service Units	2.47	0.99
	Average Cost per Component	$88,800	$157,126

			Projected Demand (Rounded)	
	Projected Service Units	Functional Pop.	Parkland (acres)	Amenities (units)
Base	2013	70,876	175	70
1	2014	72,912	180	72
2	2015	75,007	185	74
3	2016	77,163	191	76
4	2017	79,380	196	78
5	2018	81,661	202	81
6	2019	84,007	207	83
7	2020	86,421	213	85
8	2021	88,904	220	88
9	2022	91,458	226	90
10	2023	94,086	232	93
Ten-Yr. Total		**23,210**	**57**	**23**
Cost of Parks			$5,088,936	
Cost of Amenities				$3,613,898
Ten Year Total Investment				**$8,702,834**

Source: TischlerBise. (2014).

Parks and Recreational Facilities Improvements Plan

Assuming that growth occurs in the next ten years as projected in the Land Use Assumptions, the City plans to complete approximately $6.5 million in growth-related improvements to the Parks and Recreational Facilities. A summary of Parks and Recreation Facilities development fee eligible projects is shown in Figure 30. The timing of individual improvements will depend on the pace and location of new development. Some improvements may be constructed by developers in return for credits against their development fees. The Capital Improvements Plan is updated annually during the budget process. The Development Fee Study IIP and Land Use Assumptions will be used to inform future changes to the CIP necessary to meet projected demand identified by the Development Fee Study.

Figure 30: Parks and Recreational Facilities Capital Plan 2013 - 2023

Project	10 Year Project Cost	Percent Eligible	FY 2014 - 2018	FY 2019 - 2023	Total
Future Park Improvements	$6,500,000	100%		$6,500,000	**$6,500,000**
Friendship Park Enhancements	$650,000	0%			**$0**
W Valley Corridor/ Multi-Modal Trail	$3,750,000	0%			**$0**
Agua Fria Restoration	$6,300,000	0%			**$0**
Festival Fields	$1,420,000	0%			**$0**
El Rio Nature Area	$5,000,000	0%			**$0**
Impact Fee Update Studies	$31,550	100%	$15,775	$15,775	**$31,550**
Total	**$23,651,550**		**$15,775**	**$6,515,775**	**$6,531,550**

Source: City of Avondale, (2009). Parks, Recreation Facilities & Trails Master Plan.

Maximum Supportable Parks and Recreational Facilities Development Fees

The proposed development fees for Parks and Recreational Facilities are shown in Figure 31. The development fee is calculated by multiplying the *Functional Population per Unit* factors by the net capital cost per service unit.

IIP and Development Fee Study

Included in the Parks and Recreational Facilities per service unit cost is the cost to prepare the Parks and Recreational Facilities IIP and Development Fee Study. See **Appendix A – Cost of Professional Services** for the detailed calculations.

Revenue Credit

Included in the maximum supportable Parks and Recreational Facilities development fees is a *Revenue Credit* of 0 percent. The unadjusted development fees per service unit would not generate more revenue over the next ten years, based on the approved Land Use Assumptions, than the identified growth-related necessary expenditures of $8,717,032 (incremental expansions plus the IIP and Development Fee Study cost). To ensure that no more fee revenue is collected than the City plans to spend, the potential cost per service unit is reduced by the revenue credit to calculate the net capital cost per service unit. Based on the gross capital costs minus the necessary offsets per service unit, the projected development fee revenue would not exceed the necessary public services. Therefore, no revenue credit is necessary.

Figure 31: Maximum Supportable Parks and Recreational Facilities Development Fees

Parks and Recreational Residential Capital Costs		*per Functional Population*
Parkland Costs		$219.26
Park Amenity Costs		$155.18
IIP and Development Fee Study		$1.32
GROSS CAPITAL COST		$375.76
Park Debt Service Credit		($19.96)
Revenue Credit	0%	($0.00)
NET CAPITAL COST		**$355.80**

Parks and Recreational Development Fee Schedule		Development Fee per Housing Unit		
Unit Type	*Functional Pop. Per Unit*	*Proposed Fee*	*Current Fee*	*Increase (Decrease)*
2+ Unit	1.85	$658	$713	($55)
Single Unit	2.24	$796	$905	($109)

Parks and Recreational Nonresidential Capital Costs		*per Functional Population*
Parkland Costs		$219.26
Park Amenity Costs		$155.18
IIP and Development Fee Study		$1.32
GROSS CAPITAL COST		$375.76
Park Debt Service Credit		($19.96)
Revenue Credit	0%	($0.00)
NET CAPITAL COST		**$355.80**

Parks and Recreational Development Fee Schedule		Development Fee per Square Foot of Floor Area		
Nonresidential Land Use Type	*Functional Pop. Per Unit*	*Proposed Fee*	*Current Fee [1]*	*Increase (Decrease)*
	(per 1,000 SF)	*(Per Square Foot of Floor Area)*		
Commercial	2.32	$0.82	$0.00	$0.82
Office/Institutional	0.68	$0.24	$0.00	$0.24
Industrial/Flex	0.38	$0.13	$0.00	$0.13

[1] City of Avondale. The 2012 City development fees do not assess Parks and Recreational Facilities development fees on nonresidential development.

FORECAST OF REVENUES

Appendix B – Forecast of Revenues Other Than Development Fees contains a forecast of revenue other than development fees required by Arizona's enabling legislation.

Parks and Recreational Facilities Cash Flow

The cash flow summary shown below provides an indication of the 10-year projected necessary expenditures to meet the demand for growth-related Parks and Recreational Facilities, and projected development fee revenue based on the approved Land Use Assumptions. To the extent the rate of development either accelerates or slows down, there will be a corresponding change in the development fee revenue and capital costs. **The deficit shown is a result of the *Park Debt Service Credit* necessary to ensure new development is not asked to pay for the same facilities through tax and development fee payments.**

Figure 32: Potential Parks and Recreational Facilities Cash Flow Summary

Ten-Year Growth-Related Costs

Parkland	$5,088,936
Park Amenities	$3,613,898
IIP and Development Fee Study	$14,198
TOTAL	**$8,717,032**

		per Housing Unit		*Per Square Foot of Floor Area*		
		Single Unit $796	*2+ Units* $658	*Commercial* $0.82	*Office* $0.24	*Industrial* $0.13
	Year	*Housing Units Added*		*Square Feet Added (1,000)*		
Base	2013	22,792	4,548	3,486	3,919	1,723
Year 1	2014	23,291	4,650	3,681	4,111	1,921
Year 2	2015	23,802	4,754	3,887	4,312	2,142
Year 3	2016	24,323	4,861	4,104	4,523	2,388
Year 4	2017	24,856	4,970	4,334	4,744	2,663
Year 5	2018	25,400	5,081	4,576	4,976	2,969
Year 6	2019	25,957	5,195	4,832	5,219	3,310
Year 7	2020	26,525	5,312	5,102	5,475	3,691
Year 8	2021	27,106	5,431	5,388	5,742	4,115
Year 9	2022	27,700	5,553	5,689	6,023	4,588
Year 10	2023	28,307	5,677	6,007	6,318	5,116
	Ten-Yr. Increase	5,515	1,129	2,521	2,399	3,393
Projected Fees *(Rounded)* =>		$4,389,940	$742,882	$2,067,220	$575,760	$441,090
	Total Projected Revenues		**$8,216,892**			
	Cumulative Net Surplus/(Deficit)		($500,140)			

Source: TischlerBise. (2014).

FIRE FACILITIES – INFRASTRUCTURE IMPROVEMENTS PLAN

OVERVIEW

ARS § 9-463.05 (T)(5)(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 firefighters or officers from more than one station or substation."*

The Fire Facilities IIP includes components for Fire facilities, vehicles and equipment, the cost of preparing the Fire Facilities IIP and Development Fee Study, and an offset for future contributions to existing debt service.

SERVICE AREA

The current and recommended service area for Fire Facilities development fees is the Base Service Area, as defined in the Land Use Assumptions. Most Fire protection and emergency response is provided by response units located in four stations, supported by administrative facilities in Station 172. While units are typically dispatched to an incident from the nearest station, units from other stations may respond if the unit from the closest station is responding to another incident. In addition, units from multiple stations may be dispatched to a major incident. Fire Facilities thus form an integrated system, and the Base Service Area is appropriate.

PROPORTIONATE SHARE

The two most common methodologies used in calculating public safety service units and development fees are the "calls-for-service" approach and the "functional population" approach. This update utilizes the "functional population" approach to calculate the Fire Facilities IIP, and assess the proportionate share of demand placed on Fire facilities by types of land use and service units. This approach is a generally accepted methodology for development fees, and is based on the observation that demand for facilities tends to be proportional to the presence of people at a particular site.

Functional population is analogous to the concept of "full-time equivalent" employees. It represents the number of "full-time equivalent" people present at the site of a land use, and it is used to determine the impact of a particular development on the need for capital Facilities. For residential development, functional population is a factor of average household size multiplied by the percent of time a person spends at home. For nonresidential development, functional population is based on a formula that considers trip generation rates, average vehicle occupancy, employee density, and average number of hours spent by employees and visitors at a land use.

See the Functional Population section of Appendix C for additional information regarding the calculation of functional population by land use and development units (i.e., dwelling unit or 1,000 square feet of nonresidential floor area). A summary of the functional population factors per development unit, and total Base Service Area functional population by land use is shown in Figure 33.

Figure 33: Functional Population for City of Avondale, 2013

Land Use	Unit	Existing Units [1]	2013 Functional Population per Unit	2013 Functional Population Total
Single Unit	Dwelling	22,792	2.24	51,054
2+ Unit	Dwelling	4,548	1.85	8,414
Retail/Commercial	1,000 sq. ft.	3,486	2.32	8,088
Office	1,000 sq. ft.	3,919	0.68	2,665
Industrial	1,000 sq. ft.	1,723	0.38	655
Total Functional Population, 2013				70,876

Source: TischlerBise. (2014). Development Fee Land Use Assumptions.

IIP for Fire Facilities

For each necessary public service that is the subject of a development fee, ARS § 9-463.05(E) requires that the IIP include seven elements. The sections below detail each of the required components of the Fire IIP. (A forecast of new revenues generated by development can be found in **Appendix B – Forecast of Revenues Other Than Development Fees**.)

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."*

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."*

Fire Facilities

The City's recently built Northwest Public Safety Facility provides the most current construction cost information for Fire facilities. Construction of the facility is complete. The building began a phased opening in January 2014. In return for providing the land, the Maricopa County Community College District has the use of a portion of the facility. The remainder of the facility will be occupied by the City of Avondale Fire and Police Departments. The construction cost for this facility, which equates to $311 per square foot, as shown below.

Figure 34: Fire Facilities Cost per Square Foot

	Fire	Police	Comm. College	Total
Building Square Feet	8,460	7,500	2,700	18,660
Acres	1.58	1.41	0.51	3.50
Design and Construction				$3,479,520
Fire Portion Finish-Out (est.)				$1,000,000
Furniture, Fixtures and Equipment (est.)				$1,323,632
Total Construction Cost				$5,803,152
÷ Building Square Feet				18,660
Cost per Square Foot				$311

Source: City of Avondale.

The inventory of existing eligible Fire facilities and current level of service is provided in Figure 35. There are 44,054 square feet of Fire facilities in Avondale. The current level of service is 0.62 square feet per service unit, which is found by dividing the total inventory (44,054) by the 2013 Avondale functional population (70,876).

The cost per service unit is calculated by multiplying the current level of service (0.62 square feet per functional population) by the cost per square foot ($311). The current cost per service unit is $193.31, as shown below.

Figure 35: Incremental Expansion - Fire Facilities

Fire Facility	Total Square Feet
Fire Station 171	6,620
Fire Station 172/Admin	16,974
Fire Station 173	12,000
NW Pub Safety Facility [1]	8,460
Total	**44,054**

Source: City of Avondale.
[1] Fire Department share of total facility space

Level of Service (LOS) Standards	
Inventory of Fire Facilities	44,054
2013 Avondale Functional Population	70,876
LOS: SF per Service Units	**0.62**

Cost Analysis	
LOS: SF per Functional Population	0.62
Cost per Square Foot	*$311*
Fire Facilities Cost per Service Unit	**$193.31**

Fire Vehicles and Equipment

The inventory of existing Fire vehicles and equipment and current level of service is provided in Figure 36. There are 107 units in Avondale. The current level of service is 1.51 units per 1,000 service units, which is found by dividing the total inventory (107) by the 2013 Avondale functional population (70,876).

The cost per service unit is calculated by multiplying the current level of service (1.51/1,000) by the cost per unit ($58,421). The current cost per service unit is $88.20, as shown below.

Figure 36: Incremental Expansion - Fire Vehicles and Equipment

Vehicle and Equipment	Total Units	Cost per Unit	Replacement Value
Engines (Pierce)	4	$550,000	$2,200,000
Light and Air Truck	1	$550,000	$550,000
Heavy Rescue Truck (Pierce)	1	$750,000	$750,000
Ladder Truck	1	$1,260,000	$1,260,000
Brush Truck (F550)	1	$340,000	$340,000
Command Vehicle (F350)	2	$70,000	$140,000
Sedan/SUV	4	$35,000	$140,000
Life Safety Trailer (Scotty)	1	$35,000	$35,000
Light Pickup Truck	5	$25,000	$125,000
Medium Pickup Truck (F350)	1	$50,000	$50,000
Trailer - Generator and Light Tower	2	$7,000	$14,000
Utility Van	1	$40,000	$40,000
Trailer - Flatbed	1	$5,000	$5,000
ATV - EMS Rescue	1	$12,000	$12,000
ATV - Brush Truck	1	$12,000	$12,000
Portable Radios	58	$7,500	$435,000
Mobile Radios	22	$6,500	$143,000
TOTAL	107		$6,251,000
Average Cost per Unit	**$58,421**		

Source: City of Avondale.

Level of Service (LOS) Standards

Inventory of Vehicles and Equipment	107
2013 Avondale Functional Population	70,876
LOS: Vehicle and Equipment per Thousand Service Units	**1.51**

Cost Analysis

LOS: Vehicles and Equipment per Thousand Service Units	1.51
Average Cost per Unit	**$58,421**
Unit Cost per Service Unit	**$88.20**

Source: City of Avondale.

Existing Fire Facilities Debt Service

As noted in the Executive Summary, development fees should be reduced (or "offset") in order to account for other types of revenues that will be generated by new development and used to fund a portion of the cost of capacity expanding improvements funded by the development fees. Cases in which such an offset is

warranted include funding of existing deficiencies, outstanding debt payments on existing facilities, and dedicated revenue sources to fund growth-related improvements.

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

The City has funded Fire improvements with development fees and by issuing Municipal Development Corporation bonds or general obligation bonds. The debt is retired with sales tax, property tax, other general revenues, and in some cases with a pledge of development fee. **New development will generate a portion of the general revenue that will be used to retire the debt, and consequently an offset should be calculated to account for this future revenue contribution toward existing Fire Facilities inventory.**

While future debt service payments will include both principal and interest costs, the offset is calculated based on the outstanding principal only. No financing or interest costs have been included in determining the other components, and therefore it would be inconsistent to provide an offset for a cost component that is not included in the fee calculation. In addition, inclusion of interest costs would raise complicated issues about the time value of money. The simplest and most reasonable approach to calculating the offset is to determine the current amount of outstanding debt principal per existing service unit (i.e., functional population). This represents the cost of existing capital investments that is being paid for through debt by existing development. **Deducting this same amount from the Fire Facilities cost per service unit puts new development on an equal footing with existing development.**

The Fire Facilities Debt Service net cost per service unit is calculated by dividing the outstanding debt by the base year functional population (70,876), resulting in a debt service offset of $11.50 per service unit.

Figure 37: Debt Service – Fire Facilities

Bond	Year of	Name	Original Amount	Total 6/30/2014	Total Capacity
2003B GO Refunding Bonds	2003	Fire Equipment	$145,714	$46,667	$46,667
1998 GADA GO Bonds	1998	Fire Station 172	$1,800,000	$768,140	$768,140
		Total	**$1,945,714**	**$814,807**	**$814,807**

Source: City of Avondale, Finance Department

Cost Analysis	
Remaining Principal	$814,807
2013 Avondale Functional Population	**70,876**
Offset Cost per Service Unit	**$11.50**

Excluded Costs

Development fees in Avondale exclude costs to upgrade, update, improve, expand, correct or replace those necessary public services to meet existing needs and usage, stricter safety, efficiency, environmental or regulator standards. The City of Avondale Capital Improvement Plan includes the cost of these excluded items.

Current Use and Available Capacity

The current Fire Facilities discussed above are fully utilized and there is no available capacity for future development.

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."*

Displayed below are the ratios of a service unit to various types of land uses for residential and nonresidential development. See the Functional Population section of Appendix C for additional information regarding the calculation of functional population by land use and development units (i.e., dwelling unit or 1,000 square feet of nonresidential floor area).

Figure 38: Functional Population for Residential Development by Type

Housing Type	Unit	Person per Household [1]	Occupancy Factor	Functional Population per Unit
Single Unit	Dwelling	3.35	0.67	2.24
2+ Unit	Dwelling	2.76	0.67	1.85

[1] U.S. Census Bureau, American Community Survey 2011 3-Year Estimates applied to 2010 Census Summary File 1 counts

Figure 39: Functional Population per Unit for Nonresidential Uses

Land Use	Unit	Trip Rate [1]	Persons/ Trip [2]	Employee/ Unit [3]	Visitors/ Unit	Functional Population per Unit
Retail/Commercial	1,000 sq. ft.	21.35	1.96	1.98	39.86	2.32
Office	1,000 sq. ft.	5.52	1.24	1.34	5.50	0.68
Industrial	1,000 sq. ft.	3.49	1.24	0.67	3.65	0.38

[1] Institute of Transportation Engineers. (2012).Trip Generation 9th Edition.
[2] Federal Highway Administration. (2009). Nationwide Household Travel Survey.
[3] TischlerBise. Development Fee Land Use Assumptions.
Service Area 2013 estimates of employees per all existing nonresidential floor area by industry type.

PROJECTED SERVICE UNITS AND PROJECTED DEMAND FOR SERVICES

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."*

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."*

TischlerBise projects the functional population for the City of Avondale to increase by 23,210 between 2013 and 2023. This new development will demand an additional 14,427 square feet of Fire facilities and 35 units of vehicles and equipment, which equates to a total investment of $6,531,380. See Figure 40 for additional details.

Figure 40: Projected Demand for Fire Facilities

		Facilities per Service Unit	Vehicles & Equipment per 1,000 Service Units
LOS	Functional Population	0.62	1.51
	Average Cost per Unit	$311	$58,421

			Projected Demand (Rounded)	
		Projected Service Units Functional Pop.	Facilities (square feet)	Vehicles & Equipment (units)
Base	2013	70,876	44,054	107
1	2014	72,912	45,320	110
2	2015	75,007	46,622	113
3	2016	77,163	47,962	116
4	2017	79,380	49,340	120
5	2018	81,661	50,758	123
6	2019	84,007	52,216	127
7	2020	86,421	53,716	130
8	2021	88,904	55,260	134
9	2022	91,458	56,847	138
10	2023	94,086	58,481	142
Ten Yr Total		**23,210**	**14,427**	**35**
Cost of Facilities			$4,486,645	
Cost of Vehicles and Equipment				$2,044,735
Ten Year Total Investment				**$6,531,380**

Source: TischlerBise. (2014).

Fire Facilities Improvements Plan

In the next decade, the City plans to complete over $9 million in growth-related Fire Facilities improvements, as summarized below. The timing of individual improvements will depend on the pace and location of new development. Fire Facilities improvements may be constructed by developers in return for credits against Fire Facilities development fees. The Capital Improvements Plan is updated annually during the budget process. The Development Fee Study IIP and Land Use Assumptions will be used to inform future changes to the CIP necessary to meet projected demand identified by the Development Fee Study.

Figure 41: Fire Facilities Improvements Plan 2013 - 2023

Project Description	Total 10-Yr Project Cost	Percent Eligible	Planned Impact Fee-Eligible Expenditures FY 2014-18	FY 2019-23	10-Year Total
Latkin Ranch Fire Station & Pumper	$4,600,000	100%	$0	$4,600,000	$4,600,000
Northwest Fire Station Finish-Out	$2,000,000	100%	$2,000,000	$0	$2,000,000
Debt Principal for Fire Station 173	$567,298	100%	$301,613	$265,685	$567,298
Impact Fee Update Studies	$31,550	100%	$15,775	$15,775	$31,550
Vehicle and Equipment Investments	$2,024,500	100%	$941,400	$1,083,100	$2,024,500
Total	$9,223,348		$3,258,788	$5,964,560	$9,223,348

Source: City of Avondale, Annual Budget & Financial Plan, Fiscal Year 2012-2013

Maximum Supportable Fire Facilities Development Fees

The maximum supportable development fees for Fire Facilities are shown in the figure below. The development fee is calculated by multiplying the *Functional Population per Unit* by the net capital cost per service unit.

IIP and Development Fee Study

Included in the Fire Facilities per service unit cost is the cost to prepare the Fire Facilities IIP and Development Fee Study. See **Appendix A – Cost of Professional Services** for the detailed calculations.

Revenue Credit

Included in the maximum supportable Fire Facilities development fees is a *Revenue Credit* of 0 percent. The unadjusted development fees per service unit would not generate more revenue over the next ten years, based on the approved Land Use Assumptions, than the identified growth-related necessary expenditures of $6,545,578 (incremental expansions plus the IIP and Development Fee Study cost). To ensure that no more fee revenue is collected than the City plans to spend, the potential gross cost per service unit minus required offsets is reduced by the revenue credit to calculate the net capital cost per service unit. Based on the capital costs per service unit, the projected development fee revenue would not exceed the necessary public services. Therefore, no revenue credit is necessary.

Figure 42: Maximum Supportable Fire Facilities Development Fees

Fire Residential Capital Costs		*per Functional Population*
Fire Facilities		$193.31
Fire Vehicles and Equipment		$88.20
IIP and Development Fee Study		$1.32
GROSS CAPITAL COST		$282.83
Debt Service Credit		($11.50)
Revenue Credit	0%	($0.00)
NET CAPITAL COST		**$271.33**

Fire Development Fee Schedule		Development Fee per Housing Unit		
Unit Type	*Functional Pop. Per Unit*	*Proposed Fee*	*Current Fee*	*Increase (Decrease)*
2+ Unit	1.85	$501	$742	($241)
Single Unit	2.24	$607	$943	($336)

Fire Nonresidential Capital Costs		*per Functional Population*
Fire Facilities		$193.31
Fire Vehicles and Equipment		$88.20
IIP and Development Fee Study		$1.32
GROSS CAPITAL COST		$282.83
Debt Service Credit		($11.50)
Revenue Credit	0%	($0.00)
NET CAPITAL COST		**$271.33**

Fire Development Fee Schedule		Development Fee per Square Foot of Floor Area		
Nonresidential Land Use Type	*Functional Pop. Per Unit*	*Proposed Fee*	*Current Fee [1]*	*Increase (Decrease)*
	(per 1,000 SF)	*(Per Square Foot of Floor Area)*		
Commercial	2.32	$0.62	$0.70	($0.08)
Office/Institutional	0.68	$0.18	$1.07	($0.89)
Industrial/Flex	0.38	$0.10	$0.49	($0.39)

[1] The 2012 Commercial and Office fees were by size thresholds, averages are shown here.
An average of 2012 fees for Light Industrial, Warehousing, and Manufacturing are shown here.

FORECAST OF REVENUES

Appendix B – Forecast of Revenues Other Than Development Fees contains a forecast of revenue other than development fees required by Arizona's enabling legislation.

Fire Facilities Cash Flow

The cash flow summary shown below provides an indication of the 10-year projected necessary expenditures to meet the demand for growth-related Fire Facilities. To the extent the rate of development either accelerates or slows down, there will be a corresponding change in the development fee revenue and capital costs. **The deficit shown is a result of the *Fire Debt Service Credit* necessary to ensure new development is not asked to pay for the same facilities through tax and development fee payments.**

Figure 43: Fire Facilities Cash Flow Summary

Ten-Year Growth-Related Costs

Fire Facilities	$4,486,645
Fire Vehicles and Equipment	$2,044,735
IIP and Development Fee Study	$14,198
TOTAL	**$6,545,578**

		per Housing Unit		*Per Square Foot of Floor Area*		
		Single Unit **$607**	***2+ Units*** **$501**	***Commercial*** **$0.62**	***Office*** **$0.18**	***Industrial*** **$0.10**
	Year	***Housing Units Added***		***Square Feet Added (1,000)***		
Base	2013	22,792	4,548	3,486	3,919	1,723
Year 1	2014	23,291	4,650	3,681	4,111	1,921
Year 2	2015	23,802	4,754	3,887	4,312	2,142
Year 3	2016	24,323	4,861	4,104	4,523	2,388
Year 4	2017	24,856	4,970	4,334	4,744	2,663
Year 5	2018	25,400	5,081	4,576	4,976	2,969
Year 6	2019	25,957	5,195	4,832	5,219	3,310
Year 7	2020	26,525	5,312	5,102	5,475	3,691
Year 8	2021	27,106	5,431	5,388	5,742	4,115
Year 9	2022	27,700	5,553	5,689	6,023	4,588
Year 10	2023	28,307	5,677	6,007	6,318	5,116
	Ten-Yr. Increase	5,515	1,129	2,521	2,399	3,393
Projected Fees *(Rounded)* =>		$3,347,605	$565,629	$1,563,020	$431,820	$339,300
	Total Projected Revenues		**$6,247,374**			
	Cumulative Net Surplus/(Deficit)		($298,204)			

Source: TischlerBise. (2014).

POLICE FACILITIES – INFRASTRUCTURE IMPROVEMENTS PLAN

OVERVIEW

ARS § 9-463.05 (T)(5)(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 facilities, vehicles and equipment, communications equipment, and the cost of preparing the Police Facilities IIP and Development Fee Study.

SERVICE AREA

The current and recommended service area for Police development fees is the Base Service Area, as defined in the Land Use Assumptions. Most Police Facilities are centralized in the Main Police Station, and police protection is provided throughout the city from roving patrol cars. Police Facilities thus form an integrated system, and the Base Service Area is appropriate.

PROPORTIONATE SHARE

The two most common methodologies used in calculating public safety service units and development fees are the "calls-for-service" approach and the "functional population" approach. This update utilizes the "functional population" approach to calculate the Police Facilities IIP, and assess the proportionate share of demand placed on Police Facilities by types of land use and service units. This approach is a generally accepted methodology for development fees, and is based on the observation that demand for Facilities tends to be proportional to the presence of people at a particular site.

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

See the Functional Population section of Appendix C for additional information regarding the calculation of functional population by land use and development units (i.e., dwelling unit or 1,000 square feet of nonresidential floor area). A summary of the functional population factors per development unit, and total Base Service Area functional population by land use is shown in Figure 44.

Figure 44: Functional Population for City of Avondale, 2013

Land Use	Unit	Existing Units [1]	2013 Functional Population per Unit	2013 Functional Population Total
Single Unit	Dwelling	22,792	2.24	51,054
2+ Unit	Dwelling	4,548	1.85	8,414
Retail/Commercial	1,000 sq. ft.	3,486	2.32	8,088
Office	1,000 sq. ft.	3,919	0.68	2,665
Industrial	1,000 sq. ft.	1,723	0.38	655
Total Functional Population, 2013				70,876

Source: TischlerBise. (2014). Development Fee Land Use Assumptions.

IIP FOR POLICE FACILITIES

For each necessary public service that is the subject of a development fee, ARS § 9-463.05(E) requires that the IIP include seven elements. The sections below detail each of the required components of the Police IIP. (A forecast of new revenues generated by development can be found in **Appendix B – Forecast of Revenues Other Than Development Fees**.)

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."*

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."*

Police Facilities

The inventory of existing eligible Police facilities and current level of service is provided below. The construction cost per square foot will be based on the original cost of the City's main police station. The construction cost for this facility equates to $201 per square foot, as shown below.

Figure 45: Construction Cost for Police Facilities

Civic Center Police Station	Construction Cost
Design Construction	$4,827,045
Furniture, Fixtures and Equipment (FFE)	$449,781
Total Construction Cost	$5,276,826
÷ Building Square Feet	26,258
Cost per Square Foot	$201

Source: City of Avondale

There are 43,238 square feet of non-administrative Police facilities in Avondale. The current level of service is 0.61 square feet per service unit, which is found by dividing the total inventory (43,238) by the 2013 Avondale functional population (70,876).

The cost per service unit is calculated by multiplying the current level of service (0.61) by the cost per square foot ($201). The current cost per service unit is $122.62, as shown below.

Figure 46: Incremental Expansion - Police Facilities

Police Facilities	Total Square Feet
Main Police Station	26,258
Northwest Public Safety Facility [1]	7,500
Police Substation	6,480
Cashion Police Substation	3,000
Total	**43,238**

Source: City of Avondale.
[1] Police Department share of total facility space

Level of Service (LOS) Standards

Inventory of Police Facilities	43,238
2013 Avondale Functional Population	70,876
LOS: SF per Service Units	**0.61**

Cost Analysis

LOS: SF per Service Units	0.61
Cost per Square Foot	*$201*
Facilities Cost per Service Unit	**$122.62**

Police Vehicles and Equipment

The inventory of existing Police vehicles and equipment and current level of service is provided below. There are 105 units in Avondale. The current level of service is 1.48 units per 1,000 service units, which is found by dividing the total inventory (105) by the 2013 Avondale functional population (70,876 / 1,000).

The cost per service unit is calculated by multiplying the current level of service (1.48 / 1,000) by the cost per unit ($44,895). The current cost per service unit is $66.51, as shown below.

Figure 47: Incremental Expansion - Police Vehicles and Equipment

Vehicles/Equipment	Units	Cost/Unit	Total Cost
Patrol Sedan	45	$42,000	$1,890,000
Non-Patrol Sedan	25	$20,000	$500,000
Motorcycle	6	$27,500	$165,000
Light Duty Pickup	6	$22,000	$132,000
Medium Duty Pickup	7	$30,000	$210,000
Trailer	2	$5,000	$10,000
Armored Truck	1	$350,000	$350,000
Command Vehicle	1	$400,000	$400,000
SUV	6	$45,000	$270,000
Small Bus	5	$25,000	$125,000
Large Bus	1	$60,000	$60,000
Computer Hardware [1]	na	na	$602,000
Total	105		$4,714,000
Average Cost per Unit	**$44,895**		

Source: City of Avondale.

[1] Vehicle installed computer components

Level of Service (LOS) Standards

Inventory of Vehicles and Equipment	105
2013 Avondale Functional Population	70,876
LOS: Vehicle and Equipment per Thousand Service Units	**1.48**

Cost Analysis

LOS: Vehicles and Equipment per Thousand Service Units	1.48
Average Cost per Unit	**$44,895**
Vehicle and Equipment Cost per Service Unit	**$66.51**

Police Communications Equipment

The inventory of existing Police communications equipment and current level of service is provided below. There are 258 units in Avondale. The current level of service is 3.64 units per 1,000 service units, which is found by dividing the total inventory (258) by the 2013 Avondale functional population (70,876 / 1,000).

The cost per service unit is calculated by multiplying the current level of service (3.64 / 1,000) by the average cost per unit ($8,915). The cost per service unit is $32.45, as shown below.

Figure 48: Incremental Expansion - Police Communications Equipment

Communications Equipment	Units	Cost per Unit [1]	Total Value
Centracom Series II Console	4	$30,066	$120,262
XTL5000 Consolette	4	$7,612	$30,446
Alias Database Manager	1	$46,233	$46,233
Logging Recorder Interface	1	$5,638	$5,638
Portable/Mobile Radios	248	$8,457	$2,097,418
Total	258		$2,299,998
Average Cost per Unit	**$8,915**		

Source: City of Avondale.

[1] 2007 Purchase price adjusted to October 2013 value from Consumer Price Index

Level of Service (LOS) Standards

Inventory of Communications Equipment	258
2013 Avondale Functional Population	70,876
LOS: Communications Equipment per Thousand Service Units	**3.64**

Cost Analysis

LOS: Communications Equipment per Thousand Service Units	3.64
Average Cost per Unit	**$8,915**
Communications Equipment Cost per Service Unit	**$32.45**

Excluded Costs

Development fees in Avondale exclude costs to upgrade, update, improve, expand, correct or replace those necessary public services to meet existing needs and usage, stricter safety, efficiency, environmental or regulator standards. The City of Avondale Capital Improvement Plan includes the cost of these excluded items.

Current Use and Available Capacity

The current Police Facilities discussed above are fully utilized and there is no available capacity for future development.

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."*

Displayed below are the ratios of a service unit to various types of land uses for residential and nonresidential development. See the Functional Population section of Appendix C for additional information regarding the calculation of functional population by land use and development units (i.e., dwelling unit or 1,000 square feet of nonresidential floor area).

Figure 49: Functional Population for Residential Development by Type

Housing Type	Unit	Person per Household [1]	Occupancy Factor	Functional Population per Unit
Single Unit	Dwelling	3.35	0.67	2.24
2+ Unit	Dwelling	2.76	0.67	1.85

[1] U.S. Census Bureau, American Community Survey 2011 3-Year Estimates applied to 2010 Census Summary File 1 counts

Figure 50: Functional Population per Unit for Nonresidential Uses

Land Use	Unit	Trip Rate [1]	Persons/ Trip [2]	Employee/ Unit [3]	Visitors/ Unit	Functional Population per Unit
Retail/Commercial	1,000 sq. ft.	21.35	1.96	1.98	39.86	2.32
Office	1,000 sq. ft.	5.52	1.24	1.34	5.50	0.68
Industrial	1,000 sq. ft.	3.49	1.24	0.67	3.65	0.38

[1] Institute of Transportation Engineers. (2012).Trip Generation 9th Edition.
[2] Federal Highway Administration. (2009). Nationwide Household Travel Survey.
[3] TischlerBise. Development Fee Land Use Assumptions.
Service Area 2013 estimates of employees per all existing nonresidential floor area by industry type.

Projected Service Units and Projected Demand for Services

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."*

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."*

TischlerBise projects the functional population for the City of Avondale will increase by 23,210 between 2013 and 2023. This new development will demand an additional 14,159 square feet of Police facilities, 34 units of vehicles and equipment, and 84 new communications equipment units. See Figure 51 for additional details.

Figure 51: Projected Demand for Police Facilities

		Facilities	Vehicles & Equipment	Comm. Equipment
		per Service Unit	per 1,000 Service Units	
LOS	Functional Population	0.61	1.48	3.64
	Average Cost per Unit	$201	$44,895	$8,915

			Projected Demand (Rounded)		
		Projected Service Units Functional Pop.	Facilities (square feet)	Vehicles & Equipment (units)	Comm. Equipment (units)
Base	2013	70,876	43,238	105	258
1	2014	72,912	44,480	108	265
2	2015	75,007	45,758	111	273
3	2016	77,163	47,073	114	281
4	2017	79,380	48,426	118	289
5	2018	81,661	49,817	121	297
6	2019	84,007	51,249	124	306
7	2020	86,421	52,721	128	315
8	2021	88,904	54,236	132	324
9	2022	91,458	55,794	135	333
10	2023	94,086	57,397	139	342
Ten Yr. Total		**23,210**	**14,159**	**34**	**84**
Cost of Facilities			$2,846,018		
Cost of Vehicles and Equipment				$1,526,430	
Cost of Communications Equipment					$748,860
Ten Year Total Investment					**$5,121,308**

Source: TischlerBise. (2014).

Police Facilities Improvements Plan

Identified below is an incremental plan for necessary Police Facilities improvements and expansions identified by City of Avondale as qualified for development fee revenue. As demand is generated for additional Police Facilities, investments from this list will be made. The Capital Improvements Plan is updated annually during the budget process. The Development Fee Study IIP and Land Use Assumptions will be used to inform future changes to the CIP necessary to meet projected demand identified by the Development Fee Study.

Figure 52: Police Facilities Improvements Plan 2013 - 2023

Project Description	CIP No.	Total 10-Yr Project Cost	Percent Eligible	Planned Development Fee-Eligible Expenditures		
				FY 2014-18	FY 2019-23	10-Yr Total
Property and Evidence Room	PL1161	$3,000,000	100%	$0	$3,000,000	$3,000,000
Joint Training Facility with Glendale	PL1176	$450,000	0%	$0	$0	$0
RWC Radio System Consoles	PL1296	$750,000	20%	$0	$150,000	$150,000
RWC Police Radio Upgrade	PL1297	$2,218,640	5%	$0	$110,932	$110,932
Lakin Ranch Substation	PL1908	$3,000,000	100%	$0	$3,000,000	$3,000,000
Command Vehicle*	PL1999	$750,000	47%	$0	$350,000	$350,000
Debt Principal - Civic Center Station	TR09	$152,744	100%	$152,744	$0	$152,744
Impact Fee Update Studies	PL1329	$31,550	100%	$15,775	$15,775	$31,550
Total		$10,352,934		$168,519	$6,626,707	$6,795,226

Source: City of Avondale, Annual Budget & Financial Plan, Fiscal Year 2012-2013

Maximum Supportable Police Facilities Development Fees

The maximum supportable development fees for Police Facilities are shown in the figure below. The development fee is calculated by multiplying the *Functional Population per Unit* by the net capital cost per service unit.

IIP and Development Fee Study

Included in the Police Facilities per service unit cost is the cost to prepare the Police Facilities IIP and Development Fee Study. See **Appendix A – Cost of Professional Services** for the detailed calculations.

Revenue Credit

Included in the maximum supportable Police Facilities development fees is a *Revenue Credit* of 0.01 percent. The unadjusted development fees per service unit would generate more revenue over the next ten years, based on the approved Land Use Assumptions, than the identified growth-related necessary expenditures of $5,135,506 (incremental expansions plus the IIP and Development Fee Study cost). To ensure that no more fee revenue is collected than the City plans to spend, the potential gross cost per service unit is reduced by the revenue credit to calculate the net capital cost per service unit. Based on the gross capital costs per service unit, the projected development fee revenue exceeds the necessary public services by $621.31. Therefore, a small revenue credit is necessary to calculate the net capital cost per service unit.

Figure 53: Maximum Supportable Police Facilities Development Fees

Police Residential Capital Costs		*per Functional Population*
Police Facilities		$122.62
Police Vehicles and Equipment		$66.51
Police Communications Equipment		$32.45
IIP and Development Fee Study		$1.32
GROSS CAPITAL COST		$222.90
Revenue Credit	0.01%	($0.03)
NET CAPITAL COST		**$222.87**

Police Development Fee Schedule		Development Fee per Housing Unit		
Unit Type	*Functional Pop. Per Unit*	*Proposed Fee*	*Current Fee*	*Increase (Decrease)*
2+ Unit	1.85	$412	$257	$155
Single Unit	2.24	$499	$326	$173

Police Nonresidential Capital Costs		*per Functional Population*
Police Facilities		$122.62
Police Vehicles and Equipment		$66.51
Police Communications Equipment		$32.45
IIP and Development Fee Study		$1.32
GROSS CAPITAL COST		$222.90
Revenue Credit	0.01%	($0.03)
NET CAPITAL COST		**$222.87**

Police Development Fee Schedule		Development Fee per Square Foot of Floor Area		
Nonresidential Land Use Type	*Functional Pop. Per Unit*	*Proposed Fee*	*Current Fee [1]*	*Increase (Decrease)*
	(per 1,000 SF)	*(Per Square Foot of Floor Area)*		
Commercial	2.32	$0.51	$1.38	($0.87)
Office/Institutional	0.68	$0.15	$0.48	($0.33)
Industrial/Flex	0.38	$0.08	$0.15	($0.07)

[1] The 2012 Commercial and Office fees were by size thresholds, averages are shown here.
An average of 2012 fees for Light Industrial, Warehousing, and Manufacturing are shown here.

FORECAST OF REVENUES

Appendix B – Forecast of Revenues Other Than Development Fees contains a forecast of revenue other than development fees required by Arizona's enabling legislation.

Police Facilities Cash Flow

The cash flow summary shown below provides an indication of the 10-year projected necessary expenditures to meet the demand for growth-related Police Facilities. To the extent the rate of development either accelerates or slows down, there will be a corresponding change in the development fee revenue and capital costs.

Figure 54: Police Facilities Cash Flow Summary

Ten-Year Growth-Related Costs

Police Facilities	$2,846,018
Police Vehicles and Equipment	$1,526,430
Police Communications Equipment	$748,860
IIP and Development Fee Study	$14,198
TOTAL	**$5,135,506**

		per Housing Unit		*Per Square Foot of Floor Area*		
		Single Unit	*2+ Units*	*Commercial*	*Office*	*Industrial*
		$499	**$412**	**$0.51**	**$0.15**	**$0.08**
	Year	*Housing Units Added*		*Square Feet Added (1,000)*		
Base	2013	22,792	4,548	3,486	3,919	1,723
Year 1	2014	23,291	4,650	3,681	4,111	1,921
Year 2	2015	23,802	4,754	3,887	4,312	2,142
Year 3	2016	24,323	4,861	4,104	4,523	2,388
Year 4	2017	24,856	4,970	4,334	4,744	2,663
Year 5	2018	25,400	5,081	4,576	4,976	2,969
Year 6	2019	25,957	5,195	4,832	5,219	3,310
Year 7	2020	26,525	5,312	5,102	5,475	3,691
Year 8	2021	27,106	5,431	5,388	5,742	4,115
Year 9	2022	27,700	5,553	5,689	6,023	4,588
Year 10	2023	28,307	5,677	6,007	6,318	5,116
	Ten-Yr. Increase	5,515	1,129	2,521	2,399	3,393
Projected Fees *(Rounded)* =>		$2,751,985	$465,148	$1,285,710	$359,850	$271,440
	Total Projected Revenues		**$5,134,133**			
	Cumulative Net Surplus/(Deficit)		($1,373)			

Source: TischlerBise. (2014).

STREET FACILITIES – INFRASTRUCTURE IMPROVEMENTS PLAN

OVERVIEW

ARS § 9-463.05 (T)(5)(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 improvements to city-maintained arterial roadways, and signalized intersections, and the cost of preparing the Street Facilities IIP and Development Fee Study. For the purpose of the Street Facilities IIP, arterial roadways are considered as system improvements. Street Facilities development fees are calculated using a plan-based methodology.

The Street Facilities IIP does not include an offset for future contributions to existing debt service. The City of Avondale, as part of the annual Capital Improvements Plan update, has identified capacity-improving projects for existing and new arterial road segments within the City. Development fees collected under a plan-based methodology for these identified projects. Therefore, new development is not being asked to pay twice for existing capacity.

SERVICE AREA

The City of Avondale streets network includes local roads that connect to City-maintained collectors and arterials. For the purpose of calculating and imposing Street Facilities development fees the City-maintained arterials form a single integrated network serving the entire City. Therefore, the Base Service Area is appropriate.

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 on the Street Facilities system.

IIP FOR STREET FACILITIES

For each necessary public service that is the subject of a development fee, ARS § 9-463.05(E) requires the IIP to include seven elements. The sections below detail each of the required components of the Street Facilities IIP. (A forecast of new revenues generated by development can be found in **Appendix B – Forecast of Revenues Other Than Development Fees**.)

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."*

Current Inventory

Avondale has 212.83 lane miles of arterial streets, all of which are assumed to operate with a level of service at or above C, as reported by Lee Engineering (2012) *City of Avondale Transportation Plan Update*. A lane mile is a rectangular area of pavement, one lane wide and one mile long. The City maintains 47 signalized intersections on the Street Facilities arterials.

Figure 55: City of Avondale Street Facilities Inventory

Classification	Inventory
Arterial	212.83 Lane Miles
Signalized Intersections	47.00 Units

Source: Lee Engineering, City of Avondale Transportation Plan Update, Draft Final Report, October 2012

The steps to calculate a current level of service for the City of Avondale Street facilities involve calibrating existing development to the existing network of arterial streets. To do so, development units by type are multiplied by adjusted vehicle trip ends per development unit. The factors used to calculate the current level of service expressed in Vehicle Miles of Travel (VMT)[1] are discussed below, and shown in Figure 60 after the discussion.

Trip Generation Rates

Avondale Street Facilities development fees are based on average weekday vehicle trip ends, adjusted for commuting patterns and pass-by trips, and weighted by trip length. Trip generation rates are from the reference book Trip Generation published by the Institute of Transportation Engineers (ITE 9th Edition 2012). 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 a current level of service for arterials, 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. The Street Facilities methodology includes additional adjustments to make the development fees proportionate to the infrastructure demand from particular types of development.

[1] A VMT is a measurement unit equal to one vehicle traveling one mile.

Vehicle trip ends for residential development are from the reference book Trip Generation. The two categories shown in Figure 56 represent the proxy categories used to determine existing and projected *Weekday Vehicle Trip Ends* from residential development in the City of Avondale.

Figure 56: The Institute of Transportation Engineers, Residential Trip Ends, 2012

	Vehicle Trip Ends	
	Weekday	**PM-Peak Hour**
Single Family Detached	9.52	1.02
Apartment	6.65	0.67

Source: Institute of Transportation Engineers. (2012). Trip Generation, 9th Edition.

Weekday Vehicle Trip Ends for nonresidential development are also from the reference book Trip Generation. The shaded categories in Figure 57 represent the proxy categories used to determine existing and projected trips from nonresidential development in the City of Avondale.

Light Industrial serves as the proxy for industrial/flex land uses. Data for an average sized General Office is used as the proxy for office/institutional land uses. Lastly, the average for Shopping Center is used as a proxy for commercial land uses.

Figure 57: The Institute of Transportation Engineers, Nonresidential Trip Ends, 2012

ITE Code	*Land Use / Size*	*Demand Unit*	*Weekday Trip Ends per Demand Unit**	*Weekday Trip Ends per Employee**	*Emp Per Dmd Unit***	*Sq Ft Per Emp*
Commercial / Shopping Center						
820	**Average**	**1,000 Sq Ft**	**42.70**	**na**	**2.00**	**500**
General Office						
710	**Average**	**1,000 Sq Ft**	**11.03**	**3.32**	**3.32**	**301**
Other Nonresidential						
770	Business Park***	1,000 Sq Ft	12.44	4.04	3.08	325
760	Research & Dev Center	1,000 Sq Ft	8.11	2.77	2.93	342
610	Hospital	1,000 Sq Ft	13.22	4.50	2.94	340
565	Day Care	student	4.38	26.73	0.16	na
550	University/College	student	1.71	8.96	0.19	na
530	High School	student	1.71	19.74	0.09	na
520	Elementary School	student	1.29	15.71	0.08	na
520	Elementary School	1,000 Sq Ft	15.43	15.71	0.98	1,018
320	Lodging	room	5.63	12.81	0.44	na
254	Assisted Living	bed	2.66	3.93	0.68	na
151	Mini-Warehouse	1,000 Sq Ft	2.50	61.90	0.04	24,760
150	Warehousing	1,000 Sq Ft	3.56	3.89	0.92	1,093
140	Manufacturing	1,000 Sq Ft	3.82	2.13	1.79	558
110	**Light Industrial**	**1,000 Sq Ft**	**6.97**	**3.02**	**2.31**	**433**

* Trip Generation, Institute of Transportation Engineers, 9th Edition (2012).
** Employees per demand unit calculated from trip rates, except for Shopping Center data, which are derived from Development Handbook and Dollars and Cents of Shopping Centers, published by the Urban Land Institute.

Adjustment for Journey-To-Work Commuting

Residential development in the City of Avondale has a slightly larger trip adjustment factor of 65 percent to account for commuters leaving Avondale for work. According to the National Household Travel Survey (2009), home-based work trips are typically 31 percent of "production" trips, in other words, out-bound trips (which are 50 percent of all trip ends). Data from the U.S. Census Bureau's LEHD Program for 2010 indicate that 95 percent of Avondale's employed residents travel outside the City for work. In combination, these factors (0.31 x 0.50 x 0.95 = 0.15) account for 15 percent of additional production trips. The total adjustment factor for residential includes attraction trips (50% of trip ends) plus the journey-to-work commuting adjustment for a total of 65 percent *(rounded)*.

Figure 58: Adjustment for Journey-To-Work Commuting [1]

Employed Residents	33,742
Residents Working in City	1,618
Residents Commuting Outside City for Work	32,124
Percent Commuting out of the City	**95%**
Additional Production Trips [2]	15%
Residential Trip Adjustment Factor	***65%***

[1] U.S. Census Bureau, 2010 OnTheMap Application (version 6.1.1) and LEHD Origin-Destination Employment Statistics
[2] Outbound trip statistics from National Household Travel Survey, 2009: Table 30

Adjustments for Pass-By Trips

For commercial development, the trip adjustment factor is less than 50 percent because retail development and some services attract vehicles as they pass by. 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 that 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 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.

Lane Capacity

According to data provided by Lee Engineering in the 2012 report, *City of Avondale Transportation Plan Update*, the City of Avondale's network of arterials operate at a level of service of C, and have a weighted average per-lane capacity of 6,200.

Figure 59: Daily Per-Lane Capacity

Network	Lane Miles [1]	Daily Per-Lane Capacity [1]
Arterial	212.83	6,200

[1] City of Avondale

Current Level of Service

Figure 60 shows the calibration of existing development to the current City arterial street network. Knowing the current lane miles (212.83), and the daily per-lane capacity (6,200) of the arterials street network, TischlerBise, using a series of spreadsheet iterations, determined the common factor necessary to distribute the vehicle miles of travel evenly on the existing network to be a weighted-average trip length of 5.34 miles. As shown in Figure 60 below, existing development within Avondale attracted an estimated 1,319,532 Vehicle Miles of Travel (VMT) in 2013, based on the trip generation, trip adjustment, trip length factor and other assumptions shown. *Vehicle Miles of Travel* is the product of vehicle trips multiplied by the average trip length.[2] Therefore, the current Street facilities LOS is 1.61 arterial lane miles, and 0.36 signalized intersections per 10,000 VMT.

[2] Typical VMT calculations for development-specific traffic studies, along with most transportation models of an entire urban area, are derived from traffic counts on particular road segments multiplied by the length of that road segment. For the purpose of development fees, VMT calculations are based on attraction (inbound) trips to development located in the service area, with the trip lengths calibrated to the streets network considered system improvements. This refinement eliminates pass-through or external- external trips, and travel on roads that are not system improvements (e.g. interstate highways).

Figure 60: Existing Level of Service on City Arterial Network

Development Type [1]	Dev. Unit	[A] Avg Wkdy Veh Trip Ends per Dev. Unit [2]	[B] Trip Adjustment Factors [3]	[A]X[B]=[C] Trip Length	X[D] Trip Length Weighting Factor [4]
RESIDENTIAL					
Single Unit	HU	9.52	65%	6.19	121%
Multi-Unit	HU	6.65	65%	4.32	121%
NONRESIDENTIAL					
Commercial	KSF	42.70	33%	14.09	66%
Office/ Other	KSF	11.03	50%	5.52	73%
Industrial	KSF	6.97	50%	3.49	73%

Average Trip Length (Miles)	5.34
Capacity per Lane	6,200

	Base Year 2013
Development Unit	
Single Unit Residential	22,792
Multi-Unit Residential	4,548
Commercial KSF	3,486
Office/ Other KSF	3,919
Industrial KSF	1,723
Vehicle Trips	
Single Unit Residential	141,037
Multi-Unit Residential	19,659
Commercial KSF	49,121
Office KSF	21,613
Industrial KSF	6,007
TOTAL Trips	237,437
Vehicle Miles of Travel (VMT)	1,319,532
Total Lane Miles	212.83
Lane Miles per 10,000 VMT	1.61
Total Signalized Intersections	47.00
Signals per 10,000 VMT	0.36

[1] Single Unit = SFD, SFA, and Mobile Homes; KSF = square feet of floor area in thousands.
[2] Residential: TischlerBise Draft Land Use Assumptions; Nonresidential: Trip Generation, Institute of Transportation Engineers, 2012.
[3] On an average weekday, half of all trip ends are inbound. Retail and institutional include 34% pass-by adjustment (i.e. 66% are primary trips) half of which are trip ends. The residential adjustment factor accounts for 65% of employed residents commuting to jobs outside Avondale.
[4] Table 6, National Household Travel Survey, 2009.

RATIO OF SERVICE UNIT TO LAND USE

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 61 and Figure 62 display the ratios of a service unit to various types of land uses for residential and nonresidential development. Avondale Street Facilities development fees are based on average weekday vehicle trip ends, adjusted for commuting patterns, pass-by trips, and weighted by trip length. Trip generation rates are from the reference book Trip Generation. 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 in the previous section, the development fee methodology includes additional adjustments to make the fees proportionate to the infrastructure demand for particular types of development.

Shown below are the ratios for arterial roadways and signalized intersections.

Figure 61: Ratio of Service Unit to Land Use – Planned Arterial Roadways

Development Type [1]	Development Units [2] 2013	2023	Net Change 2013-2023	[A] Avg Wkdy Veh Trip Ends per Dev. Unit [3]	[B] Trip Adjustment Factors [4]	[C] Trip Length on Improv.	[D] Trip Length Weighting Factor [5]	[A]X[B]X[C]X[D] Vehicle Miles of Travel Per Unit	Net New VMT on System Improv. [6]
RESIDENTIAL									
Single Unit	22,792	28,307	5,515	9.52	65%	1.11	121%	8.30	45,770
Multi-Unit	4,548	5,677	1,129	6.65	65%	1.11	121%	5.80	6,545
NONRESIDENTIAL									
Commercial KSF	3,486	6,007	2,521	42.70	33%	1.11	66%	10.31	25,987
Office/Other KSF	3,919	6,318	2,399	11.03	50%	1.11	73%	4.46	10,705
Industrial KSF	1,723	5,116	3,393	6.97	50%	1.11	73%	2.82	9,572
RES. TOTAL	**27,340**	**33,984**	**6,644**					**TOTAL Additional Vehicle Miles of Travel**	98,579
NONRES. TOTAL	**9,128**	**17,441**	**8,313**						

[1] Single Unit = SFD, SFA, and Mobile Homes; KSF = square feet of floor area in thousands.
[2] TischlerBise Draft Land Use Assumptions
[3] Residential: TischlerBise Draft Land Use Assumptions; Nonresidential Trip Generation, Institute of Transportation Engineers, 2012.
[4] On an average weekday, half of all trip ends are inbound. Retail and institutional include 34% pass-by adjustment (i.e. 66% are primary trips) half of which are trip ends. The residential adjustment factor accounts for 65% of employed residents commuting to jobs outside Avondale.
[5] Table 6, National Household Travel Survey, 2009.
[6] Based on an average utilization of planned improvements.
VMT = Net Change in development units X VMT per Dev. Unit X 1.11 mile Average Utilization of **Planned Improvements**

Figure 62: Ratio of Service Unit to Land Use – Signalized Intersections

Development Type [1]	Development Units [2] 2013	2023	Net Change 2013-2023	[A] Avg Wkdy Veh Trip Ends per Dev. Unit [3]	[B] Trip Adjustment Factors [4]	[C] Trip Length on Improv.	[D] Trip Length Weighting Factor [5]	[A]X[B]X[C]X[D] Vehicle Miles of Travel Per Unit	Net New VMT on System Improv. [6]
RESIDENTIAL									
Single Unit	22,792	28,307	5,515	9.52	65%	5.34	121%	40.00	220,577
Multi-Unit	4,548	5,677	1,129	6.65	65%	5.34	121%	27.94	31,542
NONRESIDENTIAL									
Commercial KSF	3,486	6,007	2,521	42.70	33%	5.34	66%	49.68	125,239
Office/Other KSF	3,919	6,318	2,399	11.03	50%	5.34	73%	21.51	51,591
Industrial KSF	1,723	5,116	3,393	6.97	50%	5.34	73%	13.60	46,129
RES. TOTAL	**27,340**	**33,984**	**6,644**					**TOTAL Additional Vehicle Miles of Travel**	475,079
NONRES. TOTAL	**9,128**	**17,441**	**8,313**						

[1] Single Unit = SFD, SFA, and Mobile Homes; KSF = square feet of floor area in thousands.
[2] TischlerBise Draft Land Use Assumptions
[3] Residential: TischlerBise Draft Land Use Assumptions; Nonresidential Trip Generation, Institute of Transportation Engineers, 2012.
[4] On an average weekday, half of all trip ends are inbound. Retail and institutional include 34% pass-by adjustment (i.e. 66% are primary trips) half of which are trip ends. The residential adjustment factor accounts for 65% of employed residents commuting to jobs outside Avondale.
[5] Table 6, National Household Travel Survey, 2009.
[6] Based on an average utilization of planned improvements.
VMT = Net Change in development units X VMT per Dev. Unit X 1.11 mile Average Utilization of **the Street Facilities Network**

PROJECTED SERVICE UNITS AND FACILITIES DEMAND

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."*

The projected need for arterial lane miles and signalized intersections is a function of the ten-year development forecast (see the Land Use Assumptions) and the existing infrastructure standards discussed above. As shown in the figures above, trip generation rates and trip adjustment factors convert projected development into average weekday vehicle trips. A typical vehicle trip, such as a person leaving a home and traveling to work, generally begins on a local street that connects to a collector street, which connects to an arterial road and eventually to a state or interstate highway. For the purpose of development fees, this progression of travel up and down the functional classification chain narrows the average trip length determination to the following question: "What is the average vehicle trip length on Street Facilities system improvements (i.e., the same type of arterial used to document current infrastructure standards)?"

Arterial Roadways

With 15.9 lane miles of planned arterial improvements and a weighted average lane capacity standard of 6,200 vehicles per lane, the Street Facilities system improvements have approximately 98,579 vehicle miles of capacity (i.e., 15.9 lane miles X 6,200 vehicles per lane).

Development in Avondale attracted 237,437 average weekday vehicle trips in base year 2013. Dividing 6,200 vehicle miles of capacity by average weekday vehicle trips (237,437) yields an unweighted average trip length of 0.03 miles *(rounded)*. However, the calibration of average trip length includes the same adjustment factors used in the level of service calculation above (i.e., journey-to-work commuting, commercial pass-by adjustment, and average trip length adjustment by type of land use). Using a series of spreadsheet iterations, TischlerBise determined the common factor necessary to distribute the vehicle miles of travel evenly on the planned improvements to be a weighted-average trip length of 1.11 miles *(rounded)*, as shown in Figure 63.

The relationship between projected development in Avondale and the planned arterial improvements is shown in Figure 63. The table includes annual calculations, but years 6-9 are hidden from view. The top of the figure shows the trip adjustment factors discussed above, and used to relate projected development to planned improvements. Trip generation rates and trip adjustment factors convert projected development into average weekday vehicle trips, as shown in the middle section of the table.

The needs analysis inputs discussed above are used to calculate the net new Vehicle Miles of Travel (VMT) from new development on the planned arterial improvements over the next ten years. A VMT is a measurement unit equal to one vehicle traveling one mile. *Vehicle Miles of Travel* is the product of vehicle trips multiplied by the average trip length. New development in the next 10 years is projected to generate 98,579 VMT on the 15.90 lane miles of planned arterial improvements.

Figure 63: Plan-Based - Street Facilities Needs Analysis

Development Type	Dev. Unit	Avg Wkdy Veh Trip Ends per Dev. Unit	Trip Adjustment Factors	Trip Length Weighting Factor
RESIDENTIAL				
Single Unit	HU	9.52	65%	121%
Multi-Unit	HU	6.65	65%	121%
NONRESIDENTIAL				
Commercial	KSF	42.70	33%	66%
Office/ Other	KSF	11.03	50%	73%
Industrial	KSF	6.97	50%	73%

Average Trip Length (Miles)	1.11
Capacity per Lane	6,200

	Base Yr	*1*	*2*	*3*	*4*	*5*	*10*	*10-Year*
Year->	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2023**	**Increase**
DEMAND DATA								
SFD UNITS	22,792	23,291	23,802	24,323	24,856	25,400	28,307	**5,515**
MF RES UNITS	4,548	4,650	4,754	4,861	4,970	5,081	5,677	**1,129**
COMMERCIAL KSF	3,486	3,681	3,887	4,104	4,334	4,576	6,007	**2,521**
OFFICE KSF	3,919	4,111	4,312	4,523	4,744	4,976	6,318	**2,399**
INDUSTRIAL KSF	1,723	1,921	2,142	2,388	2,663	2,969	5,116	**3,393**
SFD TRIPS	141,037	144,125	147,287	150,511	153,809	157,175	175,164	
MF/OTHER RES TRIPS	19,659	20,100	20,549	21,012	21,483	21,963	24,539	
RES TRIPS	**160,696**	**164,224**	**167,836**	**171,522**	**175,292**	**179,138**	**199,703**	**39,007**
COMMERCIAL TRIPS	49,121	51,869	54,772	57,829	61,070	64,480	84,645	
OFFICE TRIPS	21,613	22,672	23,781	24,944	26,163	27,443	34,844	
INDUSTRIAL TRIPS	6,007	6,698	7,468	8,326	9,285	10,351	17,837	
NONRES TRIPS	**76,742**	**81,239**	**86,020**	**91,100**	**96,518**	**102,274**	**137,325**	**60,584**
TOTAL TRIPS	**237,437**	**245,463**	**253,856**	**262,622**	**271,810**	**281,412**	**337,028**	**99,591**
Total VMT	**273,802**	**281,960**	**290,448**	**299,264**	**308,453**	**318,004**	**372,381**	**98,579**
Arterial Lane Miles	44.16	45.48	46.85	48.27	49.75	51.29	60.06	
Annual Lane Mile Increase		1.32	1.37	1.42	1.48	1.54	1.91	**Cost per**
CUMULATIVE Lane Miles		1.32	2.68	4.11	5.59	7.13	15.90	**Net increase**
Annual Capacity Cost (millions)		$2.5	$2.6	$2.7	$2.8	$2.9	$3.6	**in VMT**
CUMULATIVE Capacity Cost (millions)		$2.5	$5.1	$7.7	$10.5	$13.5	$30.0	$304.32

Source: TischlerBise. (2014).

Cost per Service Unit – Arterial Roadways

The planned investment of $30 million to improve Street facilities capacity by 15.90 lane miles equates to a per lane mile investment of $1,886,792. The formula to calculate a cost per net increase in VMT for the arterial component is calculated as follows: (15.90 lane miles X $1,886,792 cost per lane mile / 98,579 net new VMT = $304.32 per VMT). The steps to calculate the arterial fee component per type of development unit based on a cost per VMT of $304.32 are shown below.

Figure 64: Cost per Development Unit - Arterials

Street Level Of Service and Capital Costs	*Per Vehicle Mile Traveled*
Arterials	$304.32
GROSS CAPITAL COST	*$304.32*
NET CAPITAL COST	**$304.32**

Residential Schedule

	[A]	*[B]*	*[C]*	*[D]*	*VMT = [A] x [B] x [C] x [D]*	
	Weekday Vehicle Trip Ends	***Trip Rate Adjustment Factors***	***Avg Miles per Veh. Trip on System***	***Trip Length Weighting Factors***	***VMT***	***Arterial Component Proposed Development Fee***
Unit Type					*per unit*	***(Per Housing Unit)***
2+ Unit	6.65	65%	1.11	121%	5.80	$1,764
Single Unit	9.52	65%	1.11	121%	8.30	$2,525

Nonresidential Schedule

	(Per 1,000 sq. ft.)				*per 1,000 sf*	***(Per Square Foot of Floor Area)***
Commercial	42.70	33%	1.11	66%	10.31	$3.14
Office/Institutional	11.03	50%	1.11	73%	4.46	$1.36
Industrial/Flex	6.97	50%	1.11	73%	2.82	$0.86

Source: TischlerBise. (2014).

Signalized Intersections

The relationship between projected development in Avondale and the need for additional signalized intersections in the City is shown in Figure 65. The table includes annual calculations, but years 6-9 are hidden from view. The top of the figure shows the trip adjustment factors discussed above, and used to relate projected development to planned improvements. Trip generation rates and trip adjustment factors convert projected development into average weekday vehicle trips, as shown in the middle section of the table.

Figure 60 above shows the calibration of existing development to the current City arterial street network. Knowing the current lane miles (212.83), and the daily per-lane capacity (6,200) of the arterials street network, TischlerBise, using a series of spreadsheet iterations, determined the common factor necessary to distribute the vehicle miles of travel evenly on the existing network to be a weighted-average trip length of 5.34 miles.

Existing development in Avondale generated 1,319,532 vehicle miles of travel on the existing network of arterial roadways. The needs analysis inputs discussed above are used to calculate the net new (VMT from new development on the existing network for arterial roadways over the next ten years. New development in the next 10 years is projected to generate 475,079 VMT on the entire network. To accommodate the projected growth in VMT, the City has identified 11 arterial intersections to be signalized over the next decade.

Figure 65: Plan-Based – Signalize Intersections Needs Analysis

Development Type	Dev. Unit	Avg Wkdy Veh Trip Ends per Dev. Unit	Trip Adjustment Factors	Trip Length Weighting Factor
RESIDENTIAL				
Single Unit	HU	9.52	65%	121%
Multi-Unit	HU	6.65	65%	121%
NONRESIDENTIAL				
Commercial	KSF	42.70	33%	66%
Office/ Other	KSF	11.03	50%	73%
Industrial	KSF	6.97	50%	73%

Average Trip Length (Miles)	5.34
Capacity per Lane	6,200

	Base Yr	*1*	*2*	*3*	*4*	*5*	*10*	*10-Year*
Year->	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2023**	**Increase**
DEMAND DATA								
SFD UNITS	22,792	23,291	23,802	24,323	24,856	25,400	28,307	**5,515**
MF RES UNITS	4,548	4,650	4,754	4,861	4,970	5,081	5,677	**1,129**
COMMERCIAL KSF	3,486	3,681	3,887	4,104	4,334	4,576	6,007	**2,521**
OFFICE KSF	3,919	4,111	4,312	4,523	4,744	4,976	6,318	**2,399**
INDUSTRIAL KSF	1,723	1,921	2,142	2,388	2,663	2,969	5,116	**3,393**
SFD TRIPS	141,037	144,125	147,287	150,511	153,809	157,175	175,164	
MF/OTHER RES TRIPS	19,659	20,100	20,549	21,012	21,483	21,963	24,539	
RES TRIPS	**160,696**	**164,224**	**167,836**	**171,522**	**175,292**	**179,138**	**199,703**	**39,007**
COMMERCIAL TRIPS	49,121	51,869	54,772	57,829	61,070	64,480	84,645	
OFFICE TRIPS	21,613	22,672	23,781	24,944	26,163	27,443	34,844	
INDUSTRIAL TRIPS	6,007	6,698	7,468	8,326	9,285	10,351	17,837	
NONRES TRIPS	**76,742**	**81,239**	**86,020**	**91,100**	**96,518**	**102,274**	**137,325**	**60,584**
TOTAL TRIPS	**237,437**	**245,463**	**253,856**	**262,622**	**271,810**	**281,412**	**337,028**	**99,591**
Town Total VMT	**1,319,532**	**1,358,848**	**1,399,752**	**1,442,242**	**1,486,522**	**1,532,552**	**1,794,611**	**475,079**
Town Lane Miles	212.83	219.17	225.77	232.62	239.76	247.19	289.45	
Annual Lane Mile Increase		6.34	6.60	6.85	7.14	7.42	9.20	
Cumulative Lane Miles		6.34	12.94	19.79	26.93	34.36	76.63	**76.63**
Signalized Intersections	30	31	32	33	34	35	41	
Annual Intersection Increase		1	1	1	1	1	2	**Cost per**
Cumulative Signalized Intersections		1	2	3	4	5	11	**Net increase**
Annual Intersection Cost (millions)		$0.45	$0.45	$0.45	$0.45	$0.45	$0.90	**in VMT**
CUMULATIVE Capacity Cost (millions)		$0.45	$0.90	$1.35	$1.80	$2.25	$4.95	$10.42

Source: TischlerBise. (2014).

Cost per Service Unit – Signalized Intersections

The planned investment of $4.95 million to improve capacity by constructing 11 signalized intersections equates to a per signal investment of $450,000. The formula to calculate a cost per net increase in VMT for the signalized intersection component is calculated as follows: (11 signals X $450,000 cost per signal / 475,079 net new VMT = $10.42 per VMT). The steps to calculate the signalized intersection fee component per type of development unit based on a cost per VMT of $10.42 are shown below.

Figure 66: Cost per Development Unit – Signalize Intersections

Street Level Of Service and Capital Costs	*Per Vehicle Mile Traveled*
Signalized Intersections	$10.42
GROSS CAPITAL COST	*$10.42*
NET CAPITAL COST	**$10.42**

Residential Schedule	*[A]*	*[B]*	*[C]*	*[D]*	*VMT = [A] x [B] x [C] x [D]*	
	Weekday Vehicle Trip Ends	***Trip Rate Adjustment Factors***	***Avg Miles per Veh. Trip on System***	***Trip Length Weighting Factors***	***VMT***	***Signalized Intersection Component Proposed Development Fee***
Unit Type					*per unit*	***(Per Housing Unit)***
2+ Unit	6.65	65%	5.34	121%	27.94	$291
Single Unit	9.52	65%	5.34	121%	40.00	$416
Nonresidential Schedule						
	(Per 1,000 sq. ft.)				*per 1,000 sf*	***(Per Square Foot of Floor Area)***
Commercial	42.70	33%	5.34	66%	49.68	$0.52
Office/Institutional	11.03	50%	5.34	73%	21.51	$0.22
Industrial/Flex	6.97	50%	5.34	73%	13.60	$0.14

Source: TischlerBise. (2014).

DESCRIPTION OF NECESSARY EXPANSIONS AND COSTS ATTRIBUTABLE TO DEVELOPMENT

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."*

Current Use and Available Capacity

The planned Street Facilities discussed above and shown in Figure 67 and Figure 68 will be necessary to accommodate net new vehicle miles of travel generated from new development.

Arterial Roadways

As shown below, the City of Avondale has identified nine arterial roadway projects to be constructed in the next ten years, which once constructed will improve circulation on the system. In total, there are 15.9 lane miles of system improvements planned at a cost to the City of $30 million in 2013 dollars (i.e., not inflated over time).

Figure 67: Street Facilities – Arterial Roadways Improvements Plan 2013 - 2023

Classification	Project	Added Lanes	Added Lane Miles	Local Share Project Cost [1]
Arterial	McDowell Road	2	1.0	$1,400,000
Arterial	107th Avenue & McDowell Roadway Improvements	1	0.3	$1,900,000
Arterial	Avondale Blvd: McDowell to Thomas	2	2.0	$1,000,000
Arterial	Dysart Rd: Harrison Dr to Lower Buckeye Rd	3	1.5	$2,500,000
Arterial	Van Buren St: El Mirage to 122nd Ave (North half)	1	0.5	$1,500,000
Arterial	Litchfield, Lower Buckeye-Broadway	3	3.0	$4,500,000
Arterial	Van Buren, 107th Ave-Avondale	4	4.0	$6,000,000
Arterial	107th Ave, Van Buren - Buckeye	2	2.0	$5,600,000
Arterial	107th Ave., Van Buren-I-10	2	1.6	$5,600,000
	TOTAL		15.9	$30,000,000
			Cost per Lane Mile	$1,886,792

[1] City of Avondale, Capital Improvements Program

Signalized Intersections

As shown below, the City of Avondale has identified eleven intersections to be signalized in the next ten years, which once completed will improve circulation on the system. In total, there are 11 signalized intersection projects planned at a cost to the City of $4.95 million in 2013 dollars (i.e., not inflated over time).

Figure 68: Street Facilities - Signalized Intersection Improvements Plan 2013 – 2023

Intersection	Project Detail	Local Share Project Cost [1]	Signalized Intersection Cost
107th Ave and Lower Buckeye	Construct traffic signal	$200,000	$200,000
Dysart and Lower Buckeye	Construct traffic signal	$475,000	$475,000
107th Ave and Dealer Dr	Construct traffic signal	$475,000	$475,000
107th Ave and Roosevelt St	Construct traffic signal	$475,000	$475,000
119th Ave and McDowell	Construct traffic signal	$475,000	$475,000
119th Ave and Lower Buckeye	Construct traffic signal	$475,000	$475,000
Central Ave and Lower Buckeye	Construct traffic signal	$475,000	$475,000
Van Buren St and 103rd Ave	Construct traffic signal	$475,000	$475,000
107th Ave and Pierce	Construct traffic signal and associated intersection improvements	$475,000	$475,000
Avondale Blvd and Lower Buckeye	Construct traffic signal and associated intersection improvements	$600,000	$475,000
El Mirage and Lower Buckeye	Construct traffic signal and associated intersection improvements	$575,000	$475,000
TOTAL		$5,175,000	$4,950,000
	Cost per Signalized Intersection		$450,000

[1] City of Avondale, Capital Improvements Program

Excluded Costs

Development fees in Avondale exclude costs to upgrade, update, improve, expand, correct or replace those necessary public services to meet existing needs and usage, stricter safety, efficiency, environmental or regulator standards. The City of Avondale Capital Improvement Plan includes the cost of these excluded items.

In addition to the projects listed above, the City of Avondale has identified a series of capital projects to maintain, improve or expand the full Street Facilities network. Projects that do not qualify for development fee revenues are listed below for informational purposes only.

Figure 69: Street Facilities – Development Fee-Eligible Capital Improvements Plan

Project Description	CIP No.	Total 10-Yr Project Cost	Percent Eligible	Planned Development Fee-Eligible Expenditures FY 2014-18	FY 2019-23	10-Yr Total
Avondale School Crosswalk Enhancement	-	$260,230	0%			$0
Street Drainage Issues	ST1007	$1,000,000	0%			$0
Citywide Pavement Overlay	ST1009	$4,900,000	0%			$0
Bridge Repair	ST1012	$500,000	0%			$0
Preventative street maintenance (Citywide)	ST1020	$4,900,000	0%			$0
Dysart Rd: Harrison Dr to Lower Buckeye Rd	ST1021	$2,500,000	100%	$2,500,000		$2,500,000
Avondale Blvd: McDowell to Thomas	ST1125	$1,000,000	100%	$1,000,000		$1,000,000
107th Ave and Pierce Traffic Signal	ST1127	$475,000	100%		$475,000	$475,000
Van Buren St: El Mirage to 122nd Ave (North half)	ST1146	$1,500,000	100%		$1,500,000	$1,500,000
Avondale & Buckeye Intersection Improvements	ST1148	$2,200,000	0%	$0		$0
CDBG Street and Sidewalk Improvements	ST1162	$3,850,000	0%			$0
Streetlights Citywide	ST1164	$500,000	0%			$0
Avondale Boulevard-Lower Buckeye to Miami	ST1166	$800,000	0%			$0
Avondale Blvd and Lower Buckeye	ST1170	$600,000	79%		$475,000	$475,000
El Mirage and Lower Buckeye	ST1171	$575,000	83%		$475,000	$475,000
El Mirage and Lower Buckeye Roadway Improvements	ST1172	$810,000	0%		$0	$0
Central Avenue: Van Buren Street south to Western Avenue	ST1178	$314,642	0%			$0
107th Ave and Dealer Dr Traffic Signal	ST1180	$475,000	100%		$475,000	$475,000
107th Ave and Roosevelt St Traffic Signal	ST1181	$475,000	100%		$475,000	$475,000
Avondale Blvd and Thomas Roundabout	ST1186	$800,000	0%	$0		$0
119th Ave and McDowell Traffic Signal	ST1187	$475,000	100%	$475,000		$475,000
119th Ave and Lower Buckeye Traffic Signal	ST1188	$475,000	100%		$475,000	$475,000
107th Ave and Lower Buckeye	ST1189	$200,000	100%		$200,000	$200,000
Litchfield, Lower Buckeye-Broadway	ST1192	$4,500,000	100%		$4,500,000	$4,500,000
Central Ave and Lower Buckeye Traffic Signal	ST1195	$475,000	100%		$475,000	$475,000
Pedestrian Ramps/Sidewalks Program (Citywide)	ST1220	$950,000				$0
Pedestrian Ramp/Sidewalks Program - Citywide	ST1220	$1,000,000				$0
107th Avenue & McDowell Roadway Improvements	ST1224	$1,900,000	100%		$1,900,000	$1,900,000
Van Buren St and 103rd Ave Traffic Signal	ST1229	$475,000	100%		$475,000	$475,000
Dysart and Lower Buckeye Traffic Signal	ST1248	$475,000	100%		$475,000	$475,000
City Center Area Intersection Improvements	ST1261	$1,500,000				$0
McDowell Road Intersection Improvements	ST1267	$1,500,000				$0
McDowell Rd: Avondale Blvd. to 99th Ave	ST1267	$1,188,000				$0
Western - Central to 4th Ave - Mill/Overlay	ST1275	$750,000				$0
Van Buren Drainage Channel	ST1286	$5,300,000				$0
McDowell Road	ST1287	$1,400,000	100%	$1,400,000		$1,400,000
Citywide Dynamic Message Signs	ST1288	$100,000	0%			$0
ITS Fiber Backbone Program	ST1294	$1,800,000				$0
Thomas Rd - 99th Ave. to 103rd Ave - Mill/Overlay	ST1306	$500,000				$0
Van Buren Rd - El Mirage to 119th Ave - Mill/Overlay	ST1307	$200,000				$0
107th Ave - Mcdowell Rd to Thomas - Mill/Overlay	ST1308	$475,000				$0
MC85 - Lichfield to Agua Fria Bridge - Mill/Overlay	ST1309	$900,000				$0
Van Buren St - 99th Ave to Avondale Blvd - Mill/Overlay	ST1310	$1,000,000				$0
Washington St - Dysart to 9th St Alignment	ST1311	$700,000				$0
Dysart Road ITS - Rancho Santa Fe to Indian School	ST1327					$0
McDowell Road ITS - Avondale to Dysart	ST1328					$0
107th Ave., Van Buren-I-10	ST1330	$5,600,000	100%	$5,600,000		$5,600,000
Central Avenue: Van Buren Street to Western Ave Multi Use Path	ST9996	$147,104				$0
Van Buren, 107th Ave-Avondale	ST9997	$6,000,000	100%		$6,000,000	$6,000,000
107th Ave, Van Buren - Buckeye	ST9998	$5,600,000	100%		$5,600,000	$5,600,000
Total		$74,019,976		$10,975,000	$23,975,000	$34,950,000

Source: City of Avondale; Finance Department

MAXIMUM SUPPORTABLE STREET FACILITIES DEVELOPMENT FEES

The maximum supportable development fees for Street Facilities are shown in the figure below.

IIP and Development Fee Study

Included in the Street Facilities per service unit cost (i.e., VMT) is the cost to prepare the Street Facilities IIP and Development Fee Study. See **Appendix A – Cost of Professional Services** for the detailed calculations.

Revenue Credit

Included in the maximum supportable development fees is a *Revenue Credit* of 0.1 percent. The unadjusted Street Facilities development fees would generate more revenue over the next ten years, based on the approved Land Use Assumptions, than the identified growth-related planned expenditures of $34,974,422 (planned Street Facilities expansions plus the IIP and Development Fee Study cost). To ensure that no more fee revenue is collected than the City plans to spend, the potential gross development fee per unit is reduced by the revenue credit to calculate the net development fee per development unit. Based on the gross development fee, the projected development fee revenue would equal $34,993,348. The formula to calculate the *Revenue Credit* is as follows: ($34,993,348-34,974,422) / $34,993,348 = 0.1 percent (rounded).

Figure 70: Maximum Supportable Street Facilities Development Fees[3]

Street Facilities Residential Development Fee Schedule

	[A]	[B]	[C]	[A] + [B] + [C]					Development Fee per Housing Unit		
	Fee Component			Gross		Revenue			Development Fee		
	Minor Arterials	Signalized Intersections	Dev. Fee Study	Development Fee per Unit		Credit 0.1%			Proposed Fee	Current Fee	Increase (Decrease)
Unit Type	(Per Housing Unit)								(Per Housing Unit)		
2+ Unit	$1,764	$291	$3	$2,058	-	($1.11)	=		$2,056	$1,137	$1,086
Single Unit	$2,525	$416	$4	$2,945	-	($1.59)	=		$2,943	$1,857	$919

Street Facilities Nonresidential Development Fee Schedule

									Development Fee per Square Foot of Floor Area		
	Fee Component			Gross		Revenue			Development Fee		
	Minor Arterials	Signalized Intersections	Dev. Fee Study	Development Fee per Unit		Credit 0.1%			Proposed Fee	Current Fee [1]	Increase (Decrease)
	(Per Square Foot of Floor Area)								(Per Square Foot of Floor Area)		
Commercial	$3.14	$0.52	$0.01	$3.66	-	($0.00)	=		$3.65	$4.09	($0.44)
Office/Institutional	$1.36	$0.22	$0.00	$1.58	-	($0.00)	=		$1.58	$1.57	$0.01
Industrial/Flex	$0.86	$0.14	$0.00	$1.00	-	($0.00)	=		$1.00	$0.51	$0.49

[1] The 2012 Commercial and Office fees were by size thresholds, averages are shown here.
An average of 2012 fees for Light Industrial, Warehousing, and Manufacturing are shown here.

[3] The Development Fee Study costs and revenue credits per development unit are shown as rounded figures. However, the analysis itself uses figures carried to their ultimate decimal places; therefore the sums and products generated in the analysis may not equal the sum or product if the reader replicates the calculation with the factors shown in the report (due to the rounding of figures shown, not in the analysis).

FORECAST OF REVENUES

Appendix B – Forecast of Revenues Other Than Development Fees contains a forecast of revenue other than development fees required by Arizona's enabling legislation.

Street Facilities Cash Flow

The cash flow summary shown below provides an indication of the 10-year projected necessary expenditures to meet the demand for growth-related Street Facilities. To the extent the rate of development either accelerates or slows down, there will be a corresponding change in the development fee revenue and capital costs.

Figure 71: Street Facilities Cash Flow Summary

Ten-Year Growth-Related Costs	
Minor Arterial Costs	$29,999,577
Signalized Intersection Costs	$4,950,000
IIP and Development Fee Study Cost	$24,845
TOTAL	**$34,974,422**

		per Housing Unit		*Per Square Foot of Floor Area*		
		Single Unit $2,943	*2+ Units* $2,056	*Commercial* $3.65	*Office* $1.58	*Industrial* $1.00
	Year	*Housing Units Added*		*Square Feet Added (1,000)*		
Base	2013	22,792	4,548	3,486	3,919	1,723
Year 1	2014	23,291	4,650	3,681	4,111	1,921
Year 2	2015	23,802	4,754	3,887	4,312	2,142
Year 3	2016	24,323	4,861	4,104	4,523	2,388
Year 4	2017	24,856	4,970	4,334	4,744	2,663
Year 5	2018	25,400	5,081	4,576	4,976	2,969
Year 6	2019	25,957	5,195	4,832	5,219	3,310
Year 7	2020	26,525	5,312	5,102	5,475	3,691
Year 8	2021	27,106	5,431	5,388	5,742	4,115
Year 9	2022	27,700	5,553	5,689	6,023	4,588
Year 10	2023	28,307	5,677	6,007	6,318	5,116
	Ten-Yr Increase	5,515	1,129	2,521	2,399	3,393
Projected Fees *(Rounded)* =>		$16,230,645	$2,321,224	$9,201,650	$3,790,420	$3,393,000
	Total Projected Revenues		**$34,936,939**			
	Cumulative Net Surplus/(Deficit)		($37,483)			

Source: TischlerBise. (2014).

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WATER FACILITIES – INFRASTRUCTURE IMPROVEMENTS PLAN

OVERVIEW

ARS § 9-463.05 (T)(5)(a) defines the 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 cost recovery components for the ground water well facilities with capacity available to serve new customers, and ground water recharge obligations. It also includes a plan-based component for system improvements identified in current capital improvement plans, the cost of preparing the Water Facilities IIP and development fees, and an offset for future contributions to existing debt service.

Water Supply

To receive a Designation of Assured Water Supply from the Arizona Department of Water Resources (ADWR), Avondale demonstrated water supplies that are physically, legally, and continuously available to supply the projected water demands for its 2010 customer base during the next 100 years. In 2010, the City received a modification to its initial Designation to recognize a total of 28,090 acre-feet/year (AFY), or 25.1 million gallons per day of water physically available to the City to meet 2010 projected and committed demands for the next 100 years. This water supply includes the City's original 8,463 AFY of SRP entitlement water and a variety of Central Arizona Project (CAP) subcontract surface water rights totaling 5,416 AFY. In addition to these surface water resources, the City has 14,211 AFY of groundwater allowance through its membership in the Central Arizona Groundwater Replenishment District (13,148 AFY), grandfathered irrigation groundwater rights (547 AFY), and groundwater incidental recharge (515 AFY). In addition to these groundwater allowances, the City has accumulated 43,626 AFY of long-term groundwater storage credits, which amounts to 436 AFY for the next 100 years.

ADWR evaluates the physical availability of underground supplies by considering groundwater allowances, storage credits, and projected pumping and recharge over 100 years. ADWR determined that Avondale has sufficient existing and projected well capacity for the anticipated 14,211 AFY of 100-year groundwater demand. Since the City has no cost basis for the groundwater allowances or long-term storage credits, the 14,211 AFY of groundwater supplies are not recovered through the water resources component of the Water Facilities development fees. However, the City's capital investments in pumping and recharge facilities, which allow the City to maintain and utilize this groundwater, are eligible to be recovered through the water resources component.

SERVICE AREA

The service area for the Water Facilities IIP is the Base Service Area.

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 Facilities IIP and development fees are assessed on both residential and nonresidential development as both types of development create a burden for additional Water Facilities. Yearly customers by land use are used to determine the proportionate share of this burden. In 2012, approximately 94% of water customers in Avondale were residential units, accounting for 67% of the average day demand. Approximately 6% were non-residential customers, accounting for 33% of the average day demand.

IIP for Water Facilities

For each necessary public service that is the subject of a development fee, ARS § 9-463.05(E) requires the IIP to include seven elements. The sections below detail each of the required components of the Water Facilities IIP. (A forecast of new revenues generated by development can be found in **Appendix B – Forecast of Revenues Other Than Development Fees**.)

Analysis of Costs, Capacity, and Usage 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."*

System Capacity

Ground Water Well Facilities

The City of Avondale relies entirely on ground water wells for its physical water supply. Because the City's water distribution system is sized to support well production capacity, the same capacity and demand characteristics apply to distribution facilities as well.

The capacity of the Ground Water Wells system is measured in terms of firm capacity. Total firm capacity represents the total combined capacity of all active wells less the capacity of the largest capacity well. The Firm capacity is used, because the City must plan for periodic down times for maintenance to be performed on each of its wells, thus the firm capacity assumes the capacity available when the largest capacity well is not operating due to maintenance or other factors. The total firm capacity of the existing ground water wells is 32.40 million gallons per day (MGD), and the current maximum day demand is 19.35 MGD. This indicates that the City currently has 13.05 MGD of existing excess capacity available to accommodate growth.

In addition to available capacity in the existing system, the City has identified plans to increase its treated water capacity by 8.5 MGD over the next ten years by adding five new ground water wells, each capable of producing 1.7 MGD. (See the ***City of Avondale Water Master Plan Update May 2013*** for additional Water facilities capital investment plans). Existing water demand and existing and projected water system capacity over the next ten years are summarized in Figure 72. Over the next ten years, there will be 21.55 MGD of existing and new Ground Water Wells capacity available for new customers.

Figure 72: Ground Water Well Capacity

Well #	Total Capacity (MGD)
6	2.23
7	2.23
8A	2.88
10	3.17
11	2.16
12	2.59
15	1.01
16	3.17
17	1.73
18	3.02
19	2.38
20	1.73
23	1.58
24	0.94
25	1.58
Total 2013, Firm	32.40

Water Source	*Total Firm Capacity (MGD)*	*Maximum Day Usage (MGD)*	*Remaining*
Existing Ground Water Wells	32.40	19.35	13.05
Planned 5 New Ground Water Wells	8.50		8.50
Total	**40.90**	**19.35**	**21.55**

Source: City of Avondale Utilities Department

Water Resources

The groundwater recharge obligation must be established to document existing capacities available to serve growth. The City's available and unused capacity to recharge water at the New River-Agua Fria River Underground Storage Project (NAUSP) recharge facility forms the basis for the water recharge component. The City's NAUSP is currently unused. Consequently, the entire 1.79 MGD capacity of the NAUSP is available for new water customers.

Figure 73: Water Recharge Capacity

Water Resource Recharge	*Capacity (Annual Acre Feet*	*Capacity (MGD)*	*Current Demand (MGD)*	*Available Capacity (MGD)*
New River-Agua Fria River Underground Storage Project	2,000	1.79	0.00	1.79

Source: City of Avondale Utilities Department

Level of Service

Level of service for Water Facilities is based on average day gallons per connection. The current Water Facilities level of service for residential development is 345 average day gallons per connection. For nonresidential connections, water demand averages 2,921 gallons per day.

Figure 74: Water Facilities Level of Service

	Avg Gallons per Day[1]	2012 Connections
Residential	7,384,216	21,374
Nonresidential	3,659,715	1,253
TOTAL	**11,043,932**	**22,627**

1. Average of water use in 2012, provided by the City of Avondale.
Nonresidential includes Commercial, Office, Government, Schools, and City.

Level of Service (LOS) Standards	*Residential*
Average Residential Gallons Per Day	7,384,216
2012 Development Units (residential connections)	21,374
Current LOS: Gallons per Connection per Day	***345***

Level of Service (LOS) Standards	*Nonresidential*
Average Nonresidential Gallons Per Day	3,659,715
2012 Development Units (nonresidential connections)	1,253
Current LOS: Gallons per Connection per Day	**2,921**

In 2012, each nonresidential water connection averaged 10 jobs. The projected increase in jobs drives the demand for water capacity from nonresidential development.

RATIO OF SERVICE UNIT TO LAND USE

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; they assume a residential unit in a multi-unit structure with a single meter would be served by a 0.75" 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.

Nonresidential development fees are assessed by size and type of water meter needed to serve the development. For nonresidential 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 gallons per average single residential unit. *Average Day Gallons* is the most direct relationship between development units, average water usage, and system capacity. The nonresidential water 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 (2012) and shown in Figure 75.

Figure 75: Water Ratio of Service Unit to Land Use

Residential Development	
Land Use	**Average Day Gallons per Connection [1]**
Residential Unit	345

[1] City of Avondale. (2012).
Based on 2012 average water use

Nonresidential Development		
Meter Size (inches)		**Capacity Ratio [2]**
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

[1] AWWA. (2012). M6 Water Meters–Selection, Installation, Testing and Maintenance, Fifth Edition.

PROJECTED SERVICE UNITS, DEMAND, AND COSTS FOR SERVICES

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."*

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 ten years, it is projected there will be an increase of 5,194 residential connections and 1,111 nonresidential connections. Average day water demand will increase by 1.79 MGD for residential customers and 3.24 MGD for nonresidential customers. This will result in a total demand of 5.04 MGD in 2023.

Figure 76: Water Facilities Projected Demand

				Demand Unit: Connections			Service Unit: MGD		
	Year	Population	Jobs	Residential Connections	Nonres. Connections	Total Connections	Residential MGD	Nonres. MGD	Total MGD
Base	2013	77,099	13,317	21,375	1,330	22,705	7.38	3.88	11.27
1	2014	79,446	14,134	21,845	1,411	23,256	7.55	4.12	11.67
2	2015	81,865	15,003	22,325	1,498	23,823	7.71	4.38	12.09
3	2016	84,358	15,931	22,816	1,591	24,407	7.88	4.65	12.53
4	2017	86,926	16,920	23,318	1,690	25,008	8.06	4.94	12.99
5	2018	89,572	17,976	23,830	1,795	25,625	8.23	5.24	13.48
6	2019	92,300	19,104	24,355	1,908	26,263	8.41	5.57	13.99
7	2020	95,110	20,308	24,891	2,028	26,919	8.60	5.92	14.52
8	2021	98,005	21,595	25,438	2,157	27,595	8.79	6.30	15.09
9	2022	100,989	22,970	25,998	2,294	28,292	8.98	6.70	15.68
10	2023	104,064	24,442	26,569	2,441	29,010	9.18	7.13	16.31
Ten Yr Increase		**26,965**	**11,125**	**5,194**	**1,111**	**6,305**	**1.79**	**3.24**	**5.04**

Source: TischlerBise. (2014). Development Fee Land Use Assumptions.

Ground Water Well Facilities

Existing System

The cost per average day gallons for the existing system component of the Water Facilities development fee is based on the share of the system's value that is attributable to the remaining 13.05 MGD of capacity. As shown in Figure 72 above, the existing system has the capacity to distribute 32.40 MGD, of which 13.05 MGD remains as unused capacity available to serve growth in service units. The remaining capacity represents 40.3 percent *(rounded)* of the full system's capacity (13.05 MGD / 32.40 MGD). Therefore, 40 percent ($127,365,757) of the full system's value ($316,218,431) equates to the growth share. The growth share value is divided by the capacity available to serve new development (13.05 MGD) to calculate a cost per average day gallon for the existing system component of $9.76.

Figure 77: Cost Recovery - Existing System

Existing Ground Water Well Infrastructure	System Value
Ground Water Wells	$30,071,639
Water Distribution Lines	$260,712,979
Pumping Stations	$1,734,941
Reservoir	$7,200,058
Land	$13,836,009
Equipment	$2,662,805
Total Existing Water System Replacement Cost	$316,218,431
x Available Percent of Existing Capacity	40.3%
Replacement Cost of Existing Available Capacity	$127,365,757
÷ Available Capacity (gpd), 2013-2024	13,050,000
Weighted Average Cost per gpd	$9.76

Source: City of Avondale Fixed Asset Listing adjusted by the Engineering News-Record Construction Cost Index from the acquisition year to 2012

Planned Improvements

The City has identified over $70 million in capital improvements to Water facilities (see Figure 79). Of the planned improvements, about $32.1 million is for projects that add system capacity and are eligible to be funded with development fee revenue. The identified projects will increase the City's Water Facilities system capacity to accommodate an additional 8.5 MGD. As shown below, the capacity improving investments ($32.1 million) is divided by the increase in capacity to the system (8.5 MGD) to calculate a cost per average day gallon of added capacity.

Figure 78: Plan Based – Capital Improvements Plan

Planned Water Infrastructure Investments	Planned Cost
Value of Planned Capacity Improvements	$32,147,324
÷ Increase in Available Capacity (gpd), 2013-2024	8,500,000
Cost per Gallon	$3.78

Source: City of Avondale Finance & Budget Department.

Figure 79: Water Facilities Capital Plan, 2013-2023

Improvement	CIP No.	Total 10-Yr Project Cost	% Eligible	Planned Impact Fee-Eligible Costs FY 2014-18	FY 2019-23	10-Yr Total
127th Ave Waterline, Lower Buckeye-Dysart	WA1153	$900,000	100%	$900,000	$0	$900,000
99th Avenue Waterline, Thomas-McDowell	WA1133	$800,000	100%	$800,000	$0	$800,000
Avondale Waterline, Lower Buckeye-Gila River	WA1139	$1,000,000	100%	$1,000,000	$0	$1,000,000
Central Avondale Waterlines, Center City Area	WA1318	$2,700,000	100%	$0	$2,700,000	$2,700,000
Dysart Rd Waterline, Roeser Align-Southern	WA1302	$1,000,000	100%	$1,000,000	$0	$1,000,000
Dysart Rd Waterline, Whyman-Lower Buckeye	WA1231	$500,000	100%	$0	$500,000	$500,000
El Mirage Rd. Waterline, Buckeye-Southern	WA1320	$3,500,000	100%	$0	$3,500,000	$3,500,000
El Mirage, Waterline, Southern-Indian Springs	WA1321	$1,500,000	100%	$0	$1,500,000	$1,500,000
Future Well, North of I-10	WA1131	$2,500,000	100%	$0	$2,500,000	$2,500,000
Future Well, North of Van Buren	WA1142	$2,500,000	100%	$0	$2,500,000	$2,500,000
McDowell Rd Waterline, 117th-Avondale	WA1135	$500,000	100%	$500,000	$0	$500,000
S Avondale Waterlines, Lwr Buckeye-Southern	WA1323	$1,000,000	100%	$0	$1,000,000	$1,000,000
Southern Ave. Waterline, Dysart-El Mirage	WA1322	$1,200,000	100%	$0	$1,200,000	$1,200,000
Tertiary Filters WRF	WA1304	$2,000,000	100%	$2,000,000	$0	$2,000,000
Well #22, Van Buren /Avondale	WA1201	$1,500,000	100%	$1,500,000	$0	$1,500,000
Well #26	WA1090	$2,500,000	100%	$2,500,000	$0	$2,500,000
Well #27 Corporate/El Mirage	WA1214	$2,500,000	100%	$0	$2,500,000	$2,500,000
Well Acquisition/Relocation, McDowell/107th	WA1315	$2,500,000	100%	$0	$2,500,000	$2,500,000
Wellhead Treatment	WA1068	$1,500,000	100%	$1,500,000	$0	$1,500,000
Booster Station Upgrades	WA1283	$300,000	0%	$0	$0	$0
CDBG Waterline Improvements	WA1162	$2,250,000	0%	$0	$0	$0
Central-Western Ave Waterline Replacement	WA1282	$1,500,000	0%	$0	$0	$0
City-wide Water Improvements	WA1057	$3,300,000	0%	$0	$0	$0
Rio Vista Waterline Replacement	WA1169	$2,900,000	0%	$0	$0	$0
Water Dist - 1st Ave, Wyman to Locust - Kill 4"	n/a	$125,000	0%	$0	$0	$0
Water Dist - County Line Road - 127th to E	n/a	$165,000	0%	$0	$0	$0
Water Dist - Dysart Road - Wolf to Elwood	n/a	$1,100,000	0%	$0	$0	$0
Water Dist - Harrison - 7th to Dysart	n/a	$100,000	0%	$0	$0	$0
Water Dist - Holy Acres Replace 6" Water Main	n/a	$300,000	0%	$0	$0	$0
Water Dist - ISR - 107th to 103rd	n/a	$150,000	0%	$0	$0	$0
Water Dist - Main - Litchfield to Central	n/a	$850,000	0%	$0	$0	$0
Water Dist- Meter Replacement Program	n/a	$1,600,000	0%	$0	$0	$0
Water Dist - Pioneer - 127th to E - New 8"/6"	n/a	$150,000	0%	$0	$0	$0
Water Dist - Pioneer - 127th to E - w/Easement	n/a	$100,000	0%	$0	$0	$0
Water Dist - Replace Western - Central to 1st	n/a	$200,000	0%	$0	$0	$0
Water Dist - Rigby - Rosier to Sunland	n/a	$200,000	0%	$0	$0	$0
Water Dist. - MC 85 - 2nd to 7th	n/a	$900,000	0%	$0	$0	$0
Water Prod - Recoat Northside Reservoirs	n/a	$1,900,000	0%	$0	$0	$0
Water Prod - Upgrade to Northside Pumping	n/a	$1,500,000	0%	$0	$0	$0
Water Prod - Well & Booster Meter Replacement	n/a	$400,000	0%	$0	$0	$0
Water Treat - Del Rio Upgrade	n/a	$4,000,000	0%	$0	$0	$0
Water Treat - Expand Nitrate Removal System	n/a	$3,000,000	0%	$0	$0	$0
Water Treat - New Chlorine Generator Well 19	n/a	$1,550,000	0%	$0	$0	$0
Well #7 Site Improvements	WA1298	$3,000,000	0%	$0	$0	$0
Well #8 Rehab, Gateway Booster Station	WA1314	$1,000,000	0%	$0	$0	$0
Well Rehabilitation/Screen Modifications	WA1284	$6,000,000	0%	$0	$0	$0
Impact Fee Study Updates	WA1329	$47,324	100%	$23,662	$23,662	$47,324
Total		$70,687,324		$11,723,662	$20,423,662	$32,147,324

Source: City of Avondale Finance & Budget Department.

Debt Service

The City's water system has no existing deficiencies on a system-wide basis, because existing capacity is greater than current demand. The City has no source of funds for capacity expansion projects other than water rates and Water Facilities development fees. The City has not received any outside grants in recent years to fund capacity–expanding projects, nor does it anticipate any such funding over the next ten years. However, the City does have almost $26 million in outstanding debt on existing Water facilities; a summary of which is shown below.

Figure 80: Water Facilities Debt Service

Bond Series	Purpose	Original Amount	Total 6/30/2014	Total Capacity
2002 MDC Bonds	Water	$13,000,000	$1,582,608	$1,582,608
2003B GO Refunding Bonds	Water (wetlands)	$2,914,286	$933,333	$933,333
2004 MDC Bonds	Water	$9,300,000	$4,796,250	$4,796,250
2005 GO Refunding Bonds	Water (wetlands)	$4,145,000	$1,655,000	$1,655,000
2005 MDC Bonds	Water	$5,000,605	$4,368,233	$4,368,233
2008 MDC Bonds	Water Lines, Well, Reservoir	$15,000,000	$12,380,000	$12,380,000
2010 Water/Sewer Refunding	Water	$567,525	$209,902	$209,902
Total Outstanding, Water			$25,925,326	$25,925,326

Source: City of Avondale Finance & Budget Department.

While future debt service payments will include principal and interest costs, the debt service offset to the Water Facilities development fees is calculated based on the outstanding principal only. No financing or interest costs have been included in determining the improvement costs, and it would be inconsistent to provide an offset for a cost component that is not included in the fee calculation. The simplest and most reasonable approach to calculating the offset is to determine the current amount of outstanding debt principal per existing average day gallons of demand. This represents the cost of existing Water Facilities that is being paid by existing development. **Deducting the $1.40 offset from the gross cost per gallon puts new development on an equal footing with existing development.**

Figure 81: Water Facilities Debt Service Offset

Existing Water Facilities Debt Service	System Value
Total Outstanding Debt Principal	$25,925,326
x Percent of Existing Capacity Used by Existing Customers	59.7%
Outstanding Debt Attributable to Existing Customers	$15,483,181
÷ Existing Usages (gpd)	11,043,932
Debt Offset per Average Day Gallon	$1.40

Source: City of Avondale Finance & Budget Department.

Water Resources

Water Resource Recharge Obligation

The City's available and unused capacity to recharge water at the NAUSP is the basis for the Water Resource Recharge component. The City's NAUSP is currently unused. Consequently, the entire 1.79 MGD capacity of the NAUSP is available for new service units. The Obligation is valued at $1,620,139; with a capacity of 1.79 MGD, the water resource recharge component cost per average day gallon is $0.91.

Figure 82: Cost Recovery – Existing Water Resource Recharge Obligation

Water Resource Recharge	Obligation
Obligation Cost of New River-Agua Fria River USP	$1,620,139
÷ Available Water Recharge Capacity (gpd), 2013-2024	1,790,000
Water Recharge Cost per gpd	$0.91

Source: City of Avondale Finance & Budget Department.

Excluded Costs

Development fees in Avondale exclude costs to upgrade, update, improve, expand, correct or replace those necessary public services to meet existing needs and usage, stricter safety, efficiency, environmental or regulator standards. The City of Avondale Capital Improvement Plan includes the cost of these excluded items.

Current Use and Available Capacity

The Water Facilities discussed above will serve existing and new development. Only the portion of each project that is attributable to growth, as calculated above, will be eligible for Water Facilities development fee revenue.

Maximum Supportable Water Facilities Development Fees

The Maximum Supportable development fees for Water Facilities are shown below. The development fee is derived from the average daily water flow per residential unit (345), multiplied by the net cost per gallon of capacity.

Residential Water Facilities development fees are assessed on a per unit basis, based on average day gallons per connection; they assume a residential unit in a multi-unit structure with a single meter would be served by a 0.75" meter. If not, then the corresponding meter size shown below would be used to determine the appropriate fee.

IIP and Development Fee Study

Included in the Water Facilities per service unit cost is the cost to prepare the Water Facilities IIP and Development Fee Study. See **Appendix A – Cost of Professional Services** for the detailed calculations.

Revenue Credit

Included in the maximum supportable development fees is a *Revenue Credit* of 0 percent. The unadjusted Water Facilities development fees would not generate more revenue over the next ten years, based on the approved Land Use Assumptions, than the identified growth-related costs of $82,979,263 (necessary public services plus the IIP and Development Fee Study cost). To ensure that no more fee revenue is collected than the City plans to spend, the unadjusted development fee per Gallon of Capacity is reduced by the revenue credit to calculate the net development fee per development unit. Based on the gross capital costs per service unit minus the debt offset, the projected development fee revenue would not exceed the necessary public services. Therefore, no revenue credit is necessary.

Figure 83: Maximum Supportable Water Facilities Development Fees

Demand Indicators		
ERU Gallons per Average Day		345
Cost Factors per Gallon of Capacity		
Cost Recovery -Existing Groundwater System		$9.76
Plan Based - Ground Water Well Expansions		$3.78
Plan Based - Water Resource Recharge Obligation		$0.91
IIP and Development Fee Study		$0.01
Gross Cost per Gallon of Capacity		$14.46
Credits per Gallon		
Debt Offset		($1.00)
Revenue Credit	0%	($0.00)
Net Cost per Gallon of Capacity		$13.46

Maximum Supportable Water Facilities Charge					
Residential					
Residential (per dwelling unit)			**$4,651**		
Nonresidential					
Meter Size (inches)		*Capacity Ratio* [1]	**Per Meter**	**Current Fees**	**Difference**
0.75	Displacement	1.00	**$4,651**	$5,251	($600)
1.00	Displacement	1.67	**$7,767**	$8,833	($1,066)
1.50	Displacement	3.33	**$15,488**	$16,985	($1,497)
2.00	Compound	5.33	**$24,790**	$27,067	($2,277)
3.00	Compound	10.67	**$49,627**	$56,248	($6,621)
4.00	Compound	16.67	**$77,533**	$86,800	($9,267)
6.00	Compound	33.33	**$155,021**	-	-

1. AWWA. (2012). M6 Water Meters–Selection, Installation, Testing and Maintenance, Fifth Edition.

FORECAST OF REVENUES

Appendix B – Forecast of Revenues Other Than Development Fees contains a forecast of revenue other than development fees required by Arizona's enabling legislation.

Water Facilities Cash Flow

The cash flow summary shown below provides an indication of the 10-year projected necessary expenditures to meet the demand for growth-related Water Facilities. To the extent the rate of development either accelerates or slows down, there will be a corresponding change in the development fee revenue and capital costs. **The deficit shown reflects the value of existing system capacity that will remain as excess capacity after ten years of projected growth.**

Figure 84: Water Facilities Cash Flow Summary

Ten-Year Growth-Related Costs

Growth Share of Existing System [1]	$49,183,406
Plan Based - Ground Water Well Expansions	$32,147,324
Plan Based - Water Resource Recharge Obligation	$1,620,139
IIP and Development Fee Study	$28,394
TOTAL	**$82,979,263**

[1] Represents approximately ten years of new demand for existing systems

		Projected Demand	
		Residential	*Nonresidential*
		$13.46	
	Year	*MGD*	
Base	2013	7.38	3.88
Year 1	2014	7.55	4.12
Year 2	2015	7.71	4.38
Year 3	2016	7.88	4.65
Year 4	2017	8.06	4.94
Year 5	2018	8.23	5.24
Year 6	2019	8.41	5.57
Year 7	2020	8.60	5.92
Year 8	2021	8.79	6.30
Year 9	2022	8.98	6.70
Year 10	2023	9.18	7.13
	Ten-Yr Increase	1.79	3.24
	Projected Fees *(Rounded)* =>	$24,157,845	$43,686,565
	Total Projected Revenues		**$67,844,410**
	Cumulative Net Surplus/(Deficit)		($15,134,853)

Source: TischlerBise. (2014).

WASTEWATER FACILITIES – INFRASTRUCTURE IMPROVEMENTS PLAN

OVERVIEW

ARS § 9-463.05 (T)(5)(b) defines the 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 a component for the capacity of the wastewater treatment system to serve new growth, the cost of preparing the Wastewater Facilities IIP and Development Fee Study, and a credit for future contributions to existing debt service.

SERVICE AREA

The service area for the Wastewater Facilities IIP is the Base Service Area.

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 and development fees are assessed on both residential and nonresidential development as both types of development create a burden for additional Wastewater Facilities. Customers by land use are used to determine the proportionate share of this burden. In 2012, approximately 97% of Wastewater customers in Avondale were residential units, accounting for 77% of the average day demand. Approximately 3% were nonresidential customers, accounting for 23% of the average day demand.

IIP FOR WASTEWATER FACILITIES

For each necessary public service that is the subject of a development fee, ARS § 9-463.05(E) requires the IIP to include seven elements. The sections below detail each of the required components of the Wastewater Facilities IIP. (A forecast of new revenues generated by development can be found in **Appendix B – Forecast of Revenues Other Than Development Fees**.)

ANALYSIS OF COSTS, CAPACITY, AND USAGE 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, which it plans to expand as necessary to serve growth. The current capacity of the Charles M. Wolf plant is 9.00 million gallons a day (MGD). According to the City of Avondale Utilities Department, current usage is approximately 5.44 MGD, leaving 3.56 MGD of excess capacity to serve new growth. In addition, the City has a ten-year capital improvements plan to increase the capacity of the Charles M. Wolf plant by 3.00 MGD.

Figure 85: Wastewater Plant Capacity

Water Source	*Total Capacity (MGD)*	*Usage (MGD)*	*Remaining*
Charles M. Wolf Wastewater Treatment Plant, 2013	9.00	5.44	3.56
Charles M. Wolf Wastewater Treatment Plant Expansion	3.00		3.00
Total	**12.00**	**5.44**	**6.56**

Source: City of Avondale Utilities Department

Level of service for Wastewater Facilities is based on gallons per connection per day. The current level of service for residential development for wastewater service is 226 average day gallons per connection. For nonresidential connections, wastewater demand averages 2,149 average day gallons per connection.

Figure 86: Wastewater Level of Service

	Avg Gallons per Day[1]	2012 Connections
Residential	4,667,649	20,614
Nonresidential	1,405,526	654
TOTAL	**6,073,175**	**21,268**

1. Average of waste water use in 2012, provided by the City of Avondale.
Nonresidential includes Commercial, Office, Government, Schools, and City.

Level of Service (LOS) Standards	*Residential*
Average Residential Gallons Per Day	4,667,649
2012 Development Units (residential connections)	20,614
Current LOS: Gallons per Connection per Day	***226***

Level of Service (LOS) Standards	*Nonresidential*
Average Nonresidential Gallons Per Day	1,405,526
2012 Development Units (nonresidential connections)	654
Current LOS: Gallons per Connection per Day	**2,149**

In 2012, each nonresidential wastewater connection averaged 19 jobs. The projected increase in jobs drives the demand for wastewater capacity from nonresidential development.

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; they assume a residential unit in a multi-unit structure with a single meter would be served by a 0.75" 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 5/8" and 3/4" meters to the average day gallons per average single residential unit. *Average Day Gallons* is the most 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 (2012) and shown in below.

Figure 87: Wastewater Facilities Ratio of Service Unit to Land Use

Residential Development	
Land Use	**Average Day Gallons per Connection [1]**
Residential Unit	226

[1] City of Avondale. (2012).
Based on 2012 average water use

Charles M. Wolf Wastewater Treatment Plant Expansion		
Meter Size (inches)		**Capacity Ratio [2]**
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

[2] AWWA. (2012). M6 Water Meters–Selection, Installation, Testing and Maintenance, Fifth Edition.

PROJECTED SERVICE UNITS, DEMAND, AND COSTS FOR SERVICES

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."*

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 ten years, it is projected there will be an increase of 5,009 residential connections, 580 nonresidential connections, 1.13 residential MGD and 1.25 nonresidential MGD. The total projected need for Wastewater facilities capacity in 2023 will be 2.38 MGD.

Figure 88: Projected Wastewater Demand

				Demand Unit: Connections			Service Unit: MGD		
	Year	Population	Jobs	Residential Connections	Nonres. Connections	Total Connections	Residential MGD	Nonres. MGD	Total MGD
Base	2013	77,099	13,317	20,615	694	21,309	4.67	1.49	6.16
1	2014	79,446	14,134	21,068	737	21,805	4.77	1.58	6.35
2	2015	81,865	15,003	21,532	782	22,314	4.88	1.68	6.56
3	2016	84,358	15,931	22,005	830	22,835	4.98	1.78	6.77
4	2017	86,926	16,920	22,489	882	23,371	5.09	1.90	6.99
5	2018	89,572	17,976	22,983	937	23,920	5.20	2.01	7.22
6	2019	92,300	19,104	23,489	996	24,485	5.32	2.14	7.46
7	2020	95,110	20,308	24,006	1,059	25,065	5.44	2.28	7.71
8	2021	98,005	21,595	24,533	1,126	25,659	5.56	2.42	7.97
9	2022	100,989	22,970	25,073	1,197	26,270	5.68	2.57	8.25
10	2023	104,064	24,442	25,624	1,274	26,898	5.80	2.74	8.54
Ten Yr Increase		**26,965**	**11,125**	**5,009**	**580**	**5,589**	**1.13**	**1.25**	**2.38**

Source: TischlerBise. (2014). Development Fee Land Use Assumptions.

Cost per Gallon of Capacity

The cost per average day gallon for the Wastewater Facilities development fee includes the valuation of existing capacity to serve new growth, and the value of planned improvements to provide capacity for additional growth.

As shown in Figure 85 above, The City of Avondale will provide 6.56 MGD of water facilities capacity for new growth. At present the wasterwater treatment plant has the capacity to process 9.00 MGD, of which 3.56 MGD remains as unused capacity available to serve growth in service units. The remaining capacity represents 39.6 percent *(rounded)* of the full system's capacity (3.56 MGD / 9.00 MGD). Therefore, 39.6 percent ($170,968,708) of the full systems value ($431,739,161) equates to the growth share of system capacity.

The City has identified over $87.5 million in capital improvements to Wastewater facilities (see Figure 90). Of the identified planned improvements, about $64.3 million is for projects that add system capacity and are eligible for development fee revenue. The identified projects will increase the City's Wastewater facilities system capacity by 3.00 MGD (see Figure 85).

In combination, the cost to provide 6.56 MGD of capacity for new growth equates to $235,291,032. Therefore, the cost per average day gallon is $35.87.

Figure 89: Plan Based – Wastewater Treatment Facilities

Wastewater Treatment Plant Infrastructure	Cost of Excess Capacity
Charles M. Wolf Wastewater Treatment Plant	$104,112,895
Wastewater Collection Lines	$324,052,966
Lift Stations	$325,856
Land	$2,443,702
Equipment	$803,742
Total Existing Wastewater System Replacement Cost	$431,739,161
x Available Percent of Existing Capacity	39.6%
Replacement Cost of Existing Available Capacity	$170,968,708
Planned Capacity Improvements	$64,322,324
Value of Waste Water Facilities Excess Capacity	$235,291,032
÷ Available Capacity (gpd)	6,560,000
Weighted Cost per Service Unit (GPD)	$35.87

Source: City of Avondale Fixed Asset Listing adjusted by the Engineering News-Record Construction Cost Index from the acquisition year to 2012

Figure 90: Wastewater Capital Plan, 2013-2023

Improvement	CIP No.	Total 10-Yr Project Cost	% Eligible	Planned Capacity Improving Costs FY 2014-18	FY 2019-23	10-Year Total
Lift Station - Southern and Dysart	SW1233	$3,500,000	100%	$0	$3,500,000	$3,500,000
Southern Ave Sewerline - Dysart to Avondale	SW1234	$3,200,000	100%	$0	$3,200,000	$3,200,000
Phase II Expansion Reclamation Facility	SW1237	$45,000,000	100%	$0	$45,000,000	$45,000,000
South Avondale/PIR Sewer Line	SW1295	$2,800,000	100%	$2,800,000	$0	$2,800,000
Tertiary Filters - WRF	SW1304	$5,400,000	100%	$5,400,000	$0	$5,400,000
Secondary Clarifier at WRF	SW1325	$3,000,000	100%	$3,000,000	$0	$3,000,000
Centrifuge Additional at WRF	SW1326	$1,000,000	100%	$1,000,000	$0	$1,000,000
Central/Western Sewer Line Upsizing	SW1282	$1,500,000	25%	$375,000	$0	$375,000
WRF Master Plan Projects	n/a	$8,500,000	0%	$0	$0	$0
WRF Headworks Crane Installation	n/a	$200,000	0%	$0	$0	$0
WRF Maintenance Projects	n/a	$1,350,000	0%	$0	$0	$0
Lift Station Rehabilitation	n/a	$1,920,000	0%	$0	$0	$0
Lift Station SCADA (Phase 1 and 2)	n/a	$250,000	0%	$0	$0	$0
Collection System - Manhole Rehabilitation	n/a	$500,000	0%	$0	$0	$0
Collection System - Sewerline Rehabilitation	n/a	$5,006,000	0%	$0	$0	$0
Collection System - Large Pipe Inspection	n/a	$375,000	0%	$0	$0	$0
Collection System - Odor Control System	n/a	$80,000	0%	$0	$0	$0
City-wide Sewer Improvements	SW1047	$970,000	0%	$0	$0	$0
10th St Lift Station Back-up Force Main	SW1108	$2,000,000	0%	$0	$0	$0
McDowell/119th Sewer Replacement	SW1270	$200,000	0%	$0	$0	$0
Fire Protection System - WRF	SW1313	$700,000	0%	$0	$0	$0
Impact Fee Study Updates	SW1329	$47,324	100%	$23,662	$23,662	$47,324
Subtotal, Planned Wastewater Improvements		$87,498,324		$12,598,662	$51,723,662	$64,322,324

Source: City of Avondale Finance & Budget Department.

Debt Service

The City's Wastewater Facilities have no existing deficiencies on a system-wide basis, because existing capacity is greater than current demand. The City has no source of funds for capacity expansion projects other than wastewater rates and development fees. The City has not received any outside grants in recent years to fund capacity-expanding projects, nor does it anticipate any such funding over the next ten years. However, the City does have over $18.85 million in outstanding debt on existing Wastewater facilities, a summary of which is shown below.

Figure 91: Wastewater Facilities Debt Service

Bond	Name	Original Amount	Total 6/30/2014	Total Capacity
2002 MDC Bonds	Wastewater	$3,800,000	$462,609	$462,609
2005 MDC Bonds	Wastewater	$1,461,716	$1,276,869	$1,276,869
2005 MDC Bonds	Wastewater	$1,489,315	$1,300,978	$1,300,978
2006 MDC Bonds	Wastewater	$8,750,000	$6,574,324	$6,574,324
2009 GO Bonds	Wastewater - WWTP Expansion II	$7,800,000	$6,255,705	$6,255,705
2010 Water/Sewer Refunding	Wastewater - WWTP Expansion I	$8,057,475	$2,980,098	$2,980,098
	Total	**$31,358,506**		**$18,850,583**

Source: City of Avondale Finance & Budget Department.

While future debt service payments will include both principal and intrest costs, the debt service offset to the Wastewater Facilities development fee is calculated based on the outstanding principal only. No financing or interest costs have been included in determining the improvement costs, and it would be inconsistent to provide an offset for a cost componenet that is not included in the fee calculation. The simplest and most reasonable approach to calculating the offset is to determine the current amount of outstanding debt principal per existing average day gallons. This represents the cost of existing Wastewater facilities that is being paid for by existing development. **Deducting this amount from the cost per gallon puts new development on an equal footing with existing development.**

Figure 92: Wastewater Debt Services Offset

Existing Wastewater Facilities Debt Service	System Value
Total Outstanding Debt Principal	$18,850,583
x Percent of Existing Capacity Used by Existing Customers	60.4%
Outstanding Debt Attributable to Existing Customers	$11,385,752
÷ Existing Usage	6,073,175
Debt Offset per Service Unit (gpd)	$2.00

Source: City of Avondale Finance & Budget Department.

Excluded Costs

Development fees in Avondale exclude costs to upgrade, update, improve, expand, correct or replace those necessary public services to meet existing needs and usage, stricter safety, efficiency, environmental or regulator standards. The City of Avondale Capital Improvement Plan includes the cost of these excluded items.

Current Use and Available Capacity

The Wastewater Facilities discussed above will serve existing and new development. Only the portion of each project that is attributable to growth, as calculated above, will be eligible for Wastewater Facilities development fee revenue.

MAXIMUM SUPPORTABLE WASTEWATER FACILITIES DEVELOPMENT FEES

The Maximum Supportable development fees for Wastewater Facilities are shown below. The development fee is derived from the average daily demand per residential unit (226 gallons), multiplied by the net cost per gallon ($33.89).

Residential Water Facilities development fees are assessed on a per unit basis, based on average day gallons per connection; they assume a residential unit in a multi-unit structure with a single meter would be served by a 0.75” meter. If not, then the corresponding meter size shown below would be used to determine the appropriate fee.

IIP and Development Fee Study

Included in the Wastewater Facilities per service unit cost is the cost to prepare the Wastewater Facilities IIP and Development Fee Study. See **Appendix A – Cost of Professional Services** for the detailed calculations.

Revenue Credit

Included in the maximum supportable development fees is a *Revenue Credit* of 11 percent. The unadjusted Wastewater Facilities development fees would generate more revenue over the next ten years, based on the approved Land Use Assumptions, than the identified growth-related share of existing systems and planned investments (i.e., necessary public services plus the IIP and Development Fee Study cost). To ensure that no more fee revenue is collected than the City plans to spend, the unadjusted development fee per Gallon of Capacity is reduced by the revenue credit to calculate the net cost per gallon of capacity. Based on the gross capital costs per gallon of capacity, the projected development fee revenue would equal exceed the growth share of costs. Therefore, a *Revenue* Credit of 11 percent (rounded) is necessary to ensure no more revenue is collected than is attributable to growth-related necessary public services for Wastewater Facilities.

Figure 93: Maximum Supportable Wastewater Development Fees

Demand Indicators		
ERU Gallons per Average Day		226
Cost Factors per Gallon of Capacity		
Wasterwater Treatment Plant		$35.87
IIP and Development Fee Study		$0.02
Gross Cost per Gallon of Capacity		$35.89
Credits per Gallon		
Debt Offset		($2.00)
Revenue Credit	11%	($3.94)
Net Cost per Gallon of Capacity		$29.95

Maximum Supportable Wastewater Facilities Charge					
Residential					
Residential (per dwelling unit)			**$6,781**		
Nonresidential					
Meter Size (inches)		*Capacity Ratio* [1]	**Per Meter**	**Current Fees**	**Difference**
0.75	Displacement	1.00	**$6,781**	$5,493	$1,288
1.00	Displacement	1.67	**$11,324**	$9,270	$2,054
1.50	Displacement	3.33	**$22,580**	$17,908	$4,672
2.00	Compound	5.33	**$36,143**	$28,575	$7,568
3.00	Compound	10.67	**$72,354**	$59,450	$12,904
4.00	Compound	16.67	**$113,040**	$91,774	$21,266
6.00	Compound	33.33	**$226,013**	-	-

FORECAST OF REVENUES

Appendix B – Forecast of Revenues Other Than Development Fees contains a forecast of revenue other than development fees required by Arizona's enabling legislation.

Wastewater Facilities Cash Flow

The cash flow summary shown below provides an indication of the 10-year projected necessary expenditures to meet the demand for growth-related Wastewater Facilities. To the extent the rate of development either accelerates or slows down, there will be a corresponding change in the development fee revenue and capital costs. **The deficit shown reflects the value of existing system capacity that will remain as excess capacity after ten years of projected growth.**

Figure 94: Wastewater Facilities Cash Flow Summary

Ten-Year Growth-Related Costs	
Cost of Planned Capacity Improvements	$64,322,324
Growth Share of Principal Debt Service [1]	$7,464,831
IIP and Development Fee Study	$21,296
TOTAL	**$71,808,451**

[1] Growth share of total remaining debt obligation for existing systems

		Projected Demand	
		Residential	*Nonresidential*
		$29.95	
	Year	*MGD*	
Base	2013	4.67	1.49
Year 1	2014	4.77	1.58
Year 2	2015	4.88	1.68
Year 3	2016	4.98	1.78
Year 4	2017	5.09	1.90
Year 5	2018	5.20	2.01
Year 6	2019	5.32	2.14
Year 7	2020	5.44	2.28
Year 8	2021	5.56	2.42
Year 9	2022	5.68	2.57
Year 10	2023	5.80	2.74
	Ten-Yr Increase	1.13	1.25
Projected Fees *(Rounded)* =>		$33,966,423	$37,329,483
Total Projected Revenues		**$71,295,906**	
Cumulative Net Surplus/(Deficit)		($512,545)	

Source: TischlerBise. (2014).

APPENDIX A – COST OF PROFESSIONAL SERVICES

The table below displays each section of the IIP and Development Fee Study. Each necessary public service is attributed a cost, followed by the proportion that is assessed against residential and nonresidential. Then, it displays the increase in service units from 2013 to 2018, and finally the cost per service unit to be assessed. (Because development fees are updated at least every five years, the cost is assessed against the service units for only 5 years.)

Figure A95: IIP and Development Fee Report

Libraries Development Fee Report

Service Unit		Residential & Nonresidential
Proportionate Share		100%
Consultant Fee	$7,493	$7,493
Demand Unit		**Functional Pop.**
Increase in Demand Unit	2013-2018	10,785
Cost per Demand Unit		$0.69

General Government Development Fee Report

Service Unit		Residential & Nonresidential
Proportionate Share		100%
Consultant Fee	$7,493	$7,493
Demand Unit		**Functional Pop.**
Increase in Demand Unit	2013-2018	10,785
Cost per Demand Unit		$0.69

Parks and Recreation Development Fee Report

Service Unit		Residential & Nonresidential
Proportionate Share		100%
Consultant Fee	$14,198	$14,198
Demand Unit		**Functional Pop.**
Increase in Demand Unit	2013-2018	10,785
Cost per Demand Unit		$1.32

Street Development Fee Report

Service Unit		Residential & Nonresidential
Proportionate Share		100%
Consultant Fee	$24,845	$24,845
Demand Unit		**Vehicle Mile of Travel**
Increase in Demand Unit	2013-2018	213,021
Cost per Demand Unit		$0.12

Water Facilities Fee Report

Service Unit		Residential & Nonresidential
Proportionate Share		100%
Consultant Fee	$28,394	$28,394
Demand Unit		**Average Day Gallons**
Increase in Demand Unit	2013-2018	2,206,299
Cost per Demand Unit		$0.01

Police Development Fee Report

Service Unit		Residential & Nonresidential
Proportionate Share		100%
Consultant Fee	$14,198	$14,198
Demand Unit		**Functional Pop.**
Increase in Demand Unit	2013-2018	10,785
Cost per Demand Unit		$1.32

WasteWater Fee Report

Service Unit		Residential & Nonresidential
Proportionate Share		100%
Consultant Fee	$21,296	$21,296
Demand Unit		**Average Day Gallons**
Increase in Demand Unit	2013-2018	1,058,425
Cost per Demand Unit		$0.02

Fire Development Fee Report

Service Unit		Residential & Nonresidential
Proportionate Share		100%
Consultant Fee	$14,198	$14,198
Demand Unit		**Functional Pop.**
Increase in Demand Unit	2013-2018	10,785
Cost per Demand Unit		$1.32

Source: TischlerBise. (2014).

APPENDIX B – FORECAST OF REVENUES OTHER THAN DEVELOPMENT 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 new development over the next ten years are 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 new development that is dedicated to growth-related capital improvements needs to be considered in determining the extent of the burden imposed by new development. Offsets against development fees are warranted in the following cases: (1) new development will be paying taxes or fees used to retire debt on existing facilities serving existing development; (2) new development will be paying taxes or fees used to fund an existing deficiency, or (3) new development will be paying taxes or fees that are dedicated to be used for growth-related improvements. The analysis provided in the individual sections of this report has identified the need for the following offsets against the fees:

- Outstanding debt for past park improvements, including Friendship Park;
- Outstanding debt for water and wastewater capital investments; and
- Outstanding debt for fire equipment and Fire Stations 172.

Projected revenues generated by new development and dedicated for these purposes are shown below for informational purposes only.

Figure B96: Revenue Characteristics of New Development

Revenue Source	Net Rate	Use	Fiscal Year 2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Local Sales Tax												
General Sales Tax												
Construction Tax												
Residential SFD	0.97%	One-Time Expenditures	$605,591	$620,154	$632,290	$646,853	$660,203	$675,980	$689,330	$705,107	$720,884	$736,661
Residential MFD			$56,639	$57,750	$59,415	$60,526	$61,637	$63,302	$64,968	$66,079	$67,745	$68,855
Non-Residential			$137,002	$147,073	$157,846	$170,024	$182,670	$196,721	$212,412	$228,806	$247,073	$267,213
		Total Construction Tax	$799,232	$824,976	$849,551	$877,403	$904,510	$936,004	$966,710	$999,991	$1,035,701	$1,072,729
All Other												
Residential	1.50%	O&M	$525,707	$1,067,542	$1,625,952	$2,201,161	$2,793,842	$3,404,890	$4,034,305	$4,682,759	$5,351,149	$6,039,922
Non-Residential			$147,162	$303,732	$469,485	$646,215	$833,247	$1,032,375	$1,244,271	$1,469,606	$1,708,829	$1,963,955
		Total General Sales Tax	$1,472,102	$2,196,250	$2,944,989	$3,724,779	$4,531,599	$5,373,269	$6,245,286	$7,152,357	$8,095,679	$9,076,606
Public Safety Sales Tax												
Construction Tax												
Residential SFD	0.32%	Police, Fire, Courts Only	$203,171	$208,057	$212,129	$217,015	$221,494	$226,787	$231,265	$236,558	$241,851	$247,144
Residential MFD			$19,002	$19,375	$19,933	$20,306	$20,679	$21,238	$21,796	$22,169	$22,728	$23,100
Non-Residential			$45,963	$49,342	$52,956	$57,042	$61,284	$65,999	$71,263	$76,763	$82,891	$89,648
		Total Construction Tax	$268,137	$276,774	$285,018	$294,363	$303,457	$314,023	$324,325	$335,490	$347,470	$359,893
All Other												
Residential	0.50%	Police, Fire, Courts Only	$135,161	$274,469	$418,038	$565,926	$718,306	$875,409	$1,037,233	$1,203,953	$1,375,799	$1,552,884
Non-Residential			$37,836	$40,255	$42,616	$45,438	$48,087	$51,197	$54,479	$57,934	$61,505	$65,594
		Total Public Safety Sales Tax	$441,134	$591,497	$745,672	$905,726	$1,069,850	$1,240,628	$1,416,037	$1,597,378	$1,784,774	$1,978,371
Dedicated Sales Tax												
Construction Tax												
Residential SFD	0.32%	Water, Sewer, Streets, Transit	$203,171	$208,057	$212,129	$217,015	$221,494	$226,787	$231,265	$236,558	$241,851	$247,144
Residential MFD			$19,002	$19,375	$19,933	$20,306	$20,679	$21,238	$21,796	$22,169	$22,728	$23,100
Non-Residential			$45,963	$49,342	$52,956	$57,042	$61,284	$65,999	$71,263	$76,763	$82,891	$89,648
		Total Construction Tax	$268,137	$276,774	$285,018	$294,363	$303,457	$314,023	$324,325	$335,490	$347,470	$359,893
All Other												
Residential	0.50%	Water, Sewer, Streets, Transit	$135,161	$274,469	$418,038	$565,926	$718,306	$875,409	$1,037,233	$1,203,953	$1,375,799	$1,552,884
Non-Residential			$37,836	$40,255	$42,616	$45,438	$48,087	$51,197	$54,479	$57,934	$61,505	$65,594
		Total Other Dedicated Sales Tax	$441,134	$591,497	$745,672	$905,726	$1,069,850	$1,240,628	$1,416,037	$1,597,378	$1,784,774	$1,978,371
Total Local Sales Tax			**$2,354,369**	**$3,379,244**	**$4,436,332**	**$5,536,231**	**$6,671,298**	**$7,854,525**	**$9,077,361**	**$10,347,112**	**$11,665,227**	**$13,033,348**
State Shared Revenue												
Income Tax		General O&M	Under Arizona State Law, State Share revenues are distributed based on the population of the most recent U.S. Census, or other approved population estimates as defined in A.R.S. 42-5033, 42-5033.1 & 28-6532. The next census would be conducted in fiscal year 2020-2021 for which the results would be available for use for the 2021-2022 fiscal year at which point new development related population would be included.								$1,471,883	$1,471,883
Sales Tax											$1,696,794	$1,696,794
Auto In-Lieu											$624,006	$624,006
Highway User Revenue		Street O&M/Debt									$1,028,249	$1,028,249
		Total State Shared Revenue	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$4,820,932**	**$4,820,932**

Figure B96: Revenue Characteristics of New Development (Continued)

Revenue Source	Net Rate	Use	Fiscal Year 2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Property Taxes												
Primary												
Residential SFD			$26,599	$53,198	$79,797	$106,396	$132,995	$159,594	$186,193	$212,792	$239,391	$265,990
Residential MFD			$2,797	$5,594	$8,391	$11,188	$13,985	$16,782	$19,579	$22,376	$25,173	$27,970
Non-Residential		General O&M	$13,790	$28,214	$43,287	$59,084	$76,056	$94,334	$114,069	$135,328	$158,283	$183,111
	Total Primary Property Tax		$43,186	$87,006	$131,475	$176,668	$223,036	$270,710	$319,841	$370,496	$422,848	$477,071
Secondary												
Residential SFD			$46,745	$46,745	$93,491	$140,236	$186,982	$233,727	$280,473	$327,218	$373,964	$420,709
Residential MFD			$4,379	$4,379	$8,758	$13,137	$17,517	$21,896	$26,275	$30,654	$35,033	$39,412
Non-Residential		GO Bonds	$340,615	$21,458	$22,424	$23,501	$25,249	$27,191	$29,360	$31,626	$34,151	$36,935
	Total Secondary Property Tax		$391,739	$72,583	$124,673	$176,875	$229,747	$282,814	$336,107	$389,498	$443,147	$497,056
Total Property Taxes			**$434,925**	**$159,588**	**$256,148**	**$353,543**	**$452,783**	**$553,524**	**$655,949**	**$759,994**	**$865,995**	**$974,127**
Water/Sewer Revenue												
Water												
Residential SFD	$22 Avg	9 KGM	$132,814	$268,822	$407,491	$549,354	$694,145	$842,396	$993,575	$1,148,214	$1,306,313	$1,467,872
Residential MFD	$17 Avg	6 KGM	$20,979	$42,370	$64,378	$86,797	$109,627	$133,075	$157,140	$181,615	$206,708	$232,213
Non-Residential	$212 Avg	95 KGM	$205,802	$426,848	$663,138	$914,674	$1,181,453	$1,468,559	$1,773,450	$2,101,209	$2,449,293	$2,822,784
	Total Water Revenue		$359,595	$738,039	$1,135,007	$1,550,825	$1,985,226	$2,444,031	$2,924,165	$3,431,038	$3,962,314	$4,522,869
Sewer												
Residential SFD	$28 Avg	7 KGM	$170,418	$344,935	$522,867	$704,897	$890,684	$1,080,911	$1,274,894	$1,473,317	$1,676,180	$1,883,483
Residential MFD	$22 Avg	6 KGM	$27,075	$85,737	$151,035	$224,031	$305,256	$395,771	$496,904	$609,450	$735,003	$875,156
Non-Residential	$126 Avg	60 KGM	$64,835	$132,686	$205,061	$283,466	$366,395	$455,356	$550,347	$651,370	$758,423	$874,524
	Total Sewer Revenue		$262,329	$563,359	$878,963	$1,212,395	$1,562,336	$1,932,037	$2,322,145	$2,734,137	$3,169,607	$3,633,162
Total Water & Sewer Revenue			**$621,924**	**$1,301,398**	**$2,013,970**	**$2,763,220**	**$3,547,562**	**$4,376,068**	**$5,246,310**	**$6,165,175**	**$7,131,921**	**$8,156,032**
Federal Revenue												
			No known sources of Federal revenue to be used for development infrastructure for the authorized necessary public services based on population, new dwelling units, non-residential sq. ft. or service connections are projected for the next ten years.									

Source: City of Avondale. (2014). Finance & Budget Department.

APPENDIX C - LAND USE ASSUMPTIONS

The City of Avondale engaged TischlerBise to update its development fees for several categories of necessary public services pursuant to Arizona Revised Statutes § 9-463.05. Municipalities in Arizona may assess development fees to offset infrastructure costs to a municipality associated with providing necessary public services to a new development. Arizona Revised Statutes (ARS) § 9-463.05 (T)(6) requires the preparation of a Land Use Assumptions document, which shows:

> *"…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."*

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 2013 are used in calculating levels-of-service (LOS) provided to existing development in the City. 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.

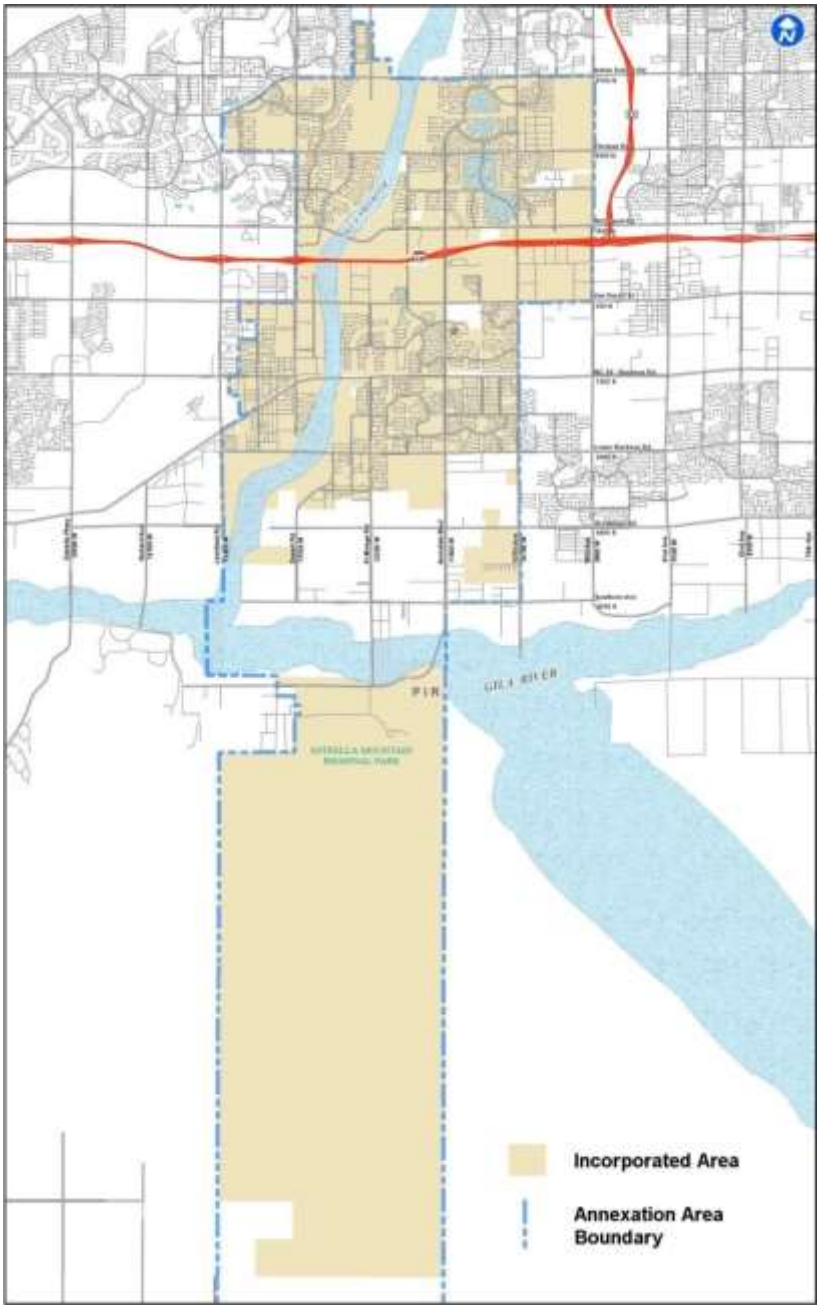
Arizona's Development Fee Act requires fees to be updated at least every five years and limits the IIP to a maximum of ten years. Therefore, the use of a very long-range "build-out" analysis is no longer acceptable for deriving development fees in Arizona municipalities.

SERVICE AREAS

The development fee Land Use Assumptions are prepared for each service area in which a development fee will be collected in the City of Avondale. Multiple service areas are not mandated by SB 1525, so long as a "substantial nexus" can be shown between new development and the necessary public service for which a development fee is collected.

Avondale currently collects development fees for Parks and Recreational facilities, Libraries, Fire, Police, Water, Wastewater, and General Government facilities. **The City currently has a single, city-wide service area for all fee types, shown in Figure C97 below as the city limits and planned annexation area.**

Figure C97: City Limits and Annexation Area

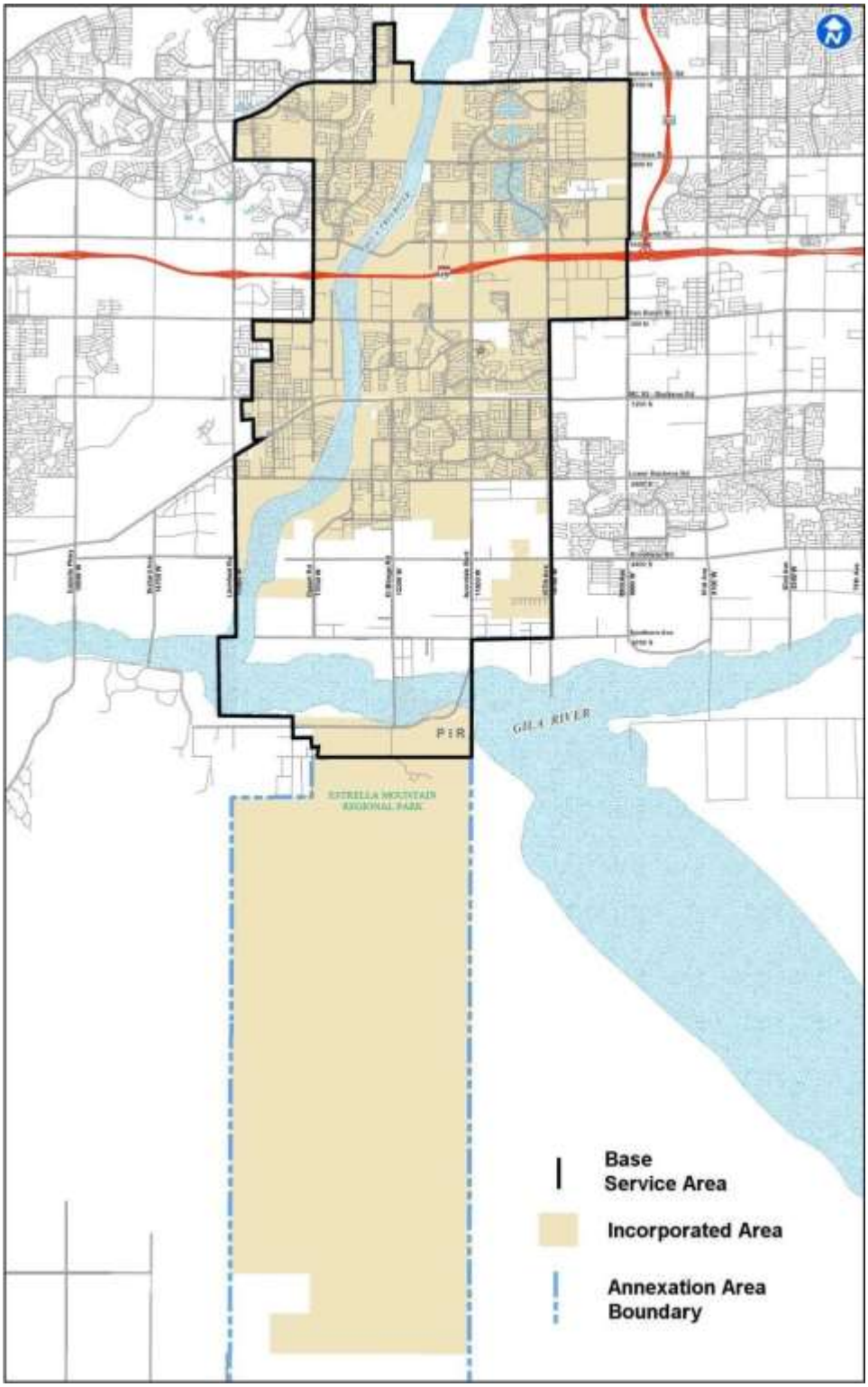


City Service Area

The City has annexed a large area south of the Estrella Mountains that is completely undeveloped and unlikely to see any development over the next ten years. North of the Gila River, there are pockets of unincorporated area north of Lower Buckeye Road, as well as a large amount of unincorporated area south of Lower Buckeye that is within the future annexation area. These unincorporated areas within the annexation boundary are largely undeveloped, containing only about 300 dwelling units according to the 2010 Census (compared to the over 27,000 within the city limits).

The single service area that will be used for most of the City's development fees is defined as the area within the City's annexation boundary north of the Estrella Mountains (see Figure C98).

Figure C98: Base Service Area



SUMMARY OF GROWTH INDICATORS

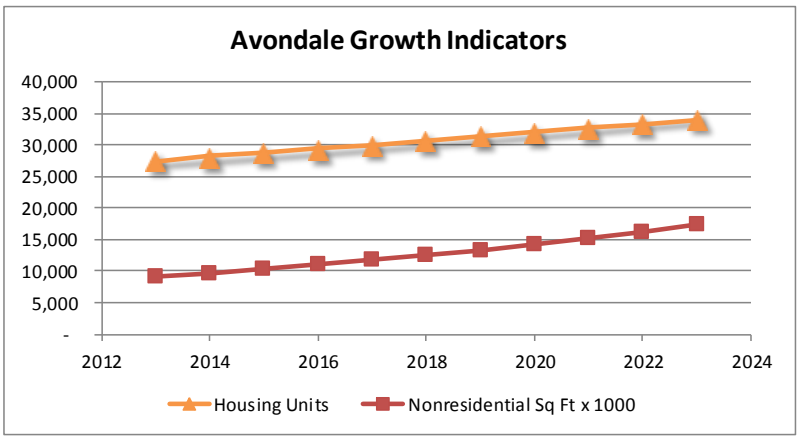
Short-term development projections and growth rates are summarized below. These projections will be used to estimate development fee revenue and to indicate the anticipated need for growth-related infrastructure. However, development fee methodologies are designed to reduce sensitivity to accurate development projections in the determination of the proportionate share fee amounts. If actual development is slower than projected, development fee revenues will also decline, but so will the need for growth-related infrastructure. In contrast, if development is faster than anticipated, the City will receive additional development fee revenue, but will also need to accelerate the capital improvements program to keep pace with development.

Over the next five years, the development fee study assumes an average increase of 628 housing units per year in the Base Service Area, which equates to a linear annual growth rate of 2.3 percent. During the same period, the City is projected to add approximately 679,000 square feet of nonresidential floor area annually, which equates to a linear annual growth rate of 7.4 percent.

Figure C99: Summary of Development Projections and Growth Rates

	Cumulative	
Year	*Housing Units*	*Nonresidential Sq Ft x 1000*
2013	27,340	9,128
2014	27,941	9,713
2015	28,556	10,341
2016	29,184	11,015
2017	29,826	11,741
2018	30,481	12,521
2019	31,152	13,361
2020	31,837	14,268
2021	32,537	15,245
2022	33,253	16,300
2023	33,984	17,441

	2013 to 2018 Average Annual	
	Increase	*Linear Growth Rate*
Residential Units	628	2.3%
Nonresidential Sq. Ft. x1,000	679	7.4%



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 (LOS). For residential development, current LOS is determined using estimates of population and housing units. To estimate current housing units in Avondale, TischlerBise obtained building permit information from the City. This information was used to determine a base year estimate of housing units.

Residential housing units and building permits by type are shown below. To calculate total housing units, the distribution of 84 percent single unit structures and 16 percent 2+ units was calculated from the 2011 U.S. Census American Community Survey (ACS), 3-Year Estimates for *Units in Structure*. This distribution was applied to the total number of units reported by the 2010 decennial census (27,001) to get 22,575 single family units, and 4,426 units in structures with 2+ dwelling units.

Figure C100: Residential Housing Units in the City of Avondale

Building Permits [1]	**2010***	**2011***	**2012***	**Total**	*Average*
Single Unit [2]	17	21	1	39	*13*
2+ Unit [3]	0	0	0	0	*0*
Total	17	21	1	39	

**Issued during calendar year*

Housing Units [4]	*2010 Distribution [5]*	**2010**	**2011**	**2012**	*Base Year* **2013**	*2013 Distribution^*
Single Unit	*84%*	22,575	22,592	22,613	22,614	*84%*
2+ Unit	*16%*	4,426	4,426	4,426	4,426	*16%*
Total		27,001	27,018	27,039	27,040	

^ Reflects the addition of issued permits

[1] City of Avondale, (2012) Building Permits by Permit Type
[2] Single Family includes detached, attached, and mobile homes
[3] Multifamily includes structures with 2 or more units
[4] U.S. Census Bureau, 2010 Decennial Census: DP1
[5] U.S. Census Bureau, 2011 American Community Survey 3-Year Estimates: Table B25024

To estimate 2011, 2012, and 2013 housing units, the building permits issued each year were added to the housing units, starting with the 2010 census count. TischlerBise estimates the City had 27,040 housing units at the start of base year 2013. The 2013 rounded distribution of housing units by type of structure remains unchanged from the 2010 distribution.

Housing Units by Service Area

According to the City of Avondale Planning Department, the development fee Base Service area includes 300 dwelling units in the City's annexation area, of which 178 are single units, and 122 are units in multi-unit structures. Therefore, the 2013 estimate of housing units for the development fee base is 27,340.

Figure C101: Housing Units by Development Fee Service Areas

Housing Unit by Type	City Limits	2013 Service Area Base
Single Unit	22,614	22,792
2+ Unit	4,426	4,548
Total	27,040	27,340

Source: City of Avondale, Planning Department

Current Household Size

The 2010 census did not obtain detailed information using a "long-form" questionnaire. Instead, the U.S. Census Bureau has switched to a continuous monthly mailing of surveys, known as the American Community Survey (ACS), which is limited by sample-size constraints in areas with relatively few residents. For cities like Avondale, data on detached housing units are now combined with attached single units (commonly known as townhouses). One way to address this limitation is to derive fees by household size, as discussed further below. Because townhouses and mobile homes generally have less floor area than detached units, fees by household size ensures proportionality and facilitates construction of affordable units. According to the U.S. Census Bureau, a household is a housing unit that is occupied by year-round residents. Development fees often use per capita standards and Persons per Household to derive proportionate share fee amounts.

As will be discussed in the **Functional Population** section to follow, some development fees use a "functional population" methodology to determine proportionate share amounts. This approach is a generally accepted methodology for these development fee types and is based on the observation that demand for certain capital facilities tends to be proportional to the presence of people at a particular site (e.g., persons per household). For residential land uses, the impact of a dwelling unit on the need for capital facilities is generally proportional to the number of persons residing in the dwelling unit. This can be measured for different housing types in terms of either average household size (average number of person per occupied dwelling unit) or person per unit (average number of persons per dwelling unit, including vacant as well as occupied units). In this analysis, average household size is used to develop the functional population multipliers, as it avoids the need to make assumptions about occupancy rates.

The U.S. Census Bureau, American Community Survey estimates for population, housing units, and households were used to establish the share of each by structure type (i.e., single unit or multi-unit). These shares were then applied to 2010 Decennial Census counts for each to establish a Persons per Household factor for each type of unit.

As shown below, decennial Census data indicate that the City had 23,386 households of the 27,001 housing units. **Dwellings with a single unit per structure (i.e., detached, attached, and mobile homes) averaged 3.35 persons per household. Dwellings in structures with multiple units averaged 2.76 persons per household.** The City of Avondale has a city-wide average *Persons per Household* factor of 3.25, and occupancy rate for the existing housing stock of 87 percent.

Figure C102: Average Household Size

2011 ACS Estimates

Type of Housing	*Persons*	*Housing Units*	*House-holds*
Single Unit [1]	65,497	21,387	18,593
2+ Unit [2]	10,305	4,193	3,555
Subtotal	75,802	25,580	22,148
Group Quarters Population	186		
TOTAL*	75,988	25,580	22,148

Source: U.S. Census Bureau, 2009-2011 American Community Survey

2010 Census Counts

	Persons	*Housing Units*	***Persons per Housing Unit***	*House-holds*	***Persons per Household***	*Household Mix*
Single Unit*	65,735	22,575	2.91	19,632	3.35	84%
2+ Units	10,343	4,426	2.34	3,754	2.76	16%
Subtotal	76,078	27,001	2.82	23,386	3.25	*Occupancy*
Group Quarters	160					*Rate*
TOTAL	76,238					87%

Source: Totals from Summary File 1, U.S. Census Bureau.
[1] Single Family includes detached, attached, and mobile homes
[2] Multifamily includes duplex and all other units with 2 or more units per structure
* Totals exclude units counted as "Boat, RV, van, etc."

Population Estimates and Projections

TischlerBise analyzed recent growth trends, reviewed the City of Avondale planning documents, and had discussions with staff, to conclude the recently released Arizona department of Administration sub-county population projections for the City of Avondale to be the most accurate reflection of current and projected growth trends for the City. According to the projections, the City has a base year population of 77,099 people. According to the Arizona Department of Administration population projections, the City of Avondale is expected to reach 128,400 in population by 2040. This is a more conservative long-term growth projection than the 2009 Maricopa Association of Governments (MAG) projections used for the 2012 City of Avondale General Plan 2030, and is reflective of both recent building activity and the 2013 update to MAG socioeconomic projections.

Applying an exponential growth rate of 1.24 percent to project population between 2023 and 2040, suggests the City of Avondale will have a 2033 population of 117,757, which means the City is expect to add 40,658 over the next two decades.

Figure C103: City of Avondale Population Estimates and Projections

	Annual July Population Estimates [1]				MAG Projections [2]		State of AZ Projections [3]		Exponential Growth Rate [3]
	2009	**2010**	**2011**	**2012**	**2013**	**2023**	**2033**	**2040**	2023-40
City of Avondale	72,360	76,468	76,392	76,870	77,099	104,064	117,757	128,400	*1.24%*

[1] Arizona Department of Administration, Interim Intercensal Population Estimates
[2] Maricopa Association of Governments. (2013). Socioeconomic Projections of Population, Housing and Employment

[3] 2040 population projection from Arizona Department of Administration
Avondale 2012-2050 Population Projections

Population and Housing Unit Projections

Figure C104 shows the base year population and housing unit estimates for the development fee *Base Service Area*. The distribution of housing units by type was calculated by holding steady the 2013 distribution of 84 percent single family and 16 percent multifamily units. The current relationship of year-round population to total housing units of 2.82 is maintained, on average, throughout the projections period.

Figure C104: Population and Housing Unit Projections for the City of Avondale, 2013-2033

											Five-Year Increments ===>			**Cumulative**	**Avg. Ann.**
	Base Yr	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**15**	**20**	**Increase**	**Increase**
	2013	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2028**	**2033**	**2013-2033**	**2013-2033**
SUMMARY OF DEMAND PROJECTIONS (Base Service Area)															
TOTAL YEAR-ROUND POPULATION	77,099	79,446	81,865	84,358	86,926	89,572	92,300	95,110	98,005	100,989	104,064	110,699	117,757	**40,658**	**2,033**
RESIDENTIAL DEVELOPMENT (Base Service Area)															
Housing Units															
Single Family	22,792	23,291	23,802	24,323	24,856	25,400	25,957	26,525	27,106	27,700	28,307	31,257	34,515	**11,723**	**586**
Multifamily	4,548	4,650	4,754	4,861	4,970	5,081	5,195	5,312	5,431	5,553	5,677	6,282	6,950	**2,402**	**120**
TOTAL	27,340	27,941	28,556	29,184	29,826	30,481	31,152	31,837	32,537	33,253	33,984	37,539	41,465	**14,125**	**706**

NONRESIDENTIAL DEVELOPMENT

In addition to data on residential development, the infrastructure improvements plan and development fees require data on nonresidential development in the Service Area. Current estimates and future projections on nonresidential development are detailed in this section, including jobs and floor area by three types of nonresidential development, each of which include the industry sectors listed below.

Figure C105: Nonresidential Land Use Categories

Category	Industry Sector
Commercial/Retail	
	Retail Trade
	Arts, Entertainment, and Recreation
	Accommodation and Food Services
	Other Services (excluding Public Administration)
Office/Institutional	
	Information
	Finance and Insurance
	Real Estate and Rental and Leasing
	Professional, Scientific, and Technical Services
	Management of Companies and Enterprises
	Administration & Support, Waste Management and Remediation
	Educational Services
	Health Care and Social Assistance
	Public Administration
Industrial	
	Agriculture, Forestry, Fishing and Hunting
	Mining, Quarrying, and Oil and Gas Extraction
	Utilities
	Construction
	Manufacturing
	Wholesale Trade
	Transportation and Warehousing

Jobs by Type of Nonresidential Development

Figure C106 shows the City's 2013 job and floor area estimates, according to three general types of nonresidential development. TischlerBise divided floor area estimates, provided by the City of Avondale, by job estimates retrieved from the Maricopa Association of Governments to indicate current average square feet per job multipliers. Although Office/Institutional services is higher than the national average of approximately 300 square feet per office job, this category also includes public sector facilities like schools which has 1,231 square feet per employee multiplier (according to 2012 data from the Institute of Transportation Engineers and published in Trip Generation), thus explaining the higher multiplier. For both industrial and commercial, square feet per employee multipliers are held constant over the projection period.

Figure C106: Jobs and Floor Area Estimates

	2013 Estd Jobs [1]	*Square Feet Per Employee*	*Nonresidential Floor Area [2]*	*Pct of Nonres Floor Area*
Commercial/Retail	6,911	504	3,486,000	38%
Office/Institutional	5,249	747	3,919,000	43%
Industrial/Flex	1,157	1,489	1,723,000	19%
TOTAL	*13,317*	*685*	*9,128,000*	*100%*

[1] Maricopa Association of Governments. (2013). Socioeconomic Projections of Population, Housing, and Employment

[2] City of Avondale. (2013). CoStar Data

For nonresidential land use assumptions, 2030 employment projections retrieved from the Maricopa Association of Governments were used to create a straight-line interpolation between 2013 estimates and 2030 projections for each year past the base. The square feet per employee factors, by industry type, discussed above were used to calculate floor area by industry type for each year past the base. A summary of nonresidential development and jobs projections is shown below.

Figure C107: Nonresidential Development and Jobs Projections for the City of Avondale, 2013-2033

											Five-Year Increments ===>			Cumulative	Avg. Ann.
	Base Yr	1	2	3	4	5	6	7	8	9	10	15	20	Increase	Increase
	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2028	2033	2013-2033	2013-2033
NONRESIDENTIAL DEVELOPMENT (Base Service Area)															
Nonres Floor Area (1,000 SF)															
Commercial (1,000 SF)	3,486	3,681	3,887	4,104	4,334	4,576	4,832	5,102	5,388	5,689	6,007	7,557	9,507	**6,021**	**301**
Office (1,000 SF)	3,919	4,111	4,312	4,523	4,744	4,976	5,219	5,475	5,742	6,023	6,318	9,872	15,424	**11,505**	**575**
Industrial/Flex (1,000 SF)	1,723	1,921	2,142	2,388	2,663	2,969	3,310	3,691	4,115	4,588	5,116	7,716	11,638	**9,915**	**496**
TOTAL	9,128	9,713	10,341	11,015	11,741	12,521	13,361	14,268	15,245	16,300	17,441	25,145	36,569	**27,441**	**1,372**
Employment By Type (Base Service Area)															
Commercial/Retail	6,911	7,298	7,706	8,137	8,592	9,072	9,580	10,116	10,682	11,279	11,910	14,983	18,849	**11,938**	**597**
Office/Institutional	5,249	5,546	5,859	6,190	6,540	6,910	7,301	7,714	8,150	8,610	9,097	14,985	24,684	**19,435**	**972**
Industrial/Flex	1,157	1,290	1,438	1,604	1,788	1,994	2,223	2,478	2,763	3,081	3,435	5,181	7,815	**6,658**	**333**
TOTAL	13,317	14,134	15,003	15,931	16,920	17,976	19,104	20,308	21,595	22,970	24,442	35,149	51,348	**38,031**	**1,902**

Source: Maricopa Association of Governments. (2013). Socioeconomic Projections of Population, Housing and Employment.

FUNCTIONAL POPULATION

This Development Fee Study update utilizes the "functional population" approach to calculate and assess the General Government, Library, Parks and Recreational, Fire, and Police Facilities development fees. This approach is a generally accepted methodology for establishing the potential demand for certain capital Facilities from both residential and nonresidential land uses.

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

Residential Functional Population

For residential land uses, the impact of a dwelling unit on the need for capital Facilities is generally proportional to the number of persons residing in the dwelling unit. This can be measured for different housing types using either average household size (average number of persons per occupied dwelling unit) or persons per unit (average number of persons per dwelling unit, including vacant as well as occupied units). **In this analysis, average household size is used to develop the functional population multipliers, as it avoids the need to make assumptions about occupancy rates.**

Determining residential functional population multipliers is considerably simpler than the nonresidential component. It is estimated that people, on average, spend 16 hours, or 67 percent, of each 24-hour day at their place of residence and the other 33 percent away from home. The *Functional Population per Unit* factors are shown below.

Figure C108: Functional Population for Residential Development by Type

Housing Type	Unit	Person per Household [1]	Occupancy Factor	Functional Population per Unit
Single Unit	Dwelling	3.35	0.67	2.24
2+ Unit	Dwelling	2.76	0.67	1.85

[1] U.S. Census Bureau, American Community Survey 2011 3-Year Estimates applied to 2010 Census Summary File 1 counts

Nonresidential Functional Population

The functional population methodology for nonresidential land uses is based on trip rates, vehicle occupancy, employee density and time spent at the site by employees and visitors. Functional population per 1,000 square feet is derived by dividing the total number of hours spent by employees and visitors during a weekday by 24 hours at a particular development. Employees are estimated to spend 8 hours per day at their place of employment, and visitors are estimated to spend one hour per visit. The formula used to derive the nonresidential functional population estimates is summarized below.

Figure C109: Nonresidential Functional Population Formula

FUNCPOP/UNIT	=	(employee hours/1000 sf + visitor hours/1000 sf) ÷ 24 hours/day
Where:		
Employee hours/1000 sf	=	employees/1000 sf x 8 hours/day
Visitor hours/1000 sf	=	visitors/1000 sf x 1 hour/visit
Visitors/1000 sf	=	weekday ADT/1000 sf x avg. vehicle occupancy – employees/1000 sf
Weekday ADT/1000 sf	=	one-way avg. daily trips (total trip ends ÷ 2)

Using this formula and information on trip generation rates, vehicle occupancy rates from the Institute of Transportation Engineers, National Household Travel Survey and other sources and assumptions, nonresidential functional population estimates per 1,000 square feet of gross floor area are calculated in Figure C110.

Figure C110: Functional Population per Unit for Nonresidential Uses

Land Use	Unit	Trip Rate [1]	Persons/ Trip [2]	Employee/ Unit [3]	Visitors/ Unit	Functional Population per Unit
Retail/Commercial	1,000 sq. ft.	21.35	1.96	1.98	39.86	2.32
Office	1,000 sq. ft.	5.52	1.24	1.34	5.50	0.68
Industrial	1,000 sq. ft.	3.49	1.24	0.67	3.65	0.38

[1] Institute of Transportation Engineers. (2012).Trip Generation 9th Edition.
[2] Federal Highway Administration. (2009). Nationwide Household Travel Survey.
[3] TischlerBise. Development Fee Land Use Assumptions.
Service Area 2013 estimates of employees per all existing nonresidential floor area by industry type.

Service units

Disparate types of development must be translated into a common unit of measurement that reflects the impact of new development on the demand for capital Facilities. This unit of measurement is called a service unit (e.g., functional population, population, or vehicle trips).

Similar to the concept of full-time equivalent employees, functional population represents the number of "full-time equivalent" people present at the site of a land use. Functional population represents the average number of equivalent persons present at the site of a land use for an entire 24-hour day. For residential development, functional population is simply average household size times the percent of time people spend at home. For nonresidential development, functional population is based on a formula that includes square foot per employee ratios, trip generation rates, average vehicle occupancy and average number of hours spent by employees and visitors at a land use. These all tend to be stable characteristics that do not change significantly over short periods of time. The City of Avondale functional population for base year 2013, by land use and total are shown below.

Figure C111: Functional Population for City of Avondale, 2013

		Existing	2013 Functional Population	
Land Use	Unit	Units [1]	per Unit	Total
Single Unit	Dwelling	22,792	2.24	51,054
2+ Unit	Dwelling	4,548	1.85	8,414
Retail/Commercial	1,000 sq. ft.	3,486	2.32	8,088
Office	1,000 sq. ft.	3,919	0.68	2,665
Industrial	1,000 sq. ft.	1,723	0.38	655
Total Functional Population, 2013				70,876

[1] Development Fee Land Use Assumptions