Cost of Service Study:
Legal and Policy Analysis

City of Tucson, Arizona

prepared by duncan associates

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INTRODUCTION

The purpose of this project is to assist the City of Tucson in the preparation of an impact fee program. The project has been divided into two phases.

- ☐ Phase One, "Feasibility," will establish the legal and policy framework for Tucson's impact fee system at the very beginning of the project. In this phase, we will review the Arizona impact fee enabling act, local data and potential fees, and determine in conjunction with local officials the type of impact fee system that should be developed in the second phase.

- ☐ Phase Two, "Implementation," will implement the policy directions provided by the City at the conclusion of Phase One. It may entail the development of impact fees for transportation, stormwater drainage, parks, libraries, police and fire protection facilities and general government facilities.

This report is the primary consultant team work product for Phase One. It is intended to provide background information and guidance to the City Council in deciding whether and how to proceed with the development of an impact fee program in Phase Two.

SUMMARY OF RECOMMENDATIONS

The major policy issues involved in developing an impact fee system, along with the consultant's recommendations, are summarized as follows.

Table 1
SUMMARY OF POLICY ISSUES AND RECOMMENDATIONS

Policy Issue	Consultant Recommendation
Types of Facilities	Calculate fees in Phase Two for roads, parks, libraries, solid waste, police, fire and general government facilities (insufficient data for drainage–consider a stormwater utility fee).
Variable Fees by Geographic Areas	Explore feasibility of variable road fees by growth area based on trip length differences; other fees would be city-wide.
Multi-Jurisdictional Fees	Consider regional library fee if Pima County is willing to participate; otherwise develop City-only fee.
Cost Components	Include ROW costs in road fee; limit to City arterials (i.e., exclude collectors, State roads and Federal highways). Exclude neighborhood and mini-parks from park fee.
Progressive Rates	Vary fees for single-family units by the size of the unit, based on demonstrated differences in impact.
Benefit Districts	Earmark funds to spend in subareas where collected for road, park, and possibly library and fire fees (address specifics in Phase Two).
Phase-in	Allow adequate time for real estate market to adjust (address specifics in Phase Two).

WHAT ARE IMPACT FEES?

Impact fees, also called "development fees" or "development impact fees," are one of the most direct ways for local governments to require new developments to pay a larger portion of the costs they impose on the community. In contrast to traditional "negotiated" developer exactions, impact fees are charges that are assessed on new development based on a standard formula based on objective characteristics, such as the number of dwelling units constructed or vehicle trips generated. The fees are one-time, up-front charges, with the payment usually made at the time of building permit issuance, although some jurisdictions allow extended payments over a period of years. Essentially, impact fees require that each developer of a new residential or commercial project pay its pro-rata share of the cost of new infrastructure facilities required to serve that development.

Among the virtues of impact fees that may appeal to developers are that they tend to "level the playing field" between developers and add predictability to the development process. Currently, developers may be required to dedicate right-of-way and/or construct adjacent or internal arterial roads at time of subdivision approval, and additional improvements or contributions may be required in the conditional rezoning process. These traditional types of developer exactions tend to penalize the developer or landowner whose property happens to have frontage on a substandard major street, for example, or happens to be located in the path of a planned arterial roadway extension. While in many cases the developer benefits somewhat from having frontage on the arterial, there is also a community benefit that is derived from the dedication of right-of-way and construction of a major roadway. Under a system of traditional exactions, only the developer with frontage on a major roadway is required to construct or widen a major roadway. Under a road impact fee system, all developments are required to pay a proportionate share of the major road system expansion cost, based on their traffic generation. While the developer with frontage may still be required to dedicate land and construct improvements to abutting roadways, he would get credit for the cost of these contributions against the road impact fees for his project. Under an impact fee program, all developers know in advance what their share of the infrastructure cost will be, and they also know that it is the same as their competitors will be paying.

While impact fees are often touted as a painless way to raise revenue, because existing residents do not pay the fees, this perception is not entirely accurate. It is true that impact fees are directly paid by developers and builders, and do not appear on an existing homeowner's tax bill. Yet while some of the cost of an impact fee may be borne by the landowner in the form of lower land prices or by the developer in the form of lower profit margins, it is likely that at least some of the fee will be indirectly paid by buyers of new homes in the form of higher home prices. And to the extent that the price of new homes is increased, upward pressure will be also be exerted on the price of existing homes.[1]

Related to this misconception is the often heard objection that existing residents who buy new homes are being double-charged, since they may have already paid for their share of the existing infrastructure through taxes and fees paid during their residence in the community. This objection misses the point that impact fees are assessed on the act of development or construction, not on the initial occupants of the new building. The new building represents additional demands on infrastructure that will continue indefinitely, whereas the occupants of the building may change many times during its useful life. In

[1]For a recent review of the literature on the issue of how impact fees affect land and housing prices, referred to as "impact fee incidence," see Keith R. Ihlanfeldt and Timothy M. Shaughnessy, *An Empirical Investigation of the Effects of Impact Fees on Housing and Land Markets*, Lincoln Institute of Land Policy, 2002.

addition, while no financing system is perfect, this alleged inequity of impact fees is overblown. As noted above, to the extent that impact fees do raise the price of new housing, they will also exert upward pressure on the prices of existing units. Consequently, if a homeowner sells an existing home in order to purchase a new home, that homeowner should recoup much if not all of the impact fee charged on the new home as a windfall in the increased sales price of the existing home.

Another poorly-understood facet of impact fees is that they can also benefit older areas of a community. Impact fees are intended to shift the burden of paying for growth-related capital improvements from jurisdiction-wide revenue sources such as property and sales taxes to the new development that creates the need for the improvements. While impact fee revenues are earmarked for capacity-expanding capital improvements that benefit new development, there is no guarantee that total funding for growth-related improvements will increase by the amount of the impact fee revenues. Communities that assess impact fees on new development are under no obligation to continue the past pattern of financing growth-related improvements from broad-based revenue sources. In most cases, impact fees do result in a significant increase in funds available for growth-related projects, as most communities continue to spend some money from other funding sources on such improvements. Nevertheless, the adoption of impact fees does create the opportunity to divert some non-impact fee funding that otherwise would have been needed for growth-related projects to be spent on existing needs, such as maintenance and rehabilitation of existing facilities in older areas of the community. As noted in the adopted Cost of Development Element of the *General Plan*, "Assessing a fair cost covers the impacts of the new development while freeing up revenues that can be used to address existing [infrastructure needs]."

LEGAL FRAMEWORK

Since impact fees were pioneered by local governments in the absence of explicit state enabling legislation, such fees have generally been legally defended as an exercise of local government's broad "police power" to protect the health, safety and welfare of the community. The courts have gradually developed guidelines for constitutionally valid impact fees, based on a "rational nexus" that must exist between the regulatory fee or exaction and the activity that is being regulated. The standards set by court cases generally require that an impact fee meet a three-part test:

1) The need for new facilities must be created by new development;

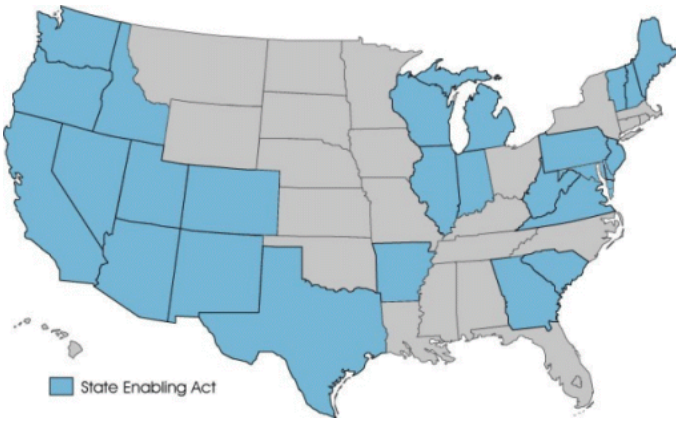
2) The amount of fee charged must not exceed a proportional fair share of the cost to serve new development; and

3) All fee revenues must be spent within a reasonable period of time and benefit the fee-paying development.

In most states, local governments have the authority to impose impact fees for water and wastewater facilities, although they may be called something else. To date, 27 states, including Arizona, have adopted general impact fee enabling legislation for facilities other than water and wastewater. Like most other state enabling acts, Arizona's impact fee enabling act reflects the constitutional standards enumerated above.

However, some states where impact fees are popular, such as Florida, still do not have impact fee enabling legislation. One of the reasons that Florida does not have an impact fee enabling act is that local governments felt that they had more freedom under Florida and national case law than they would under an explicit enabling statute. Indeed, one of the provisions in most state enabling acts is a limitation on the types of facilities for which impact fees can be assessed. The types of facilities that are eligible for impact fees are listed in Table 1. As can be seen, Arizona has one of the most progressive acts in this respect, authorizing fees for all "necessary public services" that are directly provided by the municipality (this does not include public schools, which are provided by independent school districts).

Figure 1
IMPACT FEE ENABLING ACTS



The Arizona impact fee enabling act for cities, Section 9-463.05, Arizona Revised Statutes (A.R.S.), provides that:

> A municipality may assess development fees to offset costs to the municipality associated with providing necessary public services to a development (A.R.S. 9-463.05.A).

To conform to the act, a municipal impact fee must meet the following standards:

1. Development fees shall result in a beneficial use to the development.

2. Monies received from the development fees...shall be placed in a separate fund...and may only be used for the purposes authorized by this section....

3. The schedule for payment of fees shall be provided by the municipality. The municipality shall provide a credit toward the payment of a development fee for the required dedication of public sites and improvements provided by the developer....

4. The amount of any development fee...must bear a reasonable relationship to the burden imposed upon the municipality....

5. If development fees are assessed by a municipality, such fees shall be assessed in a non-discriminatory manner (A.R.S. § 9-463.05.B).

The Arizona enabling act for municipalities is very brief, and does not contain many of the prescriptive provisions imposed by many other state enabling acts. Some states, for example, require the preparation and adoption of growth projections and capital improvement plans as a prerequisite for adopting impact fees, specify the methodology that must be used, and detail many specific provisions that an impact fee ordinance must contain. Arizona's act, in contrast, generally confines itself to enumerating the general principles to which impact fees must adhere. The only onerous part of the act is the time that is required for adoption. The act requires that 60 days notice must be given before the first public hearing, then that

an additional 14 days must elapse before the hearing at which the fee is adopted, and finally that the fees cannot go into effect for at least 90 days after adoption. Thus, a municipality adopting an impact fee in Arizona needs a minimum of 164 days from the time that the study and ordinance have been prepared to the time when fees can begin to be collected.

Table 2
FACILITIES ELIGIBLE FOR IMPACT FEES

State	Roads	Water	Sewer	Storm Water	Parks	Fire	Police	Library	Solid Waste	School
Arizona	■	■	■	■	■	■	■	■	■	
Arkansas (cities only)	■	■	■	■	■	■	■	■		
California	■	■	■	■	■	■	■	■	■	■
Colorado	■	■	■	■	■	■	■	■	■	
Delaware	■	■	■	■	■	■	■	■	■	■
Georgia	■	■	■	■	■	■	■	■		
Hawaii	■	■	■	■	■	■	■	■	■	■
Idaho	■	■	■	■	■	■	■			
Illinois	■									
Indiana	■	■	■	■	■					
Maryland (counties)	■	■	■	■	■	■	■	■	■	■
Maine	■	■	■		■	■			■	
Nevada	■	■	■	■	■	■	■			
New Hampshire	■	■	■	■	■	■	■	■	■	■
New Jersey	■	■	■	■						
New Mexico	■	■	■	■	■	■	■			
Oregon	■	■	■	■	■					
Pennsylvania	■									
Rhode Island	■	■	■	■	■	■	■	■	■	■
South Carolina	■	■	■	■	■	■	■			
Texas (cities only)	■	■	■	■						
Utah	■	■	■	■	■	■	■			
Vermont	■	■	■	■	■	■	■	■	■	■
Virginia	■									
Washington	■				■	■				■
West Virginia	■	■	■	■	■	■	■			■
Wisconsin (cities)	■	■	■	■	■	■	■	■	■	
Wisconsin (counties)		■	■	■	■	■	■	■	■	

Source: Ariz. Rev. Stat. Ann., § 9-463.05 (cities), § 9-11-1101 et seq. (counties); Ark. Code Ann., § 14-56-102; Cal. Gov't Code, § 66000 et seq.; Colo. Rev. Stat., § 29-20-104.5 et seq.; Del. Code, § 9121 et seq.; Ga. Code Ann., § 36-71-1 et seq.; Haw. Rev. Stat., § 46-141 et seq.; Idaho Code, § 67-8201 et seq.; 605 Ill. Comp. Stat. Ann., § 5-901 et seq.; Ind. Code Ann., § 36-7-4-1300 et seq.; Ann. Code of Maryland, Art. 25B, § 13D; Me. Rev. Stat. Ann., Title 30-A, § 4354; Nev. Rev. Stat., § 278B; N.H. Rev. Stat. Ann., § 674:21; N.J. Perm. Stat., § 27:1C-1 et seq.; § 40:55D-42; New Mexico Stat. Ann., § 5-8-1 et seq.; Or. Rev. State, § 223.297 et seq.; Pa. Stat. Ann., Title 53, § 10501-A et seq.; General Laws of Rhode Island, §45-22.4; Code of Laws of S.C., § 6-1-910 et seq.; Tex. Local Gov't Code Ann., Title 12, § 395.001 et seq.; Utah Code, § 11-36-101 et. seq.; Vt. Stat. Ann., Title 24, § 5200 et seq.; Va. Code Ann., § 15.2-2317 et seq., § 15.2-2119; Wash. Rev. Code Ann., § 82.02.050 et seq.; W. Va. Code, § 7-20-1 et seq.; Wis. Stats., § 66.55

In addition to the impact fee enabling act, another relevant piece of legislation is the 1998 Growing Smarter Act, which among other things amended the provisions dealing with municipalities' general plan powers. A.R.S. § 9-461.05.C.4 now requires municipalities to include a Cost of Development Element, through which the municipality must identify "policies and strategies that the municipality will use to require development to pay its fair share toward the cost of additional public service needs generated by the development..." The legislation authorizes "appropriate exceptions when in the public interest." The

Cost of Development Element must identify the various financing mechanisms that can be used to fund growth-related improvements, as well as policies to ensure that these mechanisms "result in a beneficial use to the development, bear a reasonable relationship to the burden imposed on the municipality and otherwise are imposed according to law."

The City of Tucson's Cost of Development Element, which was ratified by the voters on November 6, 2001 as part of the *General Plan*, states that the City will recover growth-related capital costs in the areas of transportation, parks and recreation, water resources and distribution, drainage, operations, police, fire, solid waste and libraries. The process for doing this will include establishing level of service (LOS) standards for each facility type and identifying the costs of expansion of City facilities required to maintain service levels. While the Growing Smarter legislation requires municipalities to identify policies and strategies to make new development to pay its fair share of growth-related capital costs, it leaves it up to each community to define the term "fair share." The City's Cost of Development Element defines fair share costs as "the total capital cost (facilities and equipment) minus developer credits and funds dedicated to a project as set forth in the City's approved Capital Improvements Program."

Three other aspects of the Cost of Development Element warrant brief discussion. Policy 4.2 states that the City should establish "a weighted measure which will be applied consistently to assign a greater share of cost to new developments as they move away from areas of existing services, increase in size, and absorb a greater portion of the benefits and services necessitated by the development." Achievement of this objective may be more appropriate for other cost recovery mechanisms besides impact fees. Of the fees under consideration, only road impact fees lend themselves to differentiation by geographic area, and this concept will be further investigated in Phase Two. Policy 4.3 states that the City should establish "development incentive areas or other incentives, such as Infill Incentive Districts, which may allow reduced costs recovery obligations for projects to foster development activity within those areas." This could be accomplished through future use of available legal mechanisms to provide infill incentives, rather than by creating multiple service areas and calculating differential fees. Finally, Policy 6 notes that regional cooperation is necessary to address the impacts of development on regional systems. This report recommends consideration of a regional, multi-jurisdictional impact fee for libraries, which are provided in Pima County as a regional service by the City, County and participating municipalities.

SURVEY OF ARIZONA FEES

For this project, a survey of impact fees (and other similar fees) charged by local governments in Arizona was conducted. In Arizona, as in other states, the most common type of impact fees are for water and wastewater facilities, even though they are often called by other names. However, these facilities are not addressed in this study because the City has already adopted a water impact fee (called a "water system equity fee") and does not provide wastewater service, which is provided by Pima County. The average non-utility impact fees charged for five selected land use types are summarized in Table 3. Detailed survey results for each land use type are shown in the next five tables.

After water and wastewater, road impact fees are the next most common and by far the largest of all the non-utility impact fees. In the Tucson area, Pima County, Oro Valley and Marana have all adopted road impact fees, at least for residential development.

So far, no community in Pima County has yet adopted impact fees for any facilities other than water and roads. However, communities in the Phoenix area and in other parts of Arizona have adopted a wide range of other types of impact fees. The most common facility types are parks, libraries, fire, police and general government facilities. Several have also adopted a solid waste fee, Sedona has a storm drainage impact fee and Mesa has a fee for cultural facilities.

Table 3
AVERAGE IMPACT FEES IN ARIZONA

Facility Type	Single-Family	Multi-Family	Retail (1000 sf)	Office (1000 sf)	Industrial (1000 sf)
Roads	$1,440	$1,027	$2,964	$1,746	$1,043
Parks	$1,165	$963	*	*	*
General Government	$329	$284	$237	$299	$223
Fire	$288	$235	$196	$221	$164
Police	$213	$177	$349	$222	$133
Libraries	$287	$224	*	*	*
Solid Waste	$256	$88	*	*	*
Total	$3,978	$2,998	$3,746	$2,489	$1,562

* fees not typically charged for nonresidential development
Source: Single-family fees from Table 4; multi-family fee from Table 5; retail fees from Table 6; office fees from Table 7; industrial fees from Table 8.

While most communities in Arizona and nationally do not charge nonresidential development for park and library impact fees because of the difficulty of demonstrating a rational nexus, several Arizona jurisdictions exempt nonresidential development from fees for facilities that clearly benefit nonresidential development. Until recently, all three jurisdictions in the Tucson area that charge road impact fees, for example, exempted nonresidential development (Pima County began charging nonresidential fees on July 7). Outside the Tucson area, Prescott does not charge any fees to nonresidential development, Payson exempts nonresidential uses from its road and park fees and Show Low exempts nonresidential uses from its police impact fee. Charging only residential development for the cost of improvements that will also benefit nonresidential development may run counter to the Arizona impact fee enabling act, which requires that impact fees be charged "in a non-discriminatory manner" (A.R.S. § 9-463.05.B.5).

Table 4
IMPACT FEES PER SINGLE-FAMILY DETACHED DWELLING

Jurisdiction	Water	Waste-Water	Roads	Parks	Library	Fire	Police	Gen. Gov't	Solid Waste	Storm Drain	Total
Tucson (1)	$1,416										$1,416
Marana			$2,435								$2,435
Oro Valley	$2,074		$2,128								$4,202
Pima County (2)			$2,500								$2,500
Apache Junction	$921	$2,000	$1,485	$564	$262		$133	$83			$5,448
Avondale	$3,289	$3,254	$873	$791	$264	$489	$187	$585	$267		$9,999
Buckeye	$1,331	$3,252				$380					$4,963
Bullhead City	$270										$270
Casa Grande		$1,391	$94	$507	$204	$324	$231	$113			$2,864
Chandler	$3,008	$1,197	$1,589	$1,106	$70	$108	$163	$237			$7,478
Chino Valley (3)			$2,519	$455	$122	$358	$252	$129			$3,835
Fountain Hills			$609	$2,388			$32	$466			$3,495
Gilbert	$2,779	$2,532	$143	$1,015		$334	$395	$332			$7,530
Glendale	$2,370	$1,677	$613	$1,091	$514	$339	$359	$660	$264		$7,887
Goodyear (4)	$2,955	$1,134	$739	$1,065	$205	$385	$290	$351		$293	$7,417
Mesa (5)	$907	$1,059		$959	$378	$145	$226		$130		$3,804
Payson	$3,785		$600	$647							$5,032
Peoria (North)	$3,795	$1,996	$4,028	$1,361	$294	$275	$186	$518			$12,453
Phoenix (6)	$3,551	$1,836	$3,755	$1,472	$271	$146	$96	$79	$362		$11,568
Prescott			$469	$1,116	$253	$167	$84	$275			$2,364
Queen Creek		$2,679		$3,229	$616		$185	$600			$7,309
Scottsdale (N)	$3,055	$2,606									$5,661
Sedona			$811	$2,378			$66	$153		$369	$3,777
Show Low	$907	$2,108		$293	$280		$283				$3,871
Sierra Vista (7)				$350							$350
Surprise (8)	$2,594	$2,236	$524	$1,356			$445	$354			$7,509
Tempe	$1,266	$1,558									$2,824
Average	$2,237	$2,032	$1,440	$1,165	$287	$288	$213	$329	$256	$331	$5,121

Notes: Assumes 3-bedroom, 2,000 sq. ft. dwelling on 10,000 sq. ft. lot valued at $200,000
(1) Effective August 11, 2003
(2) Road fee will increase to $3,500 on January 1, 2004
(3) Fire fee assessed by the Chino Valley Fire District
(4) Drainage fee is called public works
(5) Solid waste fee is actually residential development tax; park fee includes $128 cultural fee
(6) Desert View service area
(7) In the process of being increased to $1,500
(8) Road fee is called public works, park fee includes library, police fee includes fire and EMS
Source: Internet and telephone survey by Duncan Associates, completed May 29, 2003.

Table 5
IMPACT FEES PER MULTI-FAMILY DWELLING

Jurisdiction	Water	Waste-Water	Roads	Parks	Library	Fire	Police	Gen. Gov't	Solid Waste	Storm Drain	Total
Tucson (1)	$330										$330
Marana			$1,826								$1,826
Oro Valley	$1,018		$1,596								$2,614
Pima County (2)			$2,500								$2,500
Apache Junction	$107	$52	$1,029	$542	$252		$128	$80			$2,190
Avondale	$503	$359	$604	$669	$223	$413	$158	$495	$267		$3,691
Bullhead City	$224										$224
Casa Grande		$149	$65	$360	$145	$230	$164	$81			$1,194
Chandler	$2,143	$886	$1,043	$810	$58	$108	$163	$237			$5,448
Chino Valley (3)			$1,347	$455	$122	$358	$252	$129			$2,663
Fountain Hills			$326	$2,388			$32	$466			$3,212
Gilbert	$1,624	$1,722	$100	$873		$334	$395	$332			$5,380
Glendale	$366	$185	$372	$790	$372	$245	$260	$478	$49		$3,117
Goodyear (4)	$2,955	$1,134	$512	$990	$191	$358	$269	$327		$272	$7,008
Mesa (5)	$644	$752		$494	$268	$103	$160		$30		$2,451
Payson	$2,523		$600	$647							$3,770
Peoria (North)	$590	$1,996	$2,791	$859	$186	$174	$118	$326			$7,040
Phoenix (6)	$2,095	$1,285	$2,403	$559	$122	$99	$40	$36	$7		$6,646
Prescott			$469	$1,116	$253	$167	$84	$275			$2,364
Queen Creek		$295		$3,182	$607		$182	$591			$4,857
Scottsdale (N)	$1,909	$2,176									$4,085
Sedona			$534	$1,914			$66	$153		$137	$2,804
Show Low	$140	$1,669		$343	$111		$224				$2,487
Sierra Vista (7)				$350							$350
Surprise (8)	$399	$242	$369	$956			$314	$249			$2,529
Tempe	$1,226	$1,588									$2,814
Average	$1,106	$966	$1,027	$963	$224	$235	$177	$284	$88	$205	$3,215

Notes: Assumes 2-bedroom, 1,000 sq. ft. dwelling valued at $100,000; water and wastewater fee assumes five 2" water meters and two 2" irrigation meters per 240-unit complex.
(1) Effective August 11, 2003
(2) Road fee will increase to $3,500 on January 1, 2004
(3) Fire fee assessed by the Chino Valley Fire District
(4) Drainage fee is called public works
(5) Solid waste fee is actually residential development tax; park fee includes $91 cultural fee
(6) Desert View service area
(7) In the process of being increased to $1,500
(8) Road fee is called public works; park fee includes library and police fee includes fire and EMS
Source: Internet and telephone survey by Duncan Associates, completed May 29, 2003.

Table 6
IMPACT FEES PER 1,000 SQUARE FEET OF RETAIL DEVELOPMENT

Jurisdiction	Water	Waste-Water	Roads	Parks	Library	Fire	Police	Gen. Gov't	Solid Waste	Storm Drain	Total
Tucson (1)	$227										$227
Marana			no fee								$0
Oro Valley	$653		no fee								$653
Pima County (2)			$633								$633
Apache Junction	$147	$320	$3,859	no fee			$325	$203			$4,854
Avondale	$358	$358	$2,506	no fee	no fee	$343	$380	$411	$1,700		$6,056
Bullhead City	$43										$43
Casa Grande		$223	$309	no fee	no fee	$144	$282	$77			$1,035
Chandler	$592	$192	$4,057	no fee	no fee	$30	$50	$70			$4,991
Chino Valley (3)			$800	no fee	no fee	$180	$130	$70			$1,180
Fountain Hills			$190	no fee			$20	$300			$510
Gilbert	$2,779	$2,532	$143		no fee	$334	$395	$332			$6,515
Glendale	$261	$184	$1,907	no fee	no fee	$178	$390	$469	$58		$3,447
Goodyear (4)	$368	$170	$1,371	no fee	no fee	$178	$1,036	$239		$199	$3,561
Mesa (5)	$145	$169		no fee	no fee	$286	$276		no fee		$876
Payson	$505		no fee	no fee							$505
Peoria (North)	$405	$6,653	$14,339			$197	$861	$370			$22,825
Phoenix (6)	$4,261	$2,038	$8,637	$206	$49	$86	$62	$80	no fee		$15,419
Prescott			no fee	no fee	no fee	no fee	no fee	no fee			$0
Queen Creek		$286		no fee	no fee		$51	$393			$730
Scottsdale (N)	$489	$417									$906
Sedona			$2,349	$112			$208	$32		$112	$2,813
Show Low	$97	$322		no fee	no fee		no fee				$419
Sierra Vista				no fee							$0
Surprise (7)	$197	$234	$394	no fee			$762	$266			$1,853
Tempe	$222	$273									$495
Average	$691	$958	$2,964	$159	$49	$196	$349	$237	$879	$156	$3,098

Notes: Assumes a 100,000 sq. ft. shopping center built at 0.15 FAR and served by a 3" water meter.
(1) Effective August 11, 2003
(2) Road fee will increase to $1,265 on January 1, 2004
(3) Fire fee assessed by the Chino Valley Fire District
(4) Drainage fee is called public works
(5) Residential development tax for solid waste does not apply to nonresidential uses
(6) Desert View service area
(7) Road fee is called public works, police fee includes fire and EMS
Source: Internet and telephone survey by Duncan Associates, completed May 29, 2003.

Table 7
IMPACT FEES PER 1,000 SQUARE FEET OF OFFICE DEVELOPMENT

Jurisdiction	Water	Waste-Water	Roads	Parks	Library	Fire	Police	Gen. Gov't	Solid Waste	Storm Drain	Total
Tucson (1)	$227										$227
Marana			no fee								$0
Oro Valley	$653		no fee								$653
Pima County (2)			$635								$635
Apache Junction	$147	$320	$1,709	no fee			$226	$141			$2,543
Avondale	$358	$358	$831	no fee	no fee	$460	$126	$550	$1,700		$4,383
Bullhead City	$43										$43
Casa Grande		$223	$102	no fee	no fee	$217	$93	$117			$752
Chandler	$592	$192	$2,331	no fee	no fee	$30	$50	$70			$3,265
Chino Valley (3)			$800	no fee	no fee	$180	$130	$70			$1,180
Fountain Hills			$190	no fee			$20	$300			$510
Gilbert	$296	$270	$210	no fee	no fee	$180	$210	$180			$1,346
Glendale	$261	$184	$913	no fee	no fee	$268	$187	$708	$89		$2,610
Goodyear (4)	$368	$170	$803	no fee	no fee	$277	$607	$371		$309	$2,905
Mesa (5)	$145	$169		no fee	no fee	$219	$341		no fee		$874
Payson	$757		no fee	no fee							$757
Peoria (North)	$405	$832	$4,757	no fee	no fee	$297	$286	$558			$7,135
Phoenix (6)	$1,704	$84	$8,186	$280	$68	$86	$62	$69	no fee		$10,539
Prescott			no fee	no fee	no fee	no fee	no fee	no fee			$0
Queen Creek		$286		no fee	no fee		$17	$593			$896
Scottsdale (N)	$489	$417									$906
Sedona			$2,349	$112			$208	$32		$112	$2,813
Show Low	$97	$322		no fee	no fee		no fee				$419
Sierra Vista				no fee							$0
Surprise (7)	$197	$234	$634	no fee			$774	$428			$2,267
Tempe	$222	$273									$495
Average	$409	$289	$1,746	$196	$68	$221	$222	$299	$895	$211	$1,852

Notes: Based on 100,000 sq. ft. office building at 0.25 FAR and served by a 3" water meter.
(1) Effective August 11, 2003
(2) Road fee will increase to $1,270 on January 1, 2004
(3) Fire fee assessed by the Chino Valley Fire District
(4) Drainage fee is called public works
(5) Residential development tax for solid waste does not apply to nonresidential uses
(6) Desert View service area
(7) Road fee is called public works; police fee includes fire and EMS
Source: Internet and telephone survey by Duncan Associates, completed May 29, 2003.

Table 8
IMPACT FEES PER 1,000 SQUARE FEET OF INDUSTRIAL DEVELOPMENT

Jurisdiction	Water	Waste-Water	Roads	Parks	Library	Fire	Police	Gen. Gov't	Solid Waste	Storm Drain	Total
Tucson (1)	$227										$227
Marana			no fee								$0
Oro Valley	$653		no fee								$653
Pima County (2)			$805								$805
Apache Junction	$147	$320	$1,082	no fee			$157	$98			$1,804
Avondale	$358	$358	$512	no fee	no fee	$317	$77	$380	$1,700		$3,702
Bullhead City	$43										$43
Casa Grande		$223	$63	no fee	no fee	$150	$57	$81			$574
Chandler	$592	$192	$1,682	no fee	no fee	$30	$50	$70			$2,616
Chino Valley (3)			$2,290	no fee	no fee	$180	$130	$170			$2,770
Fountain Hills			$190	no fee			$20	$300			$510
Gilbert	$296	$270	$140	no fee	no fee	$180	$210	$180			$1,276
Glendale	$261	$184	$649	no fee	no fee	$185	$132	$488	$61		$1,960
Goodyear (4)	$368	$170	$215	no fee	no fee	$159	$163	$213		$177	$1,465
Mesa (5)	$145	$169		no fee	no fee	$146	$228		no fee		$688
Payson	$505		no fee	no fee							$505
Peoria (North)	$405	$333	$2,934	no fee	no fee	$204	$176	$385			$4,437
Phoenix (6)	$760	$514	$3,229	$162	$38	$86	$62	$32	no fee		$4,883
Prescott			no fee	no fee	no fee	no fee	no fee	no fee			$0
Queen Creek		$286		no fee	no fee		$10	$409			$705
Scottsdale (N)	$489	$417									$906
Sedona			$400	$126			$33	$32		$126	$717
Show Low	$97	$322		no fee	no fee		no fee				$419
Sierra Vista				no fee							$0
Surprise (7)	$197	$234	$410	no fee			$483	$277			$1,601
Tempe	$222	$273									$495
Average	$339	$284	$1,043	$144	$38	$164	$133	$223	$881	$152	$1,299

Notes: Based on 100,000 sq. ft. industrial building built at 0.15 FAR and served by a 3" water meter.
(1) Effective August 11, 2003
(2) Road fee will increase to $1,609 on January 1, 2004
(3) Fire fee assessed by the Chino Valley Fire District
(4) Drainage fee is called public works
(5) Residential development tax for solid waste does not apply to nonresidential uses
(6) Desert View service area
(7) Road fee is called public works; police fee includes fire and EMS
Source: Internet and telephone survey by Duncan Associates, completed May 29, 2003.

POLICY ISSUES

This section discusses several major policy issues:

- ☐ The **types of facilities** for which impact fees should be developed;
- ☐ Whether to develop different fee schedules by **geographic areas**;
- ☐ What **cost components** to include in each fee;
- ☐ How to **phase-in** the fees; and
- ☐ Whether to develop **progressive rates for residential units** based on unit size.

TYPES OF FACILITIES

Obviously, the major policy decision is which types of impact fees to develop. As noted below (see Data Availability) the only one that is not practical to do is drainage. The City could proceed with calculating fees for the other facilities, and then decide later which to implement; or the City could decide now to calculate fees for only certain facilities, and save some consultant costs.

Data Availability

The analysis performed for this report found that impact fees would be difficult to develop for only one of the types of facilities under consideration–drainage. The review of the City's 10-year-old drainage master plan revealed that the capital improvements identified were limited to watersheds covering less than half of the City's jurisdiction and tended to be needed to address existing drainage problems, rather than growth-related impacts. The City might want to pursue a stormwater utility fee to raise revenue for drainage-related capital improvement and maintenance costs. However, a stormwater utility fee, which would be paid by all existing households and businesses, would not result in new development bearing more of the cost of growth-related capital improvements.

Revenue Potential

Another consideration regarding the types of impact fees to develop is the amount of revenue that each could potentially generate. The potential revenue that could be generated annually by various impact fees can be estimated based on average impact fees from our survey of Arizona communities and annual growth projections. Residential building permit data presented in the Land Use and Demographic Data section of this report indicate that over the last three years the City has issued permits for an average of 2,588 single-family detached homes and 1,392 multi-family and mobile home units each year. Applying this residential growth rate of 1.9 percent to estimates of existing nonresidential square footage results in annual growth estimates of 828,000 square feet of retail/commercial, 410,000 square feet of office/institutional and 440,000 square feet of industrial/warehouse space.[2] Multiplying these annual growth projections by the average impact fees derived from the survey of Arizona communities yields the estimates of potential annual impact fee revenues by type of facility presented in Table 9. If all of the fees were implemented, the impact fees could potentially generate about $20 million annually. These revenue estimates are intended to be rough orders of magnitude only.

[2] Office estimate was reduced by one-half based on staff comments, June 19, 2003 memorandum.

The analysis reveals that road impact fee has the greatest revenue potential, although it should be kept in mind that actual revenues will be less than shown, due to the need to give credit for developer exactions. The next largest potential revenue generator is park impact fees. On the third tier are general government, fire and police impact fees. Libraries and solid waste facilities tend to have the lowest revenue potential, since the fees are relatively low and are generally assessed only on residential development.

Table 9
POTENTIAL ANNUAL IMPACT FEE REVENUE

Facility Type	Single-Family	Multi-Family	Retail	Office	Industrial	Total
Roads	$3,730,000	$1,430,000	$2,450,000	$720,000	$460,000	$8,790,000
Parks	$3,020,000	$1,340,000	$0	$0	$0	$4,360,000
General Gov't	$850,000	$390,000	$200,000	$120,000	$100,000	$1,660,000
Fire	$750,000	$330,000	$160,000	$90,000	$70,000	$1,400,000
Police	$550,000	$250,000	$290,000	$90,000	$60,000	$1,240,000
Libraries	$740,000	$310,000	$0	$0	$0	$1,050,000
Solid Waste	$660,000	$0	$0	$0	$0	$660,000
Total	$10,300,000	$4,050,000	$3,100,000	$1,020,000	$690,000	$19,160,000

Source: Average impact fees in Arizona from Table 3 and projected annual growth of 2,588 single-family units, 1,392 multi-family/mobile home units, 828,000 sq. ft. of retail/commercial, 410,000 sq. ft. of office/institutional and 440,000 sq. ft. of industrial warehouse derived from data in Land Use and Demographic Data section of this report.

Study Costs

The costs of the consultant study could be a consideration in what types of facilities to include in Phase Two of this project. While the costs could vary somewhat depending on some of the other policy options presented for consideration, the general costs for preparation of the impact fee studies and ordinances, excluding consultant trips, are roughly as shown in Table 10 (the cost of consultant trips in Phase Two may be covered by the budget for Phase One, which may not be completely utilized in that phase). Clearly, consultant costs are relatively small compared to potential revenues. Nevertheless, the study costs could be reduced by reducing the number of facilities for which impact fees are to be calculated in Phase Two.

Table 10
APPROXIMATE STUDY COSTS

Facility Type	Study Cost*	Annual Revenue	% 1st Yr. Revenue
Roads	$35,000	$8,790,000	0.4%
Parks	$15,000	$4,360,000	0.3%
General Government	$10,000	$1,660,000	0.6%
Fire	$8,500	$1,400,000	0.6%
Police	$8,500	$1,240,000	0.7%
Libraries**	$17,500	$1,050,000	1.7%
Solid Waste	$8,000	$660,000	1.2%
All Facilities	$102,500	$19,160,000	0.5%

* excludes costs of consultant trips, which may be covered by Phase One budget
** could be either city-only or joint city-county fee
Source: Annual revenue from Table 9.

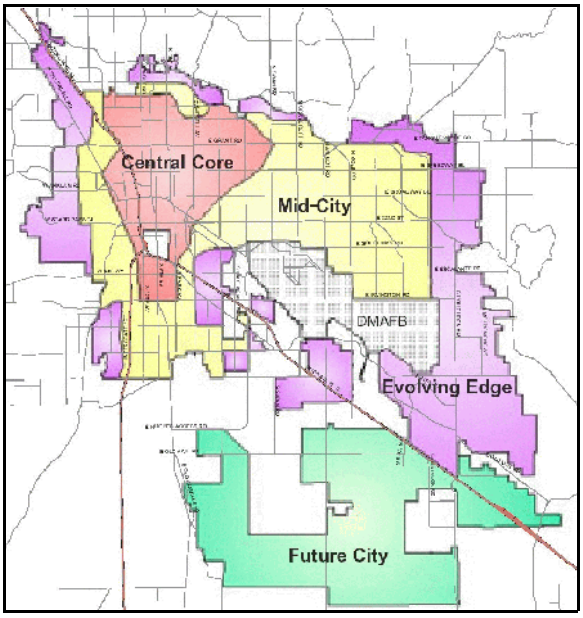
GEOGRAPHIC AREAS

There are two kinds of geographic areas in impact fee systems: service areas and benefit districts. A service area, also sometimes called an assessment district, is an area that is served by a defined group of capital facilities and is subject to a uniform impact fee schedule. A benefit district is an area within which fees collected are earmarked to be spent. For present purposes, it is more important to determine in Phase One how many service areas there will be, since each service area requires its own impact fee analysis. In Phase Two the service areas can be subdivided into benefit districts without affecting the impact fee calculations.

Service areas can differ among and even within facility types. For example, the city could be designated as a single service area for arterial roads, and be divided into multiple service areas for collectors. Similarly, there could be a city-wide service area for regional, metro and community parks, and a number of neighborhood park service areas.

Most impact fees in Arizona use a single city-wide service area. A major exception is the City of Phoenix. The Phoenix model is to develop a detailed master plan for each area and base the fees for each area on the cost of improvements and projected growth in each area. This is (1) a very costly and time-consuming approach that typically (2) excludes the cost of centralized facilities, (3) somewhat arbitrarily assigns portions of what are really system costs to subareas, and (4) may not result in significantly different fees by geographic area. It is probably no accident that no jurisdiction in the state has copied Phoenix's very complex impact fee system.

Figure 2
GROWTH AREAS



The City's *General Plan* divides the city into four "growth areas": Central Core, Mid-City, Evolving Edge and Future City (see Figure 2). According to the *Plan*, the majority of the city's population growth over the next ten years is expected to occur in the Evolving Edge. A significant amount of growth will also occur in the Mid-City, but undeveloped land is limited, with only about 45 tracts of ten acres or more available. Relatively little development is expected in the Central Core or the Future City over the next ten years.

For most types of facilities, the growth areas identified in the *General Plan* are not suitable for use as service areas. Police protection, general government and solid waste services all involve centralized facilities (e.g., police headquarters, City hall, regional landfill). Fire protection, parks and libraries involve more dispersed facilities, but here again there should be little difference in the cost to provide service by geographic area, since the City is trying to provide essentially the same level of service to all areas.

The one facility for which different fees by geographic area might make sense would be for roads. The demand for road facilities is directly proportional to average trip length, which in turn is likely to be

related to distance from the urban core. The City's growth areas do roughly correspond to concentric rings around the core, particularly if the Mid-City and Evolving Edge are divided, for example, by Craycroft Road. Thus, the growth areas could be arranged in order of increasing average trip length as follows: Central Core, Mid-City west of Craycroft, Evolving Edge west of Craycroft, Mid-City east of Craycroft, Evolving Edge east of Craycroft, and Future City. Whether average trip lengths actually correspond to this model would need to be determined in Phase Two by examining census data on travel time to work or output from the regional travel demand model.

The City's growth areas are even less suitable as benefit districts. A key characteristic of a benefit district is physical proximity, since benefit districts are used to show that improvements benefit the feepaying development because they are located in reasonably close proximity. The Mid-City and Evolving Edge growth areas, which wrap around the Central Core, are too spread out and, in the case of the Evolving Edge, too dispersed to be used for benefit districts.

Another approach that could be considered is to exclude the developed, urban core where redevelopment is to be encouraged from what is in all other respects a city-wide impact fee service area. For example, Kansas City, Missouri excluded all areas of the city annexed before 1950 from its arterial street impact fees. The rationale for this exclusion was that the excluded area was largely developed and needed few arterial street improvements. If this approach is taken, however, impact fees cannot be used to make improvements in the excluded area. The core area of the city could be excluded from the service area for certain facilities that are linear or geographically dispersed, such as roads, parks, libraries and fire protection. It would be harder to do for police protection, solid waste and general government fees, which tend to have centralized facilities. Also, a potential problem with roads is that some of the impact of development on the fringe is on the roads into the core, and the need to widen these roads cannot be included in the cost if the core area is excluded from the fees.

Another possibility is to establish a service area and collect fees only in an area where the City has a recently-completed master plan for capital improvements. For example, the City could complete master planning work for and adopt fees to implement the facility plan for the Houghton area. As a general rule, however, the fewer the number of service areas, the better. Multiple service areas add significantly to the cost of consultant studies as well as to the cost of administering a more complex impact fee system.

A review of available data and discussions with City staff indicate that a city-wide service area would be appropriate for all of the facility types, with two possible exceptions. For parks, City staff has indicated that its focus is on the development of larger parks, and suggested that the fees be limited to regional and community parks, excluding neighborhood parks. Fire-fighting units respond to incidents beyond their primary service area when needed, with the result that fire facilities form an integrated, jurisdiction-wide system. Police protection, general government and solid waste services all involve centralized facilities (e.g., police headquarters, City hall, regional landfill). Consequently, impact fees for all of these facilities could appropriately be assessed with a single, uniform, city-wide fee schedule.

The first potential exception is roads. There was general agreement that at least the initial impact fee system should focus on arterial streets, and arterial street fees are most appropriately assessed at the jurisdictional level. However, as noted above, the possibility of varying road impact fees by growth area based on differences in average trip length could be explored in Phase Two.

The second potential exception is library facilities, which would most appropriately be assessed at the county-wide level. While it would be possible to develop a city-only impact fee, the Tucson-Pima Public Library system is a joint City-County operation, and increasingly other municipalities are also participating. A multi-jurisdictional library impact fee is recommended if Pima County, at a minimum, is willing to participate. While costs per service unit could be calculated at the county-wide level, separate fee schedules would be required for each jurisdiction to reflect different revenue credits due to each jurisdiction's outstanding library debt.

While it is generally recommended that the impact fees under consideration be calculated at the city-wide level, there may be cases where it is appropriate to divide the city into multiple benefit districts. For example, the city might reasonably be divided into several wedge-shaped road impact fee benefit districts that reflect the influence of the urban core on traffic patterns. In addition, it is suggested that the City might want to divide the city into three benefit districts for the proposed regional and community park fee. Finally, a multi-jurisdictional library impact fee might need to have benefit districts that coincide with jurisdictional boundaries, provided that some funds could be used to pay for improvements to the main library, which provides support for the branch library system. Unlike multiple service areas, establishing multiple benefit districts does not substantially increase the cost and complexity of calculating and administering the impact fees. Too many benefit districts, however, may unduly restrict the City's flexibility in spending the funds.

COST COMPONENTS

The recommended cost components to include in the various impact fees are summarized in Table 11. A major alternative is whether or not to include right-of-way (ROW) costs for arterial street improvements. If ROW costs are excluded from the road impact fees, the fees would be lower, and the City could continue to require developers to dedicate ROW for adjacent or internal arterial streets without providing credit for the value of the dedication against the impact fees. Our preliminary recommendation is to include ROW costs in the initial calculations, and the decision could be made to exclude them prior to fee adoption.

Table 11
RECOMMENDED COST COMPONENTS

Facility Type	Eligible Cost Components
Roads	Construction and ROW, City Arterial Improvements
Parks	Land and Improvements, Regional/Community Parks
General Government	Non-Impact Fee, Non-Enterprise Funds, Non-Transit
Fire	Stations, Apparatus and Vehicles, Equipment, Land
Police	Stations, Vehicles, Equipment, Land
Libraries	County-Wide Libraries & Collections
Solid Waste	Residential Collection Equipment, Portion of Landfill

Another alternative for road impact fees is whether to include collectors, State roads and Federal highways. After discussions with staff, our recommendation is to exclude both collectors and State and Federal roads at this time. These exclusions have the effect of making the fee somewhat lower, but on

the other hand the exclusion of State and Federal roads simplifies the revenue credits and the exclusion of collectors is consistent with a simpler, city-wide road impact fee system.

In the park fee, it is recommended that the cost of neighborhood and mini-parks be excluded. The City's park planning is focused on providing larger parks and relying more on developers and homeowners' associations to provide their own neighborhood recreation facilities. Excluding neighborhood parks will also allow the City to use larger benefit districts and have more flexibility in where the money is spent.

The primary cost components in the proposed general government fee are the City's administrative offices, fleet and building maintenance facilities and communications facilities. Any portion of these facilities that are attributable to enterprise fund activities or mass transit, or which have already been included in the cost of other impact fees, would need to be excluded.

Fire and police impact fees may each include a portion of the cost of the training center and other joint-use facilities. However, the portion of the cost of the training center attributable to training of State troopers should be excluded from the fees.

The proposed regional library fee would be based on the replacement cost all existing libraries and library collections, regardless of which jurisdiction paid for them. However, if the City ends up developing a stand-alone library impact fee that is only charged inside the City limits, the analysis may need to be redone to exclude facilities paid for by the County or other municipalities.

The solid waste impact fee will only be assessed on new residential units with four or fewer units in the structure, since solid waste collection and disposal for larger multi-family projects and nonresidential developments is already provided on a fee-for-service basis. Consequently, only the cost of vehicles and equipment used to collect residential waste and only the portion of the landfill costs attributable to disposing of that waste will be included in the fee calculations.

PROGRESSIVE RATES FOR RESIDENTIAL UNITS

Typical impact fees charge a flat rate per dwelling unit, regardless of size. A wide range of housing sizes are being produced in today's housing market (see below). Because smaller units tend to cost less and house families with lower incomes, the one-size-fits-all approach taken by most impact fee systems imposes a much larger burden, proportionately, on smaller units, which incidently tend to house residents less likely to be able to afford it.

The regressive nature of one-size-fits-all impact fees was clearly demonstrated in a seminal 1992 article by Dr. James C. Nicholas of the University of Florida.[3] The 1985 data he presented in that article have been updated with 2001 data in Table 12 below. These national data reveal the strong correlation between the size of the dwelling unit, whether measured by the number of bedrooms or square footage,

[3] Nicholas, James C., "On the Progression of Impact Fees," *Journal of the American Planning Association*, Vol. 58, No. 4, Autumn 1992, p. 517-525

the number of persons living in the unit, which is a measure of the demand on facilities, and the value of the unit and the income of the household, which are measures of the ability to pay.

Table 12
DWELLING CHARACTERISTICS BY NUMBER OF BEDROOMS

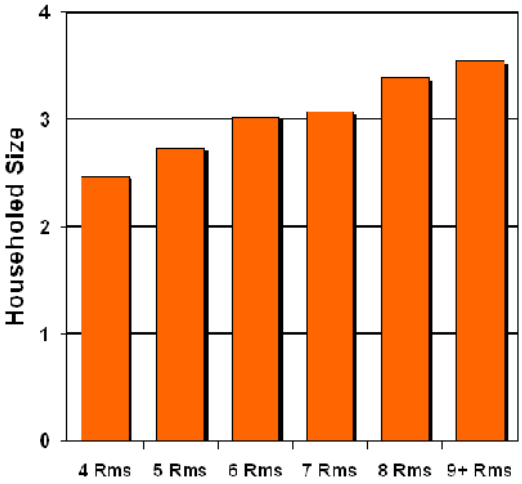
Bedrooms	Median Sq. Ft.	Mean Persons	Median Unit Value	Median Family Income	$2,000 fee as percent of income
0	500	1.2	n/a	$14,956	13%
1	828	1.5	$73,740	$21,716	9%
2	1,248	2.2	$83,655	$28,343	7%
3	1,692	2.8	$119,539	$44,649	4%
4+	2,406	3.5	$188,052	$68,834	3%

Source: U.S. Bureau of the Census, 2001 American Housing Survey (median square feet, mean persons and median family income based on all dwelling units; median unit value based on owner-occupied units only).

A flat $2,000 impact fee per dwelling unit, regardless of size or type, would constitute 13 percent of the annual income of the median household living in an efficiency apartment, but only 3 percent of the median income of a dwelling unit with four or more bedrooms (see Table 12 above). Also, since the demand on public facilities is often a function of the number of people living in a community, a large house tends to have about three times the demand for services as an efficiency apartment. Consequently, not only is a one-size-fits-all fee regressive, it tends to overcharge smaller units and undercharge larger units.

Census data is the source of much of our information about housing and household characteristics, but the census does not record dwelling size in square feet. The available indicators of dwelling size in the census are number of bedrooms and number of rooms. Although 2000 census data is not yet available, 1990 census data from the Tucson area are consistent with the pattern shown in the national housing data, revealing a strong correlation between the number of rooms and the number of persons residing in the unit, as shown in Figure 3.[4]

Figure 3
HOUSEHOLD SIZE BY ROOMS
Tucson Area, 1990



While most impact fees do acknowledge the difference between housing types, such as single-family and multi-family units, few of them vary by unit size. This is changing, however. For example, 30 percent of the 20 Florida counties that assess school impact fees currently base the fees on some measure of dwelling unit size. Three of the counties base fees on the number of bedrooms in combination with housing type, two have translated bedrooms into four or five size categories (e.g., a one-bedroom unit is on average less than 800 square feet, etc.) and one county charges school fees on a per square foot basis.

[4] See Table 21 in the back of this report for source data.

There are several reasons for the continuing predominance of impact fees that do not vary by unit size. One obvious reason is that a flat fee per dwelling unit is easier to calculate and has fewer data requirements. While this is still the case, the data requirements are not insurmountable, and greater resources are now available. The other principal reason for the predominance of one-size-fits-all residential impact fees was legal in nature. In the early days of the development of impact fees in the late 1970s and early 1980s, there were no state impact fee enabling acts, and impact fees were based on the "police power" of local governments to regulate development in order to advance the health and welfare of the community. Great care had to be taken to ensure that impact fees would not be struck down by the courts as an illegal tax. Even today, there is a residual feeling by some attorneys that a fee per square foot for residential development may appear more like a tax than a regulatory fee. However, this should no longer be a major concern. Impact fees are explicitly authorized by enabling legislation in 27 states, and are based on well-established case law in most others. In addition, impact fees for nonresidential uses have always been assessed on a square footage basis.

To date, few road impact fees have been adopted that vary by the size of the dwelling unit. This is largely because road impact fees are generally based on national trip generation rate data, and the Institute of Transportation Engineers (ITE) *Trip Generation* manual does not provide rates by dwelling unit size. However, the fact that trip generation rates for residential uses vary by the size (and even the income) of the household is actually well documented in the transportation planning literature. As shown in Table 13, the average number of vehicle trips generated per day is almost directly proportional to the number of people living in the dwelling unit, which, as demonstrated earlier, is strongly related to the size of the dwelling unit.

Table 13
DAILY TRIPS BY HOUSEHOLD SIZE

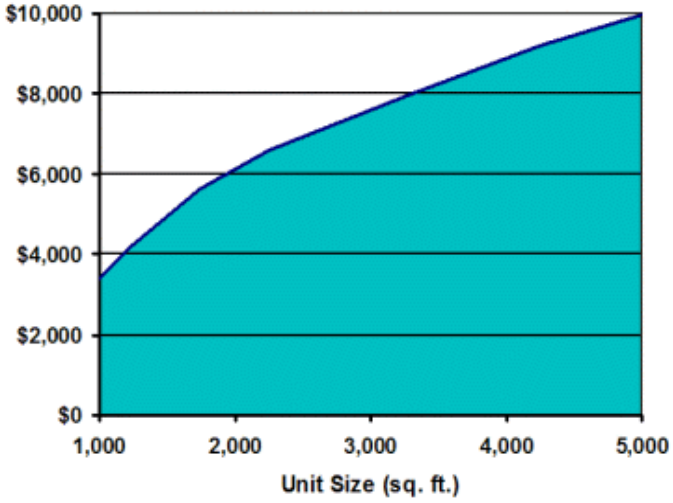
Household Size	Daily Trips
One Person	3.2
Two Persons	6.5
Three Persons	9.4
Four Persons	11.8
Five Persons or More	14.0
Weighted Avg.	8.1

Source: Transportation Research Board, NCHRP Report 365, "Travel Estimation Techniques for Urban Planning," Washington, D.C.: National Academy Press, 1998 (for urban areas with populations of 50,000 to 200,000).

While many communities have adopted variable-rate impact fees for individual facilities, few have implemented variable fees by dwelling unit size for a broad array of facilities. One community that is currently contemplating such a set of impact fees is Santa Fe, New Mexico. The sum of that City's proposed water, wastewater, road, park, police and fire impact fees is illustrated in Figure 4 for different-sized single-family homes.[5] When progressive fee structures are used for all types of impact fees, the result is a significant fee differential between small and large units.

[5] Duncan Associates and Camp Dresser & McKee, *Capital Improvements Plan for Water, Wastewater, Roads, Parks, Fire and Police Development Impact Fees*, June 2003.

Figure 4
PROPOSED FEES, SANTA FE



PHASE-IN

The decision about which fees to implement does not have to be made all at once. In fact, many communities phase-in fees over a period of time, in order to allow developers an opportunity to complete projects already underway and to take future fees into account in their financial planning. In general, it makes more sense to implement one or two fees at the full amount than to adopt all possible fees at some small percentage of the full cost.

Road impact fees, in particular, should not be adopted at a very low percentage of the maximum fee. This is because developers often make in-kind contributions in the form of right-of-way dedication or actual construction of adjacent or internal major roadways, and under an impact fee system should get credit for the value of such contributions against the road impact fee. Because developer contributions to the major road system are so common, potential road impact fee revenues are likely to significantly overstate the net gain over the existing system of developer exactions. If the road impact fee is adopted at a very low percentage, the impact fees will be too low for the developer to be fully compensated with credits.

The experience of other communities in implementing impact fee systems can provide some guidance to the City of Tucson. The City of Lincoln, Nebraska was the first city in that state to adopt impact fees, and it took a very cautious approach, phasing them in over four years to 50 percent of the maximum amounts. A consultant study completed in 2002 found that the combined net cost of water, wastewater, roads and parks facilities to accommodate a new single-family home totaled $9,017.[6] The City Council adopted the impact fee ordinance on January 13, 2003. The ordinance became effective on June 2, 2003, with the fees initially set at the following percentages of the calculated amounts: roads–38%, parks–47%,

[6] Duncan Associates, *Lincoln Impact Fee Study for Arterial Streets, Water, Wastewater, and Neighborhood Parks and Trails*, October 2002.

water and wastewater–20%. The fees are slated to increase annually, so that by June 2007 they will be at the following percentages: roads–74%, parks–100%, water and wastewater–33%.

Another method of implementing impact fees was followed by the City of Mesa, Arizona. Prior to 1998, the City had water and wastewater impact fees of about $1,000 each and a residential development tax of $468, for a total of $2,511 per single-family unit. Following a study of all potential impact fees, the City adopted new impact fees for parks, cultural, library, fire and police facilities, reduced the residential development tax to $100 and earmarked it for solid waste containers, and reduced its water and wastewater impact fees by $222 to be consistent with the study. The net result was to increase total fees for a single-family home from $2,511 to $3,073, an increase of $562 or 22 percent that went into effect in November 1998. At that time the City decided to defer consideration of a road impact fee that it could have adopted at the maximum level of $2,296 per single-family unit. The impact fees were increased 18 percent to $3,639 based on updated analysis in April 2001. An analysis completed in January 2003 updated the park fees and calculated potential drainage and general government fees of $112 and $396 per single-family unit, respectively.[7] The City decided to update the park fee, but decided not to adopt the two new fees at this time.

The Cost of Development Element of the City's *General Plan* establishes the goal of having developers pay their fair share of the cost of infrastructure needed to serve their projects, through impact fees and other legal mechanisms. Phasing-in impact fees would be a step toward this ultimate goal of the *General Plan*.

[7] Duncan Associates, *Drainage, General Government and Parks Impact Fee Study for the City of Mesa, Arizona*, January 2003.

TYPES OF FACILITIES

In this section, we discuss the types of facilities for which the City of Tucson might consider developing impact fees. Arizona cities are authorized to charge impact fees "to offset costs to the municipality associated with providing necessary public services to a development" (A.R.S. § 9-463.05). Arizona municipalities have adopted impact fees to fund a broad variety of facilities, including cultural facilities (Mesa), equipment repair (Phoenix) and public works (Goodyear). The types of facilities addressed in this section are:

- ☐ Roads,
- ☐ Drainage,
- ☐ Parks,
- ☐ Library,
- ☐ Solid Waste,
- ☐ Police Protection,
- ☐ Fire Protection and
- ☐ General Government.

ROADS

The City's current developer exactions for roads are generally limited to boundary street improvements and occasional off-site improvements to intersections or drainage structures. As discussed earlier, a road impact fee would have several advantages over this system, including leveling the playing field among developers with and without frontage, providing developers with greater certainty in the development review process, making the City's exaction system proportional to impact and therefore less subject to legal challenge, and generating greater resources for funding growth-related major road improvements.

The long-range regional transportation plan[8] has identified transportation funding needs, including both capital and maintenance costs, of $10.7 billion by the year 2025. With existing revenue sources projected to generate only about $6.6 billion, there is a projected funding shortfall of $4.1 billion. Development impact fees are among the additional funding sources identified by the *2001-2025 Regional Transportation Plan* (2025 RTP). One of the goals of the Financial Action Plan included in the 2025 RTP and adopted by the Pima Association of Governments (PAG) Regional Council in May 1998 reads as follows:

> Each member jurisdiction (Pima County, and each municipality) shall adopt a transportation development impact fee of not less than $2,500 per equivalent demand unit (EDU), allowing no more than 30 percent of the new starts to be excluded from the fee.

To date, Pima County, Oro Valley and Marana have adopted road impact fees. The fees per single-family unit range from $2,128 in Oro Valley to $2,500 in unincorporated Pima County. Of the three jurisdictions, only Pima County assesses nonresidential road impact fees, and it just began assessing them

[8] Pima Association of Governments, *2001-2025 Regional Transportation Plan*, adopted January 24, 2001.

on July 7, 2003. In addition, Marana assesses a construction sales tax of 4 percent, with 3 percent earmarked for transportation capital improvements. The Town of Sahuarita has a 3 percent construction sales tax earmarked for capital projects (but not specifically for transportation improvements), as well as developer agreements that require developers to contribute to the cost of an arterial road improvement.

Service Unit

Service units create the link between supply (roadway capacity) and demand (traffic generated by new development). An appropriate service unit basis for road impact fees is vehicle-miles of travel (VMT). Vehicle-miles is a combination of the number of vehicles traveling during a given time period and the distance (in miles) that these vehicles travel. For an individual development, the appropriate trip generation rate is multiplied by the percent new trip factor and the average trip length to determine the number of VMT generated. For the major road system as a whole, VMT is determined by multiplying the length of each road segment by the average daily traffic count and aggregating the results for all road segments.

The capacity of a roadway segment is the maximum number of vehicles that can be accommodated at a desired level-of-service during the relevant time period. In order to be aggregated for the major road system as a whole, however, capacities of individual road segments must be converted into vehicle-miles of capacity (VMC). This is accomplished by multiplying the capacity of each segment by the length of each segment in miles.

The two time periods most often used in traffic analysis are the 24-hour day (average daily trips or ADT) and the single hour of the day with the highest traffic volume (peak hour trips or PHT). The use of ADT rather than PHT tends to result in higher fees for retail development and lower fees for office and industrial development. Generally it is preferable to base road impact fees on peak hour trip generation, since it is during peak conditions that capacity becomes an issue. Most road impact fees are based on afternoon peak hour conditions, since they are insensitive to the direction of traffic flow (in almost all cases roads will be widened with the same number of lanes in each direction) and the afternoon peak tends to be larger than the morning peak (as a general rule, 10 percent of daily trips occur in the afternoon peak hour, while 8 percent occur in the morning peak hour).

The City uses PHT in traffic studies for individual projects, but available traffic counts are ADT. It is recommended that the road impact fees be based on trip generation rates during the afternoon peak hour of adjacent street traffic.

Service Areas and Benefit Districts

There are two kinds of geographic areas in impact fee systems: service areas and benefit districts. A service area is an assessment area that is served by a defined group of capital facilities and subject to a uniform impact fee schedule. A benefit district is an area within which fees collected are earmarked to be spent.

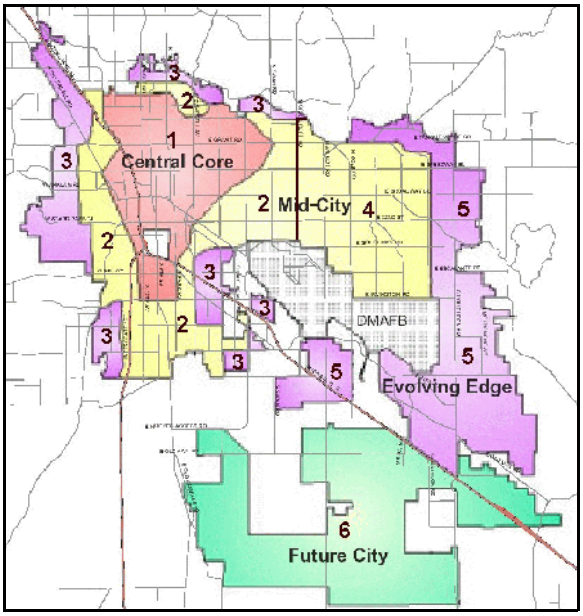
Generally, arterial road impact fees tend to have a single service area and a uniform fee schedule, whether at the municipal level or the regional, county-wide level. That is because the arterial road system is designed to move traffic from one part of a community to another, and improvements to this system are generally of community-wide benefit. In some communities, major collectors may function as part of the arterial system as well.

An alternative to a city-wide road impact fee is one that is assessed only in a defined "growth area." Marana, for example, assesses road impact fees only in the southern part of the city. Phoenix assesses impact fees only in defined growth areas, based on the cost of improvements in each area. A variant of this approach is to calculate what is essentially a city-wide fee, but to exclude a "developed area" where existing infrastructure is adequate to support infill and redevelopment from the service area. Impact fees collected in growth areas, however, cannot be spent on road improvements in areas that have been excluded from the impact fee system.

Our preliminary recommendation would be to develop a city-wide arterial street impact fee. This is consistent with our recommendations on the nature of the major road system to be funded with the impact fees and on the methodology to be used to calculate the fee (see next two sections).

An alternative that could be explored in Phase Two is to develop fees for different areas that reflect differences in average trip lengths. The demand for road facilities is directly proportional to average trip length, which in turn is likely to be related to distance from the urban core. The City's growth areas roughly correspond to concentric rings around the core, particularly if the Mid-City and Evolving Edge are divided, for example, by Craycroft Road. Thus, the growth areas could be arranged in order of increasing average trip length as follows: (1) Central Core, (2) Mid-City west of Craycroft, (3) Evolving Edge west of Craycroft, (4) Mid-City east of Craycroft, (5) Evolving Edge east of Craycroft, and (6) Future City (see Figure 5). Whether average trip lengths actually correspond to this model would need to be determined in Phase Two by examining census data on travel time to work or output from the regional travel demand model.

Figure 5
POTENTIAL ROAD SERVICE AREAS

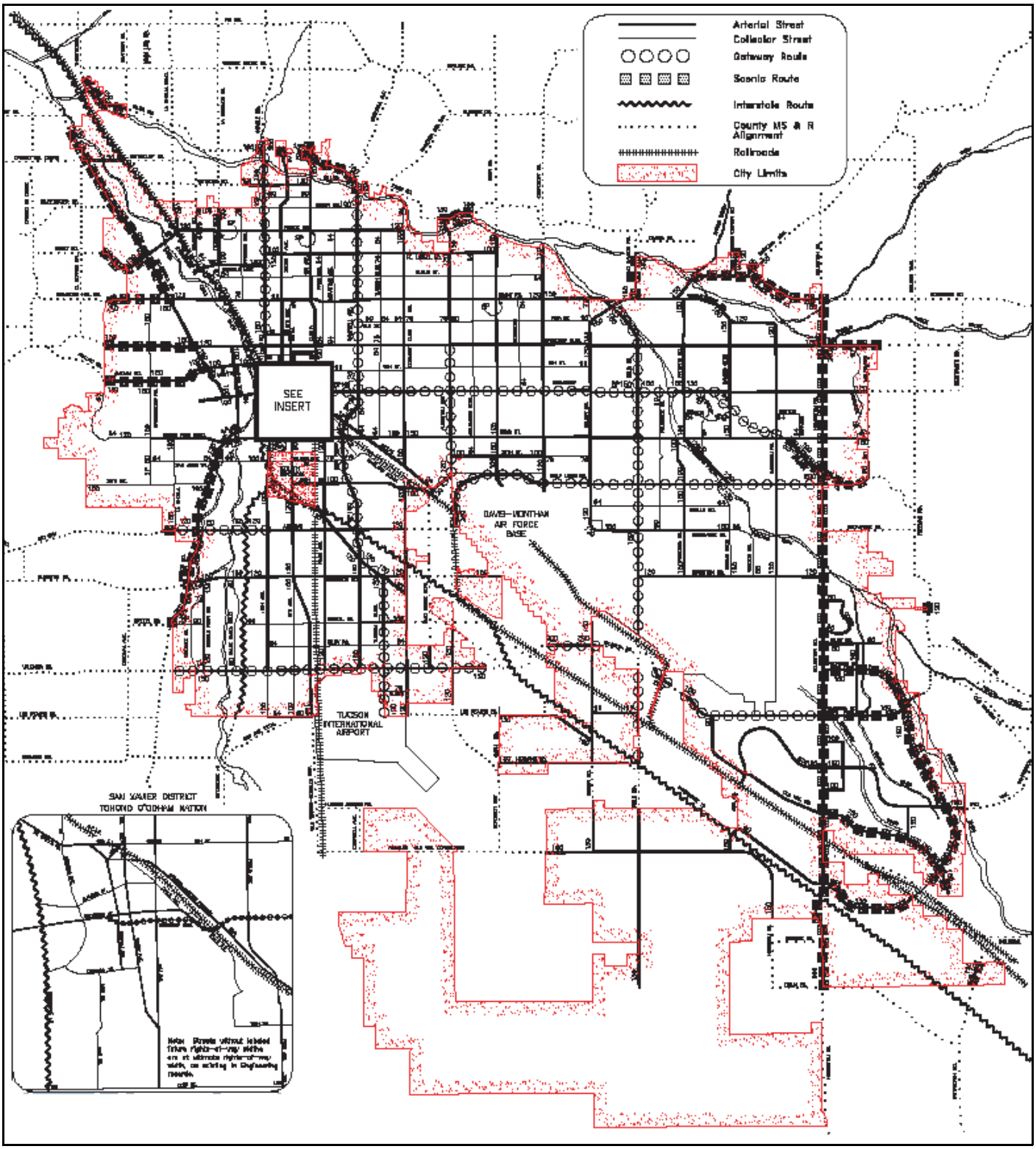


The city could be divided up into multiple benefit districts, but these districts should ideally be wedge-shaped with the points of the wedges in the downtown area. This general shape is preferred because it is consistent with city-wide cost data (each benefit district will have a full range of land costs) and it matches traffic patterns (development in the suburbs increases travel demand on major commuter routes).

Definition of Major Road System

A road impact fee system should include a clear definition of the major road system that is to be funded with the impact fees. The most common approach is to use the adopted roadway classification system. For example, in Reno/Washoe County, Nevada's regional road impact fee, the major road system includes all arterials, excluding freeways, as well as a few major collectors that met specific criteria (i.e., they crossed jurisdictional boundaries, crossed major physical barriers, provided system connectivity of had a forecast volume of 5,000 daily trips in 2004).

Figure 6
TUCSON MAJOR STREETS AND ROUTES PLAN



The choice of the major road system does have an effect on the resultant impact fee. For example, if collector roads are included, the trip length on the major road system would be longer and therefore the fee would be higher. On the other hand, developers would need to get credit for collector roadways that they install within their projects. Our preliminary recommendation is for the City to assess impact fees only for the arterial system.

Another choice is whether to include Federal and State highways. There are only two State roads (Oracle Road (SR 77) and Ajo (SR 86)), plus two Federal highways (I-19 and I-10), located within the City limits. In Arizona, there is no local participation in the cost of most improvements to Federal highways and State roads. Consequently, it is recommended that Federal and State highways be excluded from the major road system. Excluding Federal and State roads also means that it is not necessary to credit new development for the gas tax and other revenues it will generate that will go toward improving the Federal and State highway system.

Fee Calculation Methodology

The major alternative methodologies for calculating road impact fees are the "improvements-driven" and "consumption-based" approaches. The improvements-driven approach essentially divides the cost of growth-related improvements required over a fixed planning horizon by the number of new service units (e.g., vehicle-mile of travel or VMT) projected to be generated by growth over the same planning horizon in order to determine a cost per service unit. The improvements-driven approach depends on accurate planning and forecasting. For example, the fees will be accurate only if the forecasted increase in traffic actually necessitates all of the improvements identified in the transportation master plan. If many of the planned improvements will provide excess capacity beyond the planning horizon on which the fees are based, the fees may be too high.

The alternative consumption-based approach does not depend on knowing in advance what improvements will be made or what type or density of development will occur. The consumption-based model simply charges a new development the cost of replacing the capacity that it will consume on the major road system. That is, for every service unit of traffic generated by the development, the road impact fee charges the net cost to construct an additional service unit of capacity. Compiling a list of planned improvements needed to accommodate projected growth is not necessary for the development of consumption-based road impact fees, which can be calculated based on any representative list of road improvements, including an historical list or a list of projects needed at build-out. In a consumption-based system, the list of road improvements is used to determine the cost per unit of capacity. Thus, doubling the total cost of the list of road improvements will not double the fee and in fact may very well not increase the fee at all. Only if the improvements added to the list were more expensive, per unit of capacity created, would their addition have the effect of increasing the impact fee.

Since travel is never evenly distributed throughout a roadway system, actual roadway systems require more than one unit of capacity for every unit of demand in order for the system to function at an acceptable level of service. Suppose, for example, that the community completes a major arterial widening project. The completed arterial is likely to have a significant amount of excess capacity for some period of time. If the entire system has just enough capacity to accommodate all of the vehicle-miles of travel, then the excess capacity on this segment must be balanced by another segment being over-capacity. Clearly, roadway systems in the real world need more total aggregate capacity than the total aggregate demand, because the traffic does not always precisely match the available capacity.

Consequently, the standard consumption-based model generally underestimates the full cost of growth.

A modified consumption-based road impact fee model that more accurately identifies the full growth-related cost of maintaining desired service levels uses the system-wide ratio of capacity to demand. Essentially, the idea is that new development should be required to pay for the cost to construct more capacity than it directly consumes in order to maintain the system-wide ratio of capacity to demand. In this system, the cost per vehicle-mile of capacity (VMC) is multiplied by the system-wide ratio of VMC/VMT to determine the cost per VMT. This modified version of the consumption-based road impact fee methodology is used by a number of local governments, including Atlanta, Georgia, Larimer County, Colorado and Rio Rancho, New Mexico.

In most rapidly growing communities, some roadways will be experiencing an unacceptable level of congestion at any given point in time. One of the principles of impact fees is that new development should not be charged, through impact fees, for a higher level of service than is provided to existing development. In the context of road impact fees, this has sometimes been interpreted to mean that impact fees should not be spent on roadways that are already over-capacity. A variant of this approach is that impact fees should only be used to fund a percentage of the project that can be attributed to providing additional capacity beyond what is needed to remedy any existing deficiency.

These approaches for dealing with existing deficiencies create several types of problems. A major one is that impact fees are restricted from being spent on roadways that are most in need of improvement. The approach that allows a percent of the cost to be funded complicates impact fee administration by requiring that the portion of the cost of each improvement that is attributable to remedying deficiencies be funded from a different revenue source. Finally, these approaches ignore the interconnectedness of the major road system. For example, road impact fees could not be spent directly to improve a deficient segment, but could be spent to improve or construct a parallel roadway that would also relieve the congestion.

The City's adopted LOS is "E." The maximum traffic volume possible under LOS E is identical to the capacity of a roadway. Arguably, it is not necessary to address existing deficiencies in a consumption-based system, which, unlike an improvements-driven system, is not really designed to recover the full costs to maintain the desired LOS on all roadway segments. Instead, it is only designed to maintain a minimum one-to-one overall ratio between system demand and system capacity (or some other ratio, in the modified version). Virtually all major road systems have more capacity (VMC) than demand (VMT) on a system-wide basis. Consequently, under a standard consumption-based system, the level of service standard is really a systemwide VMC/VMT ratio of one. If the major road system currently has a VMC/VMT ratio higher than one, there are no existing deficiencies on a system-wide basis.

The data developed for the regional transportation plan could be used to develop an improvements-driven impact fee for the City of Tucson. The 2025 RTP includes projections of traffic volumes on major roadways over the 2001-2025 period and identifies the capacity-expanding projects and the costs that would be required to maintain acceptable levels of service on the major road system over that same time period. While the data presented in the plan document are regional summaries, it is likely that data for Tucson's arterial system could be extracted from the background analysis prepared for the RTP. The cost of the needed improvements could be divided by the projected increase in travel demand on Tucson's major road system to determine the cost per service unit.

While available data would support the improvement-driven methodology, the modified consumption-based methodology is also feasible and has several advantages. The improvements-driven system used by Phoenix, for example, is very complex and requires extensive staff resources on a continuing basis to update and maintain the system. This is because the fees are directly dependent on the improvements in the plan, and any significant changes to the plan require the fees to be recalculated. In contrast, a consumption-based methodology like the one developed for Apache Junction can be easily updated at periodic intervals. In addition, an improvements-driven road impact fee is only as reliable as the plan on which it is based, and cost estimates for projects that may not be constructed for 25 years are unlikely to be reliable.

For these reasons, the modified consumption-based methodology is recommended for use in Tucson's road impact fee system. This methodology adjusts the cost per VMT by the VMC/VMT ratio, and evaluates existing deficiencies on a system-wide basis.

The formula for calculating the modified consumption-based road impact fee is summarized in Figure 7. The maximum fee calculated under this methodology is simply the service units (VMT) that will be generated by the development times the net cost per service unit. The inputs into the formula are described in more detail below.

Figure 7
RECOMMENDED ROAD IMPACT FEE FORMULA

FEE = VMT x NET COST/VMT

Where:

VMT	=	TRIPS x % NEW x LENGTH ÷ 2
TRIPS	=	Trip ends generated by the development during the PM peak hour
% NEW	=	Percent of trips that are primary trips, as opposed to passby or diverted-link trips
LENGTH	=	Average length of a trip on major road system
÷ 2	=	Avoids double-counting trips for origin and destination
NET COST/VMT	=	COST/VMT - CREDIT/VMT
COST/VMT	=	COST/VMC x VMC/VMT
COST/VMC	=	Average cost to create a new VMC based on historical or planned improvements
VMC/VMT	=	The system-wide ratio of capacity to demand in the major road system
CREDIT/VMT	=	Credit per VMT, based on revenues to be generated by new development

Travel Demand

The travel demand generated by specific land use types is a product of three factors: 1) trip generation, 2) percent new trips and 3) trip length. The first two factors are well documented in the professional literature, and the average trip generation characteristics identified in studies of communities around the nation should be reasonably representative of trip generation characteristics in Tucson. In contrast, trip lengths are much more likely to vary between communities, depending on the geographic size and shape of the community and its major road system.

Trip generation rates will be based on information published in the most recent edition of the Institute of Transportation Engineers' (ITE) Trip Generation manual or other authoritative sources. Trip generation rates represent trip ends, or driveway crossings at the site of a land use. Thus, a single one-way trip from home to work counts as one trip end for the residence and one trip end for the work place,

for a total of two trips. To avoid over-counting, all trip rates will be divided by two. This places the burden of travel equally between the origin and destination of the trip and eliminates double-charging for any particular trip.

Trip rates also need to be adjusted by a "new trip factor" to exclude pass-by and diverted-link trips. This adjustment is intended to reduce the possibility of over-counting by only including primary trips generated by the development. Pass-by trips are those trips that are already on a particular route for a different purpose and simply stop at a particular development on that route. For example, a stop at a convenience store on the way home from the office is a pass-by trip for the convenience store. A pass-by trip does not create an additional burden on the street system and therefore should not be counted in the assessment of impact fees. A diverted-link trip is similar to a pass-by trip, but a diversion is made from the regular route to make an interim stop. The reduction for pass-by and diverted-link trips will be drawn from the ITE manual and other published information.

The average trip length is the most difficult travel demand factor to determine. In the context of a road impact fee using a consumption-based methodology, the relevant input is the average length of a trip on the major road system within the service area. The average trip length can be approximated by dividing the total VMT on the major road system by the total number of trips generated by existing development in the service area. Total VMT on the major road system is estimated by multiplying the length of each road segment by the current traffic volume on that segment and summing for the entire system (adjustments should be made to account for pass-through traffic). Total trips can be estimated by multiplying existing land uses by the appropriate trip generation rates (adjusted for new trip factors and dividing by two) and summing for all existing development in the service area.

Cost per Service Unit

The cost per VMC will be calculated based on a representative list of historical or planned improvements, by dividing the total cost of the improvements by the additional VMC added by the improvements to determine the average cost per VMC.

One policy decision related to costs is whether to include the costs of rights-of-way (ROW). If the City does not include ROW costs, it can continue to require developers to dedicate ROW for arterial streets without giving credit for the value of that land against the road impact fee. On the other hand, if ROW costs are included, developers who dedicate ROW for adjacent or internal arterial streets would need to get credit for the value of the dedication against their road impact fees.

A second policy issue is whether to multiply the cost per VMC by the system-wide ratio of VMC/VMT to get the cost per VMT, or simply to use a one-to-one ratio as in a standard consumption-based approach. This is a policy issue, but even if a one-to-one ratio is used, the modified consumption-based methodology has the advantage of quantifying the extent to which the fees are conservative.

The road impact fee is designed to cover the cost of adding capacity to the roadway system. All of the normal components of a roadway expansion project are eligible for impact fee funding, including construction of new lanes, reconstruction of existing lanes and relocation of utilities where necessary as part of a widening project, and installation of sidewalks, street lighting, and landscaping along new roads. However, road impact fees should not be used for ancillary components of an expansion project when not part of a capacity-expanding improvement. For example, installing sidewalks along an existing road, landscaping an existing median or reconstructing an existing road would not be eligible improvements.

Revenue Credits

Credit against the cost per service unit would need to be given for outstanding debt for past road improvements, and for motor fuel tax and vehicle license fee revenue that is generated by new development and used to make capital improvements. The City has $75 million in outstanding debt from the 1994 and 2000 bond authorizations which have been spent on street improvements. However, since the City relies exclusively on State-shared fuel taxes, also known as Highway User Revenue Funds (HURF), to retire the street bonds, it is only necessary to give credit for motor fuel tax and vehicle license fee revenue that is generated by new development and used to make capital improvements and retire street bonds.

DRAINAGE

No jurisdiction in Pima County currently assesses a drainage impact fee to cover the capital cost of improvements needed to manage stormwater. The Town of Sedona is the only jurisdiction in Arizona that currently imposes an impact fee for stormwater drainage facilities, although Goodyear has a "public works" fee that may be used for this purpose. The County flood control district has a county-wide tax base, but that money is mostly spent in the unincorporated area of Pima County.

Stormwater drainage impact fees are not very common, and one of the major reasons is their complexity. Unlike most other types of impact fees, it is virtually impossible to develop a drainage impact fee for a community that does not have a recent, comprehensive drainage master plan. The City of Tucson does have a drainage master plan, although the data used to develop it is about ten years old. The *Tucson Stormwater Management Study* was initiated in 1992, and the final report was completed in December 1995. This section reviews the feasibility of basing impact fees on the data in the study, and discusses the alternative of a stormwater utility fee.

Data Availability

A common problem with using drainage master plans as the basis of an impact fee is that it is often not possible to determine the land use projections that were employed in the study. Basically, one must be able to take the existing and build-out land uses and determine the number of drainage service units (e.g., acres of impervious cover) projected to be added by anticipated development. The growth-related costs identified in the study must then be divided by the new service units to determine the growth-related cost per service unit. In this case, however, while the land use data is not presented in the final report of the study, staff was able to provide it for both existing conditions and projected build-out conditions.

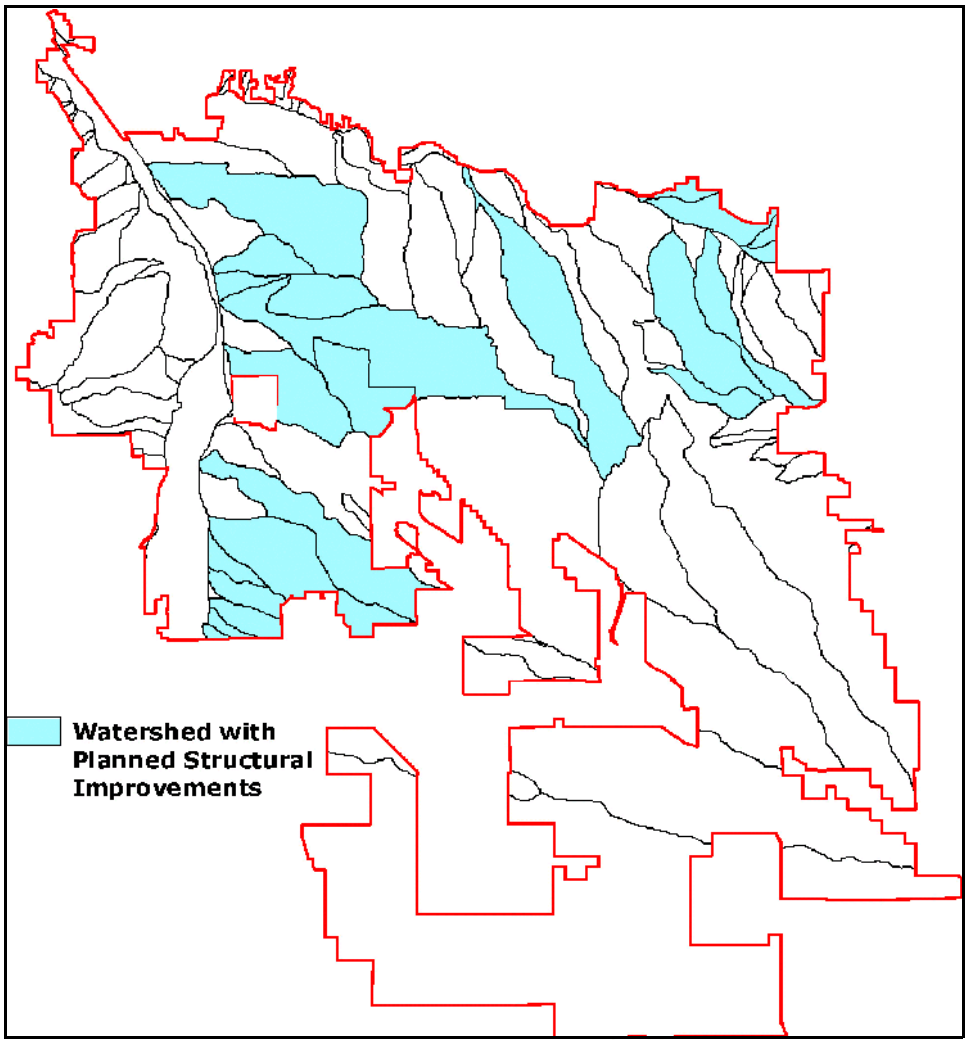
The drainage plan also contains a list of projects with cost estimates based on 1993 City bid tabulations for projects designed and constructed to City standards. Due to lack of reliable data regarding existing City right-of-way and property ownership, land costs were not included for most projects. The total cost of recommended improvements, in 1993 dollars, was $58 million.

There are two difficulties in using the *Tucson Stormwater Management Plan* as the basis of drainage impact fees. First, there is no differentiation between projects needed to remedy existing deficiencies and those needed to serve growth. Second, and more importantly, most of the improvements are located in watersheds that are already relatively developed. The plan divided the study area (the study area did not include the large amount of recently-annexed, undeveloped land to the south) into 59 watersheds, which were grouped into six hydrologic units. The three hydrologic units that are most developed account for 92 percent of the total cost of the planned improvements.

The City's approach to stormwater management favors nonstructural solutions, such as stormwater management regulations, flood insurance and preservation of naturally vegetated watercourses. In 33 of the 59 watersheds, which together comprised 55 percent of the area of the study area, only nonstructural stormwater management solutions were recommended. According to the plan, structural solutions, such as channelization, channel bank protections, storm drains and detention/retention facilities, were recommended only for those areas where flooding was found to be a danger to human life, public health and public safety. Consequently, most of the capital improvements recommended in the plan are in more developed areas and most often represent existing deficiencies, rather than growth-

related improvements (see Figure 8). The nature of the City's master plan thus makes it impractical to use as the basis of an impact fee for new development in the city's growth areas.

Figure 8
WATERSHEDS WITH PLANNED DRAINAGE IMPROVEMENTS



Stormwater Utility Fee

Not only would it be difficult to develop a drainage impact fee, such a fee would not address the City's needs for a comprehensive stormwater management program. Municipal stormwater management in an urban environment is not simply an issue of providing drainage improvement, but must also include compliance with the Clean Water Act and other unfunded federal mandates. Consequently, the City needs an on-going revenue source to address not only initial capital improvements, but maintenance of these improvements, stormwater quality and quantity management programs, habitat protection and preservation, administration of floodplain regulations, and responses to events such as spills, suspected pollution discharges and floods. The cost of implementing the Tucson Stormwater Master Plan and addressing stormwater management and drainage system maintenance is estimated to be about $11 million annually, of which only about $3.5 million is related to the cost of structural improvements.

Given the magnitude of these funding needs, the City might want to consider a stormwater utility fee instead. A stormwater utility fee is a user fee similar to a water or wastewater fee, and is typically included on the monthly City utility bill. Unlike an impact fee, a utility fee is charged to all existing development, and can be used for either capital or operating expenses. A city-wide stormwater utility fee could help fund remedies to existing drainage problems as well as on-going maintenance costs. The studies required to develop a stormwater utility fee would be much simpler and less expensive than those required to support a stormwater drainage impact fee. The main requirement for a utility is that the user fees should be related to the generation of runoff and that the fees should reasonably reflect actual costs to provide the service.

Several Arizona municipalities, including Oro Valley and Flagstaff, have passed ordinances creating a stormwater utility, although neither has yet to impose a monthly utility fee to fund the utility. In other parts of the country, stormwater utilities have become quite common. While a 1994 Environmental Protection Agency report estimated the national total at just over 100, today there are more than that in the state of Florida alone, and more than 400 nationwide, with high concentrations in Washington, Oregon, and California. By one estimate, the country will have 2,500 stormwater utilities within the next 10 years.[9]

The revenue potential of a stormwater utility is significant. Fort Collins, Colorado assesses a stormwater utility fee that is designed to fund both capital and maintenance costs. The monthly bill for a typical residence is $2.01 for maintenance and $3.58 for capital improvements. At these rates, a stormwater utility fee in Tucson would generate $7.4 million annually from existing single-family units alone.

The biggest technical challenge to implementing a stormwater utility fee is developing the database needed to perform the billing. As noted above, stormwater utility fees should be based on utility customer's stormwater generation. However, most utility billing systems do not have information on characteristics of the property relevant to stormwater runoff. A 1997 survey of stormwater utilities in Florida found that 83 percent based the fee on impervious area.[10] The most common approach is to divide residential customers into rate classes based on housing type (e.g., single-family detached, multi-family), and charge a flat rate per dwelling unit in each class based on the average impervious cover per unit for that housing type derived from a survey. While this approach will usually cover over 80 percent of most utility customers, impervious cover must still be determined for each nonresidential customer. Potential data sources include tax assessor data bases, site plans and aerial photography.

If the City desires to pursue a stormwater utility fee, it would be advisable to update the *Tucson Stormwater Management Study*. The 1993 cost estimates should be updated to 2003 dollars and should include property acquisition costs for improvement projects as well as for watershed preservation. In addition, a stormwater utility study should update, compile and project maintenance costs, estimate stormwater quality compliance costs, and develop guidelines for the rate structure, credits and appeal process.

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[9] Janice Kaspersen, "The Stormwater Utility: Will it Work in Your Community?," *Stormwater: The Journal for Surface Water Quality Professionals*, December 2000.

[10] Florida Stormwater Association, *Establishing a Stormwater Utility in Florida*, http://www.florida-stormwater.org/manual.html, accessed May 21, 2003.

PARKS

According the *Parks and Recreation Department Strategic Service Plan 2012* and the City's web site, Tucson residents currently have access to 126 parks, 15 recreation centers, two special service centers, and 26 swimming pools (including seven year-round pools). The number of parks includes two regional parks, 15 metro parks, 16 community parks, 57 neighborhood parks, 24 school parks and 12 mini-parks. While no other municipalities in Pima County currently charge a park impact fee, such fees are charged by many other Arizona cities.

Service Unit

Most park impact fees are assessed only on new residential development.. Of the 18 Arizona municipalities that charge park impact fees, only two (Phoenix and Sedona) assess them on nonresidential development. Because it is more difficult to demonstrate the nexus between nonresidential development and the need for additional park facilities, it is recommended that Tucson assess park impact fees only on residential development.

The common unit of measurement that reflects the impact of new development on the demand for capital facilities is called the "service unit." The most common service unit used in park impact fee analysis is population. Population estimates are based on three factors: the number of dwelling units, average household sizes for various types of units and occupancy rates. The number of dwelling units can be estimated with some degree of precision, and average household size has been declining somewhat predictably but has been stabilizing in recent years. Occupancy rates, on the other hand, tend to vary significantly over time, and not in predictable directions. Consequently, this report recommends the use of a service unit that avoids the need to make assumptions about occupancy rates. Instead of population, the recommended service unit is the "equivalent dwelling unit" or EDU, which represents the impact of a typical single-family dwelling. By definition, a typical single-family unit represents, on average, one EDU. Other types of units each represent a fraction of an EDU, based on their relative average household sizes.

Much of the differential in average household sizes between housing types is due to differences in the size of the dwelling units (e.g., single family homes tend to have more people than apartments because they tend to be larger). The possibility of varying the fees by the size of the unit is discussed above under General Policy Options.

Service Areas and Benefit Districts

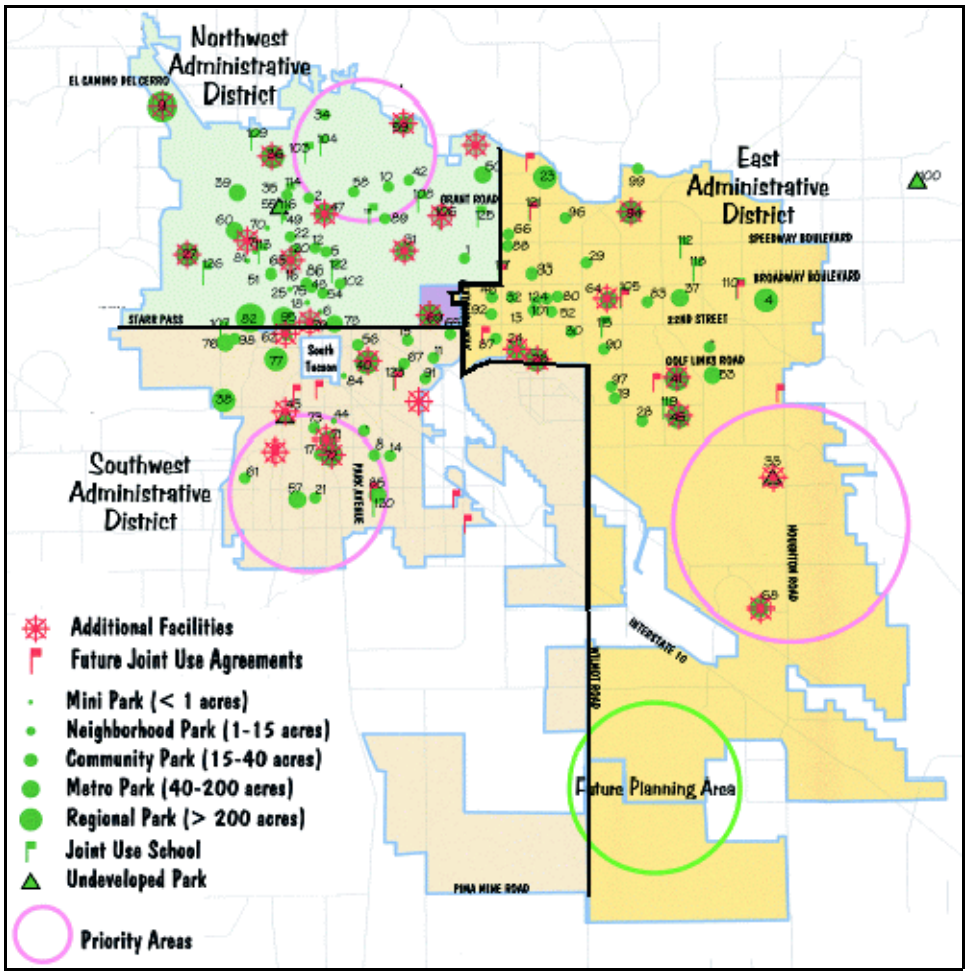
The concept of service areas and benefit districts was described in the section on roads. Service areas are geographic areas subject to a single fee schedule. Service areas may be divided into multiple benefit districts, which are areas where fees collected are earmarked to be spent.

Since the City is electing not to include neighborhood parks in any potential impact fee, the consultant recommends using a single city-wide service area. While neighborhood parks are designed to serve individual neighborhoods, recreation centers, swimming pools, community, metro and regional parks function as an interrelated system of facilities that provides service throughout the entire jurisdiction of the City. For community, metro and regional park impact fees, the primary rationale for multiple service areas would be a significant variation in land costs between different parts of the city. Since additional park land is likely to be purchased in newly-developing areas, it is the difference in land costs between

such areas that is most relevant. Based on discussion with City staff, there are unlikely to be significant variations in land cost between various growth areas.

While the types of parks and facilities that will be covered by the proposed park impact fee provide benefit to a larger area than neighborhood parks, it is nevertheless recommended that the city be divided into several benefit districts in order to better demonstrate reasonable benefit to fee-paying developments. Our tentative recommendation is to consider using the three park administrative districts as benefit areas (the Central Administrative District could be combined with the Northwest Administrative District). The configuration of the administrative districts and the distribution of existing and planned parks are illustrated in Figure 9.

Figure 9
POTENTIAL PARK BENEFIT DISTRICTS



Cost per Service Unit

The major choice in methodology for park impact fees is not improvements-driven versus standards-based, but the choice between basing the fees on the existing level of service or on a desired future level of service. Most park master plans strive to achieve a desired level of service, and the City's draft park master plan is no exception. While this is appropriate for planning purposes, it is not always desirable for impact fees. A fundamental principle of impact fees is that new development should not be charged for a higher level of service than is being provided to existing development. If the fees are based on a higher level of service, a source of funding other than impact fees must be found to bring the level of service provided to existing development up to the standard on which the impact fees for new development is based. Since in most cases new development will be contributing to the alternative revenue source being used to remedy the deficiency, the impact fees must be reduced to account for this. Because of these considerations, it is generally advisable to base the park impact fees on the existing level of service. Based on conditions in the year 2000, the existing level of service for parkland is about 6.4 acres per 1,000 residents.

Table 14
EXISTING PARK LEVEL OF SERVICE

Park Type	2000 Acres	2000 Population	Acres/ 1,000
Regional	619	486,699	1.27
Metro	1,450	486,699	2.98
Community	504	486,699	1.04
Neighborhood	520	486,699	1.07
Total	3,093	486,699	6.36

Source: 2000 acres from City of Tucson Parks and Recreation Department, *Strategic Service Plan 2012*, July 2002 draft; 2000 population from the U.S. Census Bureau.

Another consideration is what types of park facilities to include in a park impact fee. The City provides a wide range of park facilities, ranging from mini-parks to regional parks. During initial meetings with staff, it was tentatively decided that neighborhood parks would not be included in the park impact fee calculations. City parks staff recommends that small neighborhood parks be required by the land use code to be constructed by private development and maintained by homeowner's associations. The City would focus on developing and maintaining larger community, metro and regional parks. Basing the fees on these larger parks will allow the funds to be spent in larger benefit districts, increasing the flexibility in the use of impact fee revenues.

Land costs are the most difficult to determine because they vary so much by location, parcel size and other factors. The City recently paid $1.4 million for 40 acres for Case park (to supplement a donation of 15 acres from the Case family), and $1.2 million for about 35 acres at Kino and 36th Street. These recent purchases averaged about $35,000 per acre. The Parks and Recreation Department's draft strategic plan uses an average land cost of $25,000 per acre. In the second phase of the project, we will work with City staff to refine this estimate.

A park impact fee should consider the capital cost of developing a park (the cost of providing tennis courts, soccer fields, baseball fields, barbeque pits etc.). In order to incorporate the cost of park development into an impact fee, a detailed inventory of facilities for each regional, metro and community

park will have to be complied, including a replacement cost for each type of park improvement. The draft strategic parks plan includes average cost estimates for adult baseball fields, youth baseball fields, soccer fields, softball fields, multi-use paths (per mile), playgrounds and recreation centers (per square foot). Again, we will work with City staff in Phase Two to refine these cost estimates.

Some facilities other than neighborhood parks are joint ventures or were otherwise funded at least partially by other entities. For example, the William M. Clements Center is a jointly-funded partnership between the Tucson Parks and Recreation Department and the Pima County Community College District. Pima County has also paid for some City parks. In such cases, only the portion of the cost that was paid for by the City will be included in calculating the impact fee.

Other costs to be considered could include park administration and maintenance buildings, park vehicles and any other facilities owned and operated by the Park Department such as the DeMeester Outdoor Performance Center, the Rodeo Grounds, the Rose Garden or Sentinel Peak Park. Golf courses are an enterprise fund and would not be included in the park impact fee. The Colorado Rockies' spring training stadium and surrounding practice fields would also not be not included in calculating the park impact fee.

Revenue Credits

Credit against the cost per service unit would need to be given for outstanding debt for past park improvements, and for anticipated grant funding that could pay some of the costs of growth-related park improvements.

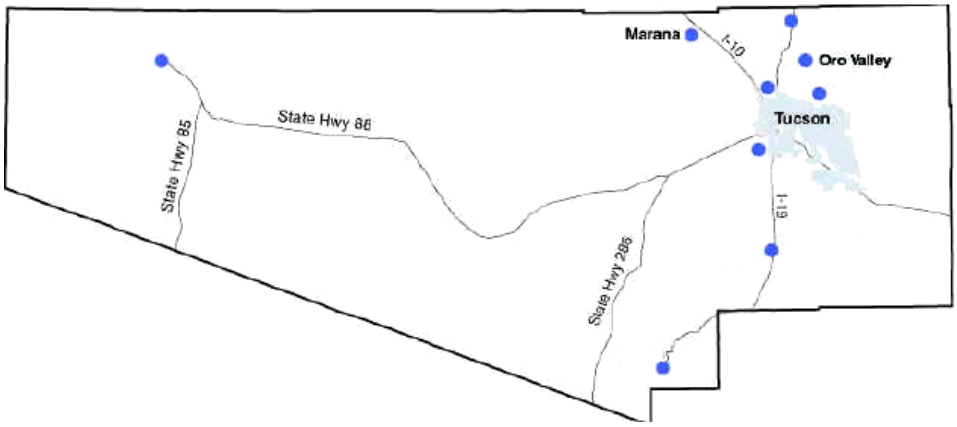
The City has $26 million in outstanding debt from the 1994 and 2000 bond authorizations which have been spent on park improvements. There may also be some outstanding park debt embedded in earlier bond issues that have been refinanced by more recent refunding issues. This debt will be repaid, in part, by new residential development. The present value of the future tax payments from new residential development that will go to retire that debt should be deducted from the impact fees.

In addition, some credit will need to be provided by State and Federal park grants. While Land & Water Conservation grant funds have been drying up, they have been replaced by Arizona Heritage Funds and some Community Development Block Grant money.

LIBRARY

While no jurisdictions in Pima County currently charge a library impact fee, such fees are charged by many other Arizona cities. The Tucson-Pima Public Library, jointly funded by the City of Tucson and Pima County, operates 22 libraries throughout Pima County. Twelve libraries, including the main library and 11 branch libraries, are located within Tucson's City limits. The location of the libraries located outside Tucson's City limits are shown in Figure 10 (the South Tucson library is not shown).

Figure 10
LOCATION OF LIBRARIES OUTSIDE OF TUCSON



While the City and County share operating expenses on an equal basis as provided for in an intergovernmental agreement, the City operates the libraries with City of Tucson employees. The exception is the Oro Valley affiliate library, which is operated by Town of Oro Valley employees. Half of the operating costs of the Oro Valley library are paid by the County, and half are paid by the Town.

Generally speaking, the City constructs and maintains libraries inside it's City limits, while the County constructs and maintains libraries in unincorporated areas with county-wide library district taxes. Several bookmobiles, which serve primarily unincorporated areas, were purchased by the County. However, there have been exceptions to this pattern. The new Midtown library in Tucson is being funded with County bonds and a supplemental City bond. The Bear Canyon library was built by the County inside the City limits. In addition, the County built two detention libraries (at the County Jail and Juvenile Court Center) that are within the City limits and are operated by the Public Library system. The Oro Valley affiliate library was built with equal contributions from Town and County funds. The City of Marana is proposing to construct a new library that would be operated by the Tucson-Pima Public Library system.

Service Unit

As with parks, most library impact fees are assessed only on new residential development. Of the 12 Arizona municipalities that charge library impact fees, only one (Sedona) assesses them on nonresidential development. Because it is more difficult to demonstrate the nexus between nonresidential development and the need for additional library facilities, it is recommended that Tucson assess library impact fees only on residential development.

The common unit of measurement that reflects the impact of new development on the demand for capital facilities is called the "service unit." As with parks, the recommended service unit is the EDU, or Equivalent Dwelling Unit.

Service Areas and Benefit Districts

The Tucson-Pima Public Library is jointly funded by the City and County, and its mission is to serve all residents in Pima County. The intergovernmental agreement between the City and the Pima County Free Library District specifically states that:

> The City will allow all residents of South Tucson, the Town of Marana, the Town of Oro Valley and of Pima County free access to all facilities and services of the Tucson-Pima Public Library on the same basis as City residents.

Because the facilities of the Tucson-Pima Public Library serve all residents of the county, the service area for a library impact fee should be county-wide. During the current decade, only 49 percent of new Pima County residents will reside in Tucson, compared to 22 percent in unincorporated areas and 29 percent in other municipalities.[11] In addition to the City of Tucson, the County and the other municipalities in Pima County should participate by charging library impact fees on new residential development within their respective jurisdictions. While the level of service and cost per service unit should be calculated at the county-wide level, the fees may need to vary between jurisdictions based on differences in outstanding debt for past library improvements.

It is likely that the municipalities participating in a county-wide impact fee system would like to see the fees that they collect being spent either within their jurisdictions or within reasonable proximity. This could be accomplished in a formal manner, by dividing the county into benefit districts, or more informally, in providing each jurisdiction with representation on a committee that decides where the money will be spent. If the benefit district approach is used, it would be advisable to provide that at least a portion of fee revenues be available to be spent for expansion of the main library, which provides support services to the branch libraries.

Cost per Service Unit

As with park impact fees, the major choice in methodology for library impact fees is not improvements-driven versus standards-based, but the choice between basing the fees on the existing level of service or on a desired future level of service. The Tucson-Pima Public Library has the goal of 0.5 square feet of library floor space per person.[12] As discussed in the Park section, it is generally advisable to base library impact fees on the existing level of service.

Given that the library system is a county-wide system, the level of service is most appropriately measured at that level. As shown in Table 1, the current county-wide level of service is 0.32 square feet per capita. If one just looks at libraries located within the City limits, and divides the square footage of those libraries by the population of the city, the level of service is twice as high as the level of service for the remainder of the county. This may be somewhat deceiving, however, since some of the square footage

[11] See Table 19.

[12] Tucson-Pima Public Library, *Draft Facility Recommendations*, February 26, 2003.

of the main library is likely to be attributable to providing support services for libraries outside the City limits. Excluding the main library, the level of service is very similar both within and outside Tucson.

Table 15
EXISTING LIBRARY LEVEL OF SERVICE

Library	Jurisdiction	Sq. Ft.	7/2003 Population	Sq. ft./ Person
Columbus	Tucson	10,000		
El Pueblo	Tucson	3,500		
El Rio	Tucson	1,000		
Himmel	Tucson	6,000		
Jail Library	Tucson	600		
Juvenile Court Center	Tucson	1,500		
Kirk-Bear Canyon	Tucson	11,000		
Miller-Golf Links	Tucson	10,000		
Mission	Tucson	10,400		
Santa Rosa Learning Center	Tucson	6,450		
Valdez Main Library	Tucson	96,000		
Valencia	Tucson	16,050		
Wilmot	Tucson	19,000		
Woods-Memorial	Tucson	16,650		
Subtotal, Tucson		208,150	514,350	0.40
Caviglia-Arivaca	County	2,500		
Dewhirst-Catalina	County	2,500		
Dusenberry-River Center	County	10,000		
Joyner-Green Valle	County	13,800		
Nanini	County	15,000		
Salazar-Ajo	County	5,000		
Southwest	County	2,200		
Marana	Marana	2,900		
Oro Valley	Oro Valley	15,000		
Lena-South Tucson	South Tucson	6,700		
Subtotal, Remainder of Pima County		75,600	396,500	0.19
Total, Pima County		283,750	910,850	0.31

Source: Library square footage from Tucson-Pima Public Library, *Draft Facility Recommendation*, February 26, 2003; population projection for July 1, 2003 from City of Tucson Comprehensive Planning Task Force, May 22, 2003.

Revenue Credits

Credit against the cost per service unit would need to be given for outstanding debt for past library improvements, and for anticipated grant funding that could pay some of the costs of growth-related improvements.

The City has $4.7 million in outstanding debt from the 1994 and 2000 bond authorizations which have been spent on library improvements. There may be some additional outstanding library debt embedded in earlier bond issues that have been refinanced by more recent refunding issues. This debt will be repaid, in part, by new residential development located within the Tucson City limits. The present value of the future tax payments from new residential development that will go to retire that debt should be

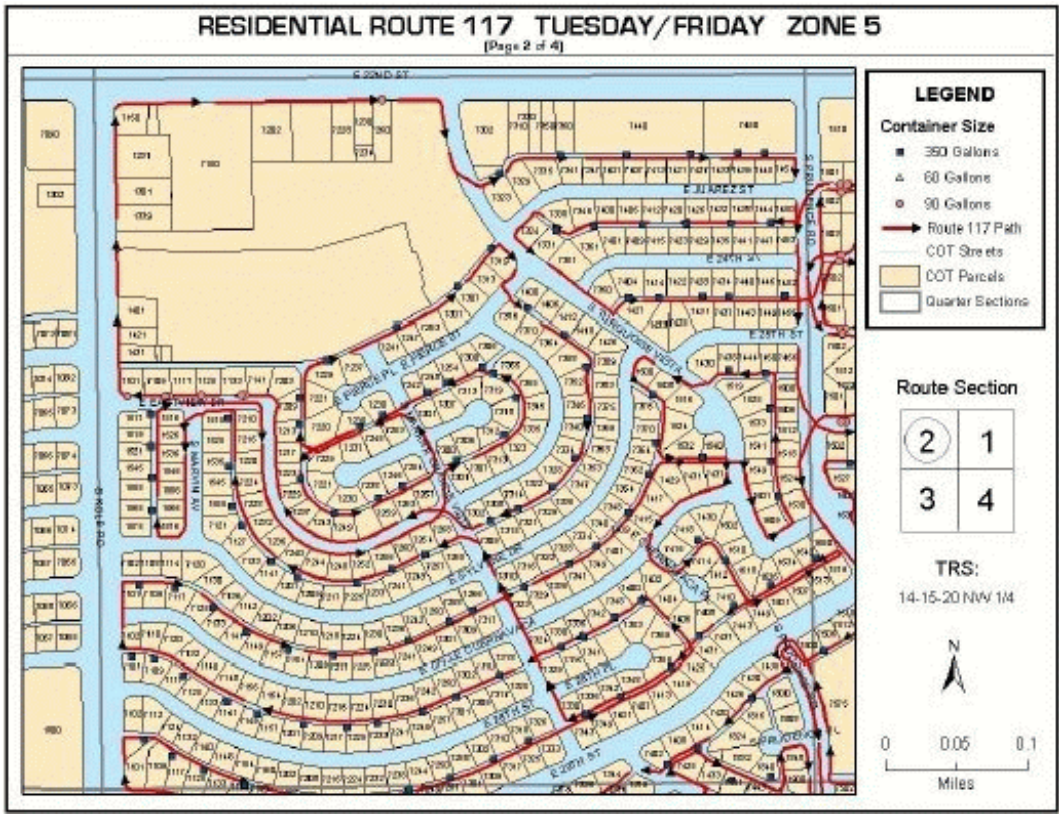
deducted from the impact fees. In addition to City library bonds, new residents, regardless of where they are located in Pima County, will also be paying County taxes that will go toward repaying outstanding library debt.

SOLID WASTE

The Solid Waste Management Department provides city-wide residential and commercial refuse and recycling collection. Residential services are provided to City residents free of charge. Funding for this service currently comes from the General Fund, which is heavily reliant on sales tax revenue. Commercial services are provided on a pay-as-you go basis, and a full range of collections are provided to most commercial establishments for a fee. The Department also operates the Los Reales Landfill. The four divisions of the Solid Waste Management Department are Administration, Customer Service and Environment Planning, Collections and Refuse Disposal.

Currently, the City provides residential solid waste collection, disposal and recycling to approximately 145,000 households, which includes all single-family units, duplexes, triplexes and four-plexes. Each eligible household or unit is offered one 90-gallon garbage container and up to two 90-gallon recycling containers free of charge. Those who need additional garbage capacity can order an additional container for $14 a month. Although a majority of customers have 90-gallon garbage and recycling containers, customers who have a 60-gallon garbage container receive a 60-gallon recycling container (a limited number of 30-gallon containers are also available for elderly, disabled, and some condominium residents). Customers who live in either a triplex or four-plex unit share a 300-gallon garbage container but maintain their own individual recycling container. Customers receive weekly garbage and recycling service, with both containers collected on the same day.

Figure 11
RESIDENTIAL COLLECTION ROUTE MAP



Twice a year the Solid Waste Management Department provides brush and bulky trash collection to all residential customers. Collection is free for up to five cubic yards (this may change if the Mayor and Council approve the $2 service fee to begin on July 1, 2003). For a nominal fee, the City will collect brush and bulky items in excess of the five cubic yards.

The City of Tucson currently operates one landfill at 5300 East Los Reales Road. At current disposal rates, the Los Reales Landfill has permitted capacity to last through approximately 2016. The first lined cell went in to use in July 2000. Construction of a second lined cell began in January 2002, and is scheduled to open early FY 2003. Based on existing fill rates, the City will have to begin construction on a third lined cell in FY 2005. A preliminary master plan conducted by staff suggests the 1,000-acre Los Reales site has the space to operate disposal activities for another 60 years.

The City has used 23 previous landfill sites over the last 30 years. Many of these have not been closed in such a manner as to fully protect the environment and the safety of the public. Consequently, closure-related improvements have to be completed for several landfills over the next five years.

Service Unit

The demand for solid waste services can be expressed in pounds per day or tons per year of solid waste generation. The service unit, or common denominator, could be one of these figures, or it could be the average solid waste generation of a typical single-family dwelling. Based on recent data on solid waste collected and number of households served, the average household generates about 7.3 pounds per day, or 1.33 tons per year.

Since the collection and disposal of residential solid waste is the only service that is not fee based, the impact fee would apply only to those types of residential development that receive such services. Multi-family projects with more than four units, for example, are considered commercial customers and are billed for the services provided.

Service Areas and Benefit Districts

Residential solid waste collection and disposal is provided to all residential developments with four or fewer dwelling units. Consequently, the service area should be city-wide. Since the landfill serves the entire city, there is no rationale for dividing the city into multiple benefit districts.

Cost per Service Unit

The FY2003-FY2007 Capital Improvement Program (CIP) for the Solid Waste Management Department consists of 23 projects totaling $50.6 million, of which only $13.3 million is currently funded. The City clearly has a need for additional funding for capital facilities to serve anticipated growth. It important to note that impact fees can not be used to fund any existing deficiencies (i.e., closure-related improvements to the Harrison Landfill or the Irvington Landfill). Also, since impact fees cannot be used of day-to-day operations, the City would have to continue to rely on the General Fund as a revenue source for the operational costs of residential solid waste collection, disposal and recycling. Impact fee revenue can only be used for capacity-expanding capital improvements, such as for the purchase of refuse or recycling containers for new residential customers, the addition of new vehicles to the fleet of residential solid waste collection vehicles and the construction of additional cells at the landfill.

Since commercial properties already have to pay for their services, this feasability analysis will only look at a solid waste impact fee to serve new residential growth. An impact fee for solid waste should be

based on the existing level of service. The existing level of service would be based on the replacement value of existing capital facilities used to provide collection services to existing residential development. After consultation with City staff, the consultant has been able to establish a rough estimate of the existing equipment used to serve residential customers. The Solid Waste Management Department has 65 side-loader refuse vehicles with a capacity of about 26-32 cubic yards, and five smaller side-loader vehicles, each with a capacity of 10 cubic yards. Brush and bulky equipment includes six skid-steers, one loader, four roll-off trucks, six rear loaders, seven open bed trucks and two tractors. The replacement value for each piece of equipment will have to be obtained from Fleet Services. Determining the number of automated plastic containers currently in use still has not been fully determined.

Another consideration is how to attribute a fair share of the cost of the Los Reales Landfill to new residential development. The landfill serves a regional market, but is owned by the City. While the City charges tipping fees to commercial and residential self-haul customers, most of the waste comes in City trucks. The capital costs include the sunk cost in purchase of the site, the construction of additional disposal cells, closure and post-closure costs. City staff estimates that these costs, excluding land, amount to approximately $132 million (in today's dollars) through the year 2060. During that time, the landfill would have the capacity to dispose of about 68 million cubic yards. At an average of 0.49 tons per cubic yard, the capital cost amounts to $3.95 per ton. With a household generation rate of about 1.33 tons per year, it would cost about $105 to accommodate the waste generated by a new household for 20 years.

Revenue Credits

Credit should be given for outstanding debt that was used for past improvements that have either been included in the level of service used to determine the fee or that have no capacity remaining to serve new development. The City has $14.2 million in outstanding debt for solid waste facilities. In addition, the City recently imposed a two dollar per month charge for brush and bulk trash collection, effective July 1, 2003. This services was previously provided to residential customers free of charge. If the City uses the revenues for any type of capacity-expanding improvements (i.e., the purchase of additional residential collection vehicles), a credit would need to be applied to avoid over-charging future residential development.

POLICE PROTECTION

The City of Tucson Police Department is responsible for upholding the law within the jurisdictional boundaries of the City of Tucson. The police force has grown from one uniformed officer in 1871 to 940 commissioned officers and 360 civilian personnel. The Police Department currently maintains several substations, a main headquarters and a regional Public Safety Academy. The Tucson Public Safety Academy is a 600-acre, joint-use facility that provides modern training for the City's fire and police departments. In addition, the Academy provides training on a contract basis for fire and police agencies throughout the southeastern portion of the state.

The police headquarters is a large facility located on South Stone Avenue. Other police facilities include the Santa Cruz substation on Park Avenue; the Midtown substation on East First Street; the Pantano substation on Speedway; the Rillito substation on West Prince Road; and the Rincon substation on Golf Links (the Pantano and Rincon substations are shared with other City departments). Table 16 below shows the location and the total floor area of each of the Police Department's seven operating facilities.

Table 16
EXISTING POLICE FACILITIES

Station	Location	Sq. Ft.
Police Headquarters	270 S. Stone Ave.	147,623
Santa Cruz Substation	4410 S. Park Ave.	13,495
Midtown Substation	3202 E. First St.	5,579
Pantano Substation	7575 E. Speedway Blvd.	9,240
Rillito Substation	1019 W. Prince Road	9,765
Rincon Substation	9670 Golf Links	17,000
Public Safety Academy*	10001 S. Wilmot Rd	89,659
Total		292,361

* shared with Fire Department (figure shown in ½ of square footage)
Source: Tucson Police Department, May 5, 2003 memorandum.

In addition to police stations, the Police Department operates several specialized support divisions such as the SWAT Team and Air Support Unit. The Air Support Unit operates three helicopters and a Cessna 172 airplane (the Heliport is leased by the Police Department and will not be included in the calculation of any impact fees). The Cessna is primarily used for airborne surveillance, drug interdiction and training for new pilots.

Service Unit

One of the most common methodologies used in calculating police protection impact fees is the "calls-for-service" approach. This approach uses historical data on calls-for-service by land use to make the connection between land use type and the demand for police facilities. However, due to the fluctuation in calls-for-service by various land use types (i.e., single-family, multi-family, office, warehouse) that can be experienced from year-to-year, it is recommended that the police impact fee be based simply on the distribution of calls-for-service between residential and nonresidential development. From past experience, the distribution of calls-for-service between residential and nonresidential development is more constant over time than distributions for more refined land use categories.

Many calls-for-service cannot included in the analysis because they can not be classified to a particular land use (i.e., any type of roadway incident such as a car accident or car jacking or any type of public assistance in the street such as a robbery, attack or mugging). Of the roughly 332,000 calls-for-service received between April 2002 and April 2003, the Tucson Police Department was to able to classify 233,886 calls-for-service into one of five land use categories: commercial; governmental; medical; non-profit and residential. Based on the call data presented below, it is estimated residential development generates about 60 percent of all police calls-for-service.

Table 17
POLICE CALLS-FOR-SERVICE BY LAND USE, 2002-03

Land Use	Calls	Percent
Commercial	73,456	31%
Governmental	14,772	6%
Medical	3,511	2%
Non-profit	1,187	1%
Residential	140,960	60%
Total	233,886	100%

Source: Police calls-for-service by land use, April 7, 2002-April 6, 2003 from the Tucson Police Department, May 8, 2003 memorandum.

Once the costs are allocated between residential and nonresidential development, they need to be further allocated to individual developments. One approach is to simply divide the replacement cost attributable to each by the total existing square footage. The consultant has determined that it is possible to prepare reasonably reliable estimates of existing residential and nonresidential building floor area from Pima County Tax Assessor records and other available data sources (see Land Use and Demographic Data section).

Service Areas and Benefit Districts

The City could develop a city-wide impact fee for police facilities and equipment. While police substations do have a primary response area, officers respond to calls on a community-wide basis. In addition, the headquarters and training facilities are centralized. Consequently, police facilities constitute an interrelated system that provides service throughout the City's jurisdiction. The consultant recommends a single city-wide impact fee with a single city-wide benefit district.

Cost per Service Unit

As noted above, the replacement value of existing police protection facilities can be allocated between residential and nonresidential development based on the percentage of calls to each to land use. The costs attributable to residential and nonresidential development can then be divided by the square footage of each land use category to determine the cost per square for police protection.

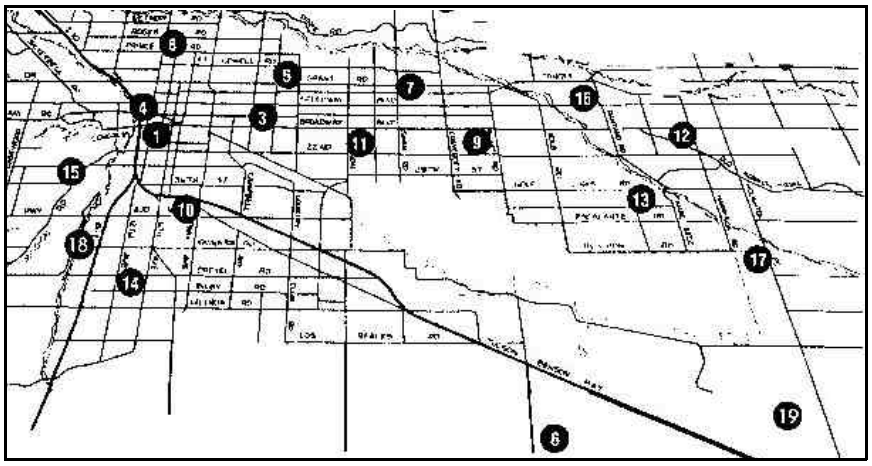
Revenue Credit

In the calculation of the impact of new development on infrastructure costs, credit should be given for non-local funding that will be generated by new development and used to pay for capacity-related capital improvements. Credit should also be provided for taxes that will be paid by new development and used to retire outstanding debt for past police protection facility improvements. The City currently has $26.6 million in outstanding debt from the 1994 and 2000 bond authorizations that have been spent on police improvements. There may be some additional outstanding police debt embedded in earlier bond issues that have been refinanced by more recent refunding issues. This debt will be repaid, in part, by new development located within the Tucson City limits. The present value of the future tax payments from new development that will go to retire that debt should be deducted from the impact fees. Staff has compiled data on the last five years of police grant funding that will be used to calculate reductions in the fee to account for potential grant contributions. Over the last five years, the Department has received over $16 million in Federal and State grants, of which almost $7 million has been used for vehicle and equipment purchases.

FIRE PROTECTION

The first fire station in the City of Tucson was founded in 1881 when the City's population was just 10,000. As of April 2003, the Tucson Fire had 18 stations (see Figure 12), 600 employees and a Regional Public Safety Academy that it shares with the Police Department (see Police Protection section for Academy information).

Figure 12
LOCATION OF EXISTING FIRE STATIONS



In addition to fire suppression, the Fire Department provides Emergency Medical Services (EMS), enforces City fire codes, reviews building plans, investigates fires and provides fire safety and injury prevention education. The Hazardous Materials Control Team is charged with the responsibility of responding to hazardous material incidents to mitigate any potential threat to humans or the environment, and the Technical Rescue Team (TRT) has the responsibility for technical rescues that include confined space rescue, trench rescue, swift-water rescue and structural collapse rescue.

The Tucson Fire Department utilizes a tiered response system for medical emergencies. The system is designed to initially dispatch Basic Life Support (BLS) personal, usually an engine or ladder company, unless Advanced Life Support (ALS) service is required. In that case, a paramedic unit is also dispatched.

Service Areas and Benefit Districts

The City could develop a city-wide impact fee for fire facilities and equipment. The Fire Department dispatches the closest, most appropriate available unit to all calls for service. This unit may not be from the closest fire station. In addition, the headquarters and training facilities are centralized. Consequently, fire/EMS facilities constitute an interrelated system that provides service throughout the City's jurisdiction. The entire city benefits each time a station or company is added. Consequently, the consultant recommends a single city-wide service area with a single city-wide benefit district.

Service Unit

As with police protection, the service unit for the fire protection impact fee should be square feet of building area as it is reasonable to assume that the demand for fire facilities is at least roughly proportional to building floor area, so that as the built environment grows, so will the demand for fire facilities. It is also reasonable to recognize that residential and nonresidential buildings may place somewhat different demands on fire facilities.

As with police protection, historical data on emergency calls-for-service by land use is used to make the connection between land use type and the demand for fire facilities. Over the last two years, Tucson Fire has dispatched about 134,000 calls-for-service, of which roughly 63,000 calls were dispatched for Advanced Life Support (ALS), 52,000 calls were dispatched for Basic Life Support (BLS) and 19,000 calls were dispatched for fire emergencies. Of the roughly 134,000 calls-for-service received in 2001 and 2002, the Tucson Fire Department was to able to classify 86,219 calls-for-service into land use categories. Based on the call data presented below it is estimated residential development generates about 74 percent of all Fire Department calls-for-service.

Table 18
FIRE CALLS-FOR-SERVICE BY LAND USE, 2001-2002

Land Use	ALS	BLS	Fire	Other	Total
Educational	668	751	764	1	2,184
Commercial/Office	3,126	2,785	1,872	42	7,825
Industrial, Utility, Defense	59	50	80	0	189
Institutional	4,361	2,410	659	1	7,431
Manufacturing	35	32	116	0	183
Public Assembly	1,585	1,636	604	15	3,840
Warehouse & Storage	273	230	128	0	631
Subtotal, Nonresidential	10,107	7,894	4,223	59	22,283
Apartments, Tenements, Flats	10,753	9,513	1,807	103	22,176
Dormitories	68	79	221	1	369
Home Hotels	4	3	1	0	8
Hotels, Motels, Inns, Lodges	385	380	160	0	925
Residential, Other	8	11	4	0	23
Residential Property: Unclassified	23	36	18	0	77
Rooming, Boarding, Lodging Houses	176	132	11	0	319
Single- and Two-Family Dwelling	20,667	15,066	4,230	76	40,039
Subtotal, Residential	32,084	25,220	6,452	180	63,936
Total Classified Calls-for-Service*	42,191	33,114	10,675	239	86,219
Percent Residential	76%	76%	60%	75%	74%

* excludes 36% of calls that could not be classified by land use type
Source: Calls-for-service by land use, January 2001-December 2002 from the Tucson Fire Department, May 2, 2003 memorandum.

Cost per Service Unit

The replacement value of existing fire protection facilities can be allocated between residential and nonresidential development based on the percentage of calls to each to land use. The costs attributable to residential and nonresidential development can then be divided by the square footage of each land use category to determine the cost per square for fire protection.

Revenue Credits

In the calculation of the impact of new development on infrastructure costs, credit should be given for non-local funding that will be generated by new development and used to pay for capacity-related capital improvements. Credit should also be provided for taxes that will be paid by new development and used to retire outstanding debt for past fire protection facility improvements. The City currently has $10.1

million in outstanding debt from the 1994 and 2000 bond authorizations that have been spent on fire improvements. There may be some additional outstanding fire facility debt embedded in earlier bond issues that have been refinanced by more recent refunding issues. This debt will be repaid, in part, by new development located within the Tucson City limits. The present value of the future tax payments from new development that will go to retire that debt should be deducted from the impact fees. Staff is gathering data on the last five years of Fire Department grant funding that will be used to calculate reductions in the fee to account for potential grant contributions.

GENERAL GOVERNMENT

Many Arizona municipalities charge impact fees for general government facilities. General government facilities can include administrative buildings, fleet maintenance facilities, communication facilities, and other facilities not covered in the road, drainage, park, library, police and fire impact fees.

The City's current general government facilities include City Hall, City Hall Annex, City Courts building, the Computer Operations building, the Thomas O. Price Service Center and the Eastside Public Service Center. The Price Service Center, located at 4003 South Park Avenue, is a multi-service center that provides preventive maintenance and repair for over 2,000 City-owned vehicles. It also houses a compressed natural gas fueling station that fuels the City's bus fleet as well as over 130 other City fleet units. Additionally, the City has intergovernmental agreements allowing for other governmental agencies, including the U.S. Postal Service, the University of Arizona, Pima County and the Tucson Unified School District, to fuel their vehicles at the Service Center. The City also provides emergency call-taking and dispatching services from the Center, including answering 911 calls and transferring them to the appropriate jurisdiction. Dispatching services are provided for the Tucson Fire Department and, on a contractual basis, dispatching services for the Northwest Fire District. Furthermore, the Center provides centralized medical dispatching services for much of Pima County outside of the City limits and also serves as the control point for non-emergency radio activity of other City divisions and departments. This function includes being an after-hour, weekend, and holiday contact point for citizens requesting City services. The Eastside Public Service Center, located at 7575 East Speedway, is another City-owned multi-service center that houses facilities for solid waste, fire, police, fleet services, operations and street maintenance.

Service Unit

Unlike parks and libraries, impact fees for general government facilities are usually assessed on both residential and nonresidential development. However, unlike impact fees for other facilities that are assessed on both residential and nonresidential development, there are no easily identifiable measures of the need for these facilities that are comparable to public safety calls for service or trip generation rates. The methodologies that have been most widely used in impact fee practice to allocate costs include "population and jobs," which equates the demand for general government facilities per household resident with that of a job generated by nonresidential development, and "functional population," which uses average household size data and nonresidential trip generation rates to determine the time people spend at the site of a land use. Our recommended approach is to simply assume that the demand for general government facilities will increase as the built environment expands, and to use 1,000 square feet of building floor area as the service unit for both residential and nonresidential development.

Cost per Service Unit

A general government impact fee does not include support facilities for mass transit. Very few communities assess mass transit impact fees, and none in Arizona. If the City were to pursue such a fee, it would need to be developed independently of a general government fee. Consequently, it will be necessary to identify and exclude any costs of fleet fueling and maintenance associated with the City bus system. It will also be necessary to exclude the portion of the cost of communications equipment used to provide contract services, since a portion of the capital cost should be covered by the fee charged for the service.

Revenue Credits

In the calculation of impact fees, credit should be given for non-local funding that will be generated by new development and used to pay for capacity-related capital improvements. Credit should also be provided for taxes that will be paid by new development and used to retire outstanding debt for past general government improvements. The City does not have any readily identifiable outstanding debt from the 1994 and 2000 bond authorizations that have been spent on general government improvements, although there may be some outstanding debt embedded in earlier bond issues that have been refinanced by more recent refunding issues. Nor has staff identified any recent grant funding received for general government facility improvements. While additional inquiries will be made in Phase Two to confirm these findings, it does not appear that any revenue credits are warranted against the proposed general government fees.

LAND USE AND DEMOGRAPHIC DATA

The purpose of this section is to provide land use and demographic background data for the City of Tucson's Cost of Service Study. This section examines:

1) Annual growth rates by decade since 1980 for the City of Tucson and the remaining portions of Pima County;

2) Population projections for 2010 for the City of Tucson and the remaining portions of Pima County;

3) Average household size from the 2000 U.S. Census for single-family detached, multi-family and mobile home units in the City of Tucson;

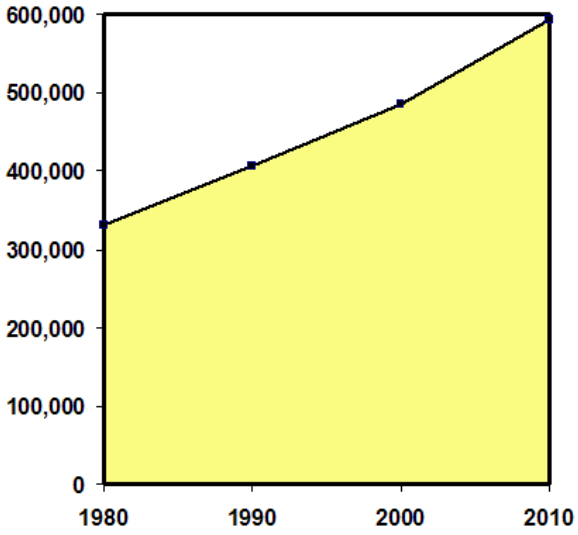
4) The relationship that exists between average household size and dwelling unit size for single-family dwelling units that can be used to vary the amount of the fee assessed by the size of the unit constructed;

5) Estimates for 2003 dwelling units by type (i.e. single-family, multi-family or mobile home) for the City of Tucson based on the number of building permits issued over the last three years; and

6) Existing residential and nonresidential land use data.

POPULATION

Figure 13
TUCSON'S POPULATION, 1980-2010



Tucson, the county seat of Pima County, is the second largest city in Arizona. The City originally incorporated as a two-square-mile village in 1877. It has now grown to accommodate approximately 226 square miles. The 2000 U.S. Census recorded the City's population as 486,699.

Tucson is currently the 30th largest city in the nation. Over the past two decades, Tucson's population growth has decreased slightly, from 2.06 percent a year in the 1980s to 1.84 percent annually in the 1990s. However, of the 57 cities in the nation that were at least 300,000 in population in 2000, Tucson was the 14th fastest-growing during the 1990s.

Pima County's population growth has remained remarkably constant over the last two decades. Since 1980, Pima County's population has increased by about 2.3 percent annually. The towns of Oro Valley and Marana have experienced exceptionally-rapid growth during the last two decades and were the two fastest growing incorporated communities in the State of Arizona during the 1990s.

According to population projections provided by the City's Comprehensive Planning Task Force, Tucson's population is expected to grow at about 1.99 percent a year over the next decade. In 2010, Tucson's population is expected to be about 592,672.

Table 19
PIMA COUNTY POPULATION GROWTH

					Annual Growth Rate		
Jurisdiction	1980	1990	2000	2010	80-90	90-00	00-10
Tucson	330,537	405,390	486,699	592,672	2.06%	1.84%	1.99%
Oro Valley	1,489	6,670	29,700	44,191	16.18%	16.11%	4.05%
Marana	1,674	2,187	13,556	41,480	2.71%	20.01%	11.83%
South Tucson	6,554	5,093	5,490	5,800	-2.49%	0.75%	0.55%
Sahuarita	na	1,622	3,242	24,094	na	7.17%	22.21%
Unincorporated	191,189	245,918	305,059	352,344	2.55%	2.18%	1.45%
Total	531,443	666,880	843,746	1,060,581	2.30%	2.38%	2.31%

Source: City of Tucson Comprehensive Planning Task Force, May 22, 2003, memorandum.

AVERAGE HOUSEHOLD SIZE

When calculating an impact fee, data on average household size for various types of housing units is a critical component. The most recent and reliable data on average household size in the City of Tucson is the 2000 U.S. Census. As shown in Table 20 below, average household size varies significantly by housing type, ranging from 2.04 persons per multi-family unit to 2.76 persons per single-family detached unit.

Table 20
AVERAGE HOUSEHOLD SIZE BY HOUSING TYPE

Housing Type	Household Population	Occupied Units	Avg. HH Size
Single-Family Detached	269,684	97,843	2.76
Multi-Family	165,644	81,361	2.04
Mobile home	31,127	13,127	2.37
All Housing Types	466,455	192,331	2.43

Source: 2000 U.S. Census for the City of Tucson, Summary File 3 (sample data).

For single-family units, the City may desire to vary the fees by the size of the dwelling unit. While the Census Bureau does not collect data on the square footage of dwelling units, it does collect data on the number of rooms in the unit, a characteristic that is related to dwelling unit size. The Census Bureau defines rooms as excluding hallways, bathrooms, porches and unfinished attics and basements. The most recent and reliable data on average household size by number of rooms is the five percent sample data from 1990 U.S. Census. The five percent sample data for the City of Tucson is combined with sample data for some other cities and unincorporated portions of Pima County. However, of the data analyzed, the City of Tucson makes up 91 percent of the total sample. The results obtained should therefore be representative of the City of Tucson.

The average household size for all single-family units from the 1990 sample data for Pima County is somewhat higher than the 2000 figure for the City of Tucson (2.91 versus 2.76), indicating that the 1990 sample data for Pima County could be over-estimating actual 2000 average household size by number of rooms. During Phase Two of the study, the consultant will consider adjusting the sample data to account for this difference in average household size.

As can be seen in Table 21, average household size is strongly related to the number of rooms in the dwelling unit. For example, a single-family detached unit with than four rooms or fewer has an average of only 2.47 persons, while a unit with more than nine rooms averages 3.54 residents.

Table 21
SINGLE-FAMILY HOUSEHOLD SIZE BY ROOMS

Housing Type	Sample Households	Weighted Population	Weighted Households	Avg. HH Size
Single-Family, 4 Rooms or Fewer	730	38,282	15,491	2.47
Single-Family, 5 Rooms	963	54,062	19,795	2.73
Single-Family, 6 Rooms	1,134	69,323	22,882	3.03
Single-Family, 7 Rooms	690	41,906	13,655	3.07
Single-Family, 8 Rooms	324	21,087	6,239	3.38
Single-Family, 9 Rooms or More	223	15,980	4,509	3.54
All Single-Family Detached Units	4,064	240,640	82,571	2.91

Source: U.S. Census Bureau, 1990 Public Use Microdata Sample (PUMS), 5 percent weighted sample data for portions of Pima County including the City of Tucson (PUMAs 203, 204 and 205) for households occupying single-family detached units.

If the calculated fees are based on dwelling unit size, it is recommended that the fees be based on square footage rather than number of rooms. This cost per square foot approach will not only avoid any type of confusion that might arise when trying to establish how many rooms a new unit might have, it also avoids sharp jumps in the fee that will occur at thresholds between the different size categories.

To determine a relationship between the average square footage of single-family detached units and number of rooms, the consultant analyzed Pima County Tax Assessor data for the 2004 tax year. Tax Assessor data gives total living space in square feet and the total number of rooms for the majority of single-family homes in the City of Tucson. The results are summarized in Table 22.

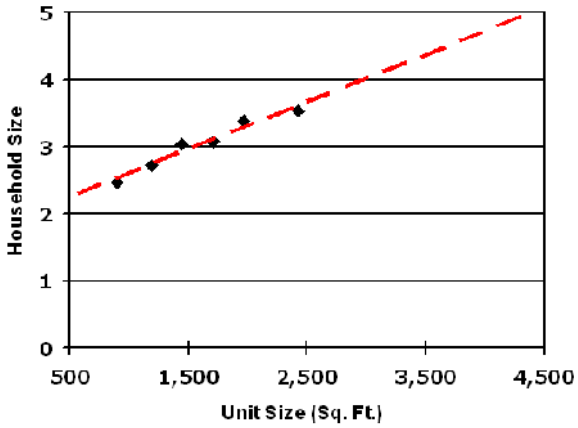
Table 22
SINGLE-FAMILY DWELLING UNIT SIZE BY ROOMS

Housing Type	Sq. Ft.	Units	Avg. Unit Size (sq. ft.)
Single-Family, 4 Rooms or Fewer	8,849,517	9,914	893
Single-Family, 5 Rooms	30,946,226	26,055	1,188
Single-Family, 6 Rooms	42,263,699	29,393	1,438
Single-Family, 7 Rooms	34,625,229	20,264	1,709
Single-Family, 8 Rooms	18,357,918	9,328	1,968
Single-Family, 9 Rooms or More	12,958,325	5,351	2,422
All Single-Family Detached Units	148,000,914	100,305	1,476

Source: Pima County Tax Assessor data for single-family detached units in the City of Tucson for the 2004 tax year, April 2003.

These data on average household size by number of rooms and dwelling unit size by number of rooms could be used to develop impact fees that vary by the square footage of the single-family unit. Regression analysis can be used to determine a trend line that best fits the six data point (corresponding to the average four-room, five-room, six-room, seven-room, eight-room and nine or more room house, which are shown as squares in Figure 14). The resulting linear equation (shown as the dashed line in Figure 14) shows the relationship between household size and dwelling unit size for single-family unit, and explains 96 percent of the variance.[13] The graphed relationship shows that there is a strong correlation between household size and unit size, and that the larger the unit the more people it is likely to contain.

Figure 14
HOUSEHOLD SIZE BY UNIT SIZE



EXISTING RESIDENTIAL UNITS

Estimating the number of existing residential dwelling units is a key building block for any impact fee analysis, since it is essential for determining the existing level of service. This is critical because a fundamental principle of impact fees is that new development should not be charged for higher level of service than is being provided to existing development. Without an accurate estimate of existing residential units, it is impossible to accurately determine the existing level of service.

To estimate existing residential units, the consultant first analyzed the number of building permits issued since 2000. Over the last three years, the City has issued 7,765 permits for single-family detached units, 2,459 multi-family permits and 1,717 permits for mobile homes, for total of 11,941 new residential units.

Table 23
RESIDENTIAL BUILDING PERMITS, 2000-2002

Housing Type	2000	2001	2002	Total
Single-Family Detached	2,876	2,534	2,355	7,765
Multi-Family	847	910	702	2,459
Mobile Home	559	611	547	1,717
Total	4,282	4,055	3,604	11,941

Source: City of Tucson Planning Department, May 8, 2003 memorandum.

The consultant then added the number of new building permits issued over the last three years to the number of housing units recorded in the 2000 U.S. Census. Since the census enumeration occurred in April 2000, adding three years of building permits yields a reasonable estimate of dwelling units as of

[13] The equation is y = 0.000706 * (x) + 1.905448, where y is the household size and x is the floor area of the unit in square feet; the R^2 is 0.96, the adjusted R^2 is 0.95 and the T-statistics are 15.82 for the intercept and 9.84 for the coefficient.

approximately April 2003. It is estimated Tucson currently has about 109,788 single-family units, 92,988 multi-family units and 18,042 mobile homes, for a total of about 220,818 existing dwelling units.

Table 24
RESIDENTIAL UNITS BY TYPE, 2003

Housing Type	2000 Units	2000-2002 Permits	2003 Estimate
Single-Family Detached	102,023	7,765	109,788
Multi-Family	90,529	2,459	92,988
Mobile Home	16,325	1,717	18,042
Total	208,877		220,818

Source: 2000 units from the U.S. Census; 2000-2002 building permits by housing type from Table 23.

EXISTING BUILDING FLOOR AREA

In addition to estimating existing residential units, it will also be necessary to estimate existing residential and nonresidential floor area in the City of Tucson. The consultant was able to obtain residential and nonresidential floor area for existing parcels of land in Pima County from the County Tax Assessor. Corresponding land use codes were retrieved from the Pima County Department of Transportation. Using Arc View GIS, the two raw data files were joined together using corresponding parcel identification numbers. The joined data files were then queried to identify only those parcels in the City of Tucson. The parcels in the city were then organized into the following land use categories: single-family detached; multi-family; mobile home; commercial/retail; office; institutional; warehouse and industrial.

The square footage for existing single-family detached units in the City of Tucson was estimated by summing the total living area for all applicable parcels, the results are presented in Table 22 above. An estimate of existing multi-family and mobile home floor area was not determined due to the presence of numerous multi-family and mobile home parcels with the same parcel identification number. This caused the square footage for some multi-family and mobile home parcels to be counted more than once, thus vastly over-estimating the total floor area for these two land use categories. An alternative approach will need to be used to estimate the total floor area for multi-family and mobile home units. For example, an average unit size for both multi-family and mobile homes could be estimated, which could then be multiplied by the total number of existing multi-family and mobile home units calculated in Table 24 above.

The square footage for existing nonresidential development in the City of Tucson was estimated by summing the total square footage for all applicable parcels. Spot checks of individual parcels revealed that the Tax Assessor data was undercounting square footage for major public uses, such as the University of Arizona, public elementary and secondary schools and the Davis Monthan Air Force Base. The results after several corrections to obvious under-counts are presented in Table 25 below. It is estimated that the city currently has about 110 million square feet of nonresidential development, of which 44 million square feet is commercial/retail space, 17 million square feet is office space, 26 million is institutional space and 23 million is industrial/warehouse space.

Table 25
NONRESIDENTIAL LAND USE, 2003

Land Use	Existing Sq. Ft.
Banks, Savings and Loan and Credit Union	581,950
Car/Truck Wash	132,461
Club or Lodge	674,075
Convenience Store	474,608
Health and Fitness Club	174,847
Hotel/Motel	5,219,799
Mixed Use	617,087
Nightclub/Bar	359,007
Restaurant, Fast Food	452,173
Restaurant, Sit-down	946,359
Service Station, Auto and Truck Repair	1,073,679
Theaters and Amusement Facilities	912,033
Vehicle Sales, Leasing, Storage, Parts	1,894,948
Shopping Center/Misc. Retail	30,048,873
Subtotal, Commercial/Retail	43,561,899
Office, Medical	6,853,319
Office, General	10,539,679
Subtotal, Office	17,392,998
Care Facilities	2,238,470
Church, Cemetery, Mausoleum	1,102,415
Day Care/Preschool Center	291,424
Hospital	688,708
Police/Fire Facility	345,515
Private Academic School	44,688
Private Vocational School	42,684
Religious-Owned School	1,208,858
Community College/University (1)	12,602,517
Public Elementary and Secondary School (2)	7,224,925
Subtotal, Institutional	25,790,204
Mini-Storage	2,878,385
Warehousing, Truck Terminal and Cold Storage	13,673,280
Manufacturing and Industrial	6,806,543
Subtotal, Industrial and Warehousing	23,358,208
Total Nonresidential Square Footage	110,103,309

Notes: (1) 9 million square feet added per Comprehensive Planning Task Force, May 20, 2003 memorandum, to correct Tax Assessor undercount; (2) 2.6 million square feet added to correct Tax Assessor undercount based on comparison with reliable data on public schools from Lee County, Florida (440,000 population in 2000).
Source: Square footage data from Pima County Tax Assessor database for 2004 Tax Year; land use codes from the Pima County Department of Transportation-Geographic Information Systems.