

# Appendix A: Demographic Estimates and Development Projections

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## Appendix A: Demographic and Development Memo

As specified in Task 1 of our Work Scope, TischlerBise has prepared documentation on current demographic *estimates* and development *projections* that will be used in the development fee study. The demographic data estimates are for July 1, 2006 (the beginning of FY2007) and are used in calculating current levels-of-service (LOS). The development projections are used primarily for the purpose of having an understanding of future LOS, development fee revenues, and capital expenditures. Our recommended approach is to forecast housing units and employment (by place of work) and then derive all other demand factors from these key demand indicators.

The demographic estimates and development projections are broken down by the six special planning areas (SPA) established by the City. The City's CIP and several of the development fee categories are differentiated by SPA. In order to better meet the rational nexus requirements of development fees, the demographic estimates and development projections are presented on a SPA basis.

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

### **PERSONS PER HOUSEHOLD**

A differentiation by type of housing is necessary to make residential development fees proportionate and reasonably related to the demand for public facilities. Household size is an important demographic factor that helps account for variations in service demand by type of housing. The best source of this data is the 2000 U.S. Census, Summary File 3. The data for Surprise are shown in Figure A-1 below.

**Figure A-1: Estimated Household Size in Surprise**

Units in Structure	Owner-Occupied			Renter-Occupied			Combined			Hsg Units
	Persons	Hsehlds	PPH	Persons	Hsehlds	PPH	Persons	Hsehlds	PPH	
1-Detached	23,307	9337	2.50	1,801	584	3.08	25,108	9,921	2.53	11,620
1-Attached	344	182	1.89	299	100	2.99	643	282	2.28	483
Two	49	4	12.25	121	67	1.81	170	71	2.39	86
3-4	46	31	1.48	321	108	2.97	367	139	2.64	151
5-9	81	38	2.13	133	61	2.18	214	99	2.16	162
10-19	103	55	1.87	159	70	2.27	262	125	2.10	322
20-49	9	5	1.80	239	139	1.72	248	144	1.72	294
50 or more	24	13	1.85	439	238	1.84	463	251	1.84	363
Mobile Homes	2,490	1107	2.25	315	106	2.97	2,805	1,213	2.31	2,200
Other	469	242	1.94	13	15	0.87	482	257	1.88	626
<b>Total</b>	<b>26,922</b>	<b>11,014</b>	<b>2.44</b>	<b>3,840</b>	<b>1,488</b>	<b>2.58</b>	<b>30,762</b>	<b>12,502</b>	<b>2.46</b>	<b>16,307</b>
								Vacant HU		3,805
								Vacancy Rate		23.3%

Source: 2000 US Census data from Summary File 3 for City of Surprise.

**Persons Per Household by Type in 2000**

	Persons	Hsehlds	PPH	Hhld Mix
Single Family Detached*	25,108	9,921	2.53	79.4%
SFA - 9 units in structure**	1,394	591	2.36	4.7%
10 units or more in structure or more***	973	520	1.87	4.2%
All Other Types of Housing****	3,287	1,470	2.24	11.8%
Total Less Group Quarters	30,762	12,502	2.46	100.00%
Group Quarters	124			
<b>TOTAL</b>	<b>30,886</b>			

\* 1-Detached; Owner-Occupied and Renter-Occupied.

\*\* 1-Attached, Two, 3-4, 5-9; Owner-Occupied and Renter-Occupied

\*\*\* 10-19, 20-49, 50 or more; Owner-Occupied and Renter-Occupied

\*\*\*\* Mobile Homes, Other; Owner-Occupied and Renter-Occupied.

**HOUSING UNIT ESTIMATES AND PROJECTIONS**

The total number of completed housing units in the City on July 1, 2006 is estimated to be 49,914. This number is derived by adding the number of units completed since July 1, 2002 through July 1, 2005. For the number of units completed in FY2006, TischlerBise used the number of permits issued from July 1, 2005 through December 31, 2005. This approach assumes there is a six month lag between when a permit is issued and the house is completed and ready for occupancy. This figure is also consistent with the historical trend of housing units completed from FY2002 to FY2005.

**Figure A-2: Current Estimate of Housing Units – Citywide Basis**

	July 1, 2002*	FY2002**	FY2003**	FY2004**	FY2005**	FY2006***	TOTAL
Single Family Detached Housing Units	20,460	2,825	2,999	4,794	6,175	6,407	43,660
Single Family Attached/Multi-family/All Other Housing Units	5,341	20	435	292	111	57	6,254
<b>TOTAL</b>	<b>25,801</b>	<b>2,845</b>	<b>3,433</b>	<b>5,086</b>	<b>6,285</b>	<b>6,464</b>	<b>49,914</b>

\* Tischler & Associates, *Development Fee Study*, City of Surprise, 2003

\*\* Net Residential Unit Completed, Maricopa Association of Government as reported by City of Surprise.

\*\*\* City of Surprise, Permits Issued July 1, 2005 through December 31, 2005.

To allocate the estimated 49,914 housing units among the six SPA's, TischlerBise used percentage allocations modified by the City Finance Department from HDR, Inc. in their *Costing the General Plan* report. This is shown in Figure A-3 below.

**Figure A-3: Current Estimate of Housing Units – By SPA**

	<i>Allocation</i>	<i>Housing</i>
	%	Units
SPA 1		
Single Family Detached Housing Units	90.6%	39,538
Single Family Attached/Multi-family/ All Other Housing Units	79.5%	4,972
<b>Total Housing Units SPA 1</b>		<b>44,510</b>
SPA 2		
Single Family Detached Housing Units	7.4%	3,232
Single Family Attached/Multi-family/ All Other Housing Units	0.0%	0
<b>Total Housing Units SPA 2</b>		<b>3,232</b>
SPA 3		
Single Family Detached Housing Units	1.7%	744
Single Family Attached/Multi-family/ All Other Housing Units	20.5%	1,282
<b>Total Housing Units SPA 3</b>		<b>2,026</b>
SPA 4		
Single Family Detached Housing Units	0.0%	0
Single Family Attached/Multi-family/ All Other Housing Units	0.0%	0
<b>Total Housing Units SPA 4</b>		<b>0</b>
SPA 5		
Single Family Detached Housing Units	0.3%	147
Single Family Attached/Multi-family/ All Other Housing Units	0.0%	0
<b>Total Housing Units SPA 5</b>		<b>147</b>
SPA 6		
Single Family Detached Housing Units	0.0%	0
Single Family Attached/Multi-family/ All Other Housing Units	0.0%	0
<b>Total Housing Units SPA 6</b>		<b>0</b>
TOTAL CITY		
Single Family Detached Housing Units	100.0%	43,660
Single Family Attached/Multi-family/ All Other Housing Units	100.0%	6,254
<b>TOTAL</b>		<b>49,914</b>

\* Costing the General Plan, Table P-7, HDR, Inc., modified by City of Surprise Finance Department.

\*\* Total housing units taken from Figure A-2.

To project the number of housing units by type by SPA, TischlerBise used the annual growth rates used by HDR, Inc. in their *Costing the General Plan* report. This is shown in Figure A-4 below.

**Figure A-4: Housing Unit Projections – By SPA**

	Fiscal Year =>	2007	2008	2009	2010	2011	5 Year Increments			
							2012	2017	2022	2027
<b>SPA 1</b>										
Single Family Detached Housing Units		39,538	42,345	45,352	48,572	52,020	54,941	57,306	57,823	57,823
Single Family Attached/Multi-family/All Other Housing Units		4,972	5,279	5,605	5,952	6,322	6,649	6,845	7,010	7,010
<b>Total Housing Units SPA 1</b>		<b>44,510</b>	<b>47,624</b>	<b>50,957</b>	<b>54,524</b>	<b>58,342</b>	<b>61,589</b>	<b>64,151</b>	<b>64,833</b>	<b>64,833</b>
<b>SPA 2</b>										
Single Family Detached Housing Units		3,232	3,742	4,333	5,018	5,811	6,424	11,624	26,222	31,293
Single Family Attached/Multi-family/All Other Housing Units		0	0	0	0	0	0	0	0	0
<b>Total Housing Units SPA 2</b>		<b>3,232</b>	<b>3,742</b>	<b>4,333</b>	<b>5,018</b>	<b>5,811</b>	<b>6,424</b>	<b>11,624</b>	<b>26,222</b>	<b>31,293</b>
<b>SPA 3</b>										
Single Family Detached Housing Units		744	1,001	1,348	1,815	2,444	2,879	5,221	7,421	10,409
Single Family Attached/Multi-family/All Other Housing Units		1,282	1,726	2,324	3,129	4,213	4,963	8,743	14,856	15,652
<b>Total Housing Units SPA 3</b>		<b>2,026</b>	<b>2,727</b>	<b>3,672</b>	<b>4,944</b>	<b>6,656</b>	<b>7,842</b>	<b>13,964</b>	<b>22,277</b>	<b>26,061</b>
<b>SPA 4</b>										
Single Family Detached Housing Units		0	0	0	0	0	0	613	1,954	3,623
Single Family Attached/Multi-family/All Other Housing Units		0	0	0	0	0	0	0	0	0
<b>Total Housing Units SPA 4</b>		<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>613</b>	<b>1,954</b>	<b>3,623</b>
<b>SPA 5</b>										
Single Family Detached Housing Units		147	264	360	512	785	1,233	2,193	3,900	6,003
Single Family Attached/Multi-family/All Other Housing Units		0	0	0	0	0	0	0	0	0
<b>Total Housing Units SPA 5</b>		<b>147</b>	<b>264</b>	<b>360</b>	<b>512</b>	<b>785</b>	<b>1,233</b>	<b>2,193</b>	<b>3,900</b>	<b>6,003</b>
<b>SPA 6</b>										
Single Family Detached Housing Units		0	0	0	0	832	1,033	1,790	3,116	3,722
Single Family Attached/Multi-family/All Other Housing Units		0	0	0	0	0	0	0	0	0
<b>Total Housing Units SPA 6</b>		<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>832</b>	<b>1,033</b>	<b>1,790</b>	<b>3,116</b>	<b>3,722</b>
<b>TOTAL CITY</b>										
Single Family Detached Housing Units		43,660	47,352	51,393	55,916	61,892	66,510	78,747	100,436	112,874
Single Family Attached/Multi-family/All Other Housing Units		6,254	7,005	7,929	9,081	10,534	11,612	15,589	21,866	22,662
<b>TOTAL</b>		<b>49,914</b>	<b>54,357</b>	<b>59,322</b>	<b>64,997</b>	<b>72,426</b>	<b>78,121</b>	<b>94,335</b>	<b>122,301</b>	<b>135,536</b>

\*2007 data from Figure A-3.  
Annual growth rates 2008-2027 taken from *Costing the General Plan*, Table P-7, HDR, Inc.

## **HOUSEHOLD & POPULATION ESTIMATES AND PROJECTIONS**

As shown in Figure A-1, Surprise has a high residential vacancy rate as a result of the large number of homes for seasonal use during the winter months. A peak population figure should be used in the development fee calculations since it is this peak population for which the City must provide and plan its infrastructure. This same approach is used in the City's current development fees.

To calculate the peak population, TischlerBise recommends using the same methodology currently used in the City's development fees which utilizes an average vacancy rate of 7.13% from the 2000 Census for the nearby communities of Avondale, Glendale, Goodyear, and Peoria. This vacancy rate is used to convert the total number of housing units by type into "peak households" by type. The number of "peak households" for each category of housing is then multiplied by the number of persons per household from Figure 1 to determine the "peak population". As shown in the lower right corner of Figure A-5, the estimated peak population in the City on July 1, 2006 is estimated to be 115,339 persons.

**Figure A-5: Household & Population Estimate - Citywide**

	<i>Total Housing Units*</i>		<i>Peak Vacancy Rate**</i>	=	<i>Total Households</i>		<i>PPH***</i>	=	<i>Population</i>
Single Family Detached Housing Units	43,660	x	7.13%	=	40,547	x	2.53	=	102,616
Single Family Attached/Multi-family/All Other Housing Units	6,254	x	7.13%	=	5,808	x	2.19	=	12,724
<b>TOTAL</b>	<b>49,914</b>				<b>46,355</b>				<b>115,339</b>

\* Taken from Figure A-2.

\*\* Tischler & Associates, *Development Fee Study*, City of Surprise, 2003

\*\*\* Taken from Figure A-1.

To allocate the estimated 115,339 persons among the six SPA's, TischlerBise applied the peak household rate of 7.13% to the estimated number of housing units by SPA in Figure A-3. The number of peak households by SPA is then multiplied by the corresponding number of persons per household for each type of housing unit. The results are shown below.

**Figure A-6: Population Estimate – By SPA**

	2007
SPA 1	
Single Family Detached Population	92,928
Single Family Attached/Multi-family/ All Other Population	10,115
<b>Total SPA 1 Population</b>	<b>103,043</b>
SPA 2	
Single Family Detached Population	7,595
Single Family Attached/Multi-family/ All Other Population	0
<b>Total SPA 2 Population</b>	<b>7,595</b>
SPA 3	
Single Family Detached Population	1,748
Single Family Attached/Multi-family/ All Other Population	2,608
<b>Total SPA 3 Population</b>	<b>4,356</b>
SPA 4	
Single Family Detached Population	0
Single Family Attached/Multi-family/ All Other Population	0
<b>Total SPA 4 Population</b>	<b>0</b>
SPA 5	
Single Family Detached Population	345
Single Family Attached/Multi-family/ All Other Population	0
<b>Total SPA 5 Population</b>	<b>345</b>
SPA 6	
Single Family Detached Population	0
Single Family Attached/Multi-family/ All Other Population	0
<b>Total SPA 6 Population</b>	<b>0</b>
TOTAL CITY	
Single Family Detached Population	102,615
Single Family Attached/Multi-family/ All Other Population	12,723
<b>Total City Population</b>	<b>115,339</b>

To project the number of peak households and peak population, the average vacancy rate of 7.13% is applied total number of projected housing units by type by SPA from Figure A-4. The projected number of peak households for each housing category is then multiplied by the number of persons per household to derive the population from each type.

**Figure A-7: Population Projections – By SPA**

	Fiscal Year =>	2007	2008	2009	2010	2011	5 Year Increments			
							2012	2017	2022	2027
<b>SPA 1</b>										
Single Family Detached Population		92,928	99,526	106,592	114,160	122,266	129,129	134,689	135,904	135,904
Single Family Attached/Multi-family/All Other Population		10,115	10,740	11,404	12,110	12,861	13,526	13,926	14,261	14,261
<b>Total SPA 1 Population</b>		<b>103,043</b>	<b>110,266</b>	<b>117,996</b>	<b>126,270</b>	<b>135,126</b>	<b>142,655</b>	<b>148,615</b>	<b>150,165</b>	<b>150,165</b>
<b>SPA 2</b>										
Single Family Detached Population		7,595	8,795	10,184	11,793	13,657	15,098	27,320	61,632	73,549
Single Family Attached/Multi-family/All Other Population		0	0	0	0	0	0	0	0	0
<b>Total SPA 2 Population</b>		<b>7,595</b>	<b>8,795</b>	<b>10,184</b>	<b>11,793</b>	<b>13,657</b>	<b>15,098</b>	<b>27,320</b>	<b>61,632</b>	<b>73,549</b>
<b>SPA 3</b>										
Single Family Detached Population		1,748	2,353	3,168	4,266	5,744	6,767	12,270	17,443	24,465
Single Family Attached/Multi-family/All Other Population		2,608	0	0	0	0	0	0	0	0
<b>Total SPA 3 Population</b>		<b>4,356</b>	<b>2,353</b>	<b>3,168</b>	<b>4,266</b>	<b>5,744</b>	<b>6,767</b>	<b>12,270</b>	<b>17,443</b>	<b>24,465</b>
<b>SPA 4</b>										
Single Family Detached Population		0	0	0	0	0	0	1,441	4,592	8,516
Single Family Attached/Multi-family/All Other Population		0	0	0	0	0	0	0	0	0
<b>Total SPA 4 Population</b>		<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1,441</b>	<b>4,592</b>	<b>8,516</b>
<b>SPA 5</b>										
Single Family Detached Population		345	620	847	1,203	1,845	2,899	5,155	9,165	14,110
Single Family Attached/Multi-family/All Other Population		0	0	0	0	0	0	0	0	0
<b>Total SPA 5 Population</b>		<b>345</b>	<b>620</b>	<b>847</b>	<b>1,203</b>	<b>1,845</b>	<b>2,899</b>	<b>5,155</b>	<b>9,165</b>	<b>14,110</b>
<b>SPA 6</b>										
Single Family Detached Population		0	0	0	0	1,956	2,429	4,208	7,324	8,749
Single Family Attached/Multi-family/All Other Population		0	0	0	0	0	0	0	0	0
<b>Total SPA 6 Population</b>		<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1,956</b>	<b>2,429</b>	<b>4,208</b>	<b>7,324</b>	<b>8,749</b>
<b>TOTAL CITY</b>										
Single Family Detached Population		102,615	111,294	120,792	131,422	145,467	156,321	185,083	236,059	265,293
Single Family Attached/Multi-family/All Other Population		12,723	10,740	11,404	12,110	12,861	13,526	13,926	14,261	14,261
<b>Total City Population</b>		<b>115,339</b>	<b>122,034</b>	<b>132,195</b>	<b>143,532</b>	<b>158,328</b>	<b>169,847</b>	<b>199,009</b>	<b>250,320</b>	<b>279,554</b>

Population figure are calculated by multiplying the projected housing units in Figure 4 by the peak vacancy rate of 7.13% then multiplying the corresponding persons per household from Figure A-5.

## **NONRESIDENTIAL MULTIPLIERS**

In addition to data on residential development, the calculation of development fees requires data on nonresidential construction in Surprise. To convert employment projections to gross floor area of nonresidential development, average square feet per employee multipliers are used. The multipliers shown in Figure A-8 are derived from national data published by the Institute of Transportation Engineers (ITE) and the Urban Land Institute (ULI).

These multipliers are also used to calculate the number of average weekday vehicle trips from nonresidential development in Surprise.

**Figure A-8: Floor Area per Employee and Nonresidential Trip Rates**

ITE Code	Land Use / Size	Demand Unit	PM-Peak Trip Ends Per Dmd Unit*	Wkdy Trip Ends Per Dmd Unit*	Wkdy Trip Ends Per Employee*	Emp Per Dmd Unit**	Sq Ft Per Emp
<b>Commercial / Shopping Center</b>							
820	25K gross leasable area	1,000 Sq Ft	10.03	110.32	na	3.33	300
820	50K gross leasable area	1,000 Sq Ft	7.92	86.56	na	2.86	350
820	100K gross leasable area	1,000 Sq Ft	6.26	67.91	na	2.50	400
820	<b>200K gross leasable area</b>	<b>1,000 Sq Ft</b>	<b>4.95</b>	<b>53.28</b>	<b>na</b>	<b>2.22</b>	<b>450</b>
820	400K gross leasable area	1,000 Sq Ft	3.91	41.80	na	2.00	500
<b>General Office</b>							
710	10K gross floor area	1,000 Sq Ft	9.00	22.66	5.06	4.48	223
710	25K gross floor area	1,000 Sq Ft	4.27	18.35	4.43	4.15	241
710	<b>50K gross floor area</b>	<b>1,000 Sq Ft</b>	<b>2.70</b>	<b>15.65</b>	<b>4.00</b>	<b>3.91</b>	<b>256</b>
710	100K gross floor area	1,000 Sq Ft	1.91	13.34	3.61	3.69	271
710	200K gross floor area	1,000 Sq Ft	1.52	11.37	3.26	3.35	287
<b>Industrial</b>							
770	<b>Business Park***</b>	<b>1,000 Sq Ft</b>	<b>1.29</b>	<b>12.76</b>	<b>4.04</b>	<b>3.16</b>	<b>317</b>
151	Mini-Warehouse	1,000 Sq Ft	0.29	2.50	56.28	0.04	22,512
150	Warehousing	1,000 Sq Ft	0.61	4.96	3.89	1.28	784
140	Manufacturing	1,000 Sq Ft	0.75	3.82	2.13	1.79	558
110	Light Industrial	1,000 Sq Ft	1.08	6.97	3.02	2.31	433
<b>Other Nonresidential</b>							
720	Medical-Dental Office	1,000 Sq Ft	4.45	36.13	8.91	4.05	247
620	Nursing Home	bed	0.30	2.37	6.55	0.36	na
610	Hospital	1,000 Sq Ft	1.61	17.57	5.20	3.38	296
565	Day Care	student	0.82	4.48	28.13	0.16	na
530	High School	student	0.28	1.71	19.74	0.09	na
520	Elementary School	student	0.28	1.29	15.71	0.08	na
320	Lodging	room	0.56	5.63	12.81	0.44	na

\* Trip Generation, Institute of Transportation Engineers, 2003.

\*\* Employees per demand unit calculated from trip rates, except for Shopping Center data, which are derived from Development Handbook and Dollars and Cents of Shopping Centers, published by the Urban Land Institute.

\*\*\* According to ITE, a Business Park is a group of flex-type buildings served by a common roadway system. The tenant space includes a variety of uses with an average mix of 20-30% office/commercial and 70-80% industrial/warehousing.

## **NONRESIDENTIAL SQUARE FOOTAGE & JOB ESTIMATES AND PROJECTIONS**

The most recent estimate of nonresidential square footage for each major category of nonresidential development in Surprise is shown in Figure 9 below based on permit data from the City. The estimated 7,135,761 square feet are divided by the square feet per job figures from Figure A-8 above, which yields an estimated 17,725 jobs in Surprise.

**Figure A-9: Job & Nonresidential Square Footage Estimates – Citywide**

	<i>Square Feet*</i>	<i>Square Feet/ Employee**</i>	<i>Estimated Jobs</i>
Commercial	3,170,290	450	7,045
Public Facilities			
Church	235,745	452	522
Government	176,737	173	1,022
Healthcare	301,751	296	1,019
Education	1,301,909	1,084	1,201
Public Facilities Subtotal	2,016,142	536	3,764
Employment			
Office	1,020,738	256	3,987
Industrial/Flex	928,591	317	2,929
Employment Subtotal	1,949,329	282	6,917
<b>TOTAL</b>	<b>7,135,761</b>		<b>17,725</b>

\* City of Surprise permit data.

\*\* *Trip Generation Manual*, ITE, 2003.

To allocate the estimated 7,135,761 square feet of nonresidential development among the six SPA's, TischlerBise used percentage allocations used by HDR, Inc. in their *Costing the General Plan* report modified by the City Finance Department. This is shown in Figure A-10 below.

**Figure A-10: Job & Nonresidential Square Footage Estimates – By SPA**

	<i>Allocation</i>	<i>Square</i>
	<i>%*</i>	<i>Feet</i>
SPA 1		
Commercial	93.1%	2,952,588
Employment	86.4%	1,684,804
Public Facilities	24.1%	486,775
<b>SPA 1 TOTAL</b>		<b>5,124,168</b>
SPA 2		
Commercial	0.4%	13,500
Employment	8.1%	157,931
Public Facilities	0.8%	15,537
<b>SPA 2 TOTAL</b>		<b>186,968</b>
SPA 3		
Commercial	4.9%	154,873
Employment	3.9%	76,721
Public Facilities	70.8%	1,428,043
<b>SPA 3 TOTAL</b>		<b>1,659,636</b>
SPA 4		
Commercial	0.0%	0
Employment	0.0%	0
Public Facilities	0.0%	0
<b>SPA 4 TOTAL</b>		<b>0</b>
SPA 5		
Commercial	1.6%	49,328
Employment	1.5%	29,873
Public Facilities	4.3%	85,788
<b>SPA 5 TOTAL</b>		<b>164,989</b>
SPA 6		
Commercial	0.0%	0
Employment	0.0%	0
Public Facilities	0.0%	0
<b>SPA 6 TOTAL</b>		<b>0</b>
TOTAL CITY		
Commercial	100.0%	3,170,290
Employment	100.0%	1,949,329
Public Facilities	100.0%	2,016,142
<b>TOTAL</b>		<b>7,135,761</b>

\* *Costing the General Plan*, Table P-8, HDR, Inc.

\*\* Total square feet by type taken from Figure A-9.

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To project the amount of nonresidential development by type by SPA, TischlerBise used the annual growth rates used by HDR, Inc. in their *Costing the General Plan* report modified by the City Finance Department. This is shown in Figure A-11 below.

**Figure A-11: Nonresidential Square Footage Projections – By SPA**

Fiscal Year =>	2007	2008	2009	2010	2011	5 Year Increments				
						2012	2017	2022	2027	
<b>SPA 1</b>										
Commercial	2,952,588	3,162,222	3,162,222	3,386,740	3,595,540	3,814,180	4,064,935	4,217,225	4,217,225	
Employment	1,684,804	1,804,425	1,804,425	1,932,540	2,051,685	2,176,445	2,319,531	2,406,431	2,406,431	
Public Facilities	486,775	519,530	519,530	554,550	586,797	620,459	657,076	676,527	676,527	
<b>SPA 1 TOTAL</b>	<b>5,124,168</b>	<b>5,486,177</b>	<b>5,486,177</b>	<b>5,873,829</b>	<b>6,234,022</b>	<b>6,611,084</b>	<b>7,041,542</b>	<b>7,300,182</b>	<b>7,300,182</b>	
<b>SPA 2</b>										
Commercial	13,500	17,010	19,486	24,553	30,667	38,272	76,094	355,941	614,400	
Employment	157,931	182,410	191,548	221,238	253,299	289,777	456,575	591,448	637,965	
Public Facilities	15,537	17,945	18,844	21,764	24,918	28,507	44,916	109,278	117,872	
<b>SPA 2 TOTAL</b>	<b>186,968</b>	<b>217,365</b>	<b>229,878</b>	<b>267,555</b>	<b>308,885</b>	<b>356,556</b>	<b>577,585</b>	<b>1,056,667</b>	<b>1,370,237</b>	
<b>SPA 3</b>										
Commercial	154,873	204,432	245,341	323,850	423,751	554,029	924,185	1,469,226	2,313,468	
Employment	76,721	101,271	121,536	160,428	209,917	274,453	457,820	727,822	1,447,713	
Public Facilities	1,428,043	1,763,143	1,763,302	1,939,632	2,114,974	2,304,333	3,015,381	3,015,381	3,015,381	
<b>SPA 3 TOTAL</b>	<b>1,659,636</b>	<b>2,068,846</b>	<b>2,130,180</b>	<b>2,423,910</b>	<b>2,748,641</b>	<b>3,132,815</b>	<b>4,397,387</b>	<b>5,212,429</b>	<b>6,776,563</b>	
<b>SPA 4</b>										
Commercial	0	0	0	0	0	0	0	0	0	
Employment	0	0	0	0	0	0	39,980	990,866	1,578,144	
Public Facilities	0	0	0	0	0	0	35,579	298,346	475,174	
<b>SPA 4 TOTAL</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>75,559</b>	<b>1,289,212</b>	<b>2,053,318</b>	
<b>SPA 5</b>										
Commercial	49,328	72,582	72,582	76,971	81,366	86,620	131,202	208,578	316,379	
Employment	29,873	52,888	89,175	165,492	306,148	570,359	3,185,580	5,064,285	7,681,689	
Public Facilities	85,788	162,966	194,389	213,827	233,157	254,032	395,738	629,126	954,281	
<b>SPA 5 TOTAL</b>	<b>164,989</b>	<b>288,436</b>	<b>356,145</b>	<b>456,290</b>	<b>620,671</b>	<b>911,011</b>	<b>3,712,519</b>	<b>5,901,989</b>	<b>8,952,350</b>	
<b>SPA 6</b>										
Commercial	0	0	0	0	0	13,338	20,779	33,033	44,143	
Employment	0	0	0	0	0	774	1,205	1,916	2,560	
Public Facilities	0	0	0	0	0	4,428	6,899	10,967	14,655	
<b>SPA 6 TOTAL</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>18,540</b>	<b>28,883</b>	<b>45,916</b>	<b>61,359</b>	
<b>TOTAL CITY</b>										
Commercial	3,170,290	3,456,246	3,499,631	3,812,113	4,131,323	4,506,439	5,217,195	6,284,004	7,505,615	
Employment	1,949,329	2,140,995	2,206,685	2,479,698	2,821,049	3,311,808	6,460,691	9,782,767	13,754,502	
Public Facilities	2,016,142	2,463,583	2,496,064	2,729,774	2,959,846	3,211,760	4,155,589	4,739,625	5,253,891	
<b>TOTAL</b>	<b>7,135,761</b>	<b>8,060,824</b>	<b>8,202,380</b>	<b>9,021,585</b>	<b>9,912,219</b>	<b>11,030,007</b>	<b>15,833,475</b>	<b>20,806,396</b>	<b>26,514,008</b>	

\*2007 data from Figure A-10.

Annual growth rates 2008-2027 taken from *Costing the General Plan*, Table P-8, HDR, Inc., modified by the City of Surprise Finance Department.

The nonresidential square footage projections are divided by the square feet per job figures from Figure A-8 above, which yields the projected number of jobs by type by SPA in Surprise. This is shown in Figure A-12 below.

**Figure A-12: Job Projections – By SPA**

	Fiscal Year =>	2007	2008	2009	2010	2011	5 Year Increments			
							2012	2017	2022	2027
SPA 1										
Commercial		6,561	7,027	7,027	7,526	7,990	8,476	9,033	9,372	9,372
Employment		5,978	6,402	6,402	6,857	7,280	7,722	8,230	8,538	8,538
Public Facilities		909	970	970	1,035	1,095	1,158	1,227	1,263	1,263
<b>SPA 1 TOTAL</b>		<b>13,448</b>	<b>14,399</b>	<b>14,399</b>	<b>15,418</b>	<b>16,365</b>	<b>17,357</b>	<b>18,490</b>	<b>19,173</b>	<b>19,173</b>
SPA 2										
Commercial		30	38	43	55	68	85	169	791	1,365
Employment		560	647	680	785	899	1,028	1,620	2,099	2,264
Public Facilities		29	33	35	41	47	53	84	204	220
<b>SPA 2 TOTAL</b>		<b>619</b>	<b>719</b>	<b>758</b>	<b>880</b>	<b>1,013</b>	<b>1,166</b>	<b>1,873</b>	<b>3,094</b>	<b>3,849</b>
SPA 3										
Commercial		344	454	545	720	942	1,231	2,054	3,265	5,141
Employment		272	359	431	569	745	974	1,624	2,582	5,137
Public Facilities		2,666	3,291	3,292	3,621	3,948	4,302	5,629	5,629	5,629
<b>SPA 3 TOTAL</b>		<b>3,282</b>	<b>4,105</b>	<b>4,268</b>	<b>4,910</b>	<b>5,635</b>	<b>6,507</b>	<b>9,307</b>	<b>11,476</b>	<b>15,907</b>
SPA 4										
Commercial		0	0	0	0	0	0	0	0	0
Employment		0	0	0	0	0	0	142	3,516	5,600
Public Facilities		0	0	0	0	0	0	66	557	887
<b>SPA 4 TOTAL</b>		<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>208</b>	<b>4,073</b>	<b>6,487</b>
SPA 5										
Commercial		110	161	161	171	181	192	292	464	703
Employment		106	188	316	587	1,086	2,024	11,303	17,969	27,256
Public Facilities		160	304	363	399	435	474	739	1,174	1,781
<b>SPA 5 TOTAL</b>		<b>376</b>	<b>653</b>	<b>841</b>	<b>1,157</b>	<b>1,702</b>	<b>2,690</b>	<b>12,333</b>	<b>19,607</b>	<b>29,740</b>
SPA 6										
Commercial		0	0	0	0	0	30	46	73	98
Employment		0	0	0	0	0	3	4	7	9
Public Facilities		0	0	0	0	0	8	13	20	27
<b>SPA 6 TOTAL</b>		<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>41</b>	<b>63</b>	<b>101</b>	<b>135</b>
TOTAL CITY										
Commercial		7,045	7,681	7,777	8,471	9,181	10,014	11,594	13,964	16,679
Employment		6,917	7,597	7,830	8,798	10,010	11,751	22,924	34,711	48,803
Public Facilities		3,764	4,599	4,660	5,096	5,525	5,996	7,757	8,848	9,808
<b>TOTAL</b>		<b>17,725</b>	<b>19,876</b>	<b>20,266</b>	<b>22,366</b>	<b>24,716</b>	<b>27,761</b>	<b>42,275</b>	<b>57,523</b>	<b>75,290</b>

Jobs are calculated by dividing the projected nonresidential square footage in Figure A-11 by the corresponding number of jobs per square foot from Figure A-9.

## **AVERAGE DAILY VEHICLE TRIP ESTIMATES & PROJECTIONS**

Figure A-13 below provides an estimate and projection of vehicle trips on an average weekday from residential and nonresidential development in Surprise.

Average Weekday Vehicle Trip Ends are from the reference book, *Trip Generation Manual*, published by the Institute of Transportation Engineers (ITE), in 2003. A “trip end” represents a vehicle either entering or exiting a development (as if a traffic counter were placed across a driveway). Trip rates have been adjusted to avoid over estimating the number of actual trips because one vehicle trip is counted in the trip rates of both the origination and destination points. A simple factor of 50% has been applied to the residential, government/institutional, office and goods production categories. The commercial category has a trip factor of less than 50% because this type of development

attracts vehicles as they pass-by on arterial and collector roads. For example, when someone stops at a convenience store on their way home from work, the convenience store is not their primary destination. The ITE Manual indicates that on average 48% of the vehicles entering shopping centers are passing by on the way to some other primary destination and 52% of the attraction trips has the shopping center as their primary destination. Therefore, the adjusted trip factor is 36% (0.52 x 0.50).

The vehicle trips from residential development utilize the housing unit projections in Figure A-4 while the vehicle trips from nonresidential development utilize the square footage projections in Figure A-11.

**Figure A-13: Average Daily Trips Estimates & Projections – By SPA**

	Trip Rate*	Adj. Factor*	2007	2008	2009	2010	2011	5 Year Increments			
								2012	2017	2022	2027
<b>SPA 1</b>											
Single Family Detached Units	9.57	50%	189,189	202,621	217,008	232,415	248,917	262,890	274,210	276,683	276,683
Single Family Attached/Multi-family Units	6.72	50%	16,706	17,737	18,834	20,000	21,241	22,339	23,000	23,553	23,553
Commercial Square Footage	53.28	36%	56,633	60,654	60,654	64,960	68,965	73,159	77,969	80,890	80,890
Employment Square Footage	15.65	50%	13,184	14,120	14,120	15,122	16,054	17,031	18,150	18,830	18,830
Public Facilities Square Footage	68.93	50%	16,777	17,906	17,906	19,113	20,224	21,384	22,646	23,317	23,317
<b>TOTAL</b>			<b>292,489</b>	<b>313,038</b>	<b>328,521</b>	<b>351,610</b>	<b>375,401</b>	<b>396,804</b>	<b>415,975</b>	<b>423,273</b>	<b>423,273</b>
<b>SPA 2</b>											
Single Family Detached Units	9.57	50%	15,463	17,905	20,733	24,010	27,805	30,737	55,619	125,474	149,737
Single Family Attached/Multi-family Units	6.72	50%	0	0	0	0	0	0	0	0	0
Commercial Square Footage	53.28	36%	259	326	374	471	588	734	1,460	6,827	11,785
Employment Square Footage	15.65	50%	1,236	1,427	1,499	1,731	1,982	2,268	3,573	4,628	4,992
Public Facilities Square Footage	68.93	50%	535	618	649	750	859	982	1,548	3,766	4,062
<b>TOTAL</b>			<b>17,494</b>	<b>20,277</b>	<b>23,255</b>	<b>26,962</b>	<b>31,234</b>	<b>34,721</b>	<b>62,199</b>	<b>140,696</b>	<b>170,576</b>
<b>SPA 3</b>											
Single Family Detached Units	9.57	50%	3,558	4,791	6,450	8,685	11,693	13,776	24,980	35,511	49,808
Single Family Attached/Multi-family Units	6.72	50%	4,307	5,799	7,808	10,513	14,155	16,676	29,377	49,915	52,590
Commercial Square Footage	53.28	36%	2,971	3,921	4,706	6,212	8,128	10,627	17,727	28,181	44,374
Employment Square Footage	15.65	50%	600	792	951	1,255	1,643	2,148	3,582	5,695	11,328
Public Facilities Square Footage	68.93	50%	49,217	60,767	60,772	66,849	72,893	79,419	103,925	103,925	103,925
<b>TOTAL</b>			<b>60,654</b>	<b>76,071</b>	<b>80,688</b>	<b>93,514</b>	<b>108,511</b>	<b>122,645</b>	<b>179,592</b>	<b>223,227</b>	<b>262,025</b>
<b>SPA 4</b>											
Single Family Detached Units	9.57	50%	0	0	0	0	0	0	2,934	9,348	17,338
Single Family Attached/Multi-family Units	6.72	50%	0	0	0	0	0	0	0	0	0
Commercial Square Footage	53.28	36%	0	0	0	0	0	0	0	0	0
Employment Square Footage	15.65	50%	0	0	0	0	0	0	313	7,754	12,349
Public Facilities Square Footage	68.93	50%	0	0	0	0	0	0	1,226	10,283	16,377
<b>TOTAL</b>			<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>4,473</b>	<b>27,384</b>	<b>46,063</b>
<b>SPA 5</b>											
Single Family Detached Units	9.57	50%	702	1,263	1,724	2,448	3,755	5,902	10,494	18,660	28,726
Single Family Attached/Multi-family Units	6.72	50%	0	0	0	0	0	0	0	0	0
Commercial Square Footage	53.28	36%	946	1,392	1,392	1,476	1,561	1,661	2,517	4,001	6,068
Employment Square Footage	15.65	50%	234	414	698	1,295	2,396	4,463	24,927	39,628	60,109
Public Facilities Square Footage	68.93	50%	2,957	5,617	6,700	7,370	8,036	8,755	13,639	21,683	32,889
<b>TOTAL</b>			<b>4,839</b>	<b>8,685</b>	<b>10,514</b>	<b>12,589</b>	<b>15,747</b>	<b>20,781</b>	<b>51,577</b>	<b>83,971</b>	<b>127,973</b>
<b>SPA 6</b>											
Single Family Detached Units	9.57	50%	0	0	0	0	0	0	0	0	0
Single Family Attached/Multi-family Units	6.72	50%	0	0	0	0	0	0	0	0	0
Commercial Square Footage	53.28	36%	0	0	0	0	0	256	399	634	847
Employment Square Footage	15.65	50%	0	0	0	0	0	6	9	15	20
Public Facilities Square Footage	68.93	50%	0	0	0	0	0	153	238	378	505
<b>TOTAL</b>			<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>415</b>	<b>646</b>	<b>1,027</b>	<b>1,372</b>
<b>TOTAL CITY</b>											
Single Family Detached Units	9.57	50%	208,913	226,580	245,916	267,558	292,170	313,305	368,237	465,675	522,291
Single Family Attached/Multi-family Units	6.72	50%	21,014	23,537	26,642	30,513	35,396	39,015	52,377	73,468	76,143
Commercial Square Footage	53.28	36%	60,809	66,294	67,126	73,119	79,242	86,437	100,070	120,532	143,964
Employment Square Footage	15.65	50%	15,253	16,753	17,267	19,404	22,075	25,915	50,555	76,550	107,629
Public Facilities Square Footage	68.93	50%	69,486	84,907	86,027	94,082	102,011	110,693	143,222	163,351	181,075
<b>TOTAL</b>			<b>375,475</b>	<b>418,071</b>	<b>442,978</b>	<b>484,676</b>	<b>530,893</b>	<b>575,365</b>	<b>714,461</b>	<b>899,577</b>	<b>1,031,102</b>

\* Trip Generation Manual, ITE, 2003.