

Methodology for generating 2000 - 2010 Intercensal estimates

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State Demographer's Office (SDO) intercensal estimate method

1) Prepare postcensal series

Collect the published place-level annual population updates from July 2000 to July 2010 into a single series; this will hereafter be referred to as the *postcensal* estimates series.

2) Initial adjustment: 2000 - 2004

For each place, adjust the postcensal estimates for July 2000 to July 2004 to conform to the Census 2000 and Special Census Survey 2005 population counts. Perform the adjustment using the *Das Gupta* method:

$$P_t = Q_t * (P_{3652} / Q_{3652})^{t/3652}$$

where:

t = time (number of days) since previous census

P_t = intercensal estimate at time t

Q_t = postcensal estimate at time t

P₃₆₅₂ = population count from most recent Census (e.g. 2010)

Q₃₆₅₂ = postcensal estimate for time of most current Census

The Das Gupta method performs the adjustment by multiplying the postcensal estimate for each year by a ratio of the postcensal estimate in the final estimate period and the population count for that period; this ratio is weighted over time so that there are larger adjustments as time increases.

3) Secondary adjustment: 2000 - 2010

Create a new series by combining the adjusted estimates for July 2000 – July 2005 from Step 2 with the postcensal estimates for July 2005 to April 2010. Adjust the entire series to conform to Census 2000 and Census 2010 population counts using the Das Gupta method.

4) Apply controls

Bench the place-level estimates so their sum matches Maricopa County intercensal total. The Maricopa County total is in turn benched to State intercensal estimates.

MAG intercensal estimate method

1) Generate forward postcensal estimates

For each place, generate a *forward postcensal estimate* series based on a simplified housing unit method using assumptions from Census 2000. For each intercensal year, obtain an estimate by multiplying the people per dwelling unit in 2000 by the total housing stock in that year. The housing stock is obtained by adding the total residential completions since April 2000 to the Census 2000 total housing unit count.

2) Generate backward postcensal series

For each place, generate a *backward postcensal estimate* series based on a simplified housing unit method using assumptions from Census 2010. For each intercensal year, obtain an estimate by multiplying the people per dwelling unit in 2010 by the total housing stock in that year. The housing stock is obtained incrementally by subtracting the number of residential completions in the current year from the housing stock in the following year.

3) Adjust forward estimates

Adjust the forward postcensal estimates to conform to Census 2000 and 2010 population counts using the Das Gupta method. The adjustments will be larger for estimates in years closer to April 1, 2010.

4) Adjust backward estimates

Adjust the backward postcensal estimates to conform to Census 2000 and 2010 population counts using an inverted Das Gupta method:

$$B_t = R_t * (P_{3652} / R_{3652})^{(3652 - t)/3652}$$

where:

t = time (number of days) since previous census

B_t = backward intercensal estimate at time t

R_t = backward postcensal estimate at time t

P₃₆₅₂ = population count from most recent Census (e.g. 2010)

R₃₆₅₂ = backward postcensal estimate for time of most current Census

The inverted Das Gupta is virtually the same as the standard method with the exception that larger adjustments are made at the beginning of the series while the estimates towards the end of the series are adjusted less.

5) Merge forward and backward estimates

Combine the adjusted estimates from Steps 3 and 4 using a temporally weighted average:

$$P_t = (F_t * ((3652 - t) / t) + (B_t * (t / 3652)))$$

where:

t = time (number of days) since previous census

P_t = intercensal estimates at time t

F_t = forward intercensal estimate at time t

B_t = backward intercensal estimate at time t

Estimates in years closer to 2000 will have a greater contribution from the forward series while estimates in years closer to 2010 will have a greater contribution from the backward series.

6) Apply Controls

Bench the results from Step 5 so that the place-level sum matches the Census Bureau intercensal estimates for Maricopa County.

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State Demographers's Office (SDO) intercensal estimates (DRAFT)

	April 2000	July 2000	July 2001	July 2002	July 2003	July 2004	July 2005	July 2006	July 2007	July 2008	July 2009	April 2010
Maricopa County	3,072,149	3,092,927	3,173,219	3,261,203	3,353,875	3,466,592	3,577,074	3,663,915	3,753,413	3,808,829	3,821,136	3,817,117
Apache Junction (part)	273	275	277	279	280	282	285	286	289	291	293	294
Avondale	35,883	36,400	40,465	47,638	54,225	60,480	66,373	69,382	71,797	72,613	72,360	76,238
Buckeye	6,537	6,697	10,982	12,630	14,139	16,110	23,685	31,290	39,767	49,131	51,560	50,876
Carefree	2,927	2,959	3,063	3,090	3,140	3,202	3,355	3,415	3,433	3,442	3,393	3,363
Cave Creek	3,728	3,766	3,905	4,034	4,172	4,398	4,651	4,746	4,882	4,960	5,012	5,015
Chandler	176,581	178,398	185,511	191,785	205,026	215,705	225,187	230,029	234,607	236,658	236,371	236,123
El Mirage	7,609	8,405	12,053	21,070	26,303	29,498	31,154	31,629	32,396	32,280	32,076	31,797
Fountain Hills	20,235	20,465	21,058	21,489	21,784	22,048	22,547	22,788	22,932	22,984	22,736	22,489
Gila Bend	1,980	1,979	1,945	1,915	1,881	1,847	1,826	1,838	1,918	1,929	1,933	1,922
Gilbert	109,697	111,250	120,447	129,864	145,758	156,412	166,919	179,602	196,602	206,264	207,783	208,453
Glendale	218,812	219,392	223,748	225,206	227,712	229,501	231,126	230,455	230,643	230,658	229,241	226,721
Goodyear	18,911	19,700	23,373	27,881	32,370	38,906	45,664	49,894	56,141	59,631	62,129	65,275
Guadalupe	5,228	5,226	5,209	5,286	5,281	5,318	5,346	5,316	5,307	5,625	5,592	5,523
Litchfield Park	3,810	3,832	3,906	3,959	4,038	4,142	4,563	5,102	5,307	5,380	5,445	5,476
Mesa	396,375	400,491	410,487	420,776	425,293	434,952	436,945	438,232	440,670	441,523	440,627	439,041
Paradise Valley	13,664	13,643	13,504	13,346	13,167	13,040	12,863	12,830	12,838	12,856	12,885	12,820
Peoria (part)	108,363	109,923	116,693	121,663	125,289	130,618	135,060	142,495	148,255	151,644	154,204	154,058
Phoenix	1,321,045	1,324,016	1,334,195	1,345,980	1,361,441	1,381,217	1,408,069	1,428,315	1,446,686	1,455,028	1,455,175	1,445,632
Queen Creek (part)	4,197	4,300	4,820	5,433	7,398	11,262	15,425	18,459	21,742	23,789	25,471	25,912
Scottsdale	202,705	204,060	209,237	212,699	215,969	218,984	221,030	220,907	221,031	220,410	218,888	217,385
Surprise	30,848	32,667	39,628	47,739	56,259	71,328	89,488	102,901	110,741	115,626	117,230	117,517
Tempe	158,625	158,671	158,645	157,956	157,722	158,421	157,711	156,271	156,522	159,336	159,762	161,719
Tolleson	4,974	5,030	5,219	5,375	5,939	6,140	6,332	6,325	6,444	6,556	6,608	6,545
Wickenburg	5,082	5,068	5,128	5,244	5,318	5,467	5,911	6,243	6,325	6,376	6,375	6,363
Youngtown	3,010	3,064	3,444	3,857	4,618	5,360	5,872	6,142	6,121	6,272	6,232	6,156
<i>Balance of County</i>	<i>211,050</i>	<i>213,250</i>	<i>216,276</i>	<i>225,010</i>	<i>229,352</i>	<i>241,955</i>	<i>249,690</i>	<i>259,023</i>	<i>270,015</i>	<i>277,568</i>	<i>281,756</i>	<i>284,404</i>

MAG intercensal estimates (DRAFT)

Controlled to Census Bureau intercensal estimates for Maricopa County

	April 2000	July 2000	July 2001	July 2002	July 2003	July 2004	July 2005	July 2006	July 2007	July 2008	July 2009	April 2010
Maricopa County	3,072,415	3,092,197	3,175,989	3,255,388	3,328,468	3,417,860	3,538,988	3,642,884	3,711,954	3,771,061	3,803,779	3,817,117
Apache Junction (part)	273	273	276	277	278	281	285	288	289	291	293	294
Avondale	35,886	36,354	42,319	49,260	53,855	58,393	64,957	68,332	70,250	73,044	73,416	76,238
Buckeye	6,538	6,677	7,072	8,212	8,977	10,561	16,169	24,106	32,192	42,394	47,534	50,876
Carefree	2,927	2,958	3,063	3,103	3,121	3,164	3,298	3,402	3,417	3,416	3,387	3,363
Cave Creek	3,728	3,761	3,890	4,006	4,126	4,325	4,578	4,711	4,821	4,916	4,995	5,015
Chandler	176,596	178,755	188,924	198,425	206,840	215,880	226,578	232,035	234,721	236,379	236,340	236,123
El Mirage	7,610	8,432	12,191	17,677	21,958	23,894	25,543	26,924	28,458	29,567	30,786	31,797
Fountain Hills	20,237	20,449	20,961	21,281	21,365	21,460	21,900	22,378	22,537	22,670	22,625	22,489
Gila Bend	1,980	1,986	1,985	1,970	1,959	1,951	1,966	1,975	1,956	1,947	1,934	1,922
Gilbert	109,706	111,527	122,059	133,556	143,821	154,299	167,497	178,015	191,206	200,314	204,821	208,453
Glendale	218,831	219,188	223,048	223,965	225,538	226,223	228,580	229,104	228,692	229,195	227,958	226,721
Goodyear	18,913	19,741	23,660	28,263	32,814	38,231	44,586	49,873	56,025	59,540	63,904	65,275
Guadalupe	5,228	5,219	5,194	5,254	5,215	5,238	5,278	5,273	5,252	5,562	5,555	5,523
Litchfield Park	3,810	3,825	3,881	3,907	3,958	4,052	4,473	5,054	5,208	5,298	5,404	5,476
Mesa	396,409	400,744	411,522	419,683	424,011	429,942	435,650	438,819	438,962	440,132	439,780	439,041
Paradise Valley	13,665	13,654	13,583	13,476	13,329	13,262	13,225	13,158	13,023	12,965	12,963	12,820
Peoria (part)	108,372	109,904	116,688	121,761	125,263	130,180	135,045	142,680	146,909	150,038	153,128	154,058
Phoenix	1,321,159	1,323,325	1,332,783	1,342,261	1,351,747	1,365,637	1,394,692	1,421,750	1,433,286	1,443,187	1,448,623	1,445,632
Queen Creek (part)	4,197	4,292	4,787	5,362	7,386	11,151	15,104	18,126	20,941	22,765	24,897	25,912
Scottsdale	202,723	203,770	207,853	210,574	211,882	213,969	216,477	218,081	218,023	218,382	218,004	217,385
Surprise	30,851	32,620	39,353	46,013	54,133	66,345	82,034	96,127	103,557	109,780	114,270	117,517
Tempe	158,639	158,597	158,460	157,370	156,404	156,828	157,380	157,183	157,652	159,348	160,622	161,719
Tolleson	4,974	4,998	5,067	5,088	5,835	5,873	5,947	6,022	6,178	6,355	6,502	6,545
Wickenburg	5,082	5,106	5,221	5,341	5,439	5,637	5,801	5,994	6,105	6,232	6,314	6,363
Youngtown	3,010	3,030	3,273	3,469	3,553	4,186	5,120	5,575	5,706	5,867	6,034	6,156
Balance of County	211,068	213,012	218,874	225,835	235,661	246,899	256,826	267,902	276,588	281,479	283,690	284,404

Note: slight change in April 2000 population for Maricopa County due to Census using Count Resolution Program count: