

APPENDIX B: POPULATION ESTIMATE AND PROJECTION METHODOLOGY

We have relied on several data sources for population estimates and projections in the 2007 Comprehensive Plan.

For our 2006 population, we use the North Central Texas Council of Governments' (NCTCOG's) estimate. NCTCOG's population estimates are based on current housing inventories for each city in the NCTCOG region with a population of 1,000 or more. The figures are reviewed at the regional level for consistency with other indicators of regional population such as labor force estimates and vital statistics.

Cities complete a building permit form that provides NCTCOG with information on building completions, demolitions, annexations and other changes in housing stock that occurred throughout the prior year. The reported housing units by type (single family, multi-family, other) are added to the 2000 Census housing stock figures to develop estimates of current year housing stock. Current estimates use 2000 Census persons per household figures. Occupancy rates are derived through purchased secondary data in order to reflect existing market conditions.

These rates were used in conjunction with building permit data to produce city level population estimates. Final population for January 1, 2006 also includes estimates of persons living in group quarters (nursing homes, dormitories, prisons etc.) All figures are reviewed by each city prior to publication. County level estimates are adjusted for cities that are in more than one county. Remainder of county totals are estimated based upon secondary resources and have been adjusted to reflect annexations.

To measure population growth and substantiate our claim that we are the fastest-growing large city, we rely on Census data. The U.S. Census Bureau produces subcounty (including city) population estimates by a housing unit method that uses housing unit change to distribute county population to subcounty areas. County population estimates are produced with a component of change population method, which updates the latest census population using data on births, deaths, and internal and international migration.

The Census Bureau develops subcounty population estimates using the Distributive Housing Unit Method, which uses housing unit estimates to distribute the county population to subcounty areas within the county. Housing unit estimates use building permits, mobile home shipments, and estimates of housing unit loss to update housing unit change since the last census. Census counts of housing units are geographically updated each year to reflect legal changes reported in the Boundary and Annexation Survey (BAS), Census corrections, and other administrative revisions. The residential building permits that result in the construction of new units for the period April 1, 2000 to July 1, 2005 include

permits issued in calendar years 2000-2004 (accounting for a six-month lag time between permit issuance and completed construction). The Census Bureau does not collect updated data at the subcounty level on mobile home placements. They derive estimates for mobile homes by allocating state mobile home shipment data to subcounty areas based on the subcounty area's share of state mobile homes in Census 2000. The Census Bureau develops a household population estimate by applying the occupancy rate and average persons per household (PPH) from the latest census at the subcounty level to an estimate of housing units. The estimate obtained from this method is then controlled to the final county population estimate. The non-household population is measured by the change in the group quarters population. They produce the final estimate by adding the population in group quarters to the household population..

To produce the future population pyramid in Chapter 1, the cohort component model was used. Two general equations are used. The first calculates the future population of children ages zero to nine and the second calculates the future population of persons age ten and over. The first equation takes the form $P_{10} = P_0 + (B - D) + (IM - OM)$ where P_{10} is the population ten years into the future, P_0 is the initial population, B is births, D is deaths, IM is in-migration and OM is out-migration. For the youngest age groups - 0 to 9, P_0 is always equal to zero and births during the ten-year period are added. The second equation takes the form $P_{10} = P_0 - D + (IM - OM)$. Births are not a factor for age groups that are 10 or older.

Births are calculated using a fertility estimation technique called the child-woman ratio. It is a simple ratio of the number of children ages zero to nine to women in their reproductive years 10 to 49. Deaths are calculated by applying to each cohort a survival ratio; this is the probability that a member of one age group will survive to become a member of the next age group. Survival rates for the United States are published annually by the U.S. Bureau of Vital Statistics. Age specific survival rates for local areas are not available, however, data from the Fort Worth Health Department indicate that the annual death rate, the number of deaths per 1,000 citizens, is five percent greater in Fort Worth (5.3%) than for the U.S. as a whole (5.0%). Thus, the only adjustment necessary was to reduce the U.S. survival rates slightly for Fort Worth to calibrate the model. Net migration is inferred from the model by applying the balancing equation in reverse. The model assumes that the child-woman ratios, survival rates, and migration will continue unaltered from the base year into the future. It is virtually impossible to account for unforeseen changes in the economy, changes in family values, medical advancements or fertility enhancements that might influence population growth. It is also impossible to account for large fluctuations from the growth trends in any given year. For these reasons, projections must be used with caution and should be reevaluated frequently, as new data becomes available.

