W. Frank Barton School of Business

Center for Economic Development and Business Research

Kansas County Population Forecast

Summary and methodology

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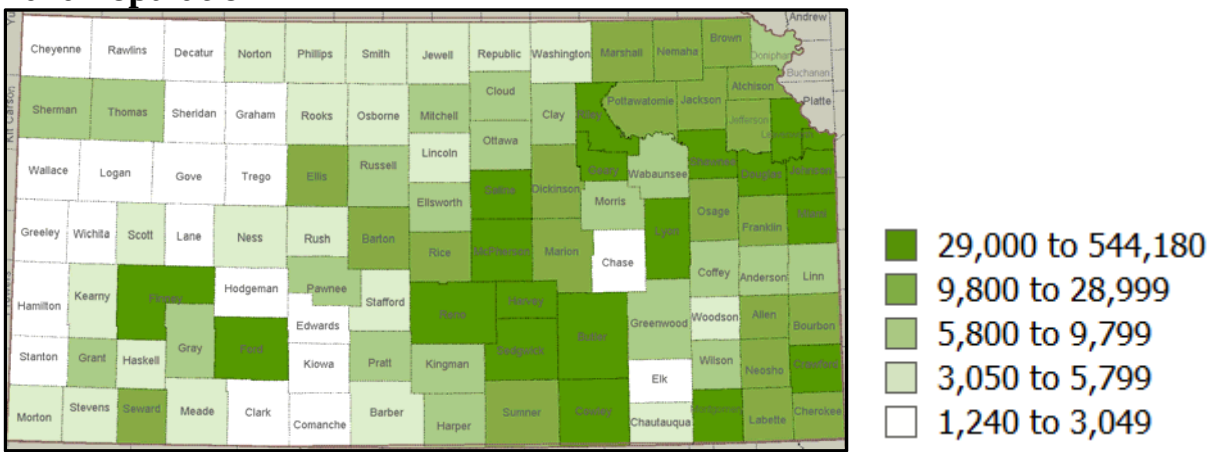
County Population Forecast: 2010 to 2040

The Center for Economic Development and Business Research, W. Frank Barton School of Business at Wichita State University, released online population projections by age cohort from 2010 through 2040 for all Kansas counties. Two sets of population projections were completed to account for the unreliability of migration patterns. Migration patterns can change rapidly due to economic conditions, government policy or natural disasters. The first projection set is based on the continuation of migration patterns (domestic and international) as experienced in each county from 2000 through 2009. The second set of projections assumes a net migration rate of zero throughout the forecast period.

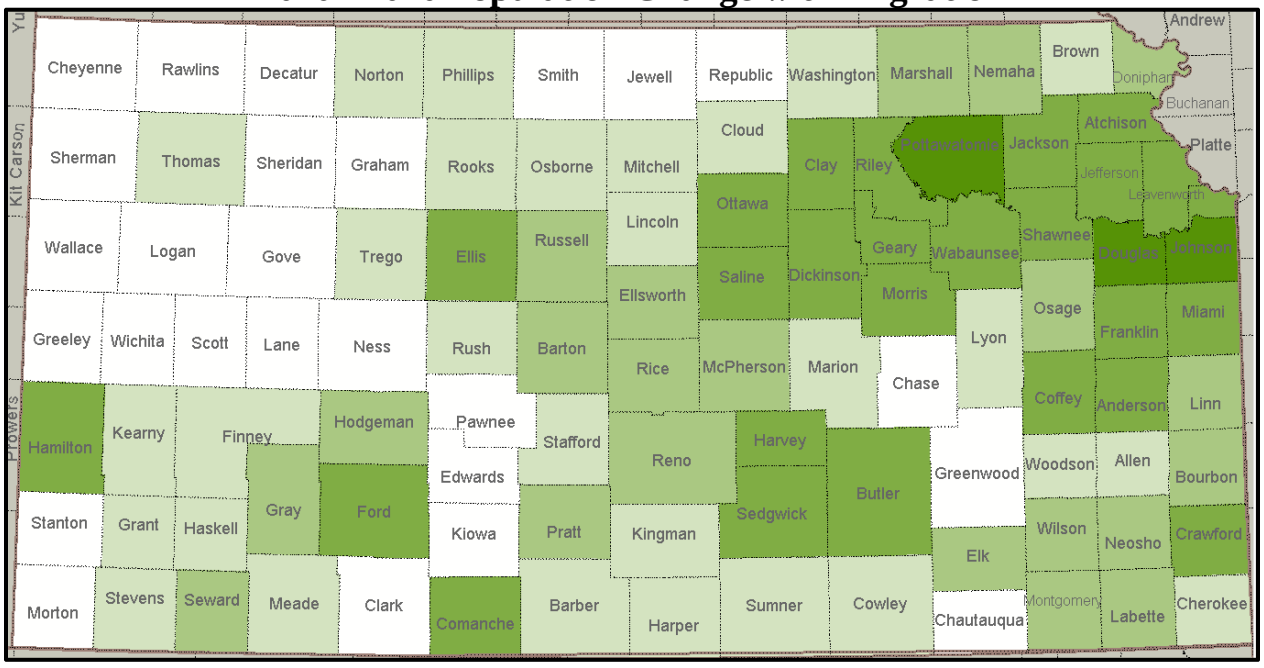
Based on recent migration patterns, the state's population is projected to increase, on average, 0.48 percent annually and grow to 3.238 million by 2040. Based on a zero migration assumption, the state's population is projected to increase, on average, 0.45 percent annually and grow to 3.217 million by 2040.

In addition to the above projection sets, additional demographic details were generated for each county, including population counts by gender. Also, using the Center's model "what if analyses" can be conducted using various migration assumptions. Please contact CEDBR for projections by additional demographic characteristics or by various migration assumptions at cedbr@wichita.edu .

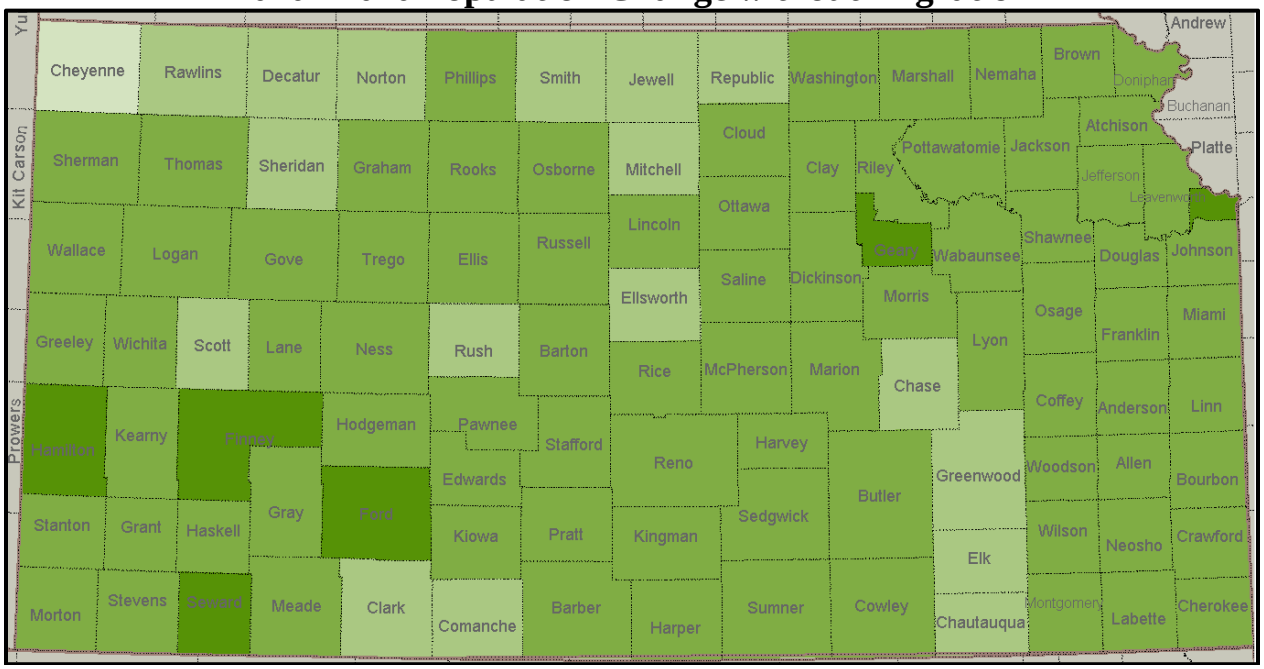
2010 Population



2010 - 2020 Population Change with Migration

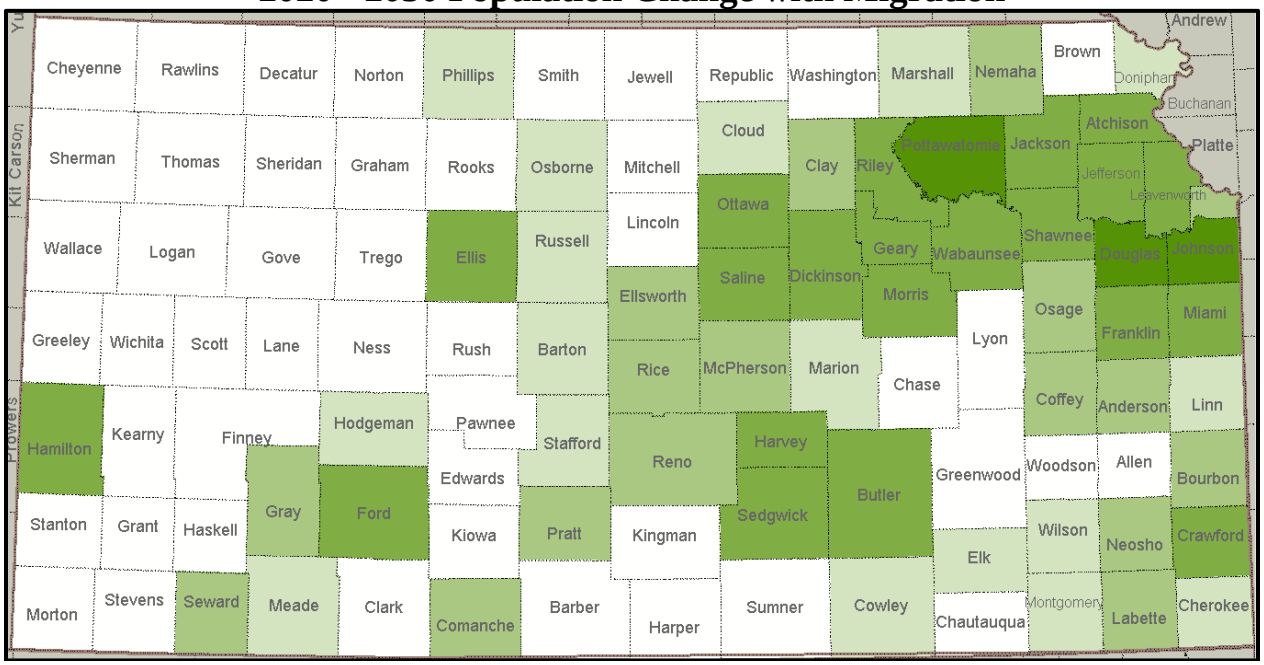


2010 - 2020 Population Change without Migration

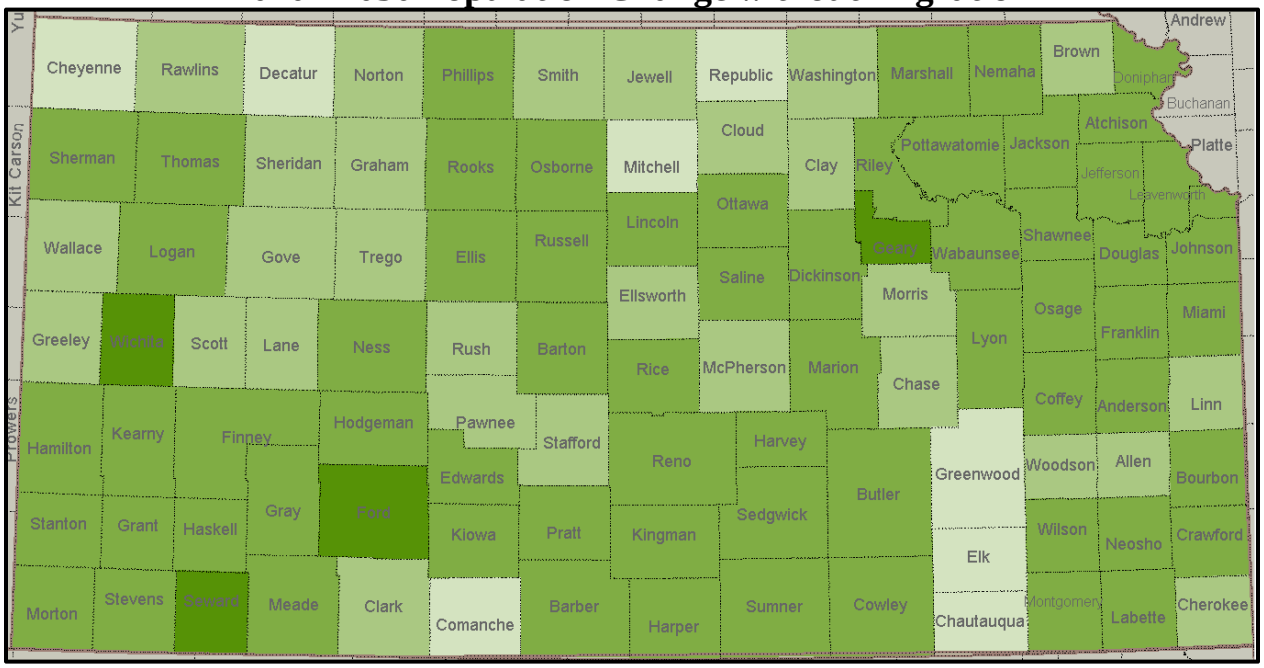


- 11% to 40%
- 0% to 10%
- -5% to -1%
- -10% to -6%
- -40% to -11%

2020 - 2030 Population Change with Migration



2020 - 2030 Population Change without Migration



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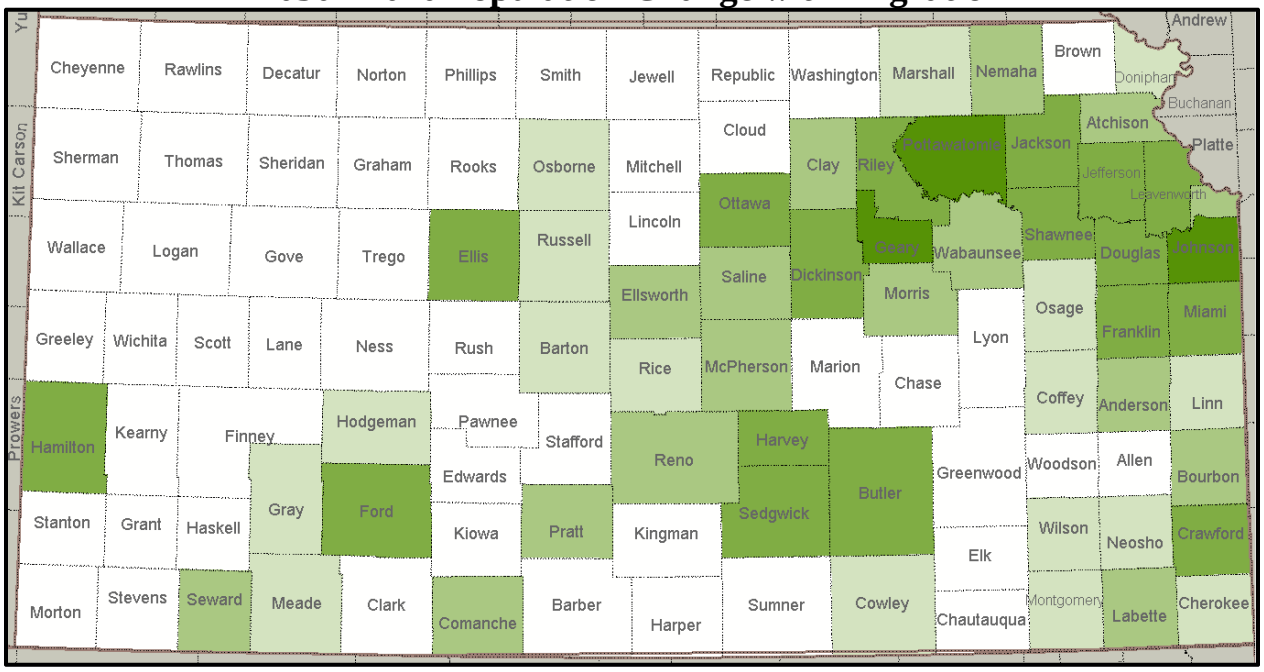
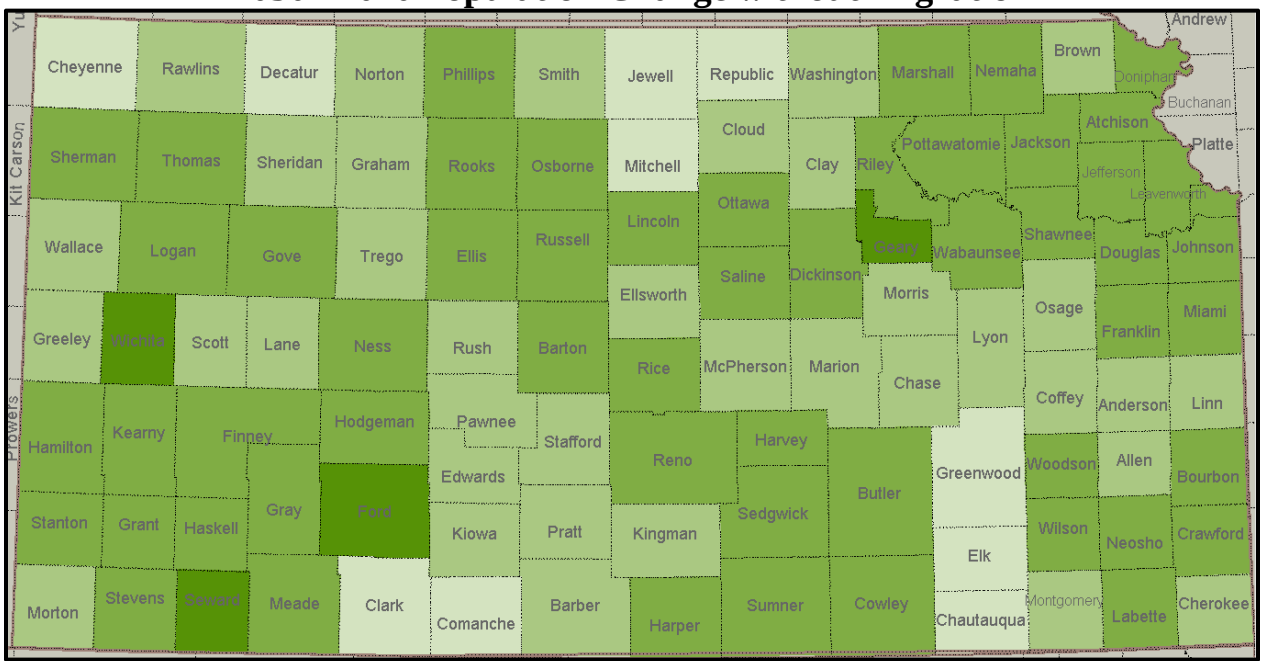
2030 - 2040 Population Change with Migration



2030 - 2040 Population Change without Migration



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Methodology

The CEDBR prepared population forecasts for Kansas counties using the conventional cohort survival model. For each of 36 age/sex cohort groups, population was forecasted using individual cohort projections of survival rates, birth rates and migration. The cohort survival model can be summarized mathematically as:

$$T = \sum_{X=1}^{36} p_{x1}$$

Where T = Population at the end of the period for all age/sex cohort groups

p_{x1} = Population at the end of the period for cohort group x

and

$$p_{x1} = p_{x0} + b_x - d_x + nm_x$$

where p_{x1} = Population at the end of the period for cohort group x

p_{x0} = Population at the beginning of the period for cohort group x

b_x = Births during the period for cohort x

d_x = Deaths during the period for cohort x

nm_x = Net migration during the period for cohort x

x = cohort group

The starting point for the projections was the Census Bureau's 2010 Demographic Profile Data.[1]

Survival Rates

The first step in the projection process is to "age" each cohort by applying the appropriate cohort survival rate. The cohort survival rate is the percentage of persons in the cohort group that will survive for five years.

The survival rates used are the complement of the age-specific death rates for Kansas for 2010, divided by 1,000.

[1] U. S. Census Bureau. http://factfinder2.census.gov/main.html

Because projected death rates were not available for years beyond 2010, CEDBR used the 2010 death rates for the entire period of the forecast. Longer life expectancies are forecast for the U. S. population, but the effect on small population projections will be minimal.

Birth Rates

To forecast the population of the 0 to 4 age cohort group, it was necessary to project the number of births for each five-year period. The total number of births for Kansas and Kansas counties were available through the Kansas Department of Health and Environment.[2] Age-specific birth rates were only available at the state level. The center used the distribution of the state level rates to distribute county birth rates to age cohorts. Those birth rates were then multiplied by the number of women in each child-bearing age cohort. The sum of all births provided the population of the 0-4 age cohort.

According to the World Population Prospects Population Database of the United Nations Population Division, birth rates are expected to decline, but only slightly, between 2010 and 2040. The effect on small population projections would be minimal. Therefore, CEDBR did not make any adjustments for declining birth rates over the projection period.

Migration

The study applied the 2000 to 2009 migration rates from the U. S. Census Bureau, Population Division, Cumulative Components of Population Change for Kansas, by county to estimate migration over the forecast period.[3] Total migration was distributed by age cohort based on the Census Bureau's November 2011 report on geographic mobility.[4] A simplifying assumption was made that migration affects sex cohorts equally.

Another simplifying assumption was made that migration patterns will remain constant over the study period. This is unlikely, but forecasting migration rates is inexact and could result in error. Population estimates should be updated every five years to reflect changing migration patterns. Furthermore, estimates should be forecasted as decennial census data becomes available.

[2] Kansas Department of Health and Environment, http://www.kdheks.gov/hci/AS2010.html
[3] U. S. Census Bureau. http://www.census.gov/popest/counties/CO-EST2009-06.html
[4] U.S. Census Bureau. http://www.census.gov/prod/2011pubs/p20-565.pdf