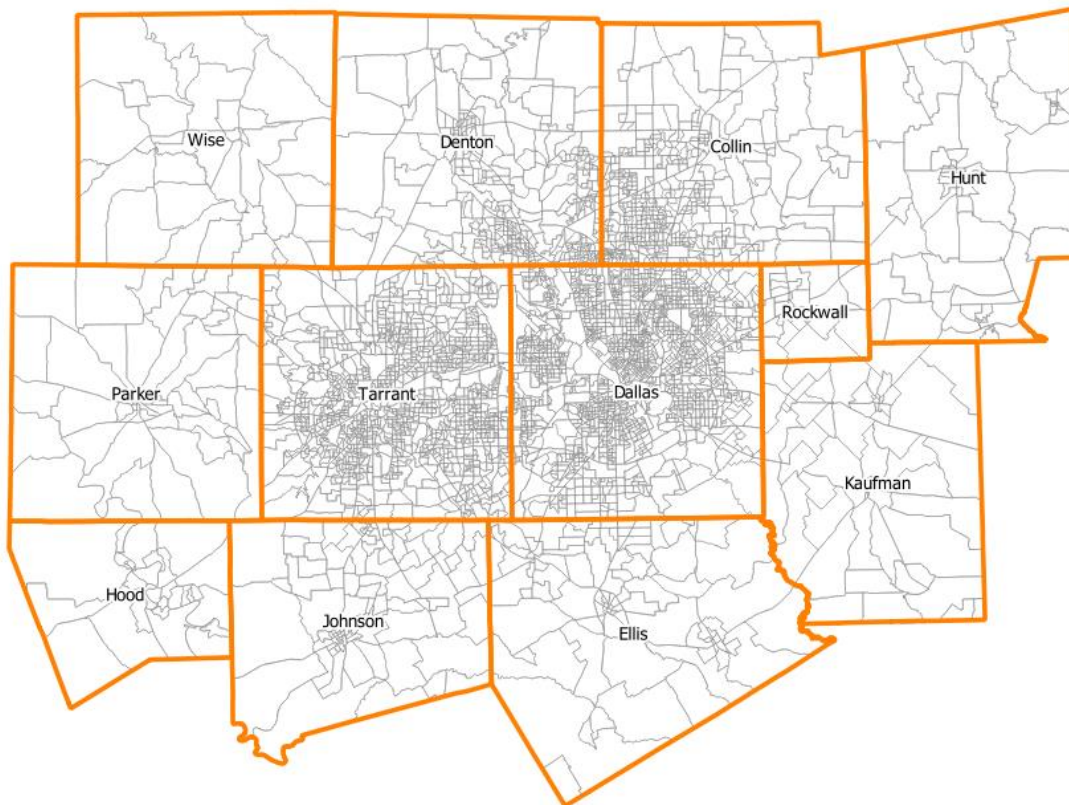


North Central Texas 2045 Demographic Forecast

The 2045 Forecast released in 2022 is an entirely new data product and supersedes the 2045 Forecast released in 2017. The 2045 Forecast covers the 12 counties in the Metropolitan Planning Area (MPA) and is released at 2010 Census Block Group geography to ease integration with other readily available data. Figure 1 shows these twelve counties along with the 2010 Census Block Groups. There are over 4,100 Census Block Groups in the MPA. Digital files of these geographies suitable for use in geographic information systems are available from the Regional Data Center: <https://data-nctcogis.opendata.arcgis.com/>.

Figure 1. Counties and 2010 Census Block Groups



The 2045 Forecast was built start to finish using a new, more efficient process that not only made production faster and easier, but also eased internal evaluation, local review, and incorporation of feedback.

Step 1 –County Control Totals

NCTCOG commissioned The Perryman Group (TPG) to develop County control totals of households, household population, and employment by major sector¹. TPG delivered their work in March of 2020. The resulting county control totals are provided in figures 2, 3, 4, 5, and 6. The county control totals served as guides for the work performed in subsequent steps.

Figure 2. 2030 and 2045 County Control Totals - Households

County	2020 Census	2030	2045	2020 - 2045
				Change
<i>Collin</i>	381,318	454,207	624,350	243,032
<i>Dallas</i>	965,537	1,076,133	1,256,645	291,108
<i>Denton</i>	328,884	390,194	535,571	206,687
<i>Ellis</i>	64,996	76,599	105,405	40,409
<i>Hood</i>	24,811	28,435	36,855	12,044
<i>Hunt</i>	36,076	40,838	51,550	15,474
<i>Johnson</i>	61,654	71,295	89,845	28,191
<i>Kaufman</i>	47,673	49,824	66,014	18,341
<i>Parker</i>	53,482	59,663	80,325	26,843
<i>Rockwall</i>	36,326	41,747	54,534	18,208
<i>Tarrant</i>	760,739	860,864	1,057,748	297,009
<i>Wise</i>	24,306	28,065	35,748	11,442
MPA	2,785,802	3,177,865	3,994,592	1,208,790

Figure 3. 2030 and 2045 County Control Totals – Household Population

County	2020 Census	2030	2045	2020 – 2045
				Change
<i>Collin</i>	1,057,649	1,294,904	1,788,851	731,202
<i>Dallas</i>	2,581,853	3,010,733	3,533,305	951,452
<i>Denton</i>	897,070	1,099,640	1,516,874	619,804
<i>Ellis</i>	190,652	230,103	318,214	127,562
<i>Hood</i>	60,702	73,050	95,154	34,452
<i>Hunt</i>	96,972	113,190	143,594	46,622
<i>Johnson</i>	176,561	203,793	258,100	81,539
<i>Kaufman</i>	143,800	157,257	209,395	65,595
<i>Parker</i>	146,840	173,427	234,655	87,815
<i>Rockwall</i>	107,130	123,161	61,686	54,556
<i>Tarrant</i>	2,083,512	2,468,156	3,047,774	964,262
<i>Wise</i>	67,826	81,225	103,976	36,150
MPA	7,610,567	9,028,639	11,411,579	3,801,012

¹ Household population excludes people living in group quarters such as dorms, jails, and nursing homes.

Figure 4. 2030 and 2045 County Control Totals – Goods Employment
2020 – 2045

County	2020 BEA	2030	2045	Change
<i>Collin</i>	103,507	131,987	162,150	58,643
<i>Dallas</i>	551,396	674,542	804,912	253,516
<i>Denton</i>	96,803	114,344	142,129	45,326
<i>Ellis</i>	29,317	33,850	38,970	9,653
<i>Hood</i>	8,082	11,467	13,035	4,953
<i>Hunt</i>	15,178	20,052	22,463	7,285
<i>Johnson</i>	28,145	33,116	38,170	10,025
<i>Kaufman</i>	19,499	20,670	23,852	4,353
<i>Parker</i>	21,299	26,877	30,420	9,121
<i>Rockwall</i>	11,580	13,292	15,745	4,165
<i>Tarrant</i>	363,106	437,324	522,913	159,807
<i>Wise</i>	13,770	17,624	19,688	5,918
MPA	1,261,682	1,535,143	1,834,447	572,765

Figure 5. 2030 and 2045 County Control Totals – Retail Employment
2020 – 2045

County	2020 BEA	2030	2045	Change
<i>Collin</i>	63,192	79,423	97,351	34,159
<i>Dallas</i>	169,048	217,486	258,451	89,403
<i>Denton</i>	43,844	54,083	65,395	21,551
<i>Ellis</i>	9,543	11,917	15,539	5,996
<i>Hood</i>	3,497	4,218	4,970	1,473
<i>Hunt</i>	4,585	5,718	6,866	2,281
<i>Johnson</i>	8,421	10,582	12,710	4,289
<i>Kaufman</i>	6,163	7,607	9,248	3,085
<i>Parker</i>	7,843	8,733	10,563	2,720
<i>Rockwall</i>	7,150	8,494	10,416	3,266
<i>Tarrant</i>	127,785	150,608	179,173	51,388
<i>Wise</i>	3,246	3,890	4,679	1,433
MPA	454,317	562,758	675,361	221,044

Figure 6. 2030 and 2045 County Control Totals – Service Employment
2020 – 2045

County	2020 BEA	2030	2045	Change
<i>Collin</i>	486,441	619,087	818,576	332,135
<i>Dallas</i>	1,523,839	2,029,847	2,521,984	998,145
<i>Denton</i>	279,080	362,480	481,949	202,869
<i>Ellis</i>	46,547	60,195	81,590	35,043
<i>Hood</i>	17,270	22,145	28,710	11,440
<i>Hunt</i>	25,148	32,329	41,310	16,162
<i>Johnson</i>	41,679	53,494	69,152	27,473
<i>Kaufman</i>	30,222	38,159	49,517	19,295
<i>Parker</i>	36,836	47,101	61,307	24,471
<i>Rockwall</i>	34,831	46,780	62,186	27,355
<i>Tarrant</i>	782,008	1,056,817	1,368,178	586,170
<i>Wise</i>	17,333	23,272	30,011	12,678
MPA	3,321,234	4,391,706	5,614,469	2,293,235

Step 2 – Urban Growth Model

The 2015 to 2045 change was allocated in annual increments to 30-by-30-meter grid cells using an urban growth model developed by NCTCOG². The model uses a long time series of satellite imagery along with cadastral-based land use data to quantify the trend relationship between urban land use/land cover change and estimates of the control totals during that time. Small-area socioeconomic data, terrain and land cover descriptor data, and proximity variables were evaluated to create a set of logistic regression models for the probability of 30-by-30-meter cells becoming urbanized into different land uses. The logistic regression models were used along with locally adopted future land use plans and the trend relationship to the control totals to predict future urban expansion based on “building forward” from the 2015 Small Area Estimates. Densities of the newly built grid cells is determined by regression-based algorithms using similar variables subject to adjustments to match the control totals. The grid cell allocations of 2030 and 2045 were tabulated by 2010 Block Group to arrive at draft 2030 and 2045 forecasts sent out for local review. Detailed information on the selection, calibration, training, and testing of the algorithms along with validation of the overall process is available in the manuscript “High Resolution Demographic Forecasting: A Data Science and Remote Sensing Approach to Small Area Forecasting” https://rdc.dfwmaps.com/pdfs/Forecast2045_UrbanGrowthModel_ExtDoc.pdf.

² Folden M., High Resolution Demographic Forecasting: The Convergence of Socioeconomic and Remote Sensing Data for Small Area Forecasting. *Applying Census Data for Transportation: 50 Years of Transportation Planning Data Progress*, 2018.

Step 3 – Local Review

Local governments and other entities participated in the process in three important ways. The first of these was the provision of future land use plans³, which were used in the urban growth model. The second was the review of the 2000, 2005, 2010, and 2015 Small Area Estimates data, which were used to train algorithms used by the urban growth model and validate the urban growth model process. The third was review of the draft 2030 and 2045 Block Group forecasts. The draft household and employment projections were sent to over 516 local contacts. Thirty-five entities representing nearly 67% of the current population of the MPA commented on the draft figures.

Local reviewers provided their own expertise, experience, and knowledge along with substantiating information such as known development activity. Some communities indicated that the 2045 figures represent an anticipated build-out. In accordance with indications from these, little or no additional growth was allocated in the 2015 to 2045 period.

All comments received as part of the local review process were given due consideration and used along with data from various other sources including datasets developed by NCTCOG to refine the final Block Group allocations. Adjustments to the 2030 and 2045 figures were subject to some constraints, primarily a respecting of county control totals⁴ resulting in development patterns absorbing all available growth in the county. Due to these constraints, some valid comments could not be accommodated. The results of the local review process were finalized household, population, and employment projections by Block Group.

Select Cities

NCTCOG does not produce city-level forecasts. Published city-level figures are the results of aggregations of 30x30 meter grid cells to the most current city boundaries. All figures are for the most current city boundaries available to NCTCOG at the time of tabulation. The year of update will vary depending on the city. Figures for select cities do not take into account future annexations or extra-territorial jurisdiction. City growth through annexation is not captured in the city-level approximations.

“Select” cities include incorporated places with a total population of at least 5,000 based on the official count from the 2020 Census. City-level aggregations are provided merely as an informational item and are likely to differ from any projections produced by or specifically for any given city.

³ These plans were gathered and compiled in 2018-2019 and represent the most current plans available at the time. Where future land use plans were not available, zoning or current land use were used.

⁴ Subject to allowances for rounding and other relatively minor differences.

Additional Data

NCTCOG has several ongoing programs that support the demographic forecast and other work including census data support, population estimates, development monitoring, small-area estimates, and land use inventories. The demographic forecast data and additional data are available from the Regional Data Center: <https://data-nctcoggis.opendata.arcgis.com/>.

Acknowledgement

The 2045 Forecast was developed through collaboration of the NCTCOG Research and Information Services and Transportation departments. NCTCOG wishes to express its appreciation to the local jurisdictions and other organizations that shared valuable insight and provided support and patience during the process.

Disclaimer

These data were developed for regional planning activities and have not been evaluated for other uses. The North Central Texas Council of Governments makes no warranty, express or implied, including warranties of merchantability and fitness for a particular purpose. Responsibility for the use of these data lies solely with the user.