Estimates and Projections for Texas

By Helen You

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Texas Demographic Center Population Estimates Program

❑ Required by Texas Law to produce population estimates for the State and its **counties** and **places** every year.

❑ TDC surveys, Administrative data and public data are used; Data collection ends on June 1, preliminary estimates out in September and final released in October.

❑ Three methods are used: Component Method II, Ratio Correlation and **Housing Unit;**

❑ County Estimates are **controlled** to the Census Bureau State Population Estimates; Place Estimates are controlled to TDC County Estimates.

❑ Controlled Estimates from the three methods are evaluated against estimates from other sources, mainly those from the Census Bureau, and historical trends to make the final TDC estimates

Three Methods are used in the TDC population Estimates

❑ **Component Method II**

➢ $Population_{(t+k)} = Population_t$

$\qquad\qquad + Natrual\ Increase_t\ (Births_t - Deaths_t\ )$

$\qquad\qquad\qquad + Net\ Migrants_t\ (In\text{-}mig_t - Out\text{-}mig_t)$

➢ *Vital statistics data, school enrollment, medicare data, GQ*

❑ **Housing Unit**

➢ *Population(t+k) = Population + New Housing Units * HH size*

➢ *Building permit data, annexation & boundary data, GQ*

❑ **Ratio Correlation**

➢ *Regression method using <u>symptomatic indicators</u>*

➢ *Birth, death, voter registration, vehicle registration, housing unit*

❑ **Group Quarter Population**

➢ *Dorms, prisons, military barracks, nursing homes…*

"Symptomatic Indicators" are Powerful Predictors of Population

	Mostly stable overtime	State Ratios Enrollment/Population	High Correlations	County Correlation Population&Enrollment
Vehicle Registration				
2010		0.862		0.998
2020		0.826		0.997
Voter Registration				
2010		0.515		0.997
2020		0.553		0.998
School Enrollment (2nd-8th Grade)				
2010		0.120		0.996
2020		0.110		0.994
Medicare Enrollment				
2010		0.099		0.993
2020		0.126		0.995

TDC Building Permit Survey

TDC Building Permit Response Rate, Incorporated Places in Texas

1,214 **1,224**

84.5% 82.1% 80.4% 82.1% 80.5% 79.8% 81.0% 81.7% 80.6% 79.6% 77.9%

NoResponse
Response
Response Rate

TDC Building Permit Response Rate, Unincorporated Places in Texas

100% 87% 89% 91% 90% 90% 85% 81% 82% 72% 72%

NoResponse
Response
Response Percent
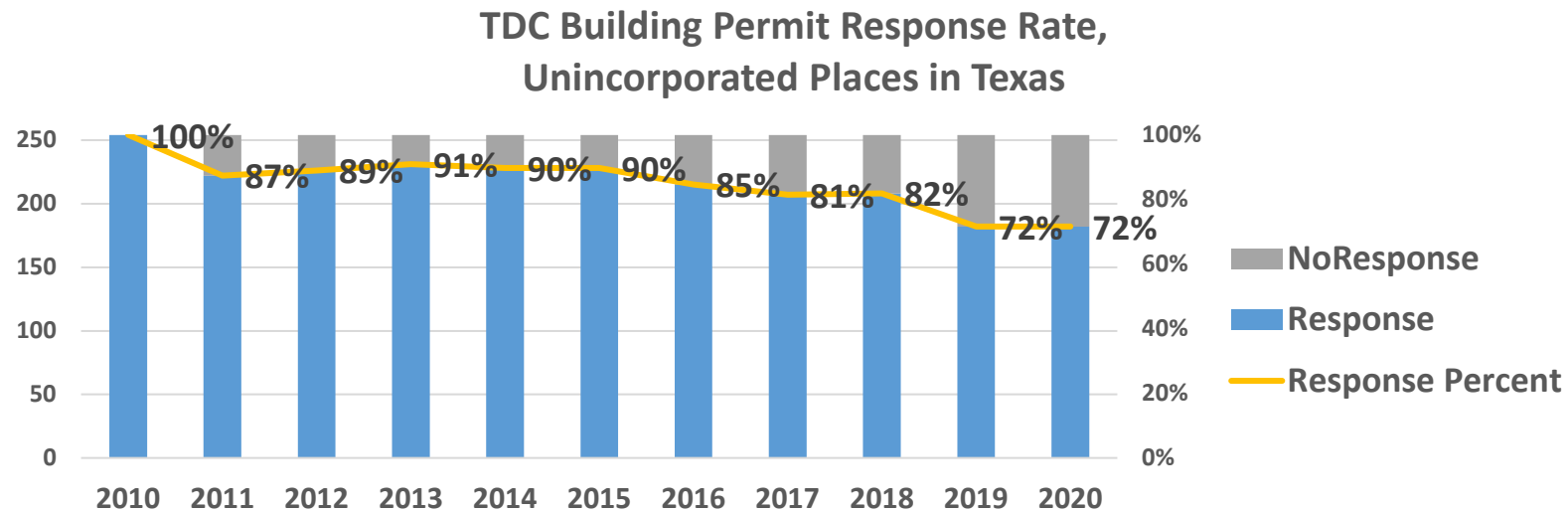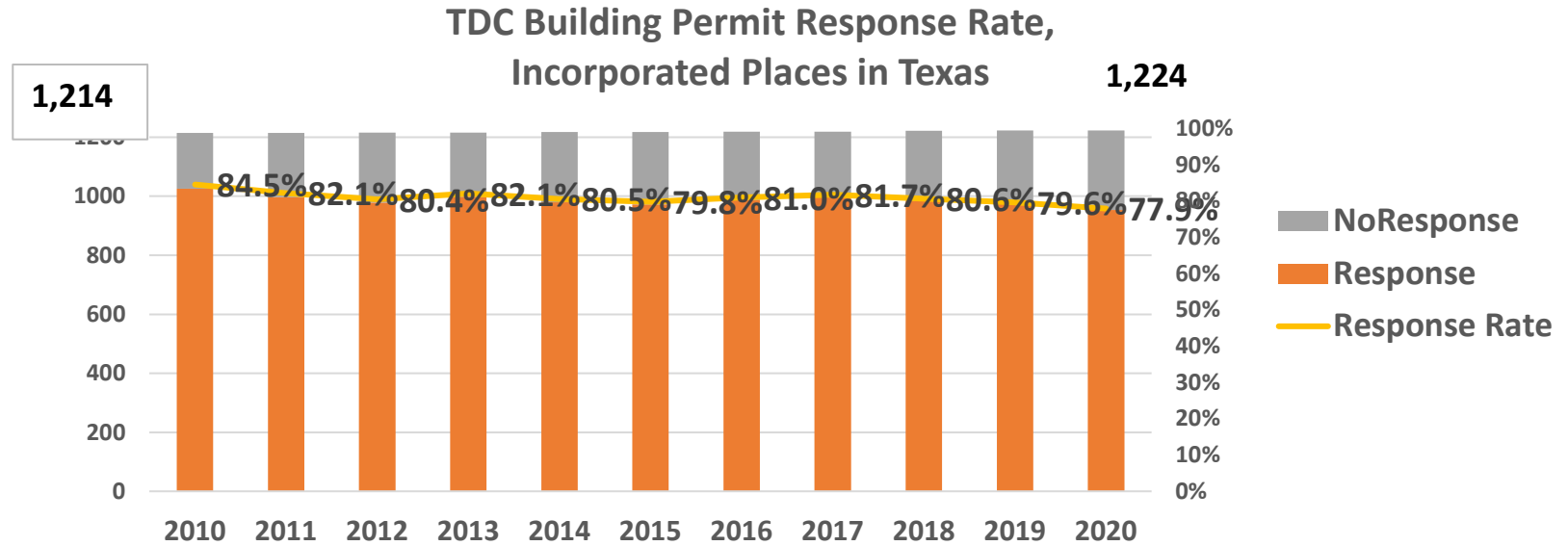
Comparing TDC 2020 Estimates with the Decennial Census, State of Texas

	Census 2020	CB Estimates	Housing Unit	Ratio Correlation	Component Method II
Population	29,145,505	**29,360,759**	29,034,349	29,373,713	30,998,108
Numeric Difference		**215,254**	-111,156	228,208	1,852,603
Percent Difference		**0.74**	-0.38	0.79	6.31

Summary Measures of Estimation Errors, CB 2020 and TDC 2020

	CBEst	HousingUnit_TDC_2020	RatioCorrelation	ComponentMethodII
Bias_Measurements				
Mean_Error	847	-438	898	7,294
Median_Error	348	530	1,040	1,476
MALPE(%)	4.4	7.7	8.8	9.6
% Positive	76.0	76.0	85.4	83.9
Median_ALPE (%)	2.3	5.1	7.5	8.6
Trimmed_mean (5%)	3.2	6.0	8.1	9.0
Index of Misallocation	**0.56**	**1.59**	**1.83**	**3.14**
Accuracy_Measurements				
Mean_Absolute_Error	1,557	3,576	4,108	8,123
Median_Absolute_Error	451	897	1,337	1,615
MAPE (%)	5.5	9.5	9.7	11.9
Median_APE (%)	3.2	6.1	7.7	9.3
RMSPE (%)	13.7	18.8	13.2	16.2
GMAPE (%)	2.5	5.1	5.9	7.7
Trimmed_APE_mean (5%)	4.1	7.4	8.7	10.6

Note: Selected measures and their calculations guided by Swanson, D and Tayman, J, 2012, *Subnational Population Estimates*

Access TDC Estimates Data, V2018 and V2022

Customized table tool available fall 2023 when new estimates are available

# Comparing TDC and Census Bureau Population Estimates

❑ **Timeline**
- o CB: estimates for July of the previous year from *December to June*:
- o TDC: estimates for July of previous year and January of current year in *early October.*

❑ **The input data**
- o CB: some input data are projected;
- o TDC: up-to-date data.

❑ **Methodology.**
- o CB: the cohort component method, a more "direct" method; access to individual level administrative data; migration estimates likely more accurate;
- o TDC: a combination of three methods (cohort component, ratio-correlation, and housing unit method); compare with Census Bureau estimates.

❑ **Data Available**
- o CB: July Estimates for previous year; components of Change;
- o TDC: July Estimates for previous year and January estimates for Current year.

❑ **Interactions with the local government.**
- o CB: collaboration with TDC; the challenge program;
- o TDC: collect data from state agencies and local governments; preliminary sent to local governments for review.

Which time frame fits you better?

Is consistency an issue?

Use caution when comparing estimates from different sources and decades.

Texas Demographic Center Population Projections Program

❑ Required by Texas Law to produce population projections for the State and its **counties** every other year. Release in fall. Available by:
  - o Single year of age;
  - o Male and Female;
  - o NH White, NH Black, Hispanics, NH Asian and NH Other;
  - o Single year, 40 years out in the future from the base year.

❑ Cohort Survival method is used to account for trends in fertility, mortality and migration.

❑ State and County projections are produced separately. County projections are **controlled** so that they add up to the state projections.

TDC Population Projection Illustration

Population 2020 (Ages 0 to 95+)

- DEATHS

*[= Base Population * Projected Death Rates]*

+ NET MIGRANTS

*[= Base Population * Constant Migration Rates]*

**Population 2021 (Ages 1 to 95+)**

+ BIRTHS

[= Women 15 -49 * Projected Fertility rates (ASFR)

Population 2021 (Ages 0)

Population 2021 (Ages 0 to 95+)

# Projected Population Growth in Texas with Various Migration Scenarios
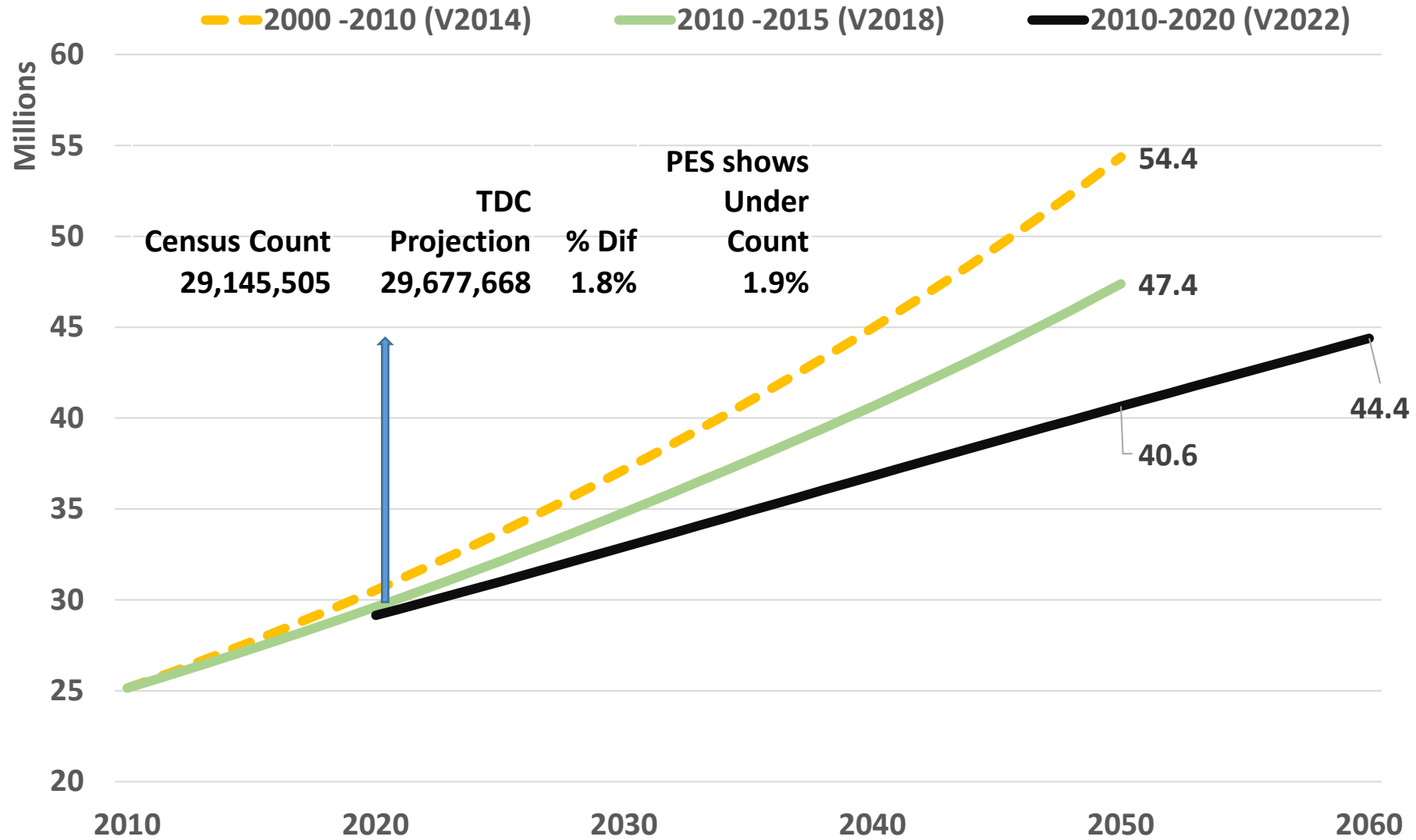
SOURCE: Texas Demographic Center, Vintage 2014 and 2018, 2022 Population Projections

Projected Population by Age and Sex, Texas, 2020-2060

Source: Texas Demographic Center Vintage 2022 Population Projections
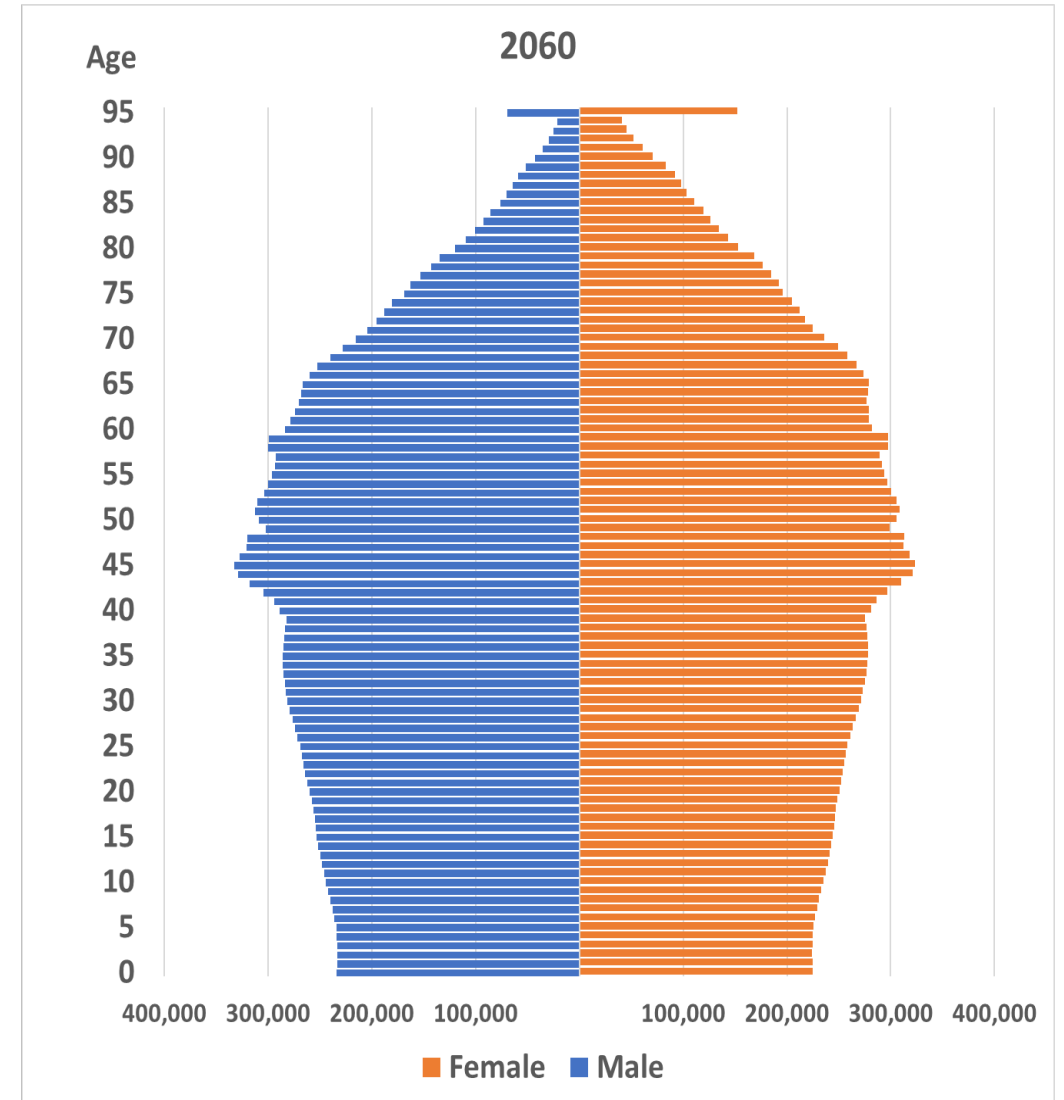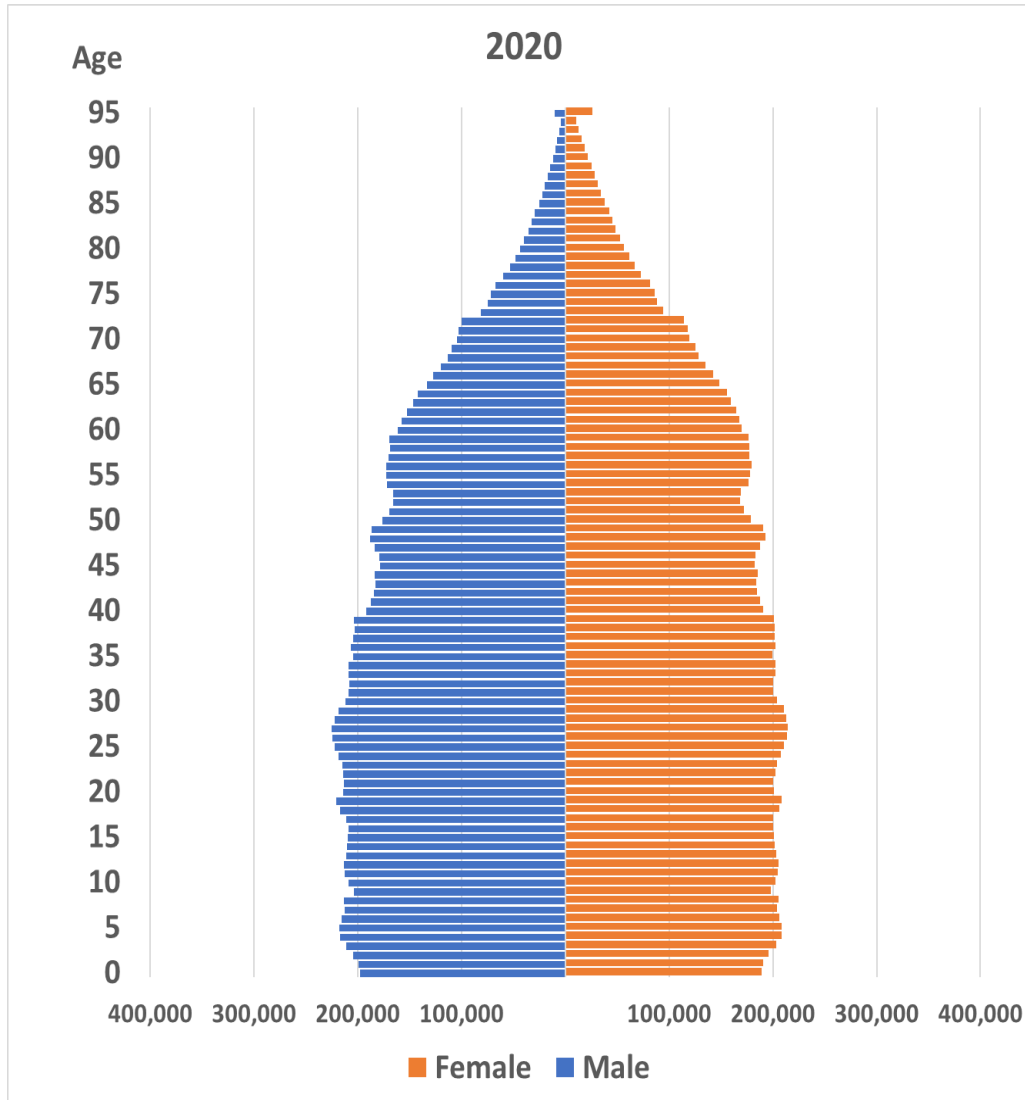
Projected Population Composition, Texas, 2020-2060

Source: Texas Demographic Center Vintage 2022 Population Projections
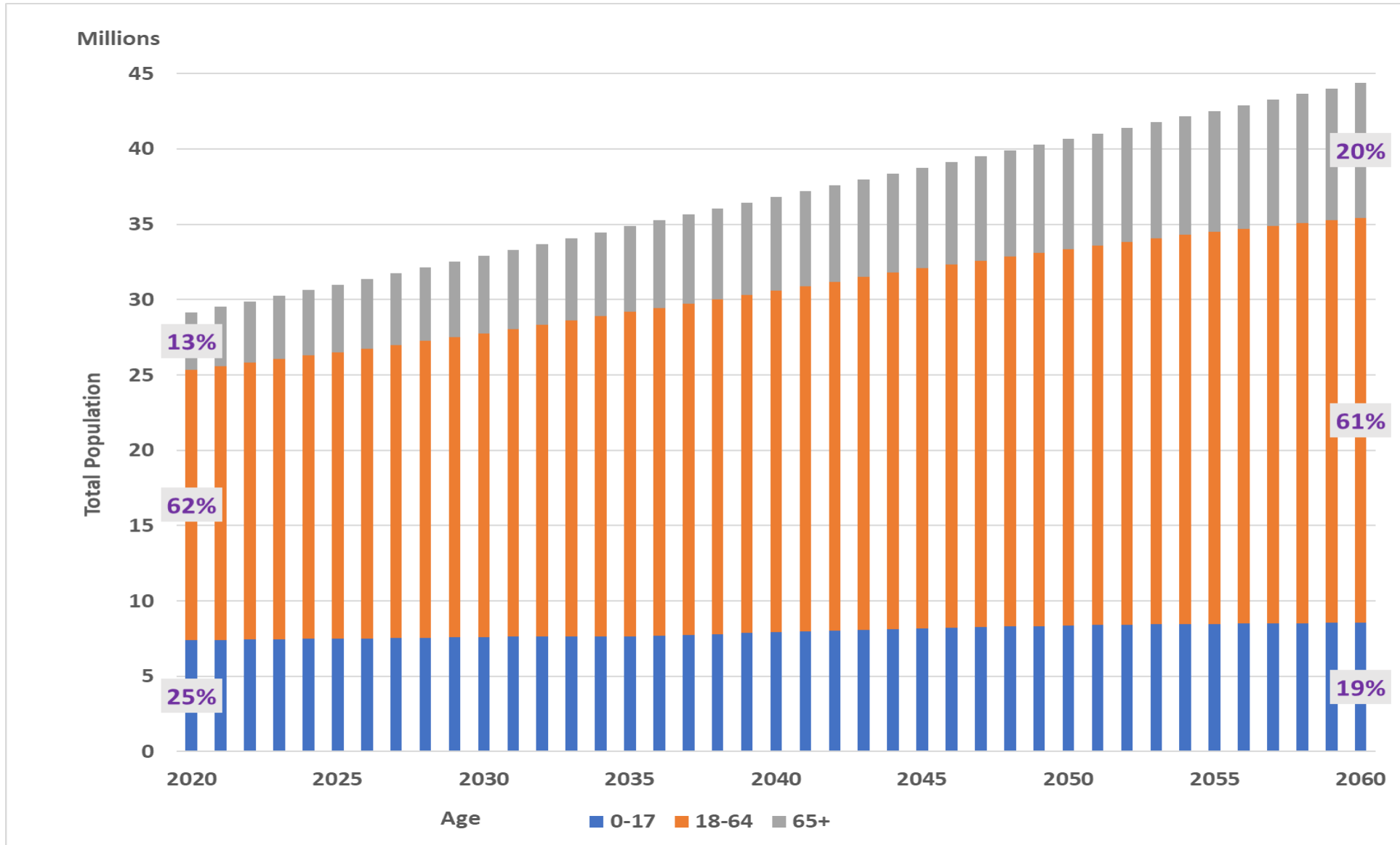
Projected Population Change 2020-2060

- -26,754 – 0 (149)
- 1 – 50,000 (70)
- 50,001 – 100,000 (8)
- 100,001 – 300,000 (15)
- 300,001 – 1,000,000 (6)
- 1,000,001 – 1,574,514 (6)
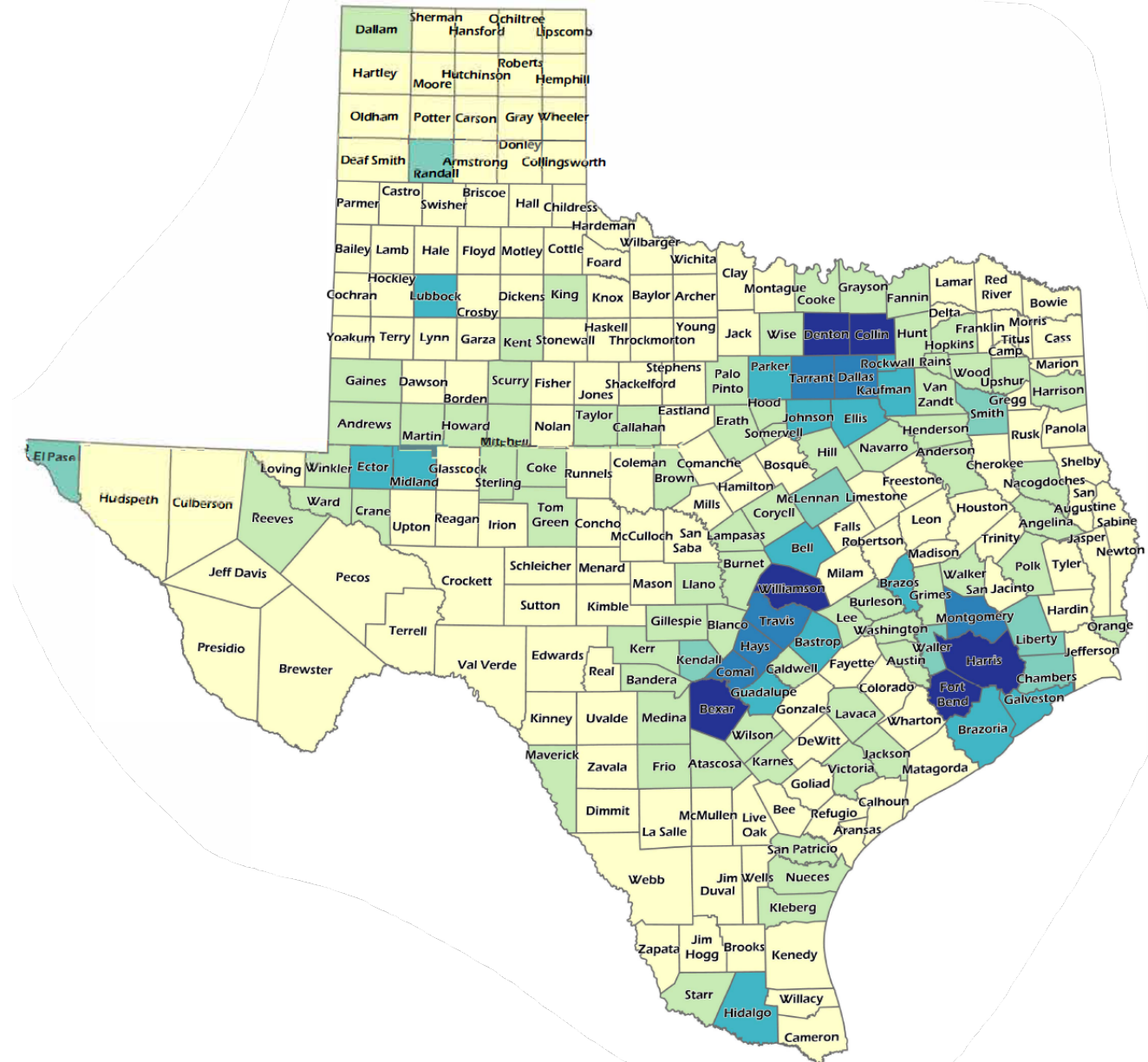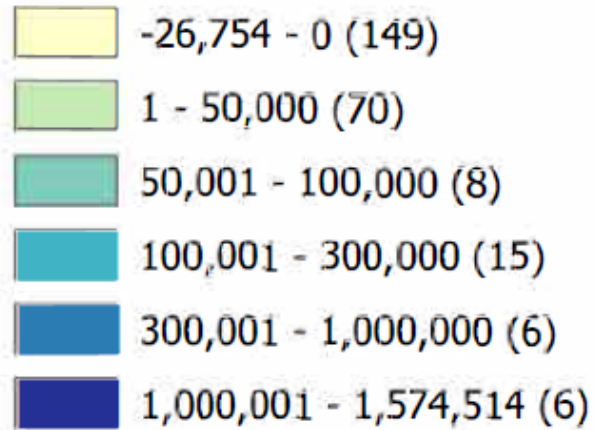
Projected Percent Change 2020-2060

- -78.6% - -38.4% (29)
- -38.3% - 0.0% (120)
- 0.1% - 10.0% (26)
- 10.1% - 25.0% (22)
- 25.1% - 50.0% (23)
- 50.1% - 316.1% (34)
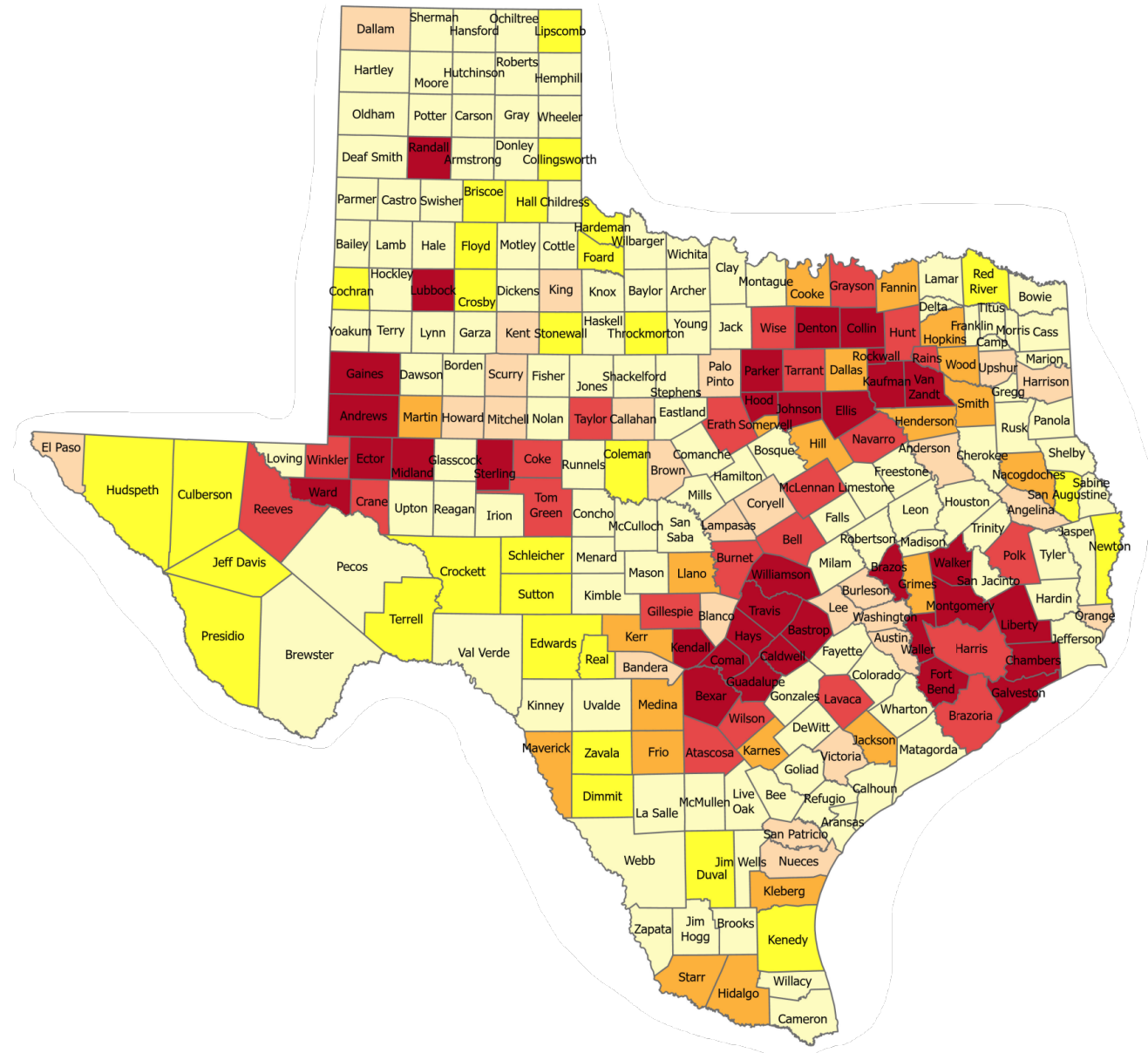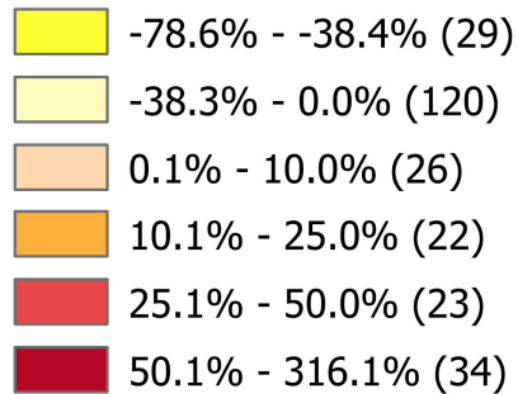
Access TDC Projections Data, V2018 and V2022

Customized tables available for V2018 TDC projections

Swipe Maps for TDC Projections
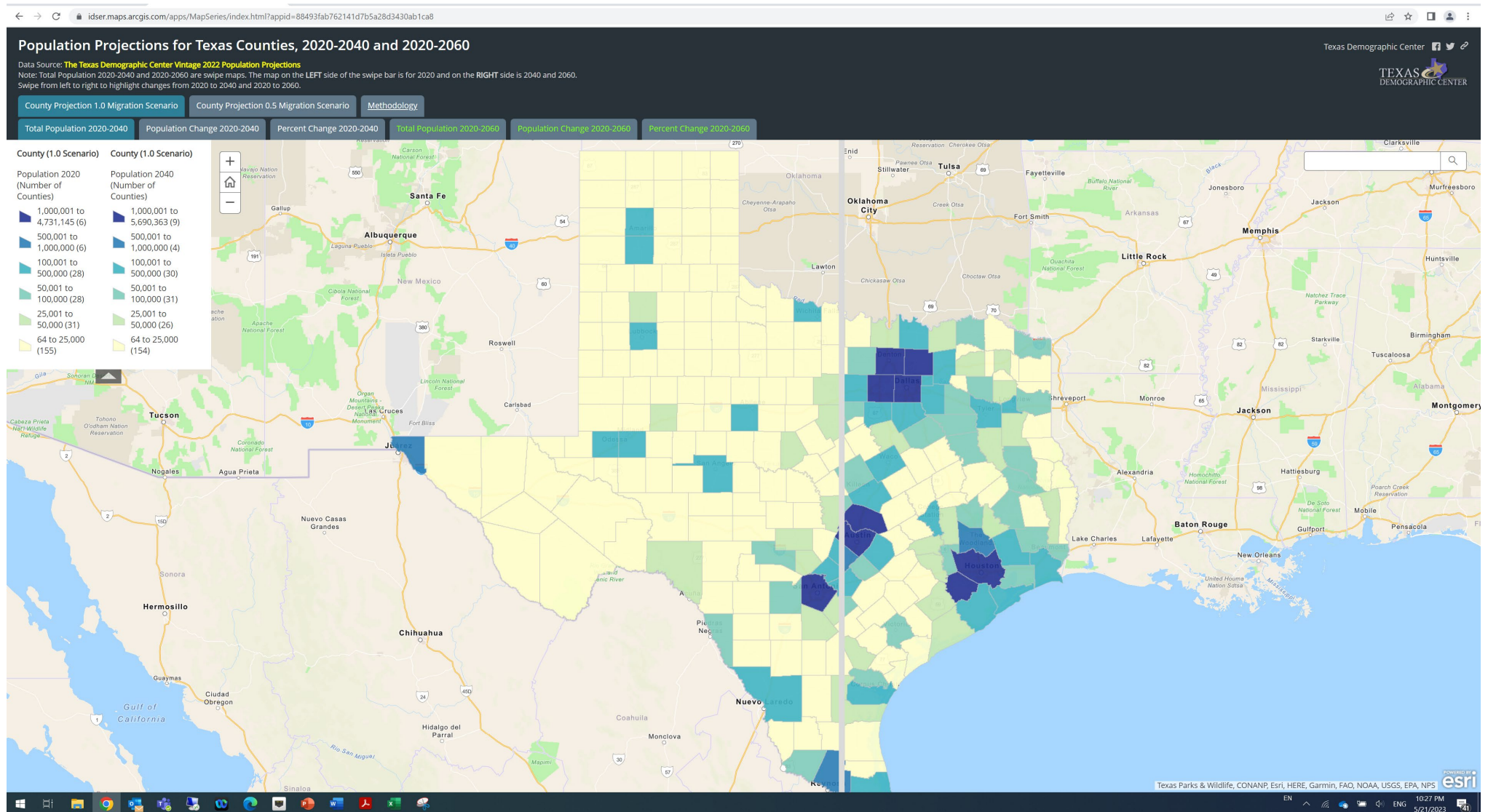
Frequently Asked Questions

❑Why is your estimate different from your projection for the same year? Which one should I use?

❑What are migration scenarios?

❑Why is the projection for my county lower at 1.0 migration scenario than that at the 0.5 migration scenario?

❑Why did my county grow in the last decade but projected to decline in the future?

❑Why is my county projected to grow more slowly than a county that saw similar growth rate with us in the last decade?

….

Challenges in the New Decade

❑ Delays and possible undercounts (for Texas) in the 2020 Decennial Census.

❑ Changes in the public data released by the Census Bureau.
  o "Differential privacy (noises)" and the "adaptive design" (varying population threshold for publication);
  o "Impossible/improbable" values, parts not adding up to totals, inconsistencies between datasets;
  o Base (2020) population for the Census Bureau estimates can change

❑ Challenges in data collections.

❑ Communications and outreach to data users

Helen You, Ph.D.

📞 (210) 458-6530

✉️ TDC@UTSA.edu

🌐 Demographics.Texas.gov

🐦 @TexasDemography

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