

Equity Index and Crash Rates Dashboard Guide

The equity index presented in this dashboard combines twelve socio-economic factors using a Principal Component Analysis (PCA). PCA serves as a valuable dimensionality reduction technique frequently employed to streamline large datasets. It achieves this by transforming an extensive set of variables into a more compact one that retains a significant portion of the information from the original set, without sacrificing essential information.

Socio-economic characteristics captured in the index include the following variables:

1. Total Population,
2. Educational Attainment,
3. Median Age,
4. Unemployment Rate,
5. Industry of Employment,
6. Health Insurance Accessibility,
7. Population Living Below Poverty Line,
8. Median Household Income,
9. Housing Occupancy Type,
10. Median House Value,
11. Race, and
12. Ethnicity.

Five-year data profiles from the American Community Survey (ACS: 2017-2021) were downloaded at the county-level for the analysis. The above socio-economic characteristics were further integrated with crash rates, adding a critical dimension to the analysis, particularly in understanding how socio-economic factors correlate with traffic safety.

Crash rate metrics used in the dashboard include the following variables:

1. Crashes Per Population (per 1,000 population),
2. Crashes Per Vehicle Miles Traveled (VMT) (per 100 million VMT in 2021).

Crashes are fatal and suspected serious injury crashes (KA) from the years 2018-2022.

Accessing and Using the Equity Index Dashboard

The Equity Index dashboard is located on the TEXASTRCC.org website.

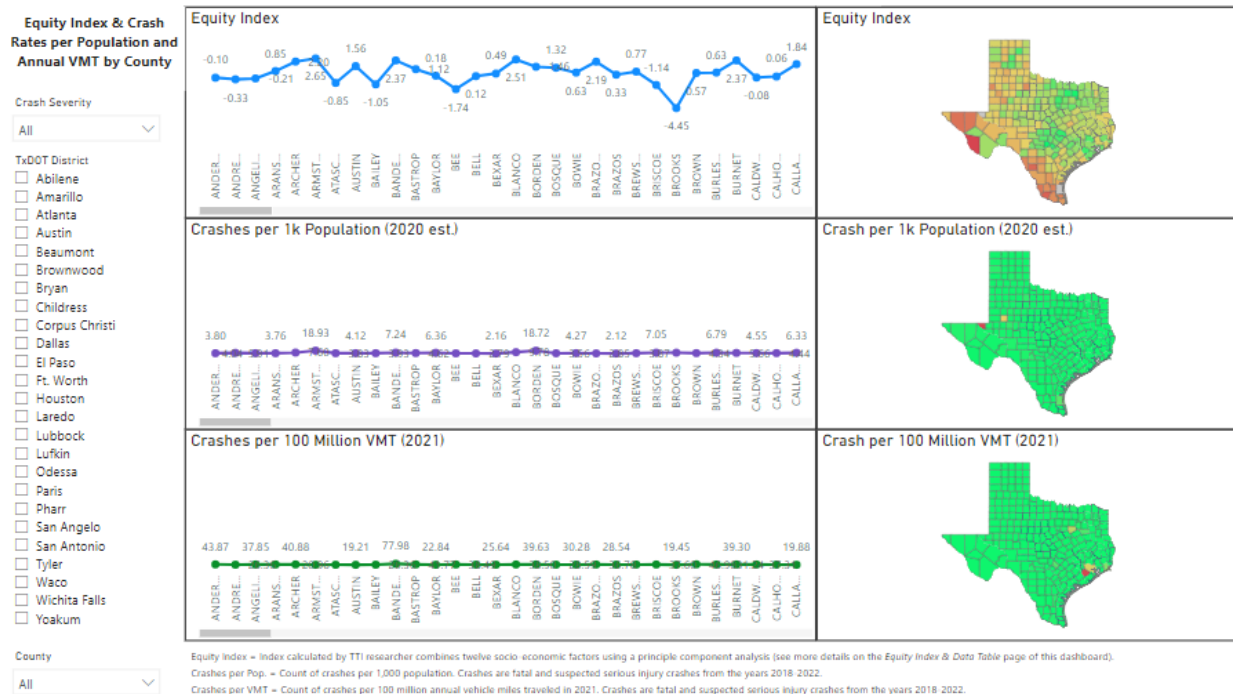
1. Click on the link to access the application: <https://texastrcc.org/equity-index-and-crash-rate-dashboard/>
2. There are 3 interactive pages in the dashboard. The following is a list of the pages that present information by TxDOT District and County:
 - Equity Index and crash rates
 - Equity index and data table

- City and roadway explorer

The crash data include fatal and suspected serious injury crashes only.

Equity Index & Crash Rates Page

This page provides a visual representation of crash rate (normalized by population and traffic volume) and socioeconomic status to understand the association between the two. The association can also be visualized at TxDOT district levels.



Microsoft Power BI | 1 of 3

- Available filters: Crash severity (KA), TxDOT District, and County.
- Top chart and map illustrate the equity index by county. The higher the number the more affluent the county. The map color coding is green (reflects counties with higher socio-economic status) to red (reflects counties with lower socio-economic status).
- Middle chart and map illustrate the crashes per 1,000 population rates by county. The population estimate is for 2020.
- Bottom chart and map illustrate the crash per 100 million VMT by county. VMT is currently for the year 2021 and was obtained from TxDOT’s multi year roadway data tables: <https://www.txdot.gov/data-maps/roadway-inventory.html>.

Equity Index & Data Table Page

This page is helpful if the user wants to easily see crash rates for each county, all in one table.

Equity Index & Crash Rates per Population and Annual VMT by County

State equity indexes range from -6.96 to 4.78. The larger the number the more affluent the county. The median equity index for the state is 0.14.

- Crash Severity
All
- TxDOT District
- Abilene
 - Amarillo
 - Atlanta
 - Austin
 - Beaumont
 - Brownwood
 - Bryan
 - Childress
 - Corpus Christi
 - Dallas
 - El Paso
 - Ft. Worth
 - Houston
 - Laredo
 - Lubbock
 - Lufkin
 - Odessa
 - Paris
 - Pharr
 - San Angelo
 - San Antonio
 - Tyler
 - Waco
 - Wichita Falls
 - Yoakum
- County
All

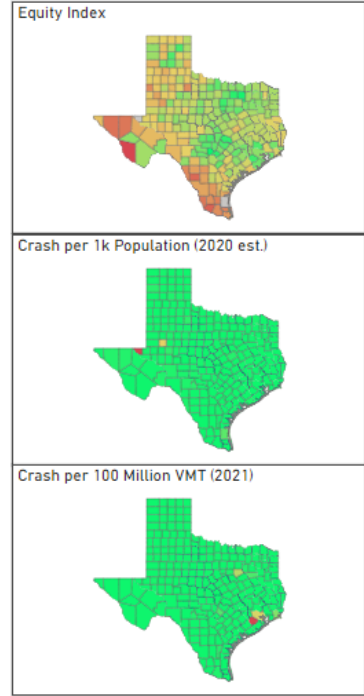
TxDOT County	Equity Index	Crashes per Pop.	Crashes per VMT	Count of Crash	Population 2020	VMT 2021	State Index Ranking
PRESIDIO	-6.96	3.93	25.62	24	6,109	93,664,825.42	252
STARR	-5.73	1.82	26.07	120	65,861	460,230,692.60	251
DIMMIT	-5.43	6.41	29.76	55	8,577	184,786,788.37	250
HUDSPETH	-5.06	27.47	15.42	88	3,203	570,545,366.95	249
ZAPATA	-4.86	2.45	26.01	34	13,874	130,701,251.03	248
CULBERSON	-4.85	26.54	16.99	58	2,185	341,422,232.14	247
BROOKS	-4.45	6.94	19.45	49	7,057	251,915,263.33	246
WILLACY	-4.32	2.73	26.45	55	20,150	207,941,075.78	245
MAVERICK	-4.07	18.85	24.59	99	5,252	402,627,675.39	244
COCHRAN	-3.93	3.91	21.98	10	2,557	45,505,980.67	243
HIDALGO	-3.89	1.87	209.07	1632	872,806	780,605,837.63	242
JIM HOGG	-3.83	1.44	0.26	7	4,846	2,692,372,662.76	241
KING	-3.82	37.59	29.64	10	266	33,740,979.76	240
FRIO	-3.43	4.83	14.35	89	18,409	620,091,347.56	239
DUVAL	-3.40	3.57	18.65	35	9,807	187,702,456.03	238
CAMERON	-3.34	1.93	24.97	813	421,445	3,255,503,300.21	237
ZAVALA	-3.20	5.69	32.95	55	9,662	166,934,689.12	236

The equity index presented here combines twelve socio-economic factors using a principle component analysis. Socio-economic characteristics captured in the index include: (i) total population, (ii) educational attainment, (iii) median age, (iv) unemployment rate, (v) industry of employment, (vi) health insurance accessibility, (vii) population living below poverty line, (viii) median household income, (ix) housing occupancy type, (x) median house value, (xi) race, and (xii) ethnicity. 5-yr data profile from the American Community Survey (ACS; 2017-2021) were downloaded at the county level for the analysis.

Crashes per Pop. = Count of crashes per 1,000 population. Crashes are fatal and suspected serious injury crashes from the years 2018-2022.

Crashes per VMT = Count of crashes per 100 million annual vehicle miles traveled in 2021. Crashes are fatal and suspected serious injury crashes from the years 2018-2022.

For other index-related details, you can reach out to n.sinha@tt.tamu.edu.



- Available filters: Crash severity (KA), TxDOT District, and County.
- The table lists the equity index, crash rate per 1,000 population, crash rate per 1 million VMT, count of crashes, estimated population, VMT, and the equity index ranking by county. The higher the state index ranking the lower the socio-economic status of the county.
- The maps are the same as on the first page.

City & Roadway Explorer Page

This page is useful to explore the actual location of the crashes. After using one of the first two pages the third page can be used to identify locations within districts and cities where resources might be allocated.

Equity Index & Crash Rates per Population and Annual VMT by County
City and Roadway Explorer

Crash Severity: All

TxDOT District:

- Abilene
- Amarillo
- Atlanta
- Austin
- Beaumont
- Brownwood
- Bryan
- Childress
- Corpus Christi
- Dallas
- El Paso
- Ft. Worth
- Houston
- Laredo
- Lubbock
- Lufkin
- Odessa
- Paris
- Pharr
- San Angelo
- San Antonio
- Tyler
- Waco

County: All

City: All

Street Name	Count of Crash
IH0010	2331
IH0035	1918
IH0045	1825
IH0020	1794
IH0030	1033
IH0035E	870
US0059	793
US0290	729
SH0006	660
US0281	619
US0069	605
IH0635	586
IH0069	566
Total	86478

City Name	Count of Crash
UNKNOWN	32557
HOUSTON	7482
DALLAS	5659
SAN ANTONIO	3367
AUSTIN	2653
FORT WORTH	2511
EL PASO	1216
ARLINGTON	937
CORPUS CHRISTI	746
AMARILLO	734
GARLAND	545
BEAUMONT	543
Total	86478

City Name Legend:

- ABILENE
- ALAMO HEIGHTS
- ALICE
- ALLEN
- AMARILLO
- ANAHUAC
- ANGLETON
- ANTHONY
- AQUILLA
- ARANSAS PASS
- ARCHER CITY
- ARLINGTON
- ATHENS
- ATLANTA
- AUSTIN
- AVINGER
- BAILEY
- BALCH SPRINGS
- BARTLETT
- BARTONVILLE
- BASTROP
- BAYTOWN
- BEACH CITY
- BEAUMONT
- BEDFORD



- Available filters: Crash severity (KA), TxDOT District, County, and City.
- The map illustrates the crashes.
- Top table lists the street name assigned to the crash and the count of crashes.
- Bottom table lists the city assigned to the crash and the count of crashes.

For other index-related details, please reach out to Nishita Sinha (n-sinha@tti.tamu.edu) or Marcie Perez (m-perez@tti.tamu.edu).