



DENTON COUNTY
TRANSPORTATION
AUTHORITY

DCTA Business Case for Transit: A-train Commuter Rail

The Antero Group
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Introduction

Investment in public transit is often thought of as simply serving a variety of needs by providing an affordable, reliable, and complementary alternative to car-oriented transportation. Indeed, these have been the focal points of many transportation agencies over the years, but further analysis indicates there are other, equally significant, reasons to invest in transit. To further explore this the Denton County Transportation Authority (DCTA) partnered with the Antero Group, an engineering and planning firm, to analyze potential, less obvious, yet significant fiscal benefits of the A-train's presence on Denton County and North Texas. Further, we explored how the A-train is positioned relative to peer systems to better understand how it compares to larger national trends. With this study, the following report sought to better understand the tax benefits and increased development opportunities that have and may result from continued investments in the A-train corridor. The results point to a substantial business case for ongoing investment in this important regional asset.

Report Methodology

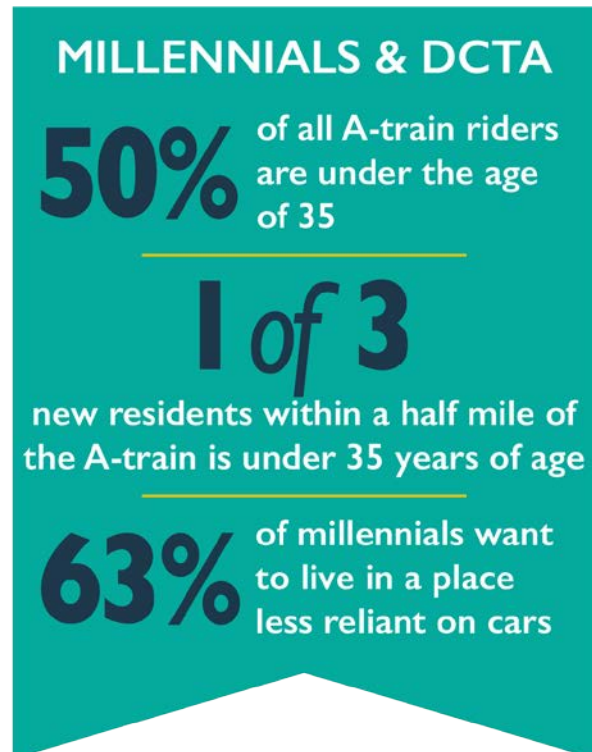
The following report analyzed local, regional, and national data sources from a variety of government, non-profit, and research institutions. This analysis quantified the costs and benefits of existing transportation for residents and businesses in the Denton County and North Texas region. Research included in this report consists of a combination of primary data from the United States Census and Bureau of Labor Statistics, DCTA ridership surveys, Denton County tax assessor data, North Central Texas Council of Governments (NCTCOG), Texas A&M building permits data, and the United States Department of Transportation (USDOT). This data was examined and then synthesized to outline the impacts of the A-train extending one-half mile along the corridor.

Current trends in terms of demographics, workforce, and consumer preferences are integrated in this report by analyzing the fiscal impacts associated with public transit investment. The report also illustrates the potential increases in property and sales taxes, decreases in public infrastructure expenditures, and increases in disposable income associated with a lower cost of living. The research also highlights potential impacts on the local real estate market of transit-oriented development (TOD) and the potential savings associated with reducing road construction. Lastly, this report utilized national case studies to determine the secondary benefits associated with reducing transportation congestion and the health benefits of improved air quality.

Key Demographics

The DCTA A-train has helped attract and serve young earners under 35, students, professionals, and seniors, all of whom benefit from the service. Additionally, the A-train is an amenity that, alongside the workforce and quality of life assets, will keep Denton County competitive for future business attraction. Below are several important points that outline demographic trends emerging along the A-train corridor, as well as within Denton County.

- *The A-train has attracted development for young, upwardly mobile Millennials (under 35).*
 - This generation is likely to be moving over the next five years, just as they enter their prime earning years, 63% of them want to live in a place less reliant on cars.ⁱ Communities best positioned to attract these future stakeholders have a multitude of transportation options.ⁱⁱ
 - Since opening in 2011, the A-train has unlocked development to attract more of this critical workforce to Denton County. In Lewisville, under 35 households are the key market for the Hebron 121 development. In Denton, Martino Group responded to the A-train station by building East End Lofts, also targeted to under 35 households.
 - As a result, Denton County has attracted this critical demographic group
 - **1 out of 3** new residents within one half mile of the A-train is 35 cohort;ⁱⁱⁱ
 - **50%** of all A-train riders are under 35^{iv}



- *The A-train attracts professionals and high wage job employers.*
 - Increasingly, workers in knowledge and professional fields are attracted to areas with good public transportation.^v Migrants into the Dallas-Fort Worth Area from domestic and international destinations with good transit access are more likely to seek to live within a community with the same amenity.
 - The DCTA helps connect member cities to the major employers growing the regional economy. Between the DCTA and the DART Green Line, Denton County can use the A-train to reach:
 - **9 out of 15** top employers in the Dallas-Fort Worth area^{vi}
 - This includes **35,170** jobs just at Southwestern Medical Center, a one-hour ride from Hebron station.^{vii}



- Member cities have utilized the A-train, alongside schools and quality of life, to market housing to in-migrants and international arrivals working at these major employers.
- Since the A-train opened in 2011, high earning professionals have used DCTA in increasing numbers. As transit ridership has grown in the County since 2010:
 - **48%** of growth came among professionals earning more than **\$65,000 per year**.^{viii}
 - **65%** of growth came among riders in professional or office occupations.^{ix}
- The A-train will keep Denton County and the Dallas region competitive for other corporate relocations.
 - In its HQ2 competition, Amazon made mass transit access one of its six core requirements in its RFP.^x

- The RFP also emphasizes areas of Countywide and regional strength, including an educated workforce, a high quality of life, and the potential availability of economic development incentives.

This preference is not limited to Amazon. A 2015 study of 40 business moves from auto-oriented to centralized locations found that companies emphasized workforce access in making the move. These moves boosted their location’s Transit Score, a national score for transit service on a 0-100 scale, by an average of 25 points.^{xi}

- DCTA service provides a critical element to future business attraction, alongside workforce, tax, and quality of life considerations.

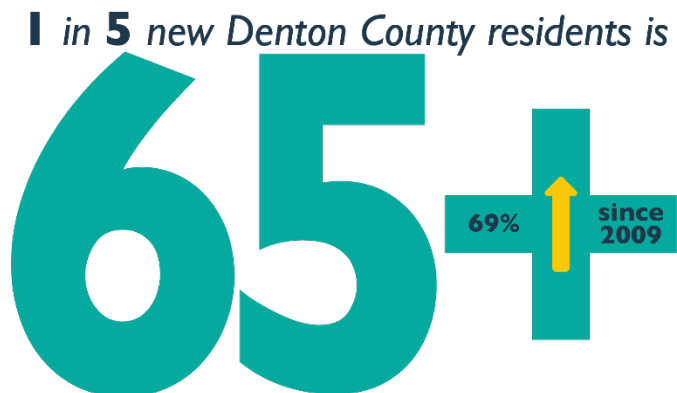
- *DCTA service gets students where they want to go.*

- Together, UNT, TWU, and NCTC 62,435 serve full- and part-time students.^{xii}
- These students include first generation families, low-income families, or both.
- They may not own or afford cars, and this strain will increase if gas prices increase, but the A-train helps them get to class.
 - 26% of A-train riders are between 18-24.^{xiii}



- *DCTA service will help older County residents as they age in place.*

- DCTA bus service will help provide a cost friendly alternative to paratransit as these residents age and increasingly need transportation to medical and other services.
- The percentage of Denton County residents above 65 is growing.
 - Since 2009, the number of residents above 65 has increased by 69%.^{xiv}
 - 1 out of every 5 new net County residents is above 65.
 - And an additional 4 out of 10 County residents will reach retirement age over the next 10 years.^{xv}



Improved Tax Revenue and Reduced Expenditures

DCTA and the A-train help pay for themselves by generating revenue for new development and reducing the need for additional infrastructure expansion as Denton County continues to grow. Development around the A-train has created new property and sales tax value that has already begun to recoup the capital and operating costs of the system. And by providing an alternative to driving, DCTA is an investment for the future as the land needed for road expansion becomes more cost prohibitive.

- The A-train has paid for its construction costs in spurring new real estate value in its member cities.
 - Responding to growing demand from the millennial generation, the multifamily residential market is booming locally and nationally. In 2017, ULI and PriceWaterhouseCoopers ranked the Dallas region the fifth hottest multifamily market in the United States.^{xvi}
 - In 2016 alone, the region attracted \$1.6B in new multifamily real estate investment.^{xvii} To date, Denton County has lagged its neighbors, attracting just \$157M in multifamily investment in 2016. Collin County, by contrast, spurred \$496M.^{xviii}



- The A-train has better positioned the County to attract more of this investment as transit- oriented development (TOD). Around the Downtown Denton Transit Center, several multifamily developments east of downtown, like Victoria Station and East End Lofts, were proposed after the A-train was announced. Hebron station helped advance the Hebron 121 development. More development is planned around the Old Town Lewisville and Highland Village/Lewisville Lake Stations.

- The A-train has helped create a development environment for TOD that has:
 - Added **1,136 residential units** and **68,000 sq. ft.** in TODs, with another **1,434 units** in the pipeline.^{xi}
 - Added new private investment of **\$345M**, roughly equal to the **\$347M** construction cost of A-train.^{xx}

THE A-TRAIN HAS HELPED INCREASE DEVELOPMENT:



- *The A-train is beginning to pay for its operational costs in new property and sales taxes.*
 - Once completed, TOD developments will create **\$11.8M** in new property and sales tax revenue for its member cities:
 - **\$2.9M** has already been created in property tax from new TOD development,^{xxi} with **\$3.3M** in the pipeline.^{xxii}
 - A projected **\$1.0M** has been created in sales tax from new consumers and reduced transportation expenditures, with **\$716,000** expected from future development.^{xxiii}
 - The estimated yearly property and sales tax return is **44%** of the **\$26.6M** sales tax contributions from member cities in 2018.^{xxiv}
- *The A-train has created additional taxable value up and down the corridor.*
 - DCTA service creates a price premium for existing properties that appreciate with new access to transit and jobs. This premium stays resilient during housing downturns. Across five transit-served regions, residential property near transit

- has been found to outperform the market by an average of 42%.^{xxv}
- Since 2011 properties within one-half mile of the A-train alignment have experienced:
 - \$1.3B in increased property value;^{xxvi}
 - A projected \$30M increase in property tax from value added.^{xxvii}



- *The A-train will provide an alternative as roadway construction becomes more expensive.*
 - Building roads can be expensive. Road building often requires the acquisition of land from private property owners.
 - According to the FHWA, right-of-way acquisition for new interstates and highways in urbanized areas costs an inflation-adjusted \$924,109 for every new land mile constructed on average.^{xxviii}
 - As the County grows and develops, the public cost of land acquisition for road expansion will continue to rise. Such expansion may require purchase of property from thriving areas, and may, ultimately, be logistically or cost prohibitive.
 - According to TXDOT, the 2013 cost of rebuilding I-35E from 635 to 380 was:
 - \$3.7 billion to construct
 - \$1 billion for right of way acquisition^{xxix}
 - The A-train parallels I-35E. As the costs for expanding road capacity escalate, the A-train provides an alternative.

Reduced Congestion and Improved Air Quality

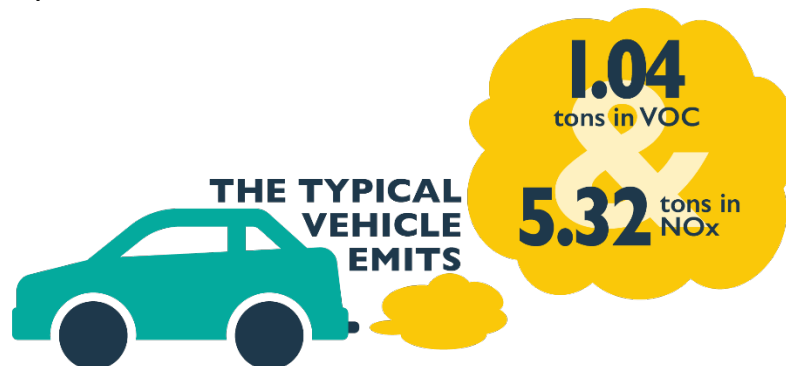
Traffic and air quality concerns have increased in Denton County. The A-train provides an alternative to congestion and, over time, an opportunity to reduce driving and provide cleaner air.

- The A-train provides a reliable alternative to worsening congestion.
 - As traffic worsens in Denton County and the Dallas region, commute times are on the rise. **1 in 10** Denton County commuters now travel more than 60 minutes to work – **an increase of 47% since 2009.**^{xxx}
 - The A-train provides a reliably scheduled alternative to this congestion.
 - Traffic congestion wastes commuter time, makes employees late, creates uncertainty in reliability for services and deliveries, and worsens tailpipe emissions from cars. Every year, congestion costs the average commuter **\$1,067**^{xxxix}

CONGESTION IS INCREASING IN DENTON COUNTY



- The A-train reduces vehicle miles and improves the air.
 - Denton County has registered the dirtiest air among Texas counties, created by large concentrations of oxides of nitrogen (NOx) and volatile organic compounds (VOC) in the air.^{xxxii} Though some of this pollution results in north winds that blow emissions from other communities into the County, local transportation plays a role.
 - Increasing vehicle miles traveled in Denton County means that vehicles emit significant amounts of pollutants even as vehicles are becoming cleaner:
 - In 2017, the typical passenger vehicle in Denton County traveled 64 miles per day, an increase in 8% just since 2006.^{xxxiii}
 - Because of these long commutes, NCTCOG estimates that the typical passenger vehicle emits **1.04 tons** in VOC and **5.32 tons** in NOx per day.^{xxxiv}



- The A-train has helped spur development in locations where people can drive a little bit less and emit fewer pollutants into the air. For example, households at Hebron 121 drove a projected 44 miles per day, 31% fewer miles than the typical County resident. For every resident able to drive these fewer miles, their car produces a projected:
 - 1.66 fewer tons of NOx.
 - 0.32 fewer tons of VOC. ^{xxxv}

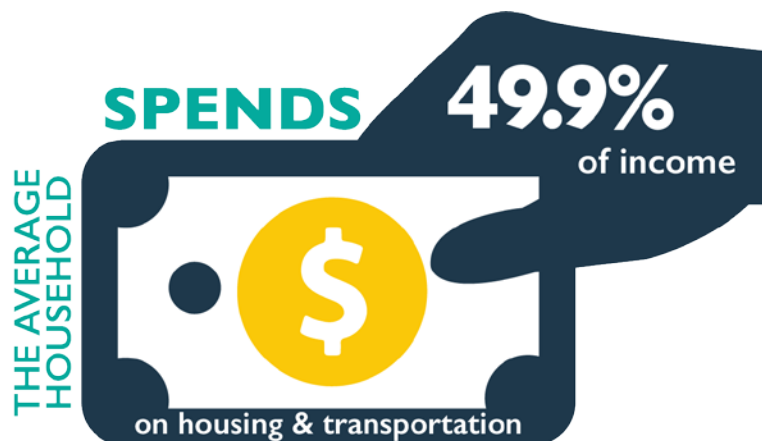
**FEWER MILES
= LESS POLLUTION**



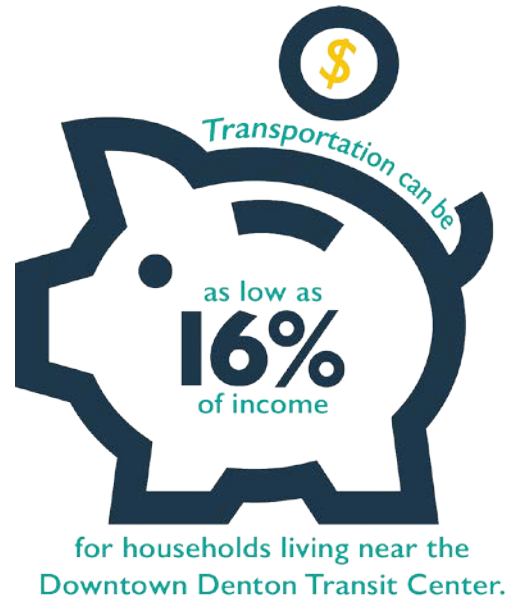
A More Affordable Cost of Living

Transportation is the second biggest cost in a household’s budget. The A-train has helped spur development in places close to jobs and amenities where residents can take transit for some trips and drive a little bit less for others. This helps reduce the overall cost of transportation. Over time, residents can reinvest those transportation savings in the local economy and generate substantial economic growth.

- Transportation significantly increases economic pressure on households, but DCTA offers relief.
 - The cost of housing, transportation, health care, and education are all rising. An average American household spends 49.9% of income just on housing and transportation.^{xxxvi} Increased spending on transportation leaves less in household pockets to spend money at local businesses and drive the economy.
 - Transportation costs include the cost of buying a car, insurance, repairs, depreciation from driving, and gasoline. These costs escalate when every driving age household member needs a car.



- Transportation costs the typical Denton County household **\$13,211 per year**:
 - **\$10,226** to own the vehicle and
 - **\$2,938** to drive it
 - That's **22% of income** for a household earning \$60,000 per year^{xxxvii}
- The A-train has created new housing in neighborhoods closer to destinations where households can take transit to some places and drive a little bit less to others. As a result, transportation costs can be as low as **16% of income** for a household living near the Downtown Denton Transit Center.



- *DCTA can help those savings aggregate as the County grows.*
 - Denton County is projected to add 152,191 households by 2040. If just one out of every five of these new households saved as much on transportation as residents around the Hebron A-train station, they would:
 - Save an aggregate **\$129,331,911** in owning and fueling cars
 - Spend an estimated **\$46,456,602** in the local economy
 - Create **1,394** new jobs just from new consumer spending^{xxxviii}

Transit-Oriented Development Case Studies

Since opening in 2011, the A-train has made new developments possible, which are generating returns for the county-wide economy and tax base. Two of these case studies, Hebron 121 and East End Lofts demonstrate that the A-train has made possible new real estate investment that is contributing to local economies and tax bases.

- **Hebron 121**
 - Huffines Development immediately thought “transit-oriented development” when it purchased a farm around Hebron station in anticipation of the A-train opening.
 - Initially, Huffines planned a single-family development, but as the economy changed after 2008/9, so did the nature of the development.
 - Hebron 121 is centered around the “Millennial renter”, and the combination of transit access, bicycle amenities, town center style development, and road connectivity all made the development possible.
 - The project has been a tremendous success. The first phases are 95% leased, and additional phases are on the way.

- Impact:
 - 1,426 new units
 - \$184,381,800 in estimated new investment
 - \$1,736,208 in property tax created and sales tax created^{xxxix}
 - \$38,062,918 in new aggregate income, plus \$1,899,882 in savings accrued from reduced transportation costs, equaling \$39,962,801 in increased effective income in the community
 - 20 fewer vehicle miles traveled per household per day, resulting in a projected:
 - 2,178 fewer tons of NOx per day
 - 424 fewer tons of VOC per day^{xl}



- **East EndLofts**

- When Martino Group first began developing projects, walkable, multifamily development had few comparables, but the company provided “proof of concept”, especially among the millennial renter market.
- Downtown Denton had an emerging market due to the presence of college population and hospitality businesses, but had yet to geographically expand eastward into an area of underutilized industrial properties.
- The A-train station made it possible to development to expand across the tracks and redevelop a vacant building and site otherwise disconnected from the Square.
- As of September 2017, the building was fully leased, reflecting high demand.
- The A-train station also made possible a co-working center, currently operated by City of Denton. Previous ownership of the center reported that the proximity to the A-train attracted tenants interested in the transit connection into the DFW area.



- Impact:
 - 110 new housing units
 - 9,061 new square footage of retail and office space
 - \$425,685 in property and sales tax created, or \$115,675 per acre^{xli}
 - \$4,355,287 in new aggregate income, plus \$134,562 in savings accrued from reduced transportation costs, equaling \$4,478,849 in increased effective income in the community
 - 18.4 fewer vehicle miles traveled per household per day, resulting in an overall projected:
 - 168 fewer tons of NOx per day
 - 33 fewer tons of VOC per day^{xlii}



Conclusion

The above analysis points to an impressive economic benefit connected directly to the presence of the DCTA A-train within Denton County. This report makes it clear that a combination of demographic changes, shifts in consumer preferences, and increased real estate development will likely continue to increase the demand for public transit investment in the near future. Furthermore, this report indicates that the reciprocal benefits of public transit investment will yield greater economic returns for Denton County in terms of increased revenue from transit-oriented development investment, reduced public expenditures on transportation, reduced congestion on roads, increased labor productivity, lower health costs resulting from decreases in pollution and ultimately, a more vibrant regional economy.

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- ⁱ Urban Land Institute, *Housing in America*, 2015.
- ⁱⁱ Urban Land Institute and PriceWaterhouseCoopers, *Emerging Trends in Real Estate*, 2017.
- ⁱⁱⁱ U.S. Census, American Community Survey 5 Year Rolling Averages, 2006 – 2010 to 2010 – 2015. All data has been aggregated to ½ mile around each A-train station.
- ^{iv} DCTA Ridership Survey, 2017.
- ^v American Public Transportation Association, *Public Transportation's Role in the Knowledge Economy*, 2016.
- ^{vi} Tiago Title data subsourced from [Dallas Business Journal data](https://www.bizjournals.com/dallas/subscriber-only/2017/07/21/largest-north-texas-employers.html) <https://www.bizjournals.com/dallas/subscriber-only/2017/07/21/largest-north-texas-employers.html> (2017)
- ^{vii} Southwest Medical District, <http://www.swmeddistrict.org/>
- ^{viii} U.S. Census, American Community Survey 5 Year Rolling Averages, 2006 – 2010 to 2010 – 2015.
- ^{ix} U.S. Census, American Community Survey 5 Year Rolling Averages, 2006 – 2010 to 2010 – 2015.
- ^x Amazon, "Amazon HQ2 RFP", https://images-na.ssl-images-amazon.com/images/G/01/Anything/test/images/usa/RFP_3._V516043504_.pdf.
- ^{xi} Smart Growth America, "Core Values: Why American Companies Are Growing Downtown", 2015.
- ^{xii} University websites
- ^{xiii} DCTA Ridership Survey, 2017.
- ^{xiv} U.S. Census, American Community Survey, 1 Year Estimates, 2009 – 2015.
- ^{xv} U.S. Census, American Community Survey, 1 Year Estimates, 2009 – 2015.
- ^{xvi} ULI and PWC, *Emerging Trends in Real Estate*.
- ^{xvii} Texas A&M Real Estate Center, "Building Permits". <https://www.recenter.tamu.edu/data/building-permits>.
- ^{xviii} Texas A&M Real Estate Center, "Building Permits". <https://www.recenter.tamu.edu/data/building-permits>.
- ^{xix} DCTA member cities and developer interviews
- ^{xx} Total real estate value created is projected using the average value per dwelling unit as provided by the Texas A&M Real Estate Center.
- ^{xxi} Denton County Tax Assessor/Collector.
- ^{xxii} Future tax generated is estimated from property tax created to date, using comparable value created per unit from the Denton County Tax Assessor/Collector and tax rates among member cities and Independent School Districts.
- ^{xxiii} Property tax revenue was generated from Denton Central Appraisal District data provided by DCTA in summer of 2017, crosschecked with County Assessor's website to confirm parcels and tax rates. Estimated sales tax revenue is projected first using projected aggregate income from the U.S. Census as well as additional transportation cost savings from the CNT H+T Affordability Index (<http://htaindex.cnt.org/>) at each A-train station area (defined as areas within a half-mile of a station), then a projection of increased local consumer spending in select categories using the BLS Consumer Expenditure Survey for residents in the southern United States (Table 1800). Sales tax is projected for each member city using the local sales tax rate.
- ^{xxiv} Denton County Transportation Authority Proposed Fiscal Year 2018 Budget.
- ^{xxv} APTA and CNT, *The New Real Estate Mantra: Location Near Public Transportation*, 2013.
- ^{xxvi} Analysis of Denton Central Appraisal District data conducted by DCTA staff.
- ^{xxvii} Property tax increase is estimated using property tax increment for each member city and Independent School District, according to the Denton County Tax Assessor/Collector.
- ^{xxviii} Victoria Transport Policy Institute, *Transportation Cost and Benefit Analysis II – Roadway Costs*, 2017. Estimates have been adjusted to reflect 2017 dollars using the Bureau of Labor Statistics Inflation Adjustment.
- ^{xxix} NCTCOG, "Interstate 35E: Project Tracker", http://www.nctcog.org/trans/committees/sttc/2011/08Aug/Ref.Itm_11.10.sttc082611.pdf.
- ^{xxx} U.S. Census, American Community Survey 5 Year Rolling Averages, 2005 – 2006 to 2011 – 2016.
- ^{xxxi} American Community Survey (2016), and Texas A & M Transportation Institute (<https://static.tti.tamu.edu/tti.tamu.edu/documents/mobility-scorecard-2015.pdf>)
- ^{xxxii} Denton Record-Chronicle, "City's average ozone level for 3 years is highest in Texas", <http://www.dentonrc.com/news/news/2016/11/29/denton-air-ranks-as-states-dirtiest>.
- ^{xxxiii} NCTCOG.
- ^{xxxiv} NCTCOG. Data modeled through the USEPA Motor Vehicle Emissions Simulator model.
- ^{xxxv} Projected VMT savings using the difference between 2017 countywide VMT modeled by NCTCOG and station area

VMT calculated by CNT H+T Affordability Index. Projected emissions savings calculated by using a multiplier using the 2017 per vehicle estimates provided by NCTCOG. This estimate does not consider idling and congestion, both of which significantly affect the level of emissions that a vehicle generates.

^{xxxvi} Bureau of Labor Statistics, Consumer Expenditure Survey by region of residence (South). Data is for mean income of \$67,731 per year.

^{xxxvii} Calculated using CNT H+T Index.

^{xxxix} Estimate generated from NCTCOG projections and CNT H+T Index.

^{xxx} Denton Central Appraisal District, Bureau of Labor Statistics, CN H+T Affordability Index, Antero Group Analysis

^{xi} U.S. Census Bureau, CNT H+T Affordability Index, Antero Group Analysis

^{xli} Denton Central Appraisal District, Bureau of Labor Statistics, CN H+T Affordability Index, Antero Group Analysis

^{xlii} U.S. Census Bureau, CNT H+T Affordability Index, Antero Group Analysis
