



Tennessee Housing Development Agency (THDA) Issue Brief: TRANSPORTATION AS A KEY TO HOUSING AFFORDABILITY

By Muhammad Yadudu, 2018

INTRODUCTION

The distance between where people live and work is widening, leading to an increase in transportation expenses for many households, particularly those who work in metro areas. For example, between the years 2000 to 2012, the number of jobs near the typical resident in the Nashville metro area declined by more than 10%.¹ Not surprisingly, transportation now ranks as the second largest expense, after housing, for Tennessee households.²

According to a Texas A&M Transportation Institute report, transportation cost is a very important factor for households when deciding where to live.³

In light of the relationship between housing and transportation, a more complete picture of housing affordability requires the consideration of transportation costs.

The aim of this brief is to demonstrate the importance of incorporating transportation costs when assessing housing affordability and will provide examples of tools and strategies that may be used to minimize combined housing and transportation cost burdens.

HOUSING AND TRANSPORTATION IN TENNESSEE

Across Tennessee and the nation, housing costs are rising faster than income, especially in the larger cities.⁴ This is making it difficult for households to

afford safe and decent housing, particularly near their places of employment.⁵ As a result, many people are driving longer distances to reach their jobs. Indeed, from 2010 to 2016, the average commute time has increased by around 5% (or 1.2 minutes daily) in the state, and more than 10% in metro Nashville. The 1.2 minute increase in average commute time in the state is the equivalent of reducing 15 million man-hours of potential productivity every year.⁶

This increase in commute times is especially pronounced in rural counties with Houston, Sequatchie, Van Buren and McNairy counties each experiencing a more than 15% increase since 2010. The figure on page 2 shows how commute times have increased in other areas of the state.

Looking at Housing and Transportation Costs Combined:

Recognizing that housing and transportation costs are interlinked, policymakers and researchers have sought ways to quantify this relationship when examining housing affordability. One such effort, by the Center for Neighborhood Technology (CNT), has advocated redefining housing cost burden to households spending more than 45 percent of income on housing and transportation.⁷ This contrasts the current federal method of defining housing affordability based upon a household spending no more than 30 percent of income on housing costs (including utilities) alone. The maps on page 2 show housing affordability for each county in Tennessee using the traditional housing cost only formula compared with the combined housing and transportation index.

¹ Elizabeth Kneebone and Natalie Holmes. "The growing distance between people and jobs in metropolitan America." 2015. Brookings Institution.

² Bureau of Labor Statistics, 2017. Consumer Expenditure Survey

³ <https://static.tti.tamu.edu/tti.tamu.edu/documents/PRC-17-33-F.pdf>

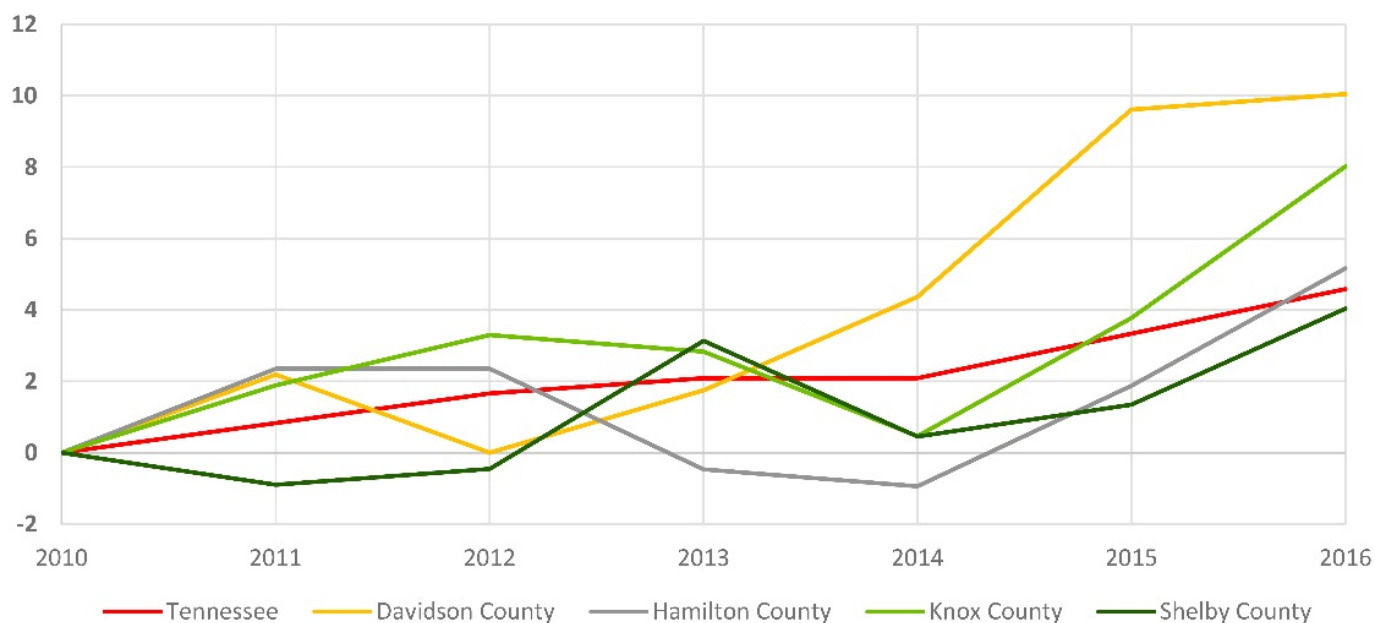
⁴ Joe Speer, et al. "Housing Indicators in Tennessee." 2017. THDA

⁵ Trip Pollard, "Jobs, Transportation, And Affordable Housing". 2010. Southern Environmental Law Center

⁶ That is 1.2 minutes per day with 250 days per year at 3 million workers in the state.

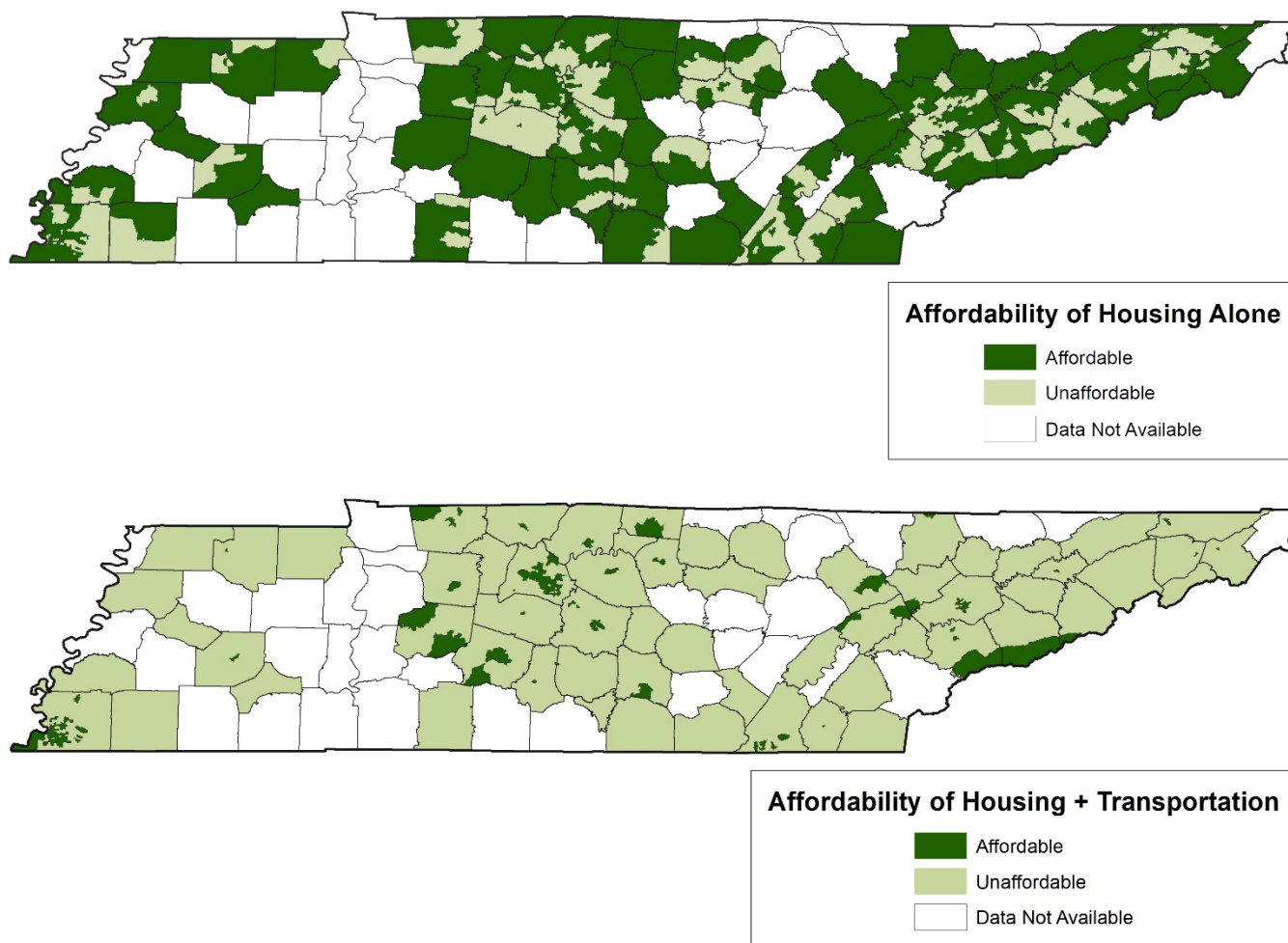
⁷ The 45-percent threshold comes from combining the 30 percent of income housing expense standard with an allowance of 15 percent of income spent on transportation

Figure 1: Cumulative Change in Average Commute Times (Percent)



Source: American Community Survey, US Census Bureau

Figure 2: Comparing Housing Affordability using Different Definitions



SOURCE: Center for Neighborhood Technology Housing and Transportation Index Data

Roughly 70 percent of Tennessee census tracts can be considered affordable to regionally typical⁸ household when considering housing costs alone.⁹ However, when using CNT's Housing and Transportation Index, only about 20 percent of Tennessee census tracts can be considered affordable. This implies that more than two-thirds of communities considered affordable under traditional methods of calculating housing affordability lose that status when transportation expenses are included in the determination.

Looking at the combined cost of housing and transportation has other implications. For example, housing that may at first seem unaffordable may eventually appear more affordable when viewed in the context of its proximity to employment opportunities and other amenities. Living in closer proximity to work and amenities may reduce transportation costs and allow more income to be channeled into buying or renting a home.

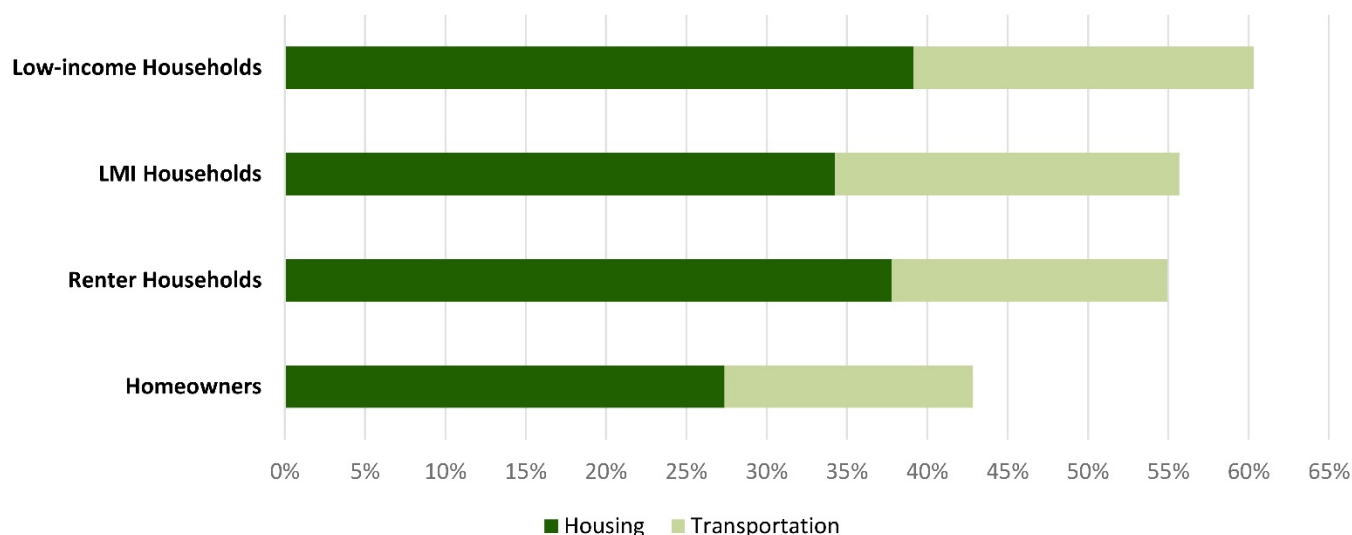
As shown in the following chart, housing and transportation costs combined consume a large share of household budgets.

Based on the CNT threshold of housing cost burden, the typical low-to-moderate income (LMI) household- who in this report are defined as those households whose income fall at or below 80% of the area median income- would be considered housing cost burdened.¹⁰ Renter households appear to be particularly vulnerable, spending around 55% of their incomes on housing and transportation combined.

When households spend a disproportionate amount of their income on housing and transportation, they are less able to afford other essentials such as food, healthcare, clothing or education costs.

The next section highlights how the combined cost of housing and transportation feature in the budget of Tennesseans in different parts of the state.

Figure 3: Housing and Transportation Burdens for Different Groups



SOURCE: Bureau of Labor Statistics' Consumer Expenditure Survey

Impact of Housing and Transportation Costs on Household Budgets:

Table 1 provides a breakdown of some relevant characteristics of a typical LMI household's budget that affect housing affordability in Tennessee. The

data come from CNT's Housing and Transportation Cost Index. In building the index, CNT made some assumptions that require cautious analysis and interpretation.¹¹ These assumptions notwithstanding, the table shows a couple of interesting features. In rural areas, transportation costs actually exceed

⁸ "The Regional Typical Household assumes a household earning the median income for the region, with the average household size for the region, and the average number of commuters per household for the region." CNT

⁹ CNT's Housing and Transportation Cost Index. Where data is available

¹⁰ It should be noted that not all LMI households are renters and vice versa.

¹¹ In constructing its index, CNT relies on some assumptions about household income. It uses the income of a typical household "defined as earning the regional area median income, having the regional average household size, and having the regional average number of commuters per household" in calculating housing costs and transportation costs as a percentage of income. These assumptions may render the housing and transportation measures from the index rather blunt when comparing communities with different characteristics.

housing costs as a percentage of income. This may be due to higher car dependence and the lack of alternative means of commuting.¹² For example, while a typical household in rural Lawrenceburg will spend \$5,537 on annual vehicle miles traveled, a typical household in the Memphis MSA will spend \$4,833. In urban areas, the share of housing and transport costs are nearly equal, with housing costs slightly higher than transportation costs.

The table also confirms the tradeoff between transportation and housing expenses. When one falls, the other rises. This underscores, again, the usefulness of considering a broader definition of housing affordability to include transportation expenses.

Table 1: Selected Housing and Transportation Characteristics of Regionally Typical Households

<i>Area</i>	<i>Housing + Transportation Costs (%) Income</i>	<i>Housing Costs (%) Income</i>	<i>Transportation Costs (%) Income</i>	<i>Annual Cost of Operating Vehicle</i>	<i>Three or More Cars (%) Population</i>	<i>Average Commute Times (Minutes)</i>
<i>Dyersburg</i>	67.04	33.23	33.81	\$5,323	35.4	20.00
<i>Sevierville</i>	67.72	35.86	31.86	\$5,358	37.2	25.70
<i>Tullahoma</i>	67.68	34.5	33.18	\$5,256	43.5	22.20
<i>Paris</i>	68.63	33.85	34.78	\$5,213	34.5	22.20
<i>Lawrenceburg</i>	71.26	34.9	36.36	\$5,537	44.6	26.40
<i>Dayton</i>	69.57	34.21	35.36	\$5,264	44.8	22.50
<i>Tri Cities</i>	67.09	35.08	32.01	\$5,045	39.05	22.13
<i>Clarksville MSA</i>	64.13	33.95	30.18	\$5,490	33.1	24.20
<i>Nashville MSA</i>	61.84	36.17	25.67	\$5,172	26	25.10
<i>Knoxville MSA</i>	65.52	36.49	29.03	\$4,963	32.8	22.00
<i>Chattanooga MSA</i>	65.2	36.51	28.69	\$5,059	34.2	21.70
<i>Memphis MSA</i>	63.03	36.7	26.33	\$4,833	28.3	22.60

Notes- Housing and Transportation costs are expressed as a percentage of income. Annual cost of operating Vehicle is a proxy for transportation costs associated with commuting. All figures are based on the Housing and Transportation index from Center for Neighborhood Technology.

Although transit ridership can reduce some transportation cost burdens, the frequency and scope of these transit options is often insufficient to meaningfully reduce transportation costs for many users. This is because transit systems cannot completely replace a vehicle for many Tennessee households, making the net benefit of public transit investments lower than its potential. Because transit infrastructure in Tennessee is mainly geared towards getting people from home to work, households that use public transit still rely on automobiles for grocery

shopping, going to the doctor, extracurricular activities etc.

As noted previously, housing and transportation cost burdens differ between larger urban metros and other areas of the state. The following section will highlight the nature of housing and transportation costs in the Nashville metro area.

¹² "Rural Transportation at a Glance." United States Department of Agriculture, Economic Research Service Agriculture Information Bulletin 795.

HOUSING AND TRANSPORTATION IN METRO NASHVILLE

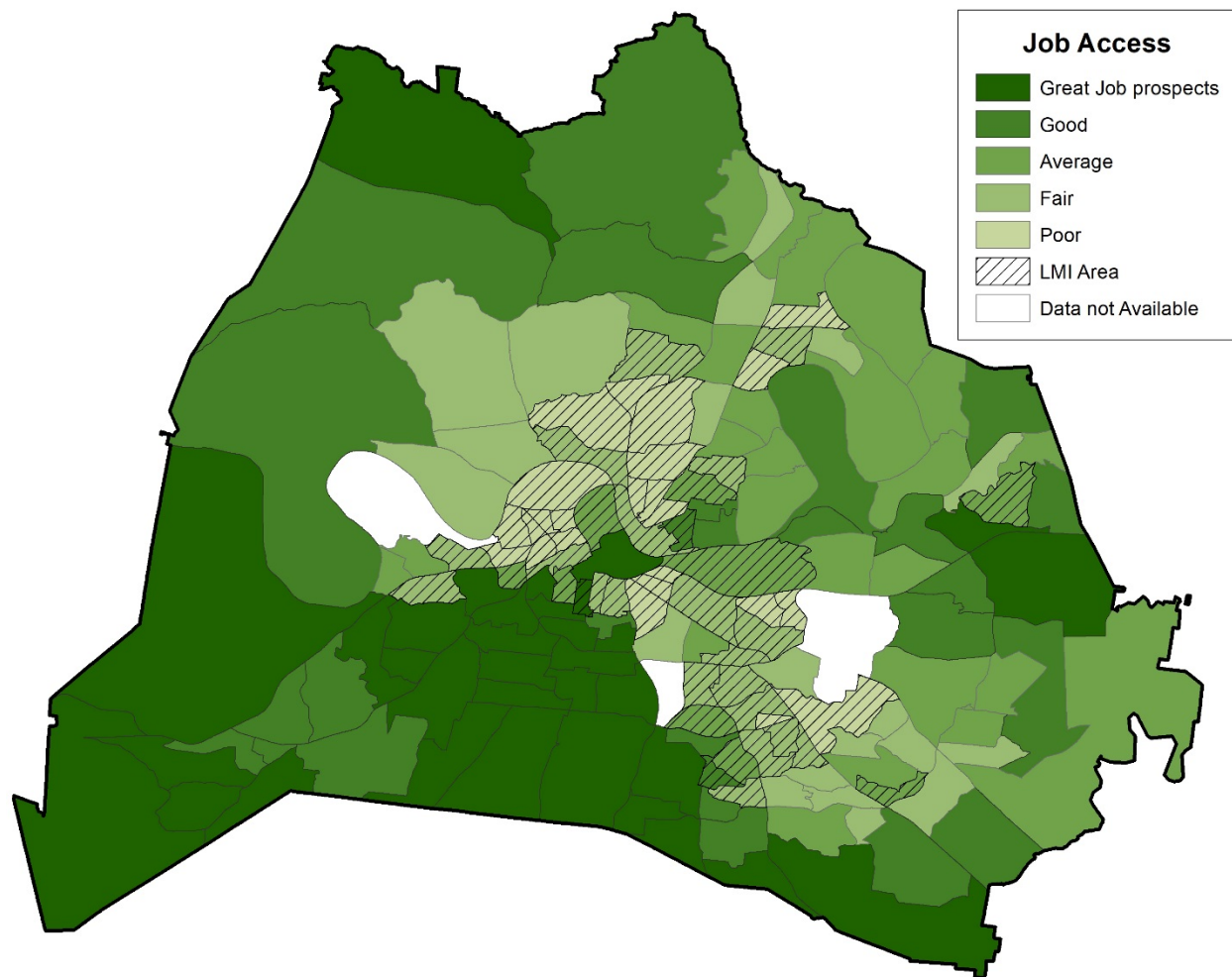
Nashville is experiencing economic growth, which has brought economic benefits to the city overall, and wage growth for many households. However, economic growth has also increased pressure on housing costs. For example, between 2010 and 2015, median rent rose 20 percent while LMI household wages increased only 7.5 percent.¹³ With wage growth lagging rent growth, rent costs are becoming a bigger share of the LMI household budget. The disproportionately high cost of housing along with frequent increases in rent in metro Nashville, are

leading some households to rent (or buy a house) in areas where housing costs are lower but where the distance to employment opportunities is greater.¹⁴

Spatial Mismatch between People and Work in the Metro Nashville Area:

The inability of households to reside where they work creates a spatial mismatch as described in a recent Brookings Institution report that examines the role of transportation in linking households to employment.¹⁵ The map below visually demonstrates the spatial mismatch between where LMI households reside and areas with access to employment (and other) opportunities in Davidson County.

Figure 4: The distance between people and jobs.



SOURCE: Longitudinal Employer-Household Dynamics data from the Center for Economic Studies and HUD Low-to moderate income census tracts.

¹³ American Community Survey 1-year estimates and the Quarterly Census of Employment and Wages. Both are 2015 figures.

¹⁴ Nashville and Davidson County's Housing Report, 2016

¹⁵ Elizabeth Kneebone and Natalie Holmes. "The growing distance between people and jobs in metropolitan America." 2015. Brookings Institution.

The census tracts with black stripes represent the areas where a majority of the residents have low-to-moderate incomes while the shaded areas represent the extent to which employment (and other) opportunities exist. The map shows a negative relationship between LMI census tracts¹⁶ and the areas with better access to employment (and other) opportunities. This suggests that households residing in LMI census tracts will find it harder to find well-paying jobs in their area of residence. Instead, they have to drive longer distances to get to jobs that pay relatively higher wages.

Indeed, the spatial mismatch highlights the importance of transportation in evaluating housing affordability. Based on analyzing CNT's Housing and Transportation Cost Index, seven out of every ten census tracts in Metro Nashville can be considered affordable to residents using the current, narrower definition of housing affordability. However, when we employ the broader definition of affordability to include transportation costs, only two out of every ten census tracts can be deemed affordable.

Higher combined housing and transportation expenses have significant implications on the financial well-being of households as explained in the following section.

Implications of High Transportation Cost Burdens

Households in metro Nashville that would traditionally be considered middle income are facing increasing challenges with housing affordability due to rising rents and home values. Consider for instance that the metro's average annual income for firefighters (\$40,410), police officers (\$47,110), office and administrative support occupations (\$36,810), and medical assistants (\$33,400) is often not sufficient to afford rent/housing costs in many neighborhoods without facing housing cost burdens.¹⁷ These households are becoming less able to afford residing in areas with better access to employment. As a result, even these middle income households are becoming less likely to reside in areas with better access to well-paying employment opportunities.¹⁸ This may also lead to an increase commute times and transportation costs for these households.

With housing affordability challenges affecting a large swath of households on the income spectrum,

stakeholders from the government to non-profit agencies have developed a number of strategies to address the issue. Some of the strategies used to address the increasing cost of housing and transportation are presented below.

POLICY MODELS FOR ADDRESSING HOUSING AND TRANSPORTATION COST BURDENS

Encourage Transit Oriented Development:

One way of relieving housing and transportation cost burdens is through the creation of affordable housing near employment centers in areas with public transportation. Transit Oriented Development (TOD) often involves the creation of high density mixed use projects centered on public transit routes. TOD Models have been successfully utilized to shrink the distance between safe, decent housing and places of employment.

Transit Oriented Development Examples:

Capital Metropolitan Transportation Authority (Austin, TX) - Through a concerted effort of the city's development and transit agencies, Austin, Texas, designed and implemented an ambitious TOD program to cater to its growing population. One TOD project, the Plaza Saltillo District, will have 800 apartments (with 18% of the units affordable to LMI households), 110,000 square feet of retail and more than 1.4 acres of open space when completed.¹⁹ This is the first of several planned affordable mixed use developments on land owned by the transit authority.

Denver Regional TOD Fund- Denver and the State of Colorado's housing finance agency partnered with both for-profit and non-profit organizations to establish the Denver Regional TOD Fund.²⁰ The fund is an acquisition fund, designed to allow governments and stakeholders in the affordable housing ecosystem to purchase and hold for preservation or future development properties in areas with access to transit and other economic opportunities. Through flexible financing terms, qualified borrowers gain affordable housing opportunities in areas they otherwise would not be able to access. As of 2016, the Denver TOD

¹⁶ I use the areas where more than 50% of the residents earn less than 80% of Area Median Income as a proxy for low-and-moderate income areas.

¹⁷ https://www.bls.gov/oes/current/oes_34980.htm#25-0000

¹⁸ K. Bischoff and S. Reardon, "The Continuing Increase in Income Segregation, 2007–2012", Stanford Center for Education Policy

Analysis, 2016.

¹⁹ <https://www.capmetro.org/plazasalttillo/>

²⁰ <https://www.enterprisecommunity.org/financing-and-development/community-loan-fund/denver-regional-tod-fund>

fund has contributed almost \$20 million towards the creation and preservation of more than 1,000 affordable housing units near transit. By leveraging existing or planned transit systems, TOD can reduce household transportation cost burdens while at the same time improving households' access to jobs and economic opportunity.

Location Efficient Mortgages:

Residing in location efficient²¹ communities can reduce transportation expenses. With lower transportation expenses, households can afford larger mortgage loans without having a larger monthly combined housing and transportation cost burden. For the most part, however, mortgage underwriting standards do not explicitly capture these cost dynamics. Location Efficient Mortgages (LEMs) are intended to fill this void by providing alternative mortgages to qualifying buyers who live in locationally-efficient communities.

Location Efficient Mortgages Examples:

In 1999, four cities (Seattle, Chicago, Los Angeles, and San Francisco) were chosen as pilot sites in 1999 after the Federal National Mortgage Association (Fannie Mae) agreed to purchase LEMs. From 2001 to 2004, 24 LEMs were issued in Seattle and 41 in Chicago with no delinquencies, defaults or foreclosures. However, due to poor awareness and perceived higher risk from this alternate financing model, demand for the model was low and the program was discontinued in 2008.²²

Fannie Mae created a similar program called Smart Commute Mortgages (SCM) that stretches the amount of credit a homebuyer may qualify for by around \$15,000 if a home purchased is within a certain distance from a transit station.²³ The market response to the introduction of SCM was also below expectation due to several challenges. SCM was perceived by some financial institutions as risky due to uncertainty surrounding the savings associated with living near transit. That is, if the transportation savings embedded in SCMs are not realized, the risk of default may increase to a point where the mortgage payment combined with actual transit costs exceeds the household budget.

With greater awareness and credit enhancement (through Ginnie Mae or other avenues), the risk associated with LEMs and SCMs can be minimized; thus, making them a more viable funding mechanism that incorporates transportation costs into mortgage underwriting.²⁴

EXPAND AND IMPROVE PUBLIC TRANSIT:

Expand Transit to Link Low-income Households to Work

Low wage jobs are increasingly becoming decentralized with more jobs moving to suburban areas. In many areas, public transit was designed based upon a dated, centralized model, and is in need of adapting to address the needs of low-income users (who are often the primary customers of public transit).

In recognition of the challenges low-income households face in using transit to access employment, the U.S. Department of Transportation tried to address the issue through the Job Access and Reverse Commute Program (JARC). JARC is a program that offered funds to transit agencies and other stakeholders to improve "transportation options for low-income persons seeking employment in suburban areas and/or at jobs that required travel at times transit doesn't usually run (e.g. early or late in the day, during weekends)."²⁵

Examples of Transit Improvements to Link Low-income Households to Work:

Chattanooga Area Regional Transportation Authority (CARTA)- Using JARC funds, CARTA expanded bus service on five routes to operate almost 20 hours a day, while at the same time improving frequency to every 10 minutes in the morning. This expansion led to the creation of 64 stops within a quarter mile of employment centers that also reach 65 childcare facilities. Ridership increased by 15% and

²¹ Location-efficient communities are amenity rich, compact and walkable communities that have good access to transit and jobs.

²²<http://archives.financialservices.house.gov/media/file/hearings/111/berstein.pdf>

²³ *ibid*

²⁴ Demystifying the Location Efficient Mortgage. http://www.via-architecture.com/pdf/Location_Efficient_Mortgage.pdf

²⁵<http://www.nationalresourcenetwork.org/Documents/Document/Document/306222>

transit coverage for welfare recipients increased to 67%.²⁶

The Metropolitan Atlanta Rapid Transit Authority (MARTA)- Using JARC funds, MARTA increased transit service on several routes; instituted a flexible demand-response door-to-door service that accommodates the users' unique working hours; and partnered with the transit system of job-rich Cobb County for a seamless and free transfer. In response to these improvements, ridership on some routes increased by more than 100%, and low-income households and welfare-to-work recipients were connected to more than 1,500 job sites with 50,000 potential jobs.²⁷

Several other cities have also used JARC funds to increase low-income households' access to work with similar results.²⁸ JARC has allowed these cities to improve transit access to jobs through small investments, often around \$1 million dollars, with an impressive impact. The next example provides a more comprehensive transit improvement plan that increased low-income households' access to employment, reduced commute times and lowered transportation costs.

Massachusetts Bay Transportation Authority's Fairmount Commuter Line- In contrast to many commuter lines that mostly serve suburban residents commuting to the city center, Fairmount Line is almost entirely concentrated around Boston's low-income and working class neighborhoods. Ridership has tripled since the transit agency made investments to open new stations and lower fares. Additional benefits of the Fairmount Line is in reduced travel time to employment centers. Residents using the Fairmount Line going to the downtown area can save up to 20% (around 14 minutes) of travel time daily.²⁹

Leverage Technology to Improve Public Transit:

At current gas prices, switching from automobile to public transit could save Nashville drivers more than \$7,500 annually.³⁰ However, switching to public transit in areas without frequent and well-connected transit options (i.e. requiring multiple transfers between home and the desired location) may lead to

a longer commute. To harness the benefit of using public transit without facing longer commute times, cities have used technology to guide the frequency and expansion of transit services.

Frequency and Scope Examples:

Denver FasTracks and Bus Rapid Transit- Denver has been engaged in a multi-billion dollar expansion and integration of its light rail and Bus Rapid Transit (BRT) options to serve more areas. This expansion, along with greater coordination among stakeholders, has been a catalyst for the creation of more affordable housing near transit. For instance, 156 units of mixed-use housing units were developed in response to the expansion of the FasTracks North metro Line.³¹

Jacksonville Regional Transportation Center- Jacksonville Transportation Authority (JTA) is creating an intermodal transportation hub to catalyze the redevelopment of certain sections of the city. This effort has spurred the creation of more than 300 units of mixed use and affordable transit oriented developments in the LaVilla area of Jacksonville.³² JTA is also leveraging advances in technology to optimize routing and frequency to connect their suburban job commuters through more cost-effective and flexible scheduling.

Transit commute times often exceed what drivers face in Tennessee cities where transit coverage to job centers is inadequate or where transit services are infrequent. Kansas City was able to help solve this problem by expanding the scope and frequency of the Kansas City Metro Area Express BRT. In turn, ridership increased by more than 50% and cut transit commute times.³³

Bridging First Mile Last Mile Problems:

While expansion helps in easing transportation burden, public transit still suffers from "first/last mile problems," which is related to the distance between the transit stop and the rider's actual destination.²²

Dallas Area Rapid Transit (DART)- DART partnered with Uber to resolve first/last mile issues confronting passengers. The ridesharing company complements

²⁶<http://web1.ctaa.org/webmodules/webarticles/anmviewer.asp?a=568&z=5>

²⁷<http://web1.ctaa.org/webmodules/webarticles/anmviewer.asp?a=575&z=5>

²⁸<http://web1.ctaa.org/webmodules/webarticles/anmviewer.asp?a=110>

²⁹<https://www.tbf.org/-/media/tbforg/files/reports/increasing-ridership-on-the-fairmount-line.pdf?la=en>

³⁰ American Public Transportation Association Savings Calculator.

³¹ <http://www.denverpost.com/2015/04/28/denver-industrial-site-to-be-affordable-housing-on-fasttracks-line/>

³² <http://www.moderncities.com/article/2016-oct-updated-urban-jax-major-projects-development-list/page/1>

³³ http://www.kcata.org/documents/uploads/MAX_Fact_Sheet.pdf

DART in improving access to the existing transit system by reducing the reliance on the use of single occupancy vehicles to transit stations.³⁴ This type of arrangement will work best in areas with a public transit system that is not adequately distributed. Other cities that have tested similar arrangements include Atlanta and Tampa.

CONCLUSION

Housing affordability is a considerable challenge in Tennessee with about 36% of all households cost burdened. When transportation expenses are incorporated into the assessment of affordability, the proportion of cost burdened households increases significantly.

There is increased awareness of the tradeoff that occurs between housing and transportation costs and that LMI households residing in areas with poor

access to employment opportunities commit a larger share of their budgets towards both housing and transportation expenses. To address these problems, several strategies have been employed.

However, the solutions are often not perfect and may introduce unintended consequences. For instance, while expanding transit generally may lower transportation costs for its users, lower income neighborhoods may not realize the benefits if stops/stations are not created in those communities. Additionally, Transit Oriented development has been criticized as being a catalyst for gentrification and displacement of long-term residents in areas with better access to transit.³⁵

As transit strategies are developed, it is important to consider housing affordability and access, particularly for LMI households, to ensure the transportation solutions create an inclusive and equitable option.

³⁴ http://www.nctcog.org/trans/transit/ops/coordination/documents/May15_WorkingGroup.pdf

³⁵ <https://www.frbatlanta.org/community-development/publications/partners-update/2016/01/160104-offsetting-gentrification-fostering-inclusive-transit-oriented-development.aspx>

ABOUT THDA

As the State's housing finance agency, the Tennessee Housing Development Agency (THDA) is a self-sufficient, independently funded, publicly accountable entity of the State of Tennessee. Our purpose is to meaningfully expand affordable housing opportunities for Tennesseans. More information about THDA can be found online at THDA.org.



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