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Authors: John Hersey, Program Officer, Transit-Oriented Development;
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ABOUT THE AUTHORS

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Michael graduated with a Masters of Science in Public Policy and Management from the Heinz College at Carnegie Mellon University. Prior experience in the community development field includes work with the Housing Assistance Council, Sustainable Pittsburgh, Allegheny County (PA) Economic Development, and the Rural Local Initiatives Support Corporation. Michael graduated Summa Cum Laude from Dickinson College in 2006, and received a Post-Baccalaureate Certificate in Community and Economic Development from the Pennsylvania State University in 2008.

ABOUT ENTERPRISE COMMUNITY PARTNERS

Enterprise works with partners nationwide to build opportunity. We create and advocate for affordable homes in thriving communities linked to jobs, good schools, health care and transportation. We lend funds, finance development and manage and build affordable housing, while shaping new strategies, solutions and policy. Over more than 30 years, Enterprise has created nearly 340,000 homes, invested nearly $18.6 billion and touched millions of lives. Join us at www.EnterpriseCommunity.org.

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EXECUTIVE SUMMARY

Investments in transportation infrastructure can catalyze regional growth and improve mobility. Given limited public funds, public officials and transportation planners have increasingly recognized the benefit of coordinating transportation investments with land use, housing and economic development investments and policies. In particular, there has been a specific emphasis on facilitating transit-oriented development (TOD) – a growth model characterized by compact development, a mix of land uses, and multi-modal transportation connectivity.[1] When properly planned, such development can support transit ridership and revenues, boost property values and enhance economic competitiveness.

What do we mean by "affordable housing?"

Housing is considered affordable if a household's full cost of shelter (rent plus utilities; or principal, interest, taxes, insurance and utilities for homeowners) is no more than 30 percent of their income. Households spending more than this amount are considered cost burdened. Those spending 50 percent or more of their income on housing are considered severely cost burdened.

While market-rate housing can be affordable to a wide range of households in some markets, there is a need for committed affordable units for those that the market cannot reach. "Affordable housing" units are income restricted and cap monthly payments at a specified level. They can be created or preserved through various means, including the federal Low-Income Housing Tax Credit program and municipal inclusionary-zoning policies.

While TOD can take many forms, for a variety of reasons there has been increased demand for transit-oriented neighborhoods with a critical mass of population, neighborhood-serving retail establishments, employment opportunities and/or economic activity. Some prefer these transit-oriented, amenity-rich neighborhoods based on lifestyle preferences. However, for others – particularly people with lower incomes or for whom driving is difficult or impossible – the accessibility that TOD offers is crucial to reaching jobs and life's other necessities in an efficient and economical manner.

Unfortunately, a number of factors – most notably the prevalence of zoning codes that separate residential from commercial and retail uses – have limited the number of compact, mixed-use, multi-modal neighborhoods. To the extent that demand for housing in such neighborhoods – as a result of either choice and/or necessity – remains strong, scarcity of housing in these neighborhoods can increase property values. Significant price increases can lead to additional cost burdens, potential displacement and/or barriers to entry for low- and moderate-income households. If these households are displaced it can also reduce likely riders' access to transit and limit employees' and customers' access to businesses.

One solution to these challenges is equitable TOD (eTOD), which is well-planned and implemented development near transit that accounts for the needs of low- and moderate-income people, largely through the preservation and creation of

1 For more information on some common characteristics of TOD, read: *Reconnecting America*. "TOD 101: Why Transit-Oriented Development And Why Now," March 28, 2007. http://www.reconnectingamerica.org/resource-center/browse-research/2007/tod-101-why-transit-oriented-development-and-why-now/.

affordable housing. eTOD can expand mobility options, lower commuting expenses and enhance access to employment, child care, schools, stores and critical services. This development model also conveys ancillary benefits to the broader community, the economy, the environment and the transportation system. *Promoting Opportunity through Equitable TOD: Making the Case*, the first of three reports that cover different aspects of eTOD, provides a non-exhaustive review of the evidence and literature that demonstrates the importance of eTOD. A second report will illustrate barriers to eTOD and best practices for overcoming them, while the third will address the federal role in supporting eTOD.

THE DIFFICULTY OF ACHIEVING ETOD

A number of factors make TOD more difficult to achieve generally, with resultant negative consequences on the ability to provide eTOD. Some factors reduce the number of neighborhoods that could be considered transit-oriented, as well as the number of housing units within such neighborhoods. These may include:

- Shortages of robust transit service in some markets
- Limited supply of developable land near transit
- The prevalence in some municipalities of Euclidian or single-use zoning, which constrains development of mixed-use communities
- Density restrictions that limit the addition of new housing in transit-oriented locations or prevent neighborhoods from reaching the population level necessary to support a mix of retail options. Such limits can be formal through municipal codes and plans, or informal as the result of not-in-my-backyard (NIMBY) opposition and/or difficult waiver and approval processes
- Automobile-oriented development patterns and parking standards that inhibit walkability

In addition, compared to suburban "greenfield" development, TOD in urban infill locations may carry higher development costs and other problems related to regulatory compliance, site layout, the need to work around existing infrastructure, and demolition, remediation or site preparation work.[2]

The combination of scarce supply and high development costs can result in price premiums within transit-oriented neighborhoods, though such premiums are context-sensitive and influenced by other factors, including the strength of the broader housing market, the quality and reliability of the transit system and the nature of the surrounding development.[3] Recent research in the Atlanta, Boston and Washington, D.C., metropolitan regions found that real estate in "walkable urban places" commanded higher values and rents than in drivable suburban locations.[4] While the same analysis showed an increased amount of walkable urban development, the continued price premium indicates insufficient supply to meet demand.

2 Jakabovics, Andrew, Lynn M. Ross, Molly Simpson, and Michael A. Spotts. *Bending the Cost Curve: Solutions to Expand the Supply of Affordable Rentals.* Washington, DC: Enterprise Community Partners & ULI Terwilliger Center for Housing, January 2014. http://www.enterprisecommunity.com/resources/ResourceDetails?ID=0086703.

3 Wardrip, Keith. *Public Transit's Impact on Housing Costs: A Review of the Literature. Insights from Housing Policy Research*. Washington, DC: Center for Housing Policy, August 2011. http://www.nhc.org/media/documents/TransitImpactonHsgCostsfinal_-_Aug_10_20111.pdf.

4 Leinberger, Christopher B. *The WalkUP Wake-Up Call: Atlanta. The WalkUp Wake-Up Call*. Washington, DC: The George Washington University School of Business & LOCUS. Accessed March 11, 2015. http://www.smartgrowthamerica.org/documents/walkup-wake-up-atlanta.pdf.

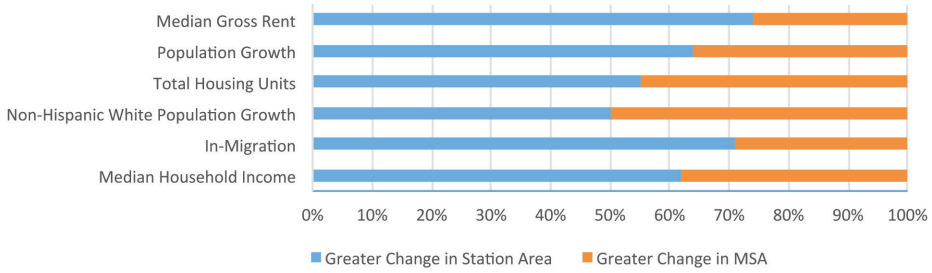
Leinberger, Christopher B., and Patrick Lynch. The WalkUP Wake-Up Call: Boston. The WalkUp Wake-Up Call. Washington, DC: The George Washington University School of Business & LOCUS, 2015. http://www.smartgrowthamerica.org/locus/walkup-boston.

Leinberger, Christopher B. The WalkUP Wake-Up Call: The Nation's Capital As a National Model for Walkable Urban Places. The WalkUp Wake-Up Call. Washington, DC: The George Washington University School of Business & LOCUS. Accessed March 11, 2015. http://www.smartgrowthamerica.org/documents/Walkup-report.pdf.

Higher costs can significantly impact low- and moderate-income households. Increases in property values (whether as a result of new transit service or a shift in demand to existing transit-served neighborhoods) may result in barriers to entry for lower-income households into such neighborhoods and would increase the likelihood of displacement.

- A study by the Dukakis Center at Northeastern University found that, in a majority of 42 neighborhoods that received new transit service between 1990 and 2000, median incomes, housing costs and levels of in-migration increased relative to the rest of the metropolitan statistical area (MSA).[5]
- Renters may be especially impacted, as neighborhoods with a higher initial proportion of renters were correlated with larger changes in racial/ethnic composition and increases in median household income.[6]

FIGURE 1 | **Changes in Neighborhoods Gaining New Transit Access between 1990-2000 (Dukakis Center)**



Neighborhoods gaining new transit access can undergo significant changes. Though such changes are not universal, a majority of such neighborhoods experienced growth in population and in-migration, as well as increased incomes and rents.

SOURCE: Pollack, Stephanie, Barry Bluestone, and Chase Billingham. *Maintaining Diversity in America's Transit-Rich Neighborhoods: Tools for Equitable Neighborhood Change*. Boston, MA: Dukakis Center for Urban and Regional Policy at Northeastern University, October 2010. http://nuweb9.neu.edu/dukakiscenter/wp-content/uploads/TRN_Equity_final.pdf.

Therefore, TOD is not necessarily synonymous with eTOD. At the most basic level, it is important to remove barriers to increasing both the number of transit-served, mixed-use neighborhoods and the number of homes within those neighborhoods. However, in many cases, eTOD requires specific tools to preserve and create affordable housing opportunities in these neighborhoods.

5 Pollack, Stephanie, Barry Bluestone, and Chase Billingham. *Maintaining Diversity in America's Transit-Rich Neighborhoods: Tools for Equitable Neighborhood Change*. Boston, MA: Dukakis Center for Urban and Regional Policy at Northeastern University, October 2010. http://nuweb9.neu.edu/dukakiscenter/wp-content/uploads/TRN_Equity_final.pdf, pages 22-24.

6 *Ibid.* page 25.

THE IMPORTANCE OF ETOD TO FAMILIES

Access to safe, decent and affordable shelter provides the foundation from which neighbors may participate in healthy, responsible and representative communities. Securing affordable station areas rebuffs market pressure to increase housing costs, burden and/or displace residents, or prevent access to high-opportunity neighborhoods. Inclusive neighborhoods with strong access to multi-modal transportation options have the potential to improve residents' job access and mobility, decrease their costs of living, and improve their overall health.

JOB ACCESS AND MOBILITY IMPROVEMENTS

Equitable, transit-oriented neighborhoods can expand mobility options, enhancing access to employment, child care, schools, stores and critical services. While people of all incomes can benefit from such access, it is especially important for those with lower incomes (and consequently fewer disposable resources). Greater access to employment opportunities can enhance these households' economic prospects if the transit has adequate service frequency and geographic scope. Transit access can play a crucial role even for lower-income households that generally commute by car, serving as a backstop in the event of an accident or maintenance. A lack of transportation alternatives for these families can result in lost wages from time missed from work and serious financial hardship. Research supports the correlation between job accessibility and employment:

- A National Bureau of Economic Research analysis of nine metropolitan areas found that better job accessibility significantly decreases the length of unemployment for certain lower-paid workers who had recently lost their jobs[7]
- In an analysis of New York City neighborhoods, those with limited transit access had higher rates of unemployment compared to neighborhoods with either more substantial transit access or complete auto-dependency[8]
- Improving the availability of affordable homes near transit could greatly expand the number of employment opportunities available to lower-income workers. According to research by The Brookings Institution, three-quarters of all jobs in the nation's 100 largest metropolitan regions are accessible by transit[9]

7 Andersson, Fredrik, John C. Haltiwanger, Mark J. Kutzbach, Henry O. Pollakowski, and Daniel H. Weinberg. *Job Displacement and the Duration of Joblessness: The Role of Spatial Mismatch. Working Paper.* National Bureau of Economic Research, April 2014. http://www.nber.org/papers/w20066.

8 Kaufman, Sarah M., Mitchell L. Moss, Justin Tyndall, and Jorge Hernandez. *Mobility, Economic Opportunity and New York City Neighborhoods.* New York, NY: NYU Wagner Rudin Center for Transportation Policy & Management, December 2014. http://wagner.nyu.edu/rudincenter/wp-content/uploads/2014/12/NYURudinJobAccessReport.pdf.

9 Tomer, Adie. *Where the Jobs Are: Employer Access to Labor by Transit. Metropolitan Infrastructure Initiative Series and Metropolitan Opportunity Series.* Washington, DC: Brookings Institution, July 2012. http://www.brookings.edu/~/media/research/files/papers/2012/7/transit%20labor%20tomer/11%20transit%20labor%20tomer%20full%20paper.pdf.

Despite the high-level of transit accessibility of many jobs, significant room for improvement remains for coordination between transportation networks and land use policy to better connect workers to employers. The Brookings Institution found that the number of jobs within a typical commuting distance declined from 2000-2012, particularly for poor and minority households.[10] The typical job is only accessible to approximately 27 percent of the metropolitan workforce within 90 minutes or less via transit, as a result of challenges related to transit routing and frequency, the dispersion of jobs throughout metropolitan areas and/or fragmented transit and land-use decision-making.[11] Furthermore, this analysis likely overstates the true accessibility of these jobs for lower-income working households, as a 90-minute commute (each way) could limit the viability of choosing transit as a commute mode for those working multiple jobs or balancing child care and other responsibilities.

Mobility via transit is not limited to the daily commute to work. Transit service may become increasingly important as the population ages. According to the 2009 National Household Travel Survey:

- Those with a medical condition were more likely to use public transportation;
- Public transportation's mode share is largest among people 85 and over; and
- There was a statistically significant decline in the usage of automobiles among that age cohort from 2001-2009.[12]

If current and future seniors and people with disabilities continue these commuting trends, demand for neighborhoods with the characteristics of eTOD will increase. Households with senior and disabled members may be reliant on limited and/or fixed-incomes, which makes housing affordability in this context especially crucial. Ensuring that a portion of this development remains affordable to lower income and other vulnerable households allows the benefits of these neighborhoods to reach those that may need it most.

10 Kneebone, Elizabeth, and Natalie Holmes. *The Growing Distance Between People and Jobs in Metropolitan America*. Washington, DC: Brookings Institution Metropolitan Policy Program, March 2015. http://www.brookings.edu/research/reports2/2015/03/24-people-jobs-distance-metropolitan-areas-kneebone-holmes.

11 Tomer, Adie. *Where the Jobs Are: Employer Access to Labor by Transit. Metropolitan Infrastructure Initiative Series and Metropolitan Opportunity Series.* Washington, DC: Brookings Institution, July 2012. http://www.brookings.edu/~/media/research/files/papers/2012/7/transit%20labor%20tomer/11%20transit%20labor%20tomer%20full%20paper.pdf.

12 Mattison, Jeremy. *Travel Behavior and Mobility of Transportation-Disadvantaged Populations: Evidence from the National Household Travel Survey.* Fargo, ND: Small Urban & Rural Transit Center; Upper Great Plains Transportation Institute; North Dakota State University, February 13, 2013. http://www.ugpti.org/pubs/pdf/DP258.pdf; Pages 21-23.

Given differences in state law with regard to regulating the ability of senior citizens to continue driving, it is unclear whether this decline is a result of changes in transportation preferences among seniors or increased efforts among the medical community and departments of motor vehicles to monitor and regulate the ability of senior citizens to safely drive.

Mikel, Katherine. "Drivers' Licenses and Age Limits: Imposition of Driving Restrictions on Elderly Drivers." *Marquette Elder's Advisor* 9, no. 2 (Spring) (2012). http://scholarship.law.marquette.edu/elders/vol9/iss2/6/?utm_source=scholarship.law.marquette.edu%2Felders%2Fvol9%2Fiss2%2F6&utm_medium=PDF&utm_campaign=PDFCoverPages.

DECREASED COST-OF-LIVING

In addition to improving access to jobs and other life necessities, transit-oriented development can also lower overall commuting expenses. In some cases, residents can save money by choosing to forego vehicle ownership altogether, which can have a drastic impact on a household budget. An analysis by AAA found that the annual cost of driving an average sedan in 2014 was $8,876.[13] Cost fluctuations in the price of gas and insurance as well as the cost of both routine and unexpected maintenance also affect drivers in automobile-dependent neighborhoods.

- The Illinois Housing Development Agency found that, among neighborhoods where it financed development, households in neighborhoods served by both bus and rail saved an average of $3,000 in annual transportation costs compared to neighborhoods without transit access.[14]
- Research for California showed a correlation between transit-accessible neighborhoods and reduced vehicle ownership across all income levels.[15]

These cost savings can allow residents to better afford housing in higher-cost, higher-opportunity transit-accessible neighborhoods. Unfortunately, in some cases higher housing costs may nullify costs savings or cause displacement from or create a barrier to entry to such neighborhoods.[16] Equitable TOD allows lower-income households to lower their overall cost of living through the provision of affordable housing opportunities, freeing resources for expenditures on healthy food, education, health care or other necessities.

13 Hunter, Heather. "Owning and Operating Your Vehicle Just Got a Little Cheaper According to AAA's 2014 'Your Driving Costs' Study." *AAA NewsRoom*, May 9, 2014. http://newsroom.aaa.com/2014/05/owning-and-operating-your-vehicle-just-got-a-little-cheaper-aaas-2014-your-driving-costs-study/.

14 Center for Neighborhood Technology. *Safe, Decent, and Affordable: Transportation Costs of Affordable Housing in the Chicago Region*. Chicago: Center for Neighborhood Technology, January 2012. http://www.cnt.org/repository/SDA.pdf.

15 TransForm, and California Housing Partnership Corporation. Why Creating and Preserving Affordable Homes Near Transit Is a Highly Effective Climate Protection Strategy. California, 2014. http://www.chpc.net/dnld/AffordableTODResearch051514.pdf; page 8.

16 The Center for Neighborhood Technology (CNT) provides a more complete measure of neighborhood affordability through its Housing + Transportation Affordability Index (H+T Index). The H+T Index allows users to access location-specific data on housing and transportation costs, and the tradeoffs that result from living in a given neighborhood. Their research found that households living in transit-rich neighborhoods spent 9 percent of their income on transportation, compared to 19 percent for the average American family and 25 percent for those living in auto-dependent neighborhoods.

Center for Transit-Oriented Development. *Realizing The Potential: Expanding Housing Opportunities Near Transit*, April 2007. http://www.reconnectingamerica.org/resource-center/books-and-reports/2007/realizing-the-potential-expanding-housing-opportunities-near-transit-2/.

IMPROVED HEALTH

Greater access and proximity to a number of destinations can allow station-area residents to enjoy healthier lifestyles that include walking and biking trips.

- Auto-dependent development patterns promote less active lifestyles that can contribute to a number of illnesses, including obesity, heart disease and asthma.[17]
- Alternatively, TOD encourages highly accessible multi-modal environments for routine, affordable and healthy mobility options such as walking and biking.[18]
- A literature review by Reconnecting America identified research that indicated that people with easier access to medical facilities were more likely to receive recommended care and that transit access was associated with a reduction in body mass index in Charlotte.[19]
- A literature review by the Victoria Transport Policy Institute found that "smart growth communities," which share many of the same characteristics as TOD, had significantly lower per capita traffic fatality rates when compared to more sprawling communities.[20]

17 Marshall, Wesley E. "Community Design, Street Networks, and Public Health." *Journal of Transport & Health* 1, no. 4 (December 2014): 326–40.

18 The Pew Charitable Trusts. *Transit Oriented Development at the Quitman Light Rail Station - Health Impact Assessment*. The Pew Charitable Tursts, June 1, 2012. http://www.pewtrusts.org/en/research-and-analysis/reports/2012/06/01/transit-oriented-development-at-the-quitman-light-rail-station-hia.

19 *Locating Affordable Housing near Transit: A Strategic Economic Decision*. Washington, DC: Reconnecting America, n.d. http://www.reconnectingamerica.org/assets/Uploads/20120904AHpolicybrief.pdf.

20 Litman, Todd. *Understanding Smart Growth Savings: What We Know About Public Infrastructure and Service Cost Savings, and How They Are Misrepresented by Critics*. Victoria Transport Policy Institute, September 10, 2012. http://www.vtpi.org/sg_save.pdf.

THE IMPORTANCE OF ETOD TO THE BROADER COMMUNITY, REGION AND ECONOMY

The benefits of eTOD are not limited to individual households. Anecdotal and analytical evidence show that well-planned and implemented eTOD can improve transportation-system performance, local and regional economies, municipal finance, the environment and public health for all residents and riders regardless of income. Therefore, local and regional stakeholders should look beyond the aggregate effects of infrastructure investments and development choices to consider also the distribution of associated impacts within a city or region (both positive and negative). The failure of planning, investment and development to account for equity can lead to negative impacts on local households, with spillover effects for the transportation system and local economy.

TRANSPORTATION-SYSTEM PERFORMANCE

Dense station-area development can encourage transit use, promote the use of a variety of non-automotive travel options, relieve congestion and reduce demand for automotive infrastructure.

- In practice, fast-growing communities have managed increased transportation demand through compact development and transit access. The land-use policies of Arlington County, Virginia, (part of the Washington, D.C., metropolitan region) allow for concentrated development near transit nodes, resulting in significant traffic reductions across most major arterial roads despite large increases in population and economic activity.[21] Montgomery County, Maryland, (within the same region) also focused growth in urban centers. Despite an increase of 100,000 residents, vehicle miles traveled (VMT) levels in the county have been relatively flat since 2002, with levels of walking and biking highest in denser parts of the county.[22]
- A California-based study indicated that proximity between housing and transit was associated with reductions in VMT and household vehicle trips per day across all income levels.[23] From a broader geographic base, a review of research from the Urban Land Institute (ULI) found that compact development resulted in significant VMT reductions.[24]

21 Merchant, Canaan. "As Arlington Booms, Traffic Drops." *Greater Greater Washington*, June 30, 2014. http://greatergreaterwashington.org/post/23318/as-arlington-booms-traffic-drops/.

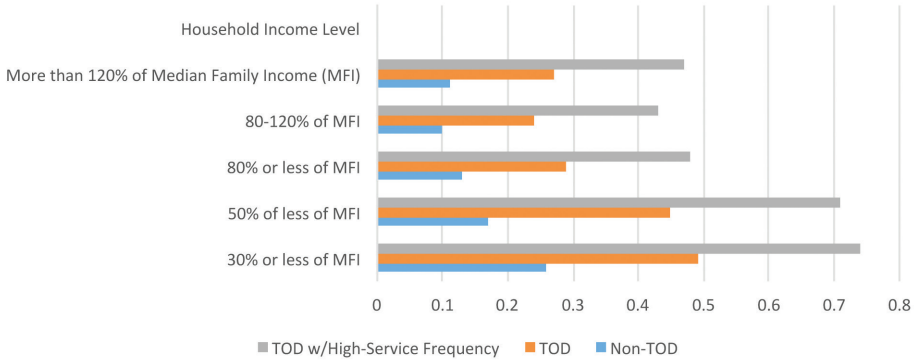
22 Montgomery County (MD) Planning Department. *Mobility Assessment Report. Montgomery County, MD,* April 2014. http://www.montgomeryplanningboard.org/agenda/2014/documents/MobilityAssessmentReport2014-DRAFT4-9-2014_000.pdf.

23 TransForm, and California Housing Partnership Corporation. *Why Creating and Preserving Affordable Homes Near Transit Is a Highly Effective Climate Protection Strategy*. California, 2014. http://www.chpc.net/dnld/AffordableTODResearch051514.pdf.

24 Urban Land Institute. *Land Use and Driving: The Role Compact Development Can Play in Reducing Greenhouse Gas Emissions.* Washington, DC: Urban Land Institute, June 2010. http://www.uli.org/wp-content/uploads/ULI-Documents/Land-Use-and-Driving-Low-Res.pdf.

- The California study also found that proximity between housing and transit was associated with an increase in household transit trips per day across all income levels.[25] A separate analysis of California transit ridership found that transit ridership rates among station-area residents increase exponentially as the distance between home and station declines, and residents living less than ½-mile from a station were approximately four times more likely to commute by transit.[26] Finally, a 2014 Government Accountability Office analysis found that, among a subset of federally-funded transit projects, those with accompanying TOD experienced increased ridership, while those with less TOD had fewer riders than projected.[27]

FIGURE 2 | **Household Transit Trips per Day in California (TransForm & the CA Housing Partnership Corporation)**



TOD: High Quality Transit Areas as defined by California Senate Bill 375: areas within ½ mile of a rail or ferry station and bus stops with 15-minute service frequency during peak periods

TOD with High-Service Frequency: Defined by the California Department of Housing and Community Development's TOD Housing Program; areas within ¼ mile of a rail or ferry station or bus stop with 10 minute headways during peak periods and additional service during weekday evenings and weekends

SOURCE: TransForm, and California Housing Partnership Corporation. Why Creating and Preserving Affordable Homes Near Transit Is a Highly Effective Climate Protection Strategy. California, 2014. http://www.chpc.net/dnld/AffordableTODResearch051514.pdf.

25 TransForm, and California Housing Partnership Corporation. *Why Creating and Preserving Affordable Homes Near Transit Is a Highly Effective Climate Protection Strategy.* California, 2014. http://www.chpc.net/dnld/AffordableTODResearch051514.pdf; page 10.

26 Lee, Richard W., and Robert Cervero. *Research Basis for Proposed Criteria of the TOD Housing Program (Appendix A): The Effect of Housing Near Transit Stations on Vehicle Trip Rates and Transit Trip Generation - A Summary Review of Available Evidence.* California: University of California Institute of Urban and Regional Development, September 2007. http://www.hcd.ca.gov/fa/tod/todresearch_sumappda102207.pdf.

27 Government Accountability Office. *Public Transportation: Multiple Factors Influence Extent of Transit-Oriented Development.* Washington, DC: Government Accountability Office, November 2014. http://www.gao.gov/products/GAO-15-70?source=ra.

Not all development near transit will yield the same amount of ridership for the system or mitigate the impact of population growth on traffic congestion. Increasing the transit system's mode share and ridership requires retaining existing "core riders" who use the system regularly and expanding their numbers.[28] Core riders are more likely to come from three groups – low-income households, people of color and renters.[29]

- A 2007 analysis indicates that nearly 66 percent of transit users had annual household incomes below $50,000 (in 2004 dollars)[30]
- According to 2009 National Household Travel Survey data, the less a household earns (under $100,000 annually), the more likely it is to utilize public transportation[31]
- Research from California indicates that households earning less than 80 percent of area median income (AMI) rode transit more and made fewer vehicle trips per day than those above that threshold, and those earning 30 percent AMI or less took 50 percent more trips than households earning 120 percent of AMI or more[32]
- A 2009 survey of affordability in station-area development found that more than 10 percent of low-income residents living in station areas in Denver use transit as their primary commute mode – more than twice the rate of any other income group[33]

28 Pollack, Stephanie, Barry Bluestone, and Chase Billingham. Maintaining Diversity in America's Transit-Rich Neighborhoods: Tools for Equitable Neighborhood Change. Boston, MA: Dukakis Center for Urban and Regional Policy at Northeastern University, October 2010. http://nuweb9.neu.edu/dukakiscenter/wp-content/uploads/TRN_Equity_final.pdf, page 15.

29 *Ibid.* page 15.

30 American Public Transportation Association. A Profile of Public Transportation Passenger Demographics and Travel Characteristics Reported in On-Board Surveys. Washington, DC: American Public Transportation Association, May 2007. http://www.apta.com/resources/statistics/Documents/transit_passenger_characteristics_text_5_29_2007.pdf.

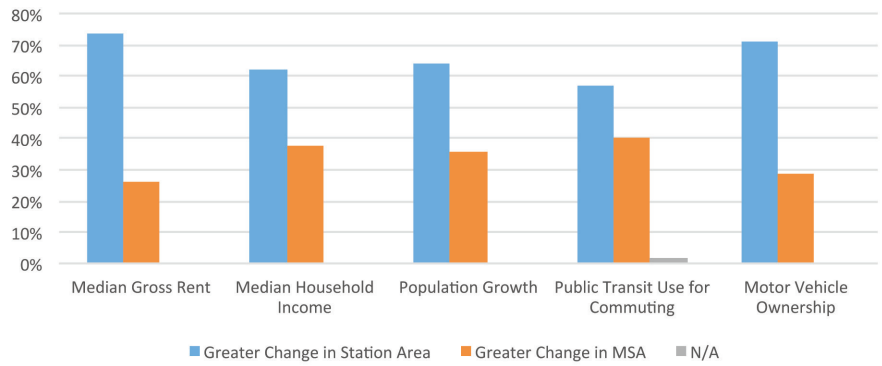
31 Mattison, Jeremy. Travel Behavior and Mobility of Transportation-Disadvantaged Populations: Evidence from the National Household Travel Survey. Fargo, ND: Small Urban & Rural Transit Center; Upper Great Plains Transportation Institute; North Dakota State University, February 13, 2013. http://www.ugpti.org/pubs/pdf/DP258.pdf.

32 TransForm, and California Housing Partnership Corporation. Why Creating and Preserving Affordable Homes Near Transit Is a Highly Effective Climate Protection Strategy. California, 2014. http://www.chpc.net/dnld/AffordableTODResearch051514.pdf.

33 Kniech, Robin, and Melinda Pollack. Making Affordable Housing at Transit a Reality: Best Practices in Transit Agency Joint Development. Denver, CO: Enterprise Community Partners & FRESC, 2010. http://www.enterprisecommunity.com/resources/ResourceDetails?ID=67359.pdf.

New transit investment or increases in TOD may not attract "core riders" as residents. The Dukakis Center research found that while a majority of transit-rich neighborhoods studied saw an increase in public transit use for commuting, the level of use in 40 percent of the neighborhoods actually declined relative to the broader Metropolitan Statistical Area (MSA).[34] Meanwhile, automobile ownership increased in 71 percent of the transit-rich neighborhoods studied.[35] This may be the result of an influx of wealthier residents who are not reliant on transit access and for whom the decision to live near transit may be based on lifestyle preferences. Attracting these "potential riders" is unlikely to boost ridership if these households are replacing core riders who have been priced out of the neighborhood.[36] This underscores the need for a balanced eTOD strategy that focuses on the preservation of affordable housing to retain core riders and uses increases in housing supply to attract incremental ridership.

FIGURE 3 | **Changes in Neighborhoods Gaining New Transit Access Between 1990-2000 (Dukakis Center)**



SOURCE: Pollack, Stephanie, Barry Bluestone, and Chase Billingham. Maintaining Diversity in America's Transit-Rich Neighborhoods: Tools for Equitable Neighborhood Change. Boston, Mass.: Dukakis Center for Urban and Regional Policy at Northeastern University, October 2010. http://nuweb9.neu.edu/dukakiscenter/wp-content/uploads/TRN_Equity_final.pdf

In addition, eTOD can stabilize "reverse-commuting" and/or off-peak ridership to the extent to which lower-income workers have jobs with hours outside the standard business day. Uncharacteristic of many transit systems in the U.S., the figure below illustrates a fairly even distribution of entries and exits throughout the day at

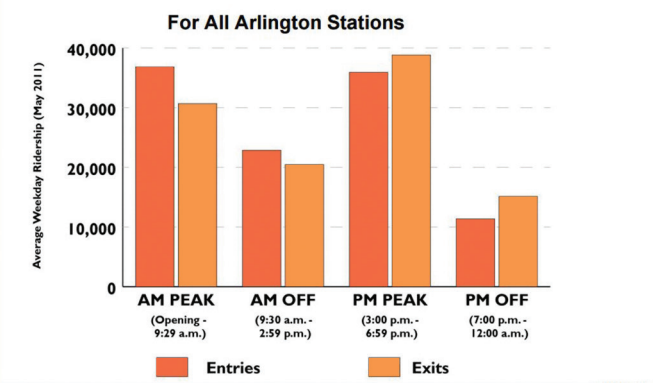
34 Pollack, Stephanie, Barry Bluestone, and Chase Billingham. Maintaining Diversity in America's Transit-Rich Neighborhoods: Tools for Equitable Neighborhood Change. Boston, MA: Dukakis Center for Urban and Regional Policy at Northeastern University, October 2010. http://nuweb9.neu.edu/dukakiscenter/wp-content/uploads/TRN_Equity_final.pdf, pages 22-24.

35 *Ibid.* pages 22-24.

36 *Ibid.* page 15.

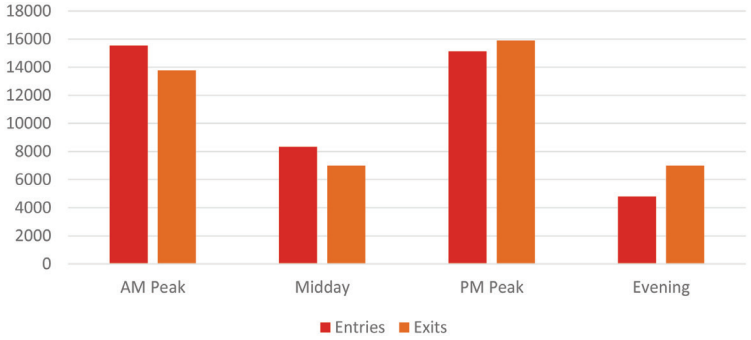
five stations in Arlington, Virginia.[37] This corridor contains a high level of residential density (including several affordable housing properties) and a mix of entertainment and retail establishments. While a portion of this balanced ridership is likely to result from higher-income consumers utilizing transit to reach these establishments, these businesses also rely on lower-wage employees (such as food service workers and cashiers) who may utilize the transit service as well.

FIGURE 4 | **Metrorail Stations Entries and Exits by Time Period for all Arlington County, Va. Stations [38]**



SOURCE: Chart copied with permission from: 40 Years of Smart Growth: Arlington County's Experience with Transit Oriented Development in the Rosslyn-Ballston Metro Corridor, Arlington County.

FIGURE 5 | **Metrorail Stations Entries and Exits by Time Period along the Rosslyn-Ballston Corridor in Arlington County, Va.[39]**



SOURCE: Enterprise analysis of WMATA Ridership Data; Washington Metropolitan Area Transit Authority. "Data Download: Metrorail Ridership by Origin and Destination." *PlanItMetro*, October 31, 2012. http://planitmetro.com/2012/10/31/data-download-metrorail-ridership-by-origin-and-destination/.

37 Cervero, Robert. "Transit-Oriented Development's Ridership Bonus: A Product of Self-Selection and Public Policies." Environment and Planning A 39, no. 9 (2007): 2068–85. doi:10.1068/a38377.

38 Arlington County Department of Community Planning, Housing and Development. "40 Years of Smart Growth: Arlington County's Experience with Transit Oriented Development in the Rosslyn-Ballston Metro Corridor." December 6, 2012. http://www.fairfaxcounty.gov/mason/seven_corners_special_working_group/arlington_countys_40_years_of_smart_growth_presentation.pdf.

39 Washington Metropolitan Area Transit Authority. "Data Download: Metrorail Ridership by Origin and Destination." *PlanItMetro*, October 31, 2012. http://planitmetro.com/2012/10/31/data-download-metrorail-ridership-by-origin-and-destination/.

LOCAL/REGIONAL ECONOMIES

Spatial mismatches between workers and jobs as well as businesses and customers can negatively impact the economy. A diverse and vibrant economy requires a range of job types at various income levels. Similarly, efficient neighborhoods and regions provide housing options that serve a wide range of incomes.

- According to an analysis by The Brookings Institution, "Problems with the daily commute don't just affect workers – they affect employers' bottom lines, too."[40]
- Transportation system inefficiencies (characterized by traffic congestion and an inability of workers to reach jobs efficiently – via transit or otherwise) can reduce labor-catchment areas, limit business markets, reduce employee productivity and increase labor costs that later pass on to end consumers.[41]

Conversely, well-planned development patterns and transportation networks crucially connect employers with workers and suppliers, businesses with customers and households with their everyday needs. TOD can support economic vibrancy in the following ways:

- The clustering effect and greater accessibility provided by TOD can lead to "agglomeration economies," increased labor productivity, and increased information exchange.[42]
- A review of literature and case studies by Reconnecting America found numerous economic benefits from transit that were tied to the surrounding development, including $8 billion in new development near light-rail stations in Portland, Oregon, and significant increases in retail sales near transit in Dallas.[43]
- When a strong public transit system is combined with effective TOD, it can reduce demand for parking (some estimates have indicated residential demand reductions between 20 and 50 percent), allowing land and resources to support more productive economic uses.[44]

40 Tomer, Adie. Where the Jobs Are: Employer Access to Labor by Transit. Metropolitan Infrastructure Initiative Series and Metropolitan Opportunity Series. Washington, DC: Brookings Institution, July 2012. http://www.brookings.edu/~/media/research/files/papers/2012/7/transit%20labor%20tomer/11%20transit%20labor%20tomer%20full%20paper.pdf, page 2.

41 *Ibid.*

42 Chatman, Daniel G., and Robert B. Noland. "Transit Service, Physical Agglomeration and Productivity in US Metropolitan Areas." Journal of Urban Studies 50, no. 12 (September 2013). http://usj.sagepub.com/content/early/2013/08/01/0042098013494426.abstract?papetoc.

43 Locating Affordable Housing Near Transit: A Strategic Economic Decision. Washington, DC: Reconnecting America, n.d. http://www.reconnectingamerica.org/assets/Uploads/20120904AHpolicybrief.pdf.

44 Zhang, Ph.D., Ming, Katie Mulholland, Jane Zhang, and Ana J. Gomez-Sanchez. Getting the Parking Right for Transit-Oriented Development. Austin, TX: Center for Transportation Research/University of Texas at Austin, March 2012. http://metro.kingcounty.gov/up/projects/right-size-parking/pdf/getting-the-parking-right-transit-oriented-development.pdf.

As with transportation-system performance, excluding low- and moderate-income households from transit-oriented, amenity-rich neighborhoods also negatively impacts the economy. Whereas advances in communication and information technology allow many people to work remotely and forego an inefficient commute, many employers fully rely on the ability of their employees to work onsite. These jobs (which may include restaurant staff, custodians and maintenance personnel, first responders and health workers) often pay lower wages and/or follow stricter schedules. Therefore, the expanded access provided by eTOD critically supports a healthy local and regional economy.

MUNICIPAL FINANCE

The economic growth supported by TOD (and more intensive development in general) can also positively impact municipal budgets with potential increases in tax revenue and reduce demand for costly infrastructure and municipal services. This is especially important, given that a U.S. Government Accountability Office study recently showed a growing long-term gap between expenditures and receipts for state and local governments across the country.[45] Therefore, it is imperative that governments ensure that development patterns play a role in remedying this imbalance rather than exacerbating it moving forward.

- Smart Growth America found that, compared to less efficient use of land with separated homes, schools and businesses and areas designed primarily for driving, smart-growth development generates 10 times more tax revenue per acre, upfront infrastructure cost savings of one-third, and a 10 percent reduction in ongoing service delivery costs.[46]
- A review of literature and policy brief from the Victoria (British Columbia) Transport Policy Institute echoed many of the same findings, showing that, overall, residential service costs decreased as density increased, as did a range of municipal capital and operating costs. The analysis also found that denser development yielded higher tax revenues per acre. Given lower infrastructure costs, the author found approximately 35 percent annual infrastructure return on investment for compact development (annual tax revenue relative to annualized infrastructure costs), compared to two percent for sprawled development.[47]

45 U.S. Government Accountability Office. State and Local Governments' Fiscal Outlook: 2014 Update. Washington, DC: U.S. Government Accountability Office, December 17, 2014. http://www.gao.gov/products/GAO-15-224SP.

46 Smart Growth America. Building Better Budgets: A National Examination of the Fiscal Benefits of Smart Growth Development. Washington, DC: Smart Growth America, May 21, 2013. http://www.smartgrowthamerica.org/2013/05/21/building-better-budgets-quantifies-average-savings-and-revenue-of-smart-growth-development/.

47 Litman, Todd. Understanding Smart Growth Savings: What We Know About Public Infrastructure and Service Cost Savings, and How They Are Misrepresented by Critics. Victoria Transport Policy Institute, September 10, 2012. http://www.vtpi.org/sg_save.pdf.

Affordable housing in transit-oriented neighborhoods tends to take the form of multifamily rental housing, thus contributing to the density levels that support efficient municipal budgets. Furthermore, locating affordable housing near transit nodes and existing facilities can more easily connect program beneficiaries to services, potentially reducing the cost of social service provision.

ENVIRONMENTAL RESILIENCE

TOD can facilitate the use of alternative modes of transportation and reduces the amount of land necessary to accommodate a growing population and economy.

- In 2012, the transportation sector accounted for 28 percent of total U.S. greenhouse gas emissions, according to the Environmental Protection Agency.[48]
- Sprawling development patterns not only lead to longer commutes (and higher emissions); they also result in the loss of farmland and open space.[49]
- The aforementioned ULI review of research and California TOD analysis estimated that the reduction in VMT associated with compact development patterns could lead to significant reductions in greenhouse gas emissions.[50]

As previously stated, TOD will not necessarily lead to decreased automobile use if higher-income residents who may occasionally utilize transit take the place of core transit riders who no longer can afford a neighborhood. Furthermore, a lack of housing affordable to people with low or moderate incomes within the urban core can push these households farther from the urban core, potentially exacerbating sprawl and increasing VMT.

Conversely, eTOD can facilitate greater transit use and reduced VMT if barriers to increased housing supply near transit can be overcome. eTOD expands the market for housing near transit to encompass households of wider range of incomes. By contrast, exclusively higher-end TOD, by definition, competes for a more limited number of households, reducing the number of people who could viably live in transit-oriented neighborhoods. These homes may also be significantly larger (for example, townhomes instead of multifamily condominiums), resulting in fewer units and further limiting the number of potential transit riders.

48 US EPA, Climate Change Division. "Greenhouse Gas Emissions: Transportation Sector Emissions." Overviews & Factsheets. Accessed August 25, 2014. http://www.epa.gov/climatechange/ghgemissions/sources/transportation.html.

49 Benfield, Kade. Paving Paradise: Sprawl and the Environment. Natural Resources Defense Council, April 14, 2000. http://www.nrdc.org/cities/smartgrowth/rpave.asp.

50 Urban Land Institute. Land Use and Driving: The Role Compact Development Can Play in Reducing Greenhouse Gas Emissions. Washington, DC: Urban Land Institute, June 2010. http://www.uli.org/wp-content/uploads/ULI-Documents/Land-Use-and-Driving-Low-Res.pdf.

TransForm, and California Housing Partnership Corporation. Why Creating and Preserving Affordable Homes Near Transit Is a Highly Effective Climate Protection Strategy. California, 2014. http://www.chpc.net/dnld/AffordableTODResearch051514.pdf.

ETOD: A WORTHWHILE ENDEAVOUR REQUIRING PROACTIVE EFFORTS

As the preceding sections demonstrate, robust evidence supports implementing eTOD to benefit regional growth, mobility and access, public health and cost of living. Importantly, transit-oriented affordable housing particularly promotes transit use, increases farebox revenue and supports robust economies.

However, developers working to preserve and create affordable housing in transit-rich neighborhoods face considerable challenges. Zoning constraints, density restrictions, parking requirements and urban redevelopment can all create barriers to TOD in general. The costs of addressing these burdens particularly jeopardize eTOD developers with limited resources and tight project margins.

Despite these challenges, stakeholders throughout the country have successfully implemented integrating affordable housing in station areas. Future installments in the *Promoting Opportunity through Equitable Transit-Oriented Development* research series will provides more details on this issue.

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