Transportation, Services and Jobs:
A Comparison of Accessibility for Affordable Housing Locations in Florida

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Abstract

Low-income renters are particularly vulnerable to the combined costs of housing and transportation. The two most active federal affordable housing initiatives—the Housing Choice Voucher (HCV) and Low-Income Housing Tax Credit (LIHTC) programs—address the housing side of the location affordability calculation through rent subsidies and caps, respectively. This study evaluates the extent to which these programs also provide units that are well-located in terms of travel costs, transit accessibility, and walking access to key services.

The study evaluates location affordability and efficiency for 139,210 units in Florida subsidized by vouchers, LIHTC and other funds allocated by Florida Housing Finance Corporation (Florida Housing), or both. HUD's Location Affordability Index is used to estimate travel costs. A new parcel-level dataset is used to measure transit and walking access to services that promote residents' health, education, and community and social involvement, as well as transit access to jobs. The study devotes particular attention to locations combining Florida Housing and voucher assistance. Market-rate voucher locations are further stratified into multifamily and single-family units.

We find that in general, voucher locations in market-rate multifamily developments provide the most accessible locations, single family voucher locations are the least accessible, and Florida Housing-sponsored units occupy a middle ground. However, two subsets of Florida Housing-sponsored units meet or exceed the accessibility of market-rate apartments in many parts of the state: pre-1989 properties acquired and rehabilitated with Florida Housing assistance, and recent developments built after Florida Housing began incentivizing proximity to transportation and services in its funding process.

Introduction

This paper evaluates affordable housing locations in Florida based on their accessibility to transportation, services and jobs. It addresses this research question: how do affordable housing units funded by the Housing Choice Voucher program, the Low Income Housing Tax Credit, and the two programs combined compare in terms of transit accessibility, walkability, and travel costs?

Researchers use two related concepts to describe the link between a housing unit's location and its access to transportation:

> *Location efficiency* refers to the overall convenience of a location to a variety of destinations, such that travel time and cost and auto use are reduced. It can be measured by a variety of indicators related to physical form, including density of residences and destinations; street network density; and proximity to shopping, jobs, transit stops and other services (Holtzclaw et al., 2002).
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> *Location affordability* refers to the combined costs of the housing unit and transportation for a particular location, and the extent to which a households at a given income level can afford these combined costs (HUD, n.d.). Measures of location affordability throw into relief the tradeoffs that households often must make to afford the full costs of their housing. Households may choose units with affordable mortgage costs or rents, but if they are forced to travel long distances to reach work, services, and other destinations, their increased transportation costs may outweigh housing unit savings. Conversely, location efficient units may command premium rents or home prices.

All families can benefit from lower transportation costs, shorter commutes, and quick access to services and jobs, but location affordability and efficiency are particularly valuable for renters with low incomes. The bottom third of earners saw their share of income spent on transportation rise from 9-10 percent in the 2000s to 16 percent in 2014, while the share spent by middle- and high-income households showed little change (Pew, 2016). Also, low-income tenants are more likely to depend on alternatives to auto travel, such as walking and transit. One-third percent of poor renters have no vehicle in the household, compared to just eight percent of American households overall (U.S. Census Bureau, 2013).

We undertook this study to explore the extent to which the two most active federal affordable rental housing initiatives—the Housing Choice Voucher (HCV) and Low-Income Housing Tax Credit (LIHTC) programs—provide efficient and affordable housing locations for these vulnerable households in Florida. Both programs address the housing side of the location affordability calculation: the HCV program through deep, ongoing financial assistance to tenants renting units on the private market, and the LIHTC program through rent and income ceilings. However, the two programs approach transportation affordability differently. Under the LIHTC program, most state housing agencies have phased in incentives in their funding competitions for development near transit or in otherwise efficient locations (Nedwick and Burnett, 2015). In contrast, HCV program rules do not incorporate any incentives for location efficiency or affordability, although individual tenants may seek out units located near their workplaces and other activities.

This study incorporates measures of both location affordability and location efficiency to evaluate sites funded by the HCV and LIHTC programs. It devotes particular attention to the location of units with both HCV and LIHTC assistance. Given that LIHTC-funded developments are prohibited from rejecting tenants solely because they have a voucher, we are interested in whether these developments open doors

for voucher holders to units well located in terms of transportation costs and accessibility to jobs and services.

The Shimberg Center obtained household location and tenant characteristics data from HUD for HCV-subsidized households. For the LIHTC evaluation, we used location and tenant data from Florida Housing Finance Corporation (Florida Housing) on its portfolio of subsidized multifamily units in the state. Nearly all of these units used LIHTC resources allocated by Florida Housing as a funding source, and we use "LIHTC-funded" and "Florida Housing-funded" interchangeably below to refer to this inventory. The analysis covers 16 Florida counties in four major and three smaller metropolitan areas. In total, the dataset covers 139,210 tenant households in locations subsidized by one or both of the housing programs.

Other data and analytic tools come from the Shimberg Center's Housing Suitability Model (HSM), a GIS-based model developed for Florida communities. Through the HSM, each land parcel in a county or metropolitan area is scored in terms of physical, land use, transportation, and neighborhood characteristics. Different types of parcels can then be compared with each other to determine their relative suitability for affordable housing based on the user's policy priorities. The analysis takes advantage of the detailed geographic data developed for the HSM, including assisted housing locations, transit lines, road networks, parcel-level characteristics from property tax rolls, and locations of businesses and public facilities.

Florida was chosen as a study area because of the detailed data available from the Housing Suitability Model, but also as a counterweight to the heavy emphasis in the prior literature on affordable housing location outcomes in traditional older, high-density cities such as Chicago and New York. The Florida study area encompasses a range of development patterns common to Sunbelt regions, including major urban centers and suburbs developed in the early and mid-20th century, newly developed suburbs, and small resort communities. Unlike in older traditional cities, transit access is provided almost entirely by bus; at the time household data were collected, only Miami provided rail service.[1]

The paper begins with a description of the affordable housing programs under study and previous literature on location efficiency of the subsidized housing stock. It then describes the household dataset and method for developing the multi-layered location accessibility scores. Next, we compare the accessibility of four housing types: Florida Housing units with voucher holders, Florida Housing units without voucher holders, multifamily market-rate voucher locations, and single family voucher locations.

The analysis is further stratified in two ways. We compare locations within the housing types by building age to account for two countervailing tendencies. On the one hand, we expect older developments of any type to be more centrally located and, therefore, associated with lower driving costs and better access to destinations by walking and transit. On the other hand, Florida Housing introduced incentives for proximity to transit and services in its LIHTC competitive funding process in 2002; therefore, we expect the most recent Florida Housing-sponsored developments to show improved accessibility. We also compare outcomes for elderly and non-elderly households within housing type. Access to services by modes other than auto travel can be beneficial for all low-income renters, but it is essential for older residents who no longer drive. In a previous study, the Shimberg Center found that 58 percent of extremely low-income renters age 75 and older had no vehicle at home (Shimberg Center, 2016).

[1] Affordable housing locations and household characteristics come from 2013 data. The Orlando region introduced a new commuter rail service, SunRail, in 2014.

Background

The Housing Choice Voucher and Low Income Housing Tax Credit Programs

Nationwide, 2.2 million households are currently assisted by the HCV program and 2.78 million units have been funded the LIHTC program since 1987 (CBPP, 2015; HUD, 2016). In Florida, approximately 102,000 households are currently served by the HCV program and 163,000 by the LIHTC program (HUD, 2016; Shimberg Center, 2016). The two programs represent most of the decisions now being made about the location of subsidized housing—by tenants, landlords and public housing authorities under the HCV program, and by developers and state housing finance agencies under the LIHTC program. In contrast, few new housing units are being sited under the other major federal subsidy programs, public housing and project-based rental assistance.

The dataset for this study includes over 52,000 units subsidized by vouchers in the 16 study counties. Under the HCV program, vouchers are allocated to local public housing authorities (PHAs). The PHAs distribute vouchers to tenants, who use them on the rental housing market to find housing units. The tenant typically pays 30 percent of income to the landlord, with the remainder of the rent paid to the landlord through a monthly assistance payment by the PHA. As a deep rental assistance program, the HCV program serves some of the nation's lowest income tenants. In 2015, average income for HCV tenants in the U.S. was $13,821. Three-quarters of these tenants were "extremely low-income," meaning their incomes were below 30 percent of the area median income (AMI) adjusted for household size. (HUD, 2015).

Tenants and landlords are the key actors determining the location of voucher-subsidized housing. Tenants may choose units that meet the rent and quality standards, as long as the landlord agrees to accept vouchers. These may include multifamily units, single family homes, and mobile homes. PHAs also play a significant role in determining voucher locations, since PHA-managed rental listings are one of the most commonly used sources of housing search information for voucher holders (Galvez, 2010; Wang, 2016).

The dataset also includes over 94,000 units funded by Florida Housing Finance Corporation (Florida Housing), including over 7,000 with voucher holders. The vast majority of these units (94 percent) have funding from the LIHTC program. Many of the developments also receive funding from Florida's affordable housing trust fund and private activity bonds allocated by Florida Housing and local housing finance authorities.

The LIHTC program provides investors in rental housing developments with credits to reduce their federal income taxes. State housing finance agencies (HFAs) are responsible for allocating tax credits to developers for specific rental projects. The developers typically sell the tax credits to investors or syndicators to raise equity for the development. In return, the development is subject to affordability restrictions (Novogradic, n.d.). Tenant incomes are usually restricted to 50 or 60 percent of AMI adjusted for household size, although some units are subject to more stringent units. Rents are restricted to the level at which a household at the maximum income level would pay no more than 30 percent of monthly income. HFAs may incentivize or require deeper income targeting as a condition of funding.

Decisions about LIHTC locations are made by the developers, who propose and acquire sites for development, but also by HFAs who allocate tax credits and other competitive financing such as state housing trust fund dollars. Most HFAs provide incentives or requirements for LIHTC developments to be located near transit (Nedwick and Burnett, 2015). Many provide incentives for location near other services and amenities such as job centers and high-performing schools (Ellen et al., 2015).

The incentives most relevant to this study are the "proximity points" offered by Florida Housing in its funding competitions since 2002. Applicants for funding receive higher scores for developments within a half-mile of transit stops and to services including grocery stores, schools, medical facilities, pharmacies, senior centers, libraries, and community centers (Florida Housing, n.d.). We use these categories to identify essential service destinations in the analysis.

As noted above, we are particularly interested in the units where voucher and LIHTC assistance overlap. The HCV and LIHTC programs are typically discussed as two separate approaches to providing rental housing for low-income tenants: the HCV program as a tenant-based, deep subsidy enabling extremely low-income tenants to rent from private landlords, and LIHTC as a project-based construction program serving households with modest, but not extremely low, incomes. In practice, however, thousands of tenants use vouchers in LIHTC-funded units. In Florida, an estimated 16 percent of HCV tenants reside in Florida Housing-funded developments; conversely, approximately 9 percent of Florida Housing units are occupied by voucher holders (Shimberg Center, 2017).

The major disadvantage of combining LIHTC and HCV assistance is that it reduces the total number of households that can be served by the two programs. However, this approach also confers several advantages. First, even restricted LIHTC rents can be out of reach for extremely low-income tenants. HCV assistance can bring LIHTC rents down to a manageable level for these tenants. In Florida, for example, average monthly tenant-paid rent for all units funded by LIHTC or other Florida Housing programs is $718; in the subset of Florida Housing units with vouchers or similar levels of project-based assistance, average rent is $294 (Shimberg Center, 2016). Second, the LIHTC program can be used to expand the limited supply of housing available to HCV holders. Housing seekers often have trouble finding units that accept vouchers and meet rent and quality standards, particularly in strong market neighborhoods (Freeman, 2012). Federal law prohibits owners of LIHTC developments from practicing "source of income discrimination" against voucher holders; that is, unlike privately financed rental housing in most areas, a LIHTC development cannot reject an applicant solely because the tenant would be paying for housing with a voucher. A third advantage is that newly constructed or rehabilitated LIHTC units may offer better physical conditions than units in comparable market-rate rental properties (Bostic, 2012), including those typically available to voucher holders. This analysis examines whether this improvement extends to the quality of *locations* of LIHTC units compared to market rate apartments and homes.

Location Efficiency. Location Affordability, and Subsidized Housing

The launch of the federal Partnership for Sustainable Communities in 2009 brought unprecedented attention to location efficiency and affordability. The Partnership, an interagency agreement between HUD, the Environmental Protection Agency (EPA), and the Department of Transportation, called for the U.S. to "expand location- and energy-efficient housing choices for people of all ages, incomes, races, and ethnicities to increase mobility and lower the combined cost of housing and transportation." (EPA, 2009). Using methods and data developed by the Center for Neighborhood Technology (CNT), HUD launched the Location Affordability Index (LAI), an online GIS-based tool estimating housing and transportation cost burdens for households with a given location, tenure, family composition, and income (HUD, n.d.). Similarly, EPA launched an online Smart Location Database (SLD) to provide geographic, demographic, employment and job location, road and transit network, and accessibility indicators as input for models evaluating location efficiency (EPA, 2014). More recently, *Housing Policy Debate* devoted a special double issue to location affordability, including a number of studies evaluating location affordability for low-income households and neighborhoods and for residents of subsidized housing (Renne and Sturtevant, 2016).

The Census block group has been the most common geographic unit of analysis. The Location Affordability Index and Smart Location Database are both measured at this level. The block group is the smallest geographic unit available for key input variables for these datasets from the Census Bureau's American Community Survey and Longitudinal Employer-Household Dynamics (LEHD).

The nascent literature on location efficiency and affordability of subsidized rental housing suggests three patterns. First, subsidized housing developments tend to be more location efficient than the voucher locations or the general housing supply. Talen and Koschinsky (2011) found that subsidized developments (mainly public housing, project-based rental assistance, and LIHTC) fared better than HCV locations in Chicago when measured by location in a Census block group or tract with in proximity to transit, grocery stores and other shopping, schools, and parks. They later compared HUD project-based rental assistance, public housing, and HCV locations nationwide using Walkscore, an address-level dataset measuring walkability to amenities such as shopping, entertainment, parks and schools. This study found that project-based rental assistance and public housing locations tended to be more walkable than the overall rental housing stock, but that neighborhoods with subsidized housing developments were more likely to be "compromised" by poverty, segregation, and low school quality. The HCV locations, on the other hand, were similar in walkability to the overall rental supply. (Koschinsky and Talen, 2016).

Second, the research suggests that program incentives for location efficiency have a small but measurable effect. Nedwick and Burnett (2015) found that LIHTC developments were slightly more likely to be located near rail and other fixed guideway stations in states where the Qualified Allocation Plan (QAP) guiding LIHTC selections included points for locating near transit. Adkins et al. (2017) compared location efficiency for LIHTC developments placed in service between 2007 and 2011 to the general housing supply using a combination of block-group level indicators from the EPA SLD, HUD/CNT LAI, and the American Community Survey. They found that most LIHTC units did not meet the study's threshold for location efficiency, but that the general housing supply was even less likely to meet those requirements. On the other hand, states with incentives in their QAPs for proximity to services and with more non-profit developers had slightly higher shares of LIHTC developments that were location efficient.

Third, the research highlights the role of regional land use and development patterns in determining a site's location efficiency. Tremoulet et al. (2016) found that HCV locations in the city of Portland were more location efficient than those in the surrounding suburbs as measured by a combination of EPA SLD variables, HUD/CNT LAI, and Walkscore. Hamidi et al. (2016) modeled household transportation costs for HUD project-based rental assistance locations in 15 metropolitan statistical areas (MSAs). They found that housing sites were more likely to have estimated travel costs above 15 percent of household income if they were located in either sprawling MSAs or suburban locations within otherwise compact MSAs.

This study builds on the prior literature on location outcomes for the affordable housing stock in two key ways. First, it introduces a set of parcel-level measurements of transit and walking access to employment and service destinations. The parcel scale allows us to account for the wide variability in transit and walking access present within neighborhoods, not just across them. The custom selection of destination types makes it possible to hone in on access to job concentrations as well as a core set of service destinations that support the health, education, and community and social involvement of affordable housing residents. We combine this analysis with block group-level indicators of travel costs from HUD's Location Affordability Index, so that the study incorporates both location efficiency and location affordability measures.

Second, this study delves more deeply than previous works into the different housing types available to voucher-subsidized tenants. As noted above, the study distinguishes among units receiving both HCV and LIHTC assistance, LIHTC units occupied by tenants without vouchers, and the market-rate (non-LIHTC) units occupied by voucher holders. For voucher holders who do rent market-rate units, we further distinguish between single family homes and multifamily developments. Although one-third of voucher holders reside in single family homes nationwide (An et al., 2017), the prior literature has not addressed differences in location outcomes for these households versus those in multifamily developments. In many communities local zoning imposes separation between single family and multifamily land uses, and by definition neighborhoods dominated by single family homes tend toward lower residential densities than multifamily neighborhoods. Therefore, we would expect different locational outcomes across the two housing types.

Data and Methods

Household Dataset

The study dataset is made up of affordable housing locations in 16 counties, from seven of the state's HUD Metro Fair Market Rent areas (HMFA), as shown in Table 1. To simplify the analysis, the metropolitan areas are further collapsed into "functional regions" with similar characteristics. These include Miami-Dade County, representing the state's most populous, urban area with the most developed transit and walkable access. For contrast, the three smaller, less populated areas are grouped together (Alachua, Polk, and Volusia counties). Initially, the state's other three large metropolitan areas—Jacksonville, Tampa, and Orlando—were grouped as a single category. However, because accessibility scores for affordable housing locations in the Orlando metropolitan area are much lower than for Jacksonville and Tampa, it was separated into a fourth functional region.

Table 1. Functional Regions

Functional Region	HUD Metro Fair Market area	Counties
Miami-Dade County	Miami-Miami Beach-Kendall HMFA	Miami-Dade
Jacksonville/Tampa MSAs	Jacksonville HMFA	Clay
		Duval
		Nassau
		St. Johns
	Tampa-St. Petersburg-Clearwater MSA	Hernando
		Hillsborough
		Pasco
		Pinellas
Medium Counties	Gainesville MSA	Alachua
	Lakeland-Winter Haven MSA	Polk
	Deltona-Daytona Beach-Ormond Beach HMFA	Volusia
Orlando MSA	Orlando-Kissimmee-Sanford MSA	Lake
		Orange
		Osceola
		Seminole

The unit of analysis for the study is a household in one of these counties receiving a voucher, residing in a Florida Housing-sponsored unit, or both in 2013.

Tenant administrative datasets provided most of the household and unit-level information used in the study. HUD provided records for HCV participants from its Form 50058 database, which tracks address, demographic, income, housing structure type, and rent characteristics for voucher recipients. Location and household characteristics for tenants of Florida Housing-sponsored developments came from the Shimberg Center's Assisted Housing Inventory (AHI) database and administrative records provided by Florida Housing.

Both datasets include geocoding information for the residents' addresses. These were matched to parcel identifiers from the Florida Department of Revenue's tax roll data from county property appraisers. In this way, households could be matched to the appropriate parcel-level accessibility scores and block group-level travel cost. When the parcel identifier in the HCV dataset matched parcels assigned to Florida Housing properties, the unit was identified as receiving both voucher and Florida Housing assistance.

In all, the dataset included 139,210 households. Using information from the matched HCV, Florida Housing, and property appraiser datasets, each household was classified in one of four housing types:

- Florida Housing units without a voucher: 86,822 households
- Florida Housing units with a voucher: 7,259 households
- Voucher in market-rate single family home: 18,489 households
- Voucher in market-rate multifamily unit: 26,640 households

The property appraisers' data also provided a year built for each household's unit. The tenant datasets identified households as elderly, defined as including at least one person over age 62, or non-elderly.

Table 2 shows the distribution of the dataset by region, housing type, building age, and household composition. It shows that the Florida Housing-financed units are considerably newer than the market-rate multifamily and single family voucher locations, regardless of region.

Table 2. Housing Location Characteristics

Region	Housing Type	House-hold Count	Mean Year Built	Year Built Category			% Elderly
				Pre-1989	1989-2003	>2004	
Miami-Dade County	Florida Housing without Voucher	23,357	1991	27%	45%	28%	23%
	Florida Housing with Voucher	1,706	1999	12%	46%	43%	41%
	Voucher in Market-Rate Single Family (SF)	4,964	1968	78%	10%	12%	13%
	Voucher in Market-Rate Multifamily (MF)	12,492	1968	87%	6%	7%	52%
Jacksonville/ Tampa MSAs	Florida Housing without Voucher	26,888	1996	18%	48%	33%	20%
	Florida Housing with Voucher	2,907	1999	11%	57%	32%	21%
	Voucher in Market-Rate SF	9,779	1966	83%	9%	8%	7%
	Voucher in Market-Rate MF	9,361	1978	78%	10%	12%	26%
Medium Counties (Alachua, Volusia and Polk)	Florida Housing without Voucher	7,451	1997	24%	45%	31%	15%
	Florida Housing with Voucher	831	2000	6%	67%	26%	16%
	Voucher in Market-Rate SF	1,963	1974	75%	14%	11%	8%
	Voucher in Market-Rate MF	2,505	1976	84%	11%	5%	27%
Orlando MSA	Florida Housing without Voucher	29,126	1998	8%	72%	20%	11%
	Florida Housing with Voucher	1,815	1998	6%	82%	12%	20%
	Voucher in Market-Rate SF	1,783	1981	58%	31%	11%	6%
	Voucher in Market-Rate MF	2,282	1983	68%	24%	8%	23%

Travel Cost, Transit Accessibility and Walking Accessibility Indicators

Each household location received four scores: travel cost, transit accessibility to services, transit accessibility to jobs, and walking accessibility to services.

Travel costs were measured using HUD's Location Affordability Index. The LAI provides modeled estimates of the annual costs of owning a car, operating a car, and transit fees by Census block group. The LAI provides different estimates for household profiles based on housing tenure (owner versus renter), number of household members and presumed commuters, and income level expressed as a percentage of area median income. We used the profile for a single parent family with income at 50 percent of area median income, which most closely resembles the households in the study dataset.[2] For each block group, the LAI provides an estimated annual income in dollars and an estimated percentage of income spent on transportation for households with this profile. We multiplied these to create an annual transportation cost

[2] Statewide, 59 percent of tenants in Florida Housing units and 92 percent of voucher recipients have incomes below 50 percent of AMI (Shimberg Center 2016; HUD 2015).

in dollars for each block group. Each household received an estimated travel cost based on the block group in which their parcel was located. Across the dataset, these values ranged from $3,469 to $10,491, with most in the $6,000-8,000 range.

The estimated travel costs were supplemented by parcel-level measures of transit and walking accessibility for several reasons. First, for the areas under study, the costs modeled by the LAI are heavily dominated by driving costs. Given widespread auto use in Florida communities, the LAI model estimates at least one car per household in over 90 percent of block groups in the 16 study counties, even for the single parent/very low-income household profile. Nevertheless, many low-income renters in Florida *are* transit-dependent, and some of the households with cars might choose walking or transit if jobs and services were accessible. These households' needs and interests would not be addressed without explicit walking and transit indicators. Second, parcel-level measures provide more precise information about location accessibility. While driving access to destinations may not vary much within a block group, transit and walking access can, especially in low-density, large area block groups or where there are physical barriers such as cul-de-sacs. For example, a Jacksonville block group contains a number of short roads accessible by a single outlet road, with fences and cul-de-sacs interrupting road connections. From one housing location within the block group, transit users can reach over 104,000 jobs within a 30-minute transit trip; from another, 39,000 jobs are accessible. Third, while transit access to jobs is critical, many household members in subsidized housing are unlikely to be commuters, particularly children and seniors. Including the service-related scores places additional emphasis on access to essential destinations supporting health, education, and community and social involvement.

The parcel-level accessibility scores measure the availability of destination types (jobs, services) from origins (all parcels) within a given distance or travel time. Service destinations include medical facilities, pharmacies, schools, libraries, community and senior centers, and grocery stores. As noted above, proximity to these destinations is incentivized under Florida Housing Finance Corporation's competitive process for funding from LIHTC and the state's affordable housing trust fund.

For each accessibility component, the general process was to create a matrix showing distance and associated time along the travel network between all origin parcels and all destinations. To do so, we chose random origin points, measured their distance and time to destinations, and then interpolated from those origin points to create a raster (matrix of cells organized into a grid) with estimates of origin-destination availability for a given travel time within each study county. The cell values from raster data were then summarized to the parcel level so that accessibility could be measured from any parcel.

Appendix 1 describes the process by which the origin-destination matrices were translated into three scores for each parcel:

- A walking score consisting of a count of service destinations with ¼ mile network walking distance. Possible scores range from zero to no upper limit, but in practice most locations are walkable to 0-2 destinations, and less than five percent are walkable to more than 12 destinations;
- A transit to services score ranging from 0 to 100 based on accessibility to the eight service destination types within 15-60 minutes. Destinations within a shorter transit trip are weighted more heavily; and
- A transit to jobs score ranging from 0 to 40 based on accessibility to employment destinations within 15-60 minutes, again with greater weight given to destinations within a shorter trip.

Composite Accessibility Score

A Chi-Square Test of Independence showed that the four measurements of accessibility were highly correlated with each other. Therefore, the scores were combined into an overall accessibility score. Principal components analysis (PCA) can be used as a dimension reduction technique when there is correlation between variables. PCA in SPSS extracted a standardized factor to replace the four access variables, based on statistically estimated weights applied to the original scores. Finally, linear transformation was used to convert the standardized factor to a 0-10 scale, with zero as the lowest access and 10 as the highest.

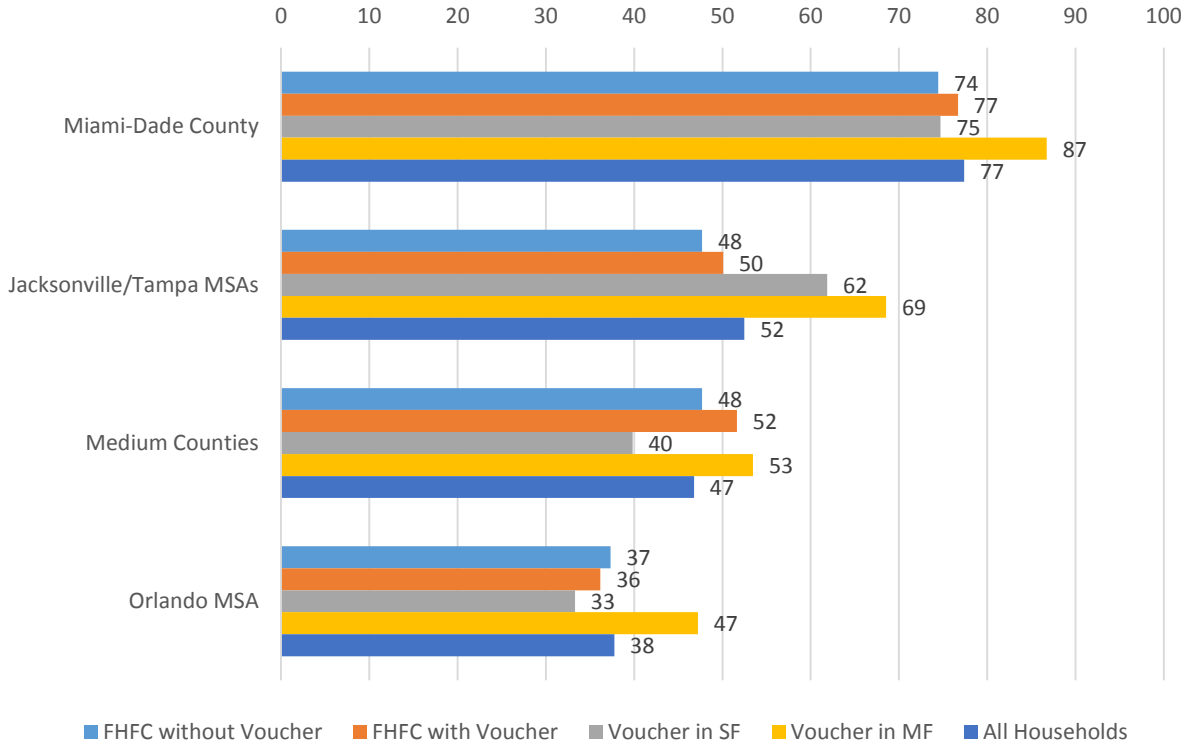
In the analysis below, we provide descriptive statistics for the transit accessibility scores and travel cost measure. We use Least Significant Differences post hoc tests to compare mean accessibility scores across the four housing types (Florida Housing units without vouchers, Florida Housing units with vouchers, vouchers in market-rate multifamily, vouchers in single family) within regions and across building age categories. We use the Mann-Whitney U test to compare the distributions of elderly versus non-elderly households by accessibility.

Results

Figures 1 through 4 show the mean scores for each accessibility component. The figures reveal three patterns.

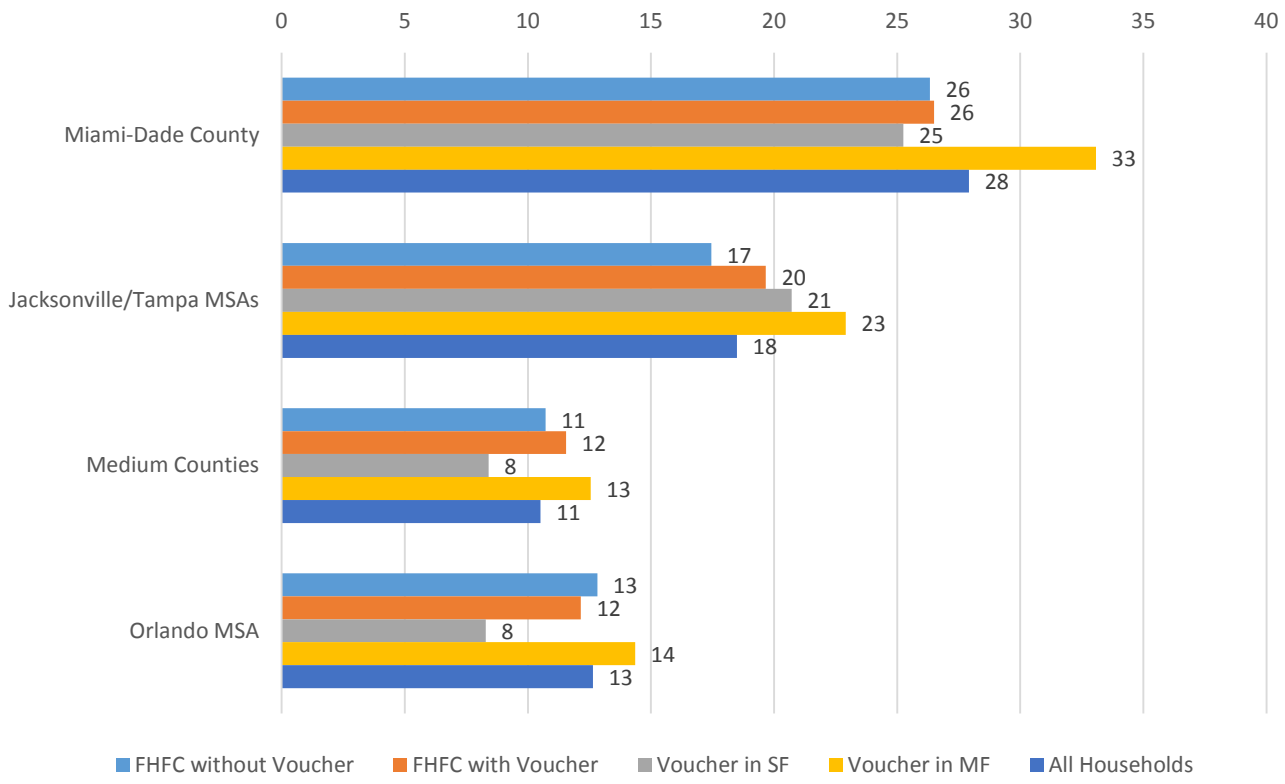
First, differences across regions are greater than differences by housing type within region. In particular, transit and walking scores are consistently highest and travel costs consistently lowest in Miami-Dade County than in the other regions, regardless of housing type. Second, across regions and the different components, vouchers in market-rate multifamily developments consistently show better accessibility than other housing types. Among the remaining housing types, vouchers in single-family homes generally are less accessible, but the results are more mixed. For travel cost estimates, single family voucher units have the highest cost estimates across all regions. For transit to jobs, the Florida Housing units are more accessible than single family voucher units in all regions except Jacksonville/Tampa. For the other two components, transit to services and walking to services, results are more mixed, with Florida Housing units more accessible than single family voucher units in some areas and less in others. Third, outside of Miami-Dade County, walking access to services is poor. Given that each walkable destination receives one point, the results show that outside of Miami-Dade, on average there are only 1-3 walkable destinations across the various housing types.

Figure 1. Mean Transit Access to Services Score by Housing Type and Region



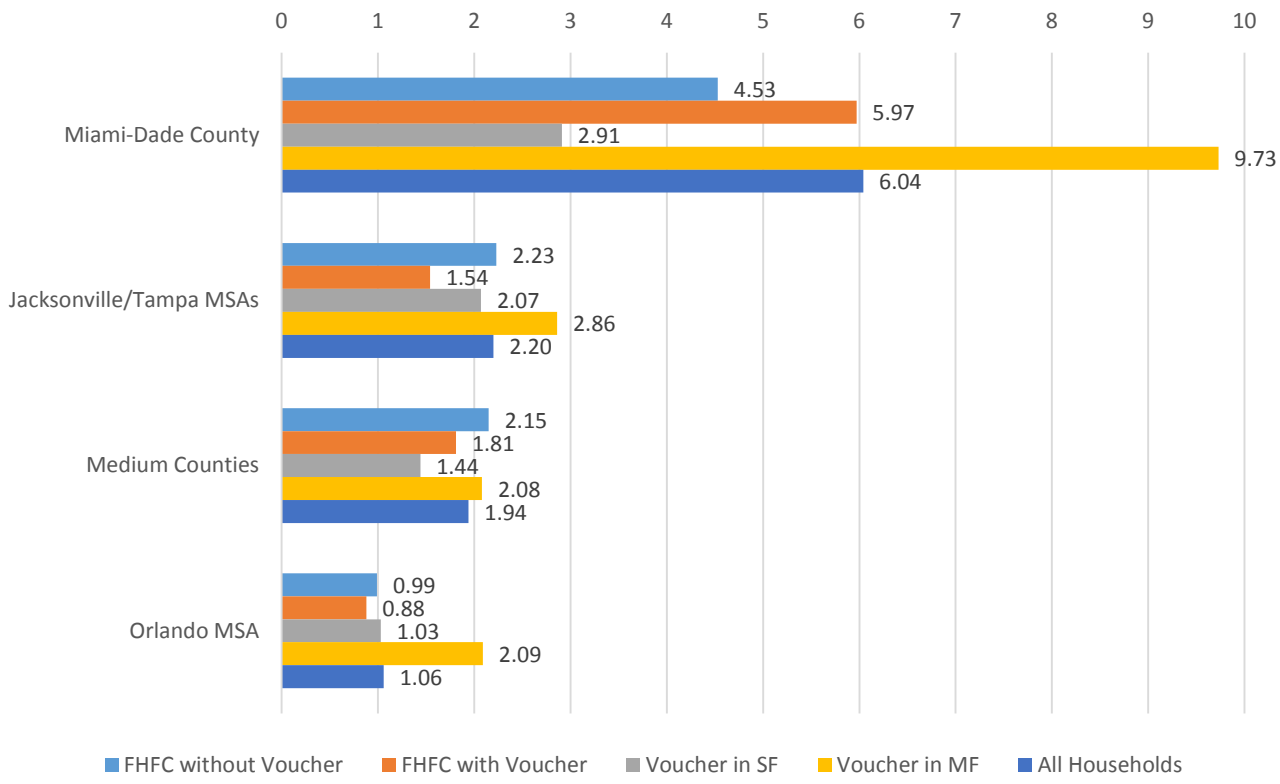
Note: Represents composite score for access to eight service categories by combination of walking and transit, weighted by transit shed (15/30/45/60 minutes). Possible values range from 0 to 100.

Figure 2. Mean Transit Access to Jobs Score by Housing Type and Region



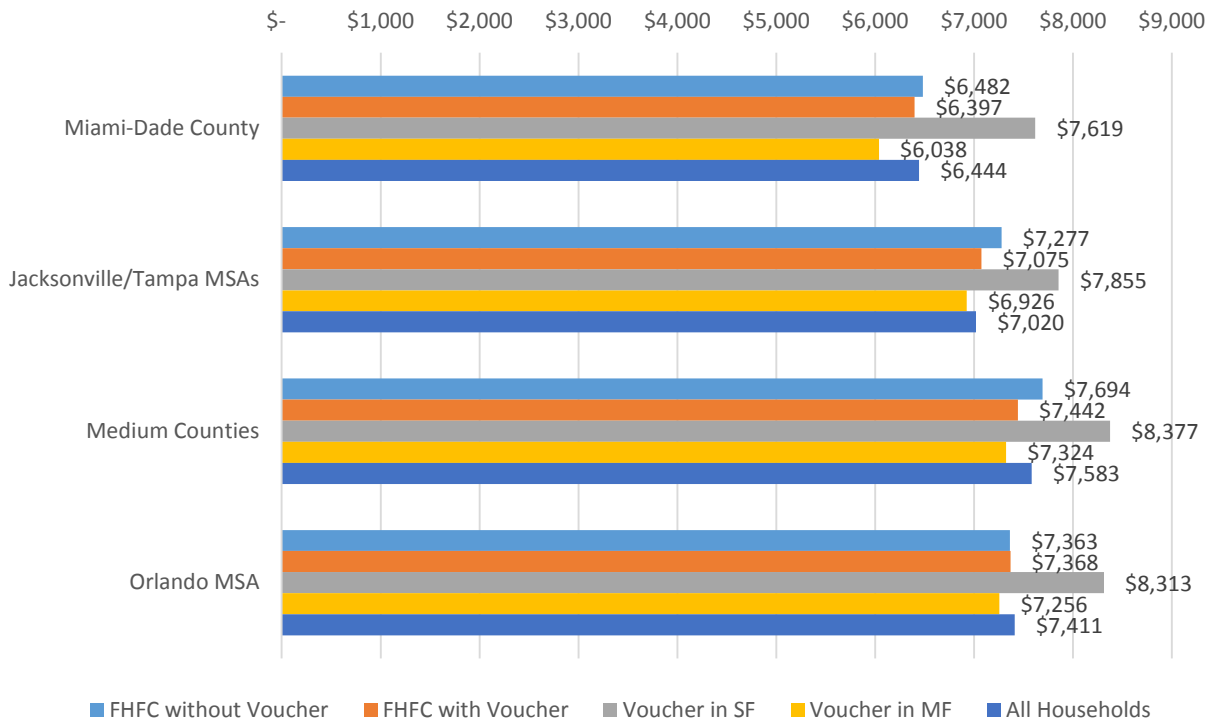
Note: Represents composite score measuring number of jobs reachable from the origin by combination of walking and transit, weighted by transit shed (15/30/45/60 minutes). Possible values range from 0 to 40.

Figure 3. Mean Walkable Service Destinations Count by Housing Type and Region



Note: Represents count of destinations in the eight service categories that are reachable from the origin by walking up to ¼ mile. There is no limit on the upper value, but in practice 95 percent of the housing locations in the dataset are walkable to 12 or fewer destinations.

Figure 4. Travel Cost Estimate by Housing Type and Region



Note: Represents estimated annual travel cost for single parent, very low-income renter household (<50% AMI) in dollars.

Composite Access Scores

These patterns are also apparent in the mean composite accessibility score, as shown in Figure 5. As noted earlier, the accessibility score is measured on a scale of 0-10. Again, scores for Miami-Dade County are higher than for other regions, regardless of housing type, and market-rate multifamily units with vouchers score highest in all regions. With the combined scores, Florida Housing units with and without vouchers outscore single family voucher units in all regions except Jacksonville/Tampa.

Figure 5. Mean Accessibility Score by Housing Type and Region

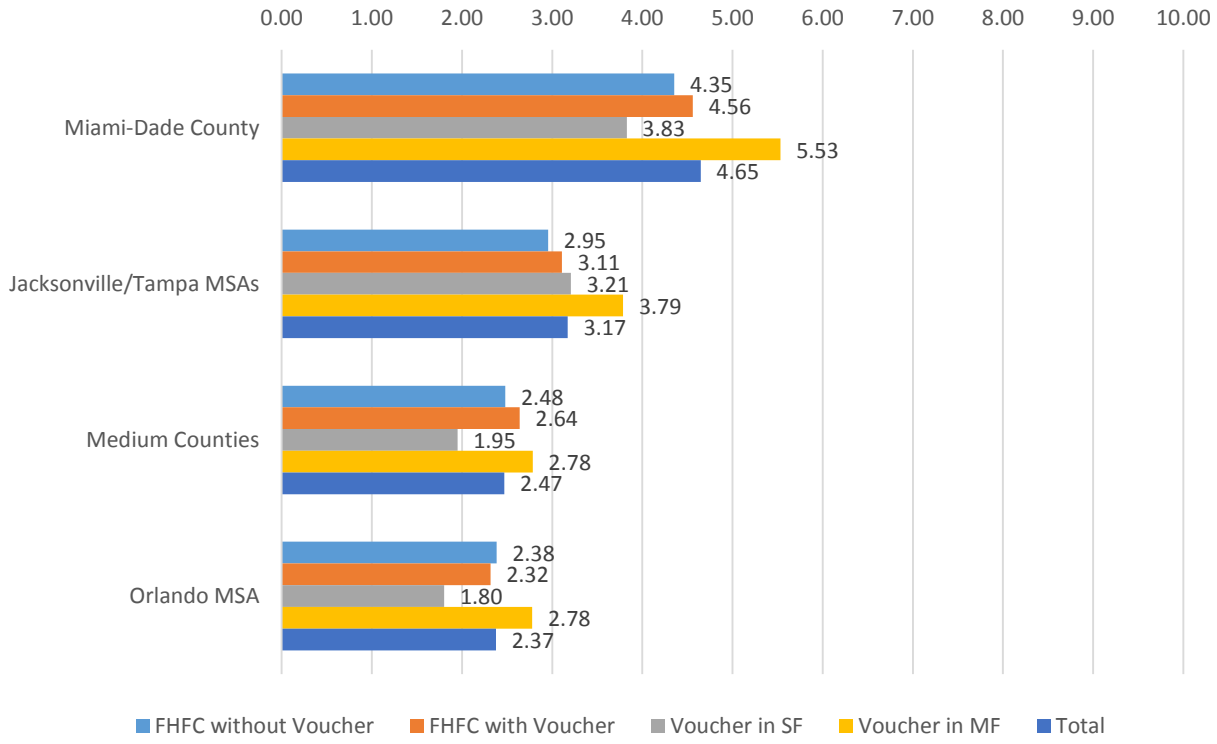


Table 3 shows additional descriptive statistics for accessibility scores by housing type and region.

Table 3. Accessibility Scores by Housing Type and Region

Region	Housing Type	Mean	Min	Max	Std. Deviation	N
Miami-Dade County	Florida Housing without Voucher	4.35	.10	10.00	1.84	23,357
	Florida Housing with Voucher	4.56	1.01	10.00	2.04	1,706
	Voucher in Market-Rate SF	3.83	.13	9.53	1.54	4,964
	Voucher in Market-Rate MF	5.53	.46	10.00	1.62	12,492
Jacksonville/Tampa MSAs	Florida Housing without Voucher	2.95	.26	7.42	1.66	26,888
	Florida Housing with Voucher	3.11	.26	5.97	1.55	2,907
	Voucher in Market-Rate SF	3.21	.04	7.08	1.60	9,779
	Voucher in Market-Rate MF	3.79	.15	7.42	1.32	9,361
Medium Counties (Alachua, Volusia and Polk)	Florida Housing without Voucher	2.48	.41	4.90	0.97	7,451
	Florida Housing with Voucher	2.64	.41	4.90	0.80	831
	Voucher in Market-Rate SF	1.95	.08	4.71	1.22	1,963
	Voucher in Market-Rate MF	2.78	.13	5.20	1.01	2,505
Orlando MSA	Florida Housing without Voucher	2.38	.24	5.76	1.22	29,126
	Florida Housing with Voucher	2.32	.50	5.76	1.17	1,815
	Voucher in Market-Rate SF	1.8	.02	5.99	1.28	1,783
	Voucher in Market-Rate MF	2.78	.02	6.48	1.35	2,282

To test these differences for statistical significance, we compared access values by structure types using Least Significant Differences (LSD) post hoc pairwise comparisons. Marginal means differences were estimated between structure types as groups and layered for each geographic region. The results support rejection of the null hypothesis that there are no differences in mean accessibility scores among structure types.

Table 4 shows the pairwise comparison results. All results are significant at the .05 level.

Table 4. Post Hoc Least Significant Differences Results for Housing Type Layered by Region

Region	(I) Housing Type	(J) Housing Type	Mean Diff. (I-J)	Std. Error	Sig.
Miami-Dade County	Florida Housing w/o Voucher	Florida Housing with Voucher	-0.21*	0.04	0.000
		Voucher in Market-Rate SF	0.53*	0.03	0.000
		Voucher in Market-Rate MF	-1.18*	0.02	0.000
	Florida Housing with Voucher	Florida Housing w/o Voucher	0.21*	0.04	0.000
		Voucher in Market-Rate SF	0.73*	0.05	0.000
		Voucher in Market-Rate MF	-0.97*	0.05	0.000
	Voucher in Market-Rate SF	Florida Housing w/o Voucher	-0.53*	0.03	0.000
		Florida Housing with Voucher	-0.73*	0.05	0.000
		Voucher in Market-Rate MF	-1.71*	0.03	0.000
	Voucher in Market-Rate MF	Florida Housing w/o Voucher	1.18*	0.02	0.000
		Florida Housing with Voucher	0.97*	0.05	0.000
		Voucher in Market-Rate SF	1.71*	0.03	0.000
Jacksonville/ Tampa MSAs	Florida Housing w/o Voucher	Florida Housing with Voucher	-0.15*	0.03	0.000
		Voucher in Market-Rate SF	-0.25*	0.02	0.000
		Voucher in Market-Rate MF	-0.83*	0.02	0.000
	Florida Housing with Voucher	Florida Housing w/o Voucher	0.15*	0.03	0.000
		Voucher in Market-Rate SF	-0.1*	0.03	0.003
		Voucher in Market-Rate MF	-0.68*	0.03	0.000
	Voucher in Market-Rate SF	Florida Housing w/o Voucher	0.25*	0.02	0.000
		Florida Housing with Voucher	0.1*	0.03	0.003
		Voucher in Market-Rate MF	-0.58*	0.02	0.000
	Voucher in Market-Rate MF	Florida Housing w/o Voucher	0.83*	0.02	0.000
		Florida Housing with Voucher	0.68*	0.03	0.000
		Voucher in Market-Rate SF	0.58*	0.02	0.000
Medium Counties (Alachua, Volusia and Polk)	Florida Housing w/o Voucher	Florida Housing with Voucher	-0.16*	0.04	0.000
		Voucher in Market-Rate SF	0.53*	0.03	0.000
		Voucher in Market-Rate MF	-0.3*	0.02	0.000
	Florida Housing with Voucher	Florida Housing w/o Voucher	0.16*	0.04	0.000
		Voucher in Market-Rate SF	0.69*	0.04	0.000
		Voucher in Market-Rate MF	-0.14*	0.04	0.000
	Voucher in Market-Rate SF	Florida Housing w/o Voucher	-0.53*	0.03	0.000
		Florida Housing with Voucher	-0.69*	0.04	0.000
		Voucher in Market-Rate MF	-0.83*	0.03	0.000
	Voucher in Market-Rate MF	Florida Housing w/o Voucher	0.3*	0.02	0.000
		Florida Housing with Voucher	0.14*	0.04	0.000
		Voucher in Market-Rate SF	0.83*	0.03	0.000
Orlando MSA	Florida Housing w/o Voucher	Florida Housing with Voucher	0.07*	0.03	0.026
		Voucher in Market-Rate SF	0.58*	0.03	0.000
		Voucher in Market-Rate MF	-0.4*	0.03	0.000
	Florida Housing with Voucher	Florida Housing w/o Voucher	-0.07*	0.03	0.026
		Voucher in Market-Rate SF	0.51*	0.04	0.000
		Voucher in Market-Rate MF	-0.46*	0.04	0.000
	Voucher in Market-Rate SF	Florida Housing w/o Voucher	-0.58*	0.03	0.000
		Florida Housing with Voucher	-0.51*	0.04	0.000
		Voucher in Market-Rate MF	-0.98*	0.04	0.000
	Voucher in Market-Rate MF	Florida Housing w/o Voucher	0.4*	0.03	0.000
		Florida Housing with Voucher	0.46*	0.04	0.000
		Voucher in Market-Rate SF	0.98*	0.04	0.000

* Significant at the .05 level

LSD post hoc pairwise comparisons were also performed for the four individual components of the access score (transit to services, transit to jobs, walking access to services, travel costs). Again, marginal means

differences for each score are estimated between housing types as groups and layered for each geographic region. With a few exceptions—largely when comparing Florida housing units with vouchers to those without—differences in marginal mean scores are significant. See Table A1 in the appendix for results.

Accessibility by Year-Built Period

The previous analysis showed that as a group, voucher locations in market-rate multifamily developments tend to be more accessible than Florida Housing-sponsored units or voucher locations in single family homes. One factor that might affect these results is the era in which the units were built for each housing type. The Florida Housing-funded housing supply is considerably newer as a group than the market-rate multifamily and single family voucher locations. Most Florida Housing developments were built from 1989 onward, following the advent of the LIHTC program two years earlier. Only 17 percent of the Florida Housing units in the study dataset were built before 1989, compared to 80 percent of the voucher locations in market-rate multifamily and single family homes. The pre-1989 Florida Housing properties were existing developments later acquired and rehabilitated under Florida Housing's programs. Some of these were market-rate developments that were converted to affordable housing with funding from Florida Housing. Others were older subsidized properties, originally financed by HUD or USDA Rural Development, that were preserved as affordable housing using LIHTC funding from Florida Housing.

We expect building age to affect the relative accessibility of the Florida Housing and market-rate voucher units in two ways. First, to the extent older housing tends to be more centrally located, it can also be more accessible by walking and transit. Therefore, the concentration of market-rate voucher locations in pre-1989 buildings will tend to be more accessible than the largely post-1989 Florida Housing units. Second, as noted above, Florida Housing instituted incentives for proximity to transit and services in its competitive funding cycles beginning in 2002. Assuming a two-year lag between selection for funding and construction completion, for Florida Housing units built from 2004 onward, we might expect to see improvements in Florida Housing units' accessibility relative to market-rate voucher locations.

Figure 6 shows that for most housing types and regions, average accessibility scores are higher for pre-1989 units than for the stock built 1989-2003. In all regions but the Orlando MSA, the mean accessibility scores improved for units built in 2004 or later in the two Florida Housing unit types and single family voucher locations, but continued to decline for the market-rate multifamily voucher locations.

Figure 6. Mean Accessibility Score by Housing Type, Region and Year Built

The differences in mean accessibility scores for housing types within year-built category were also tested for statistical significance using LSD post hoc pairwise comparisons, one set for each of the three time periods. Results are included in the appendix as Tables A2-A4. Most of the differences in mean accessibility across housing type are statistically significant, with the exception of some comparisons between the two types of Florida Housing units and two comparisons of Florida Housing units with vouchers to the market-rate multifamily locations.

As with the overall analysis, the voucher locations in single family homes consistently score lower than the other types of housing within each time period. However, the results for comparisons of market-rate multifamily voucher locations with Florida Housing units are far more mixed when stratified by time period. For the middle period, 1989-2003, results are largely consistent with the original all-periods analysis, with market-rate multifamily voucher locations scoring higher on average than the Florida Housing locations. For the pre-1989 period, however, Florida Housing's preservation/rehabilitation portfolio scores higher than the market-rate multifamily voucher locations in all areas except Miami-Dade County.

Results for the 2004 and later period are mixed, but indicate that in many places the Florida Housing units made up some or all of the accessibility gap with the market-rate multifamily locations from the previous construction period. Both types of Florida Housing locations score higher on average than market-rate multifamily voucher locations in Miami-Dade County and the medium counties, and differences between the Florida Housing voucher locations and market-rate multifamily locations in Jacksonville/Tampa are

not statistically significant. For the Orlando area, on the other hand, average accessibility for all housing types continued to fall for units built after 2003.

Accessibility for Elderly Households

Within the regions and housing types, we also compared the accessibility of units occupied by at least one member age 62 and older ("elderly households") with other units. Access to essential services by modes other than the car can be beneficial to all low-income renters, but particularly to older residents. In a previous study, the Shimberg Center found that 35 percent of extremely low-income renters in Florida have no vehicle at home; for those age 75 and older, the share rises to 58 percent (Shimberg Center, 2016).

Table 5 on the following page shows the mean accessibility scores for elderly and non-elderly units within each region and housing type. Outside of a couple of cases in the medium counties, mean scores are slightly higher for elderly households than for non-elderly households.

Next, Mann Whitney tests were performed to evaluate differences in accessibility scores between elderly and non-elderly household locations within each housing type and region. The results show significant differences in distributions of scores in nearly all housing type-region combinations ($p<.05$; see Table 5). Results are not significant for the single family voucher and Florida Housing/voucher housing types in the medium counties and Orlando regions. Both categories include few elderly households.

For most housing types, therefore, the locations of elderly households are slightly more accessible on average than for households without an elderly member.

Table 5. Mean Accessibility Score and Mann-Whitney Test of Significance for Elderly and Non-Elderly Households

Region	Housing Type	Household Type	Mean	Std. Deviation	Mann-Whitney Sig.
Miami-Dade County	Florida Housing without Voucher	Elderly	5.07	1.79	
		Non-elderly	4.14	1.81	0.00
	Florida Housing with Voucher	Elderly	5.10	2.18	
		Non-elderly	4.19	1.84	0.00
	Voucher in Market-Rate SF	Elderly	4.11	1.75	
		Non-elderly	3.78	1.50	0.00
	Voucher in Market-Rate MF	Elderly	6.04	1.44	
		Non-elderly	4.97	1.63	0.00
Jacksonville/Tampa MSAs	Florida Housing without Voucher	Elderly	3.25	1.93	
		Non-elderly	2.88	1.58	0.00
	Florida Housing with Voucher	Elderly	3.20	1.50	
		Non-elderly	3.08	1.57	0.049
	Voucher in Market-Rate SF	Elderly	3.36	1.58	
		Non-elderly	3.19	1.60	0.00
	Voucher in Market-Rate MF	Elderly	3.98	1.36	
		Non-elderly	3.72	1.29	0.00
Medium Counties	Florida Housing without Voucher	Elderly	2.63	0.99	
		Non-elderly	2.45	0.96	0.00
	Florida Housing with Voucher	Elderly	2.63	0.79	
		Non-elderly	2.64	0.81	0.68
	Voucher in Market-Rate SF	Elderly	2.04	1.18	
		Non-elderly	1.94	1.22	0.19
	Voucher in Market-Rate MF	Elderly	2.74	1.00	
		Non-elderly	2.80	1.02	0.02
Orlando MSA	Florida Housing without Voucher	Elderly	2.48	1.34	
		Non-elderly	2.37	1.21	0.00
	Florida Housing with Voucher	Elderly	2.33	1.17	
		Non-elderly	2.31	1.18	0.89
	Voucher in Market-Rate SF	Elderly	1.87	1.31	
		Non-elderly	1.80	1.28	0.58
	Voucher in Market-Rate MF	Elderly	2.97	1.27	
		Non-elderly	2.72	1.37	0.00

Conclusion

The analysis supports previous findings that regional differences are key to understanding differences in accessibility across affordable housing types. Regardless of housing subsidy, structure type, and household composition, Miami locations outscore their counterparts in other regions.

When the analysis is stratified by region, on the other hand, differences emerge across housing types. The analysis adds nuance to previous research showing that subsidized housing developments are more location-efficient than voucher locations. In this study, we find that voucher holders' housing choices matter. Taken as a whole, market-rate multifamily voucher locations are more accessible than Florida Housing-sponsored developments, but the Florida-Housing units outperform single family voucher locations in most regions. Also, the line between project-based and tenant-based locations is not a neat one. The voucher locations and Florida Housing units do overlap, and the combined voucher/LIHTC units often occupy a middle ground in accessibility between market-rate multifamily and single family options.

The analysis points to a phenomenon that has received almost no attention in the literature: the use of vouchers to rent single family homes. Over one-third of voucher holders in the dataset were located in single family homes, including nearly half of voucher holders in the Jacksonville/Tampa combined region. The voucher occupied-single family homes generally were shown to be less accessible than other affordable housing types, particularly when the analysis was stratified by building age—an unsurprising result given lower density patterns for single family neighborhoods.

Finally, the analysis of location efficiency by building age suggests that accessibility of housing can improve over time. Florida Housing's pre-1989 and post-2003 locations were more accessible on average than those built from 1989 to 2003. As noted earlier, Florida Housing's pre-1989 portfolio reflects a program choice to incentivize acquisition, rehabilitation and preservation of existing developments as affordable housing. Similarly, accessibility improved for Florida Housing-sponsored new construction units from 2004 and later, a period associated with funding incentives for proximity to services and transit. For voucher holders, the combination of location efficiency and new construction housing quality in the post-2003 Florida Housing units may offer the best of both worlds, particularly since source-of-income discrimination is prohibited in LIHTC-funded developments.

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Appendix 1. Scoring Methods for Transit to Services, Walkability to Services, and Transit to Jobs

The analysis includes three parcel-level indicators of location efficiency: walking access to services, transit access to services, and transit access to jobs. These indicators are based on measurements of destination types (jobs, services) from origins (all parcels) within a given distance or travel time.

Employment destinations came from the Transit Boardings Estimation and Simulation Tool (TBEST), available from the Florida Department of Transportation. TBEST is a transit simulation and demand modeling tool that includes data on business destinations and numbers of employees (Center for Urban Transportation Research, 2015). Service destinations came from the Florida Geographic Data Library (FGDL), a source of statewide geospatial data collected from more than 35 federal, state, regional, local and private agencies (Florida Geographic Data Library, n.d.).

Walking Score

Walking times were measured based on network distance between two points. We found destinations within a five-minute walking distance of a particular origin by assuming a walking speed of 4.8 km (approximately three miles) per hour, resulting in a maximum distance of 400 meters. The street network was created from NAVTEQ data. ArcGIS's Network Analyst tool was used to create an origin-destination matrix, where random points were selected as origins and the service locations from FGDL were destinations. Each random point was assigned a count of destinations from each of the eight service categories that were within 400 meters of the origin. Next, inverse destination weighting (IDW) was used to interpolate values between the random points to create a raster layer with origin-destination counts for the entire county. IDW creates a matrix of cells whose values are determined by applying a weight that progressively decreases as the distance to the nearest origin point increases (ESRI, n.d. a).

Finally, the raster data were summarized to the parcel level to create a count of each type of service destination located within 400 meters of each origin parcel. Composite walking scores consist of a count of the total number of service destinations available from the parcel. For example, a parcel within 400 meters of one grocery store and two pharmacies would receive a score of 3.

Transit Access to Services and Jobs

We measured accessibility from origin parcels to service and job destinations by creating a series of time sheds; that is, by counting the number of destinations accessible to a parcel by transit within a 15, 30, 45, and 60 minute trip.

Information about transit stops, routes, and schedules came from the General Transit File Specification (GTFS) dataset. The GTFS data was used to produce a point feature class containing the transit stops and a line feature class containing the transit lines. We used ESRI's ArcGIS Network Analyst extension to create connector features between the transit lines/stops and the underlying street network and create a transit network dataset using connectivity groups to specify travel routes between origins and destinations. Using the new transit network dataset, total transit time was calculated as the sum of all components of an origin-destination trip, including walking time to the origin transit stop, waiting time for transit, travel along the transit network to a destination stop, and walking time to destination.

Again, we created a series of origin-destination matrices, this time for employment destinations plus the eight categories of service destinations. Transit network service areas were created by generating 400m-

radius buffers around each stop, which were then dissolved to create a single transit stop walking shed.[3] Random points were generated within the transit stop walking sheds to serve as the universe of origin points. Transit travel times between origins and destinations were calculated based on distances and impedances depending on time of day and transportation network complexity. Origins and destinations were aggregated based on time step thresholds into 15, 30, 45 and 60-minute travel bins. The bins were cumulative; that is, a destination appearing in a shorter travel time shed would also appear in all of the longer time sheds. For example, a destination within 30 minutes of an origin would appear in the 30 minute time shed and, in addition, the 45 and 60 minute time sheds. Finally, as with the walking scores, point-based travel times were estimated for all origins in the transit shed using inverse distance weighting interpolation. This resulted in four raster layers for each of the destination categories, with origin-destination counts for the entire county within each of the time sheds. Again, raster values were summarized to the parcel level.

Next, we created two composite scores for each parcel—one for combined service accessibility and one for jobs. In each case, we used a decay function to combine the four transit shed counts into a single score, with destinations appearing in the shorter time sheds receiving more weight.

Transit to Services Score

The transit to services decay score for each parcel was higher if a variety of service types was accessible from the origin, if there were several instances of a single type of destination, and if travel times were shorter. First, for each time shed, each service category was assigned a point value based on the number of destinations of that type:

Table 1. Point Values for Service Counts, Transit to Services Score

Services Count		Points
0	=	0
1	=	0.75
2 or 3	=	1.5
3 +	=	3.125

For each parcel, the points for each destination type and time shed were entered into a matrix as shown in Table 2 (cell values in the table indicate maximum number of points available). The sum of the points for each time shed was multiplied by the weights in the second-to-last line of Table 2, which in turn were based on the percentage of transit trips of each length in Florida from the 2009 National Household Travel Survey. Finally, the weighted points from the four sheds were summed, generating a score between zero and 100.

[3] Four hundred meters (approximately 0.25 miles) has been found to be more representative with respect to job accessibility, in contrast to the widely-used standard of 800 meters for identifying walking-accessible transit stops (Guerra, et al., 2011; Houston, et al., 2013; Walter, et al., 2016).

Table 2. Scoring Matrix for Transit to Services Score

	15 min shed (max points)	30 min shed (max points)	45 min shed (max points)	60 min shed (max points)
Community Centers	3.125	3.125	3.125	3.125
Grocery Stores	3.125	3.125	3.125	3.125
Libraries	3.125	3.125	3.125	3.125
Medical Facilities	3.125	3.125	3.125	3.125
Parks	3.125	3.125	3.125	3.125
Pharmacies	3.125	3.125	3.125	3.125
Schools	3.125	3.125	3.125	3.125
Senior Centers	3.125	3.125	3.125	3.125
Max. Total Points	25	25	25	25
weights	**0.3324**	**0.8300**	**1.2692**	**1.5684**
Max. Weighted Points	8.31	20.75	31.73	39.21

(Maximum total score = 100; i.e. 8.31 + 20.75 + 31.73 + 39.21)

Because destinations within a shorter time shed also appear in all longer time sheds, a destination closer to the origin contributes more to the total score. For example, a single grocery store within the 15 minute time shed would contribute a total of 3 points to the score when its contribution to the 15, 30, 45 and 60 minute time shed scores are totaled. (0.75 * (0.3324 + .8300 + 1.2692 + 1.5684)). A single grocery store that is only located within the 60 minute time shed, however, would contribute 1.18 points (0.75 * 1.5684).

A zero score indicates that no destinations of any of the service types were accessible from the origin within a 60-minute time shed, while the maximum score of 100 indicates that three or more instances of each destination type were accessible within a 15-minute time shed.

Transit to Jobs Score

The transit to jobs score is calculated differently, since the number of jobs accessible by transit from origins can vary from zero into the hundreds of thousands. Therefore, the base scores were determined by the relative number of jobs in the time shed rather than the absolute number of destinations.

All parcels were placed in four master files, one for each of the time shed values. Within each file, parcels were classified into one of 10 possible quantiles based on the number of jobs accessible within that time shed, with equal numbers of parcels in each quantile (excluding parcels with zero accessible jobs). The result is that each parcel has four time shed attributes with associated values from 1-10, or zero if there were no jobs at all in that time shed. For example, TOT15 refers to this 1-10 value for the 15-minute time shed, and so forth for the other time sheds.

An overall employment accessibility score was derived by weighting each time shed quantile score and summing the weighted results. Weights for the time sheds were the same as used for service destinations. For each parcel, scores were calculated as follows:

([TOT15] * 0.3324) + ([TOT30] * 0.83) + ([TOT45] * 1.2692) + ([TOT60] * 1.5684)
where minimum value for each TOT(n) score is zero and maximum value is 10.

As with service destinations, employment destinations are cumulative, with destinations located within the 15-minute time shed also counted as being within all subsequent time sheds. Therefore, closer destinations contribute a higher value to the overall score. The maximum job score is 40, which would be obtained if the destination fell in the highest quantile of job counts in the county for all four time sheds. The lowest is zero, which would only occur if no jobs were accessible by transit within even a 60 minute transit trip from the origin.

Appendix 2. Additional Tables

Table A1. Post Hoc Least Significant Differences, Individual Component Scores, Results for Housing Type Layered by Region

Region	Dependent Variable	(I) Housing type	(J) Housing type	Mean Difference (I-J)	Std. Error	Sig.
Miami-Dade County	Transit to services score	Florida Housing without Voucher	Florida Housing with Voucher	-2.24*	0.66	0.00
			Voucher in Market-Rate SF	-0.25	0.41	0.55
			Voucher in Market-Rate MF	-12.3*	0.29	0.00
		Florida Housing with Voucher	Florida Housing without Voucher	2.24*	0.66	0.00
			Voucher in Market-Rate SF	2*	0.74	0.01
			Voucher in Market-Rate MF	-10.06*	0.68	0.00
		Voucher in Market-Rate SF	Florida Housing without Voucher	0.25	0.41	0.55
			Florida Housing with Voucher	-2*	0.74	0.01
			Voucher in Market-Rate MF	-12.05*	0.44	0.00
		Voucher in Market-Rate MF	Florida Housing without Voucher	12.3*	0.29	0.00
			Florida Housing with Voucher	10.06*	0.68	0.00
			Voucher in Market-Rate SF	12.05*	0.44	0.00
	Transit to jobs score	Florida Housing without Voucher	Florida Housing with Voucher	-0.16*	0.30	0.59
			Voucher in Market-Rate SF	1.09*	0.19	0.00
			Voucher in Market-Rate MF	-6.74*	0.13	0.00
		Florida Housing with Voucher	Florida Housing without Voucher	0.16*	0.30	0.59
			Voucher in Market-Rate SF	1.25*	0.34	0.00
			Voucher in Market-Rate MF	-6.58*	0.31	0.00
		Voucher in Market-Rate SF	Florida Housing without Voucher	-1.09*	0.19	0.00
			Florida Housing with Voucher	-1.25*	0.34	0.00
			Voucher in Market-Rate MF	-7.83*	0.20	0.00
		Voucher in Market-Rate MF	Florida Housing without Voucher	6.74*	0.13	0.00
			Florida Housing with Voucher	6.58*	0.31	0.00
			Voucher in Market-Rate SF	7.83*	0.20	0.00
	Walking service destinations count	Florida Housing without Voucher	Florida Housing with Voucher	-1.44*	0.20	0.00
			Voucher in Market-Rate SF	1.63*	0.12	0.00
			Voucher in Market-Rate MF	-5.2*	0.09	0.00
		Florida Housing with Voucher	Florida Housing without Voucher	1.44*	0.20	0.00
			Voucher in Market-Rate SF	3.07*	0.22	0.00
			Voucher in Market-Rate MF	-3.76*	0.20	0.00
		Voucher in Market-Rate SF	Florida Housing without Voucher	-1.63*	0.12	0.00
			Florida Housing with Voucher	-3.07*	0.22	0.00
			Voucher in Market-Rate MF	-6.83*	0.13	0.00
		Voucher in Market-Rate MF	Florida Housing without Voucher	5.2*	0.09	0.00
			Florida Housing with Voucher	3.76*	0.20	0.00
			Voucher in Market-Rate SF	6.83*	0.13	0.00
	LAI travel cost	Florida Housing without Voucher	Florida Housing with Voucher	85.07*	28.32	0.00
			Voucher in Market-Rate SF	-1137.17*	17.65	0.00
			Voucher in Market-Rate MF	444.13*	12.52	0.00
		Florida Housing with Voucher	Florida Housing without Voucher	-85.07*	28.32	0.00
			Voucher in Market-Rate SF	-1222.25*	31.69	0.00
			Voucher in Market-Rate MF	359.05*	29.14	0.00
		Voucher in Market-Rate SF	Florida Housing without Voucher	1137.17*	17.65	0.00
			Florida Housing with Voucher	1222.25*	31.69	0.00
			Voucher in Market-Rate MF	1581.3*	18.95	0.00
		Voucher in Market-Rate MF	Florida Housing without Voucher	-444.13*	12.52	0.00
			Florida Housing with Voucher	-359.05*	29.14	0.00
			Voucher in Market-Rate SF	-1581.3*	18.95	0.00

Region	Dependent Variable	(I) Housing type	(J) Housing type	Mean Difference (I-J)	Std. Error	Sig.

Jacksonville/Tampa MSAs	Transit to services score	Florida Housing without Voucher	Florida Housing with Voucher	-2.38*	0.64	0.00
			Voucher in Market-Rate SF	-14.16*	0.39	0.00
			Voucher in Market-Rate MF	-20.83*	0.40	0.00
		Florida Housing with Voucher	Florida Housing without Voucher	2.38*	0.64	0.00
			Voucher in Market-Rate SF	-11.78*	0.70	0.00
			Voucher in Market-Rate MF	-18.45*	0.70	0.00
		Voucher in Market-Rate SF	Florida Housing without Voucher	14.16*	0.39	0.00
			Florida Housing with Voucher	11.78*	0.70	0.00
			Voucher in Market-Rate MF	-6.67*	0.48	0.00
		Voucher in Market-Rate MF	Florida Housing without Voucher	20.83*	0.40	0.00
			Florida Housing with Voucher	18.45*	0.70	0.00
			Voucher in Market-Rate SF	6.67*	0.48	0.00
	Transit to jobs score	Florida Housing without Voucher	Florida Housing with Voucher	-2.22*	0.23	0.00
			Voucher in Market-Rate SF	-3.26*	0.14	0.00
			Voucher in Market-Rate MF	-5.46*	0.14	0.00
		Florida Housing with Voucher	Florida Housing without Voucher	2.22*	0.23	0.00
			Voucher in Market-Rate SF	-1.04*	0.25	0.00
			Voucher in Market-Rate MF	-3.25*	0.26	0.00
		Voucher in Market-Rate SF	Florida Housing without Voucher	3.26*	0.14	0.00
			Florida Housing with Voucher	1.04*	0.25	0.00
			Voucher in Market-Rate MF	-2.2*	0.17	0.00
		Voucher in Market-Rate MF	Florida Housing without Voucher	5.46*	0.14	0.00
			Florida Housing with Voucher	3.25*	0.26	0.00
			Voucher in Market-Rate SF	2.2*	0.17	0.00
	Walking service destinations count	Florida Housing without Voucher	Florida Housing with Voucher	0.69*	0.07	0.00
			Voucher in Market-Rate SF	0.16*	0.04	0.00
			Voucher in Market-Rate MF	-0.63*	0.04	0.00
		Florida Housing with Voucher	Florida Housing without Voucher	-0.69*	0.07	0.00
			Voucher in Market-Rate SF	-0.53*	0.08	0.00
			Voucher in Market-Rate MF	-1.32*	0.08	0.00
		Voucher in Market-Rate SF	Florida Housing without Voucher	-0.16*	0.04	0.00
			Florida Housing with Voucher	0.53*	0.08	0.00
			Voucher in Market-Rate MF	-0.79*	0.05	0.00
		Voucher in Market-Rate MF	Florida Housing without Voucher	0.63*	0.04	0.00
			Florida Housing with Voucher	1.32*	0.08	0.00
			Voucher in Market-Rate SF	0.79*	0.05	0.00
	LAI travel cost	Florida Housing without Voucher	Florida Housing with Voucher	201.99*	19.25	0.00
			Voucher in Market-Rate SF	-578.06*	11.64	0.00
			Voucher in Market-Rate MF	351.2*	11.83	0.00
		Florida Housing with Voucher	Florida Housing without Voucher	-201.99*	19.25	0.00
			Voucher in Market-Rate SF	-780.05*	20.82	0.00
			Voucher in Market-Rate MF	149.21*	20.93	0.00
		Voucher in Market-Rate SF	Florida Housing without Voucher	578.06*	11.64	0.00
			Florida Housing with Voucher	780.05*	20.82	0.00
			Voucher in Market-Rate MF	929.27*	14.25	0.00
		Voucher in Market-Rate MF	Florida Housing without Voucher	-351.2*	11.83	0.00
			Florida Housing with Voucher	-149.21*	20.93	0.00
			Voucher in Market-Rate SF	-929.27*	14.25	0.00

Region	Dependent Variable	(I) Housing type	(J) Housing type	Mean Difference (I-J)	Std. Error	Sig.
Medium Counties (Alachua, Volusia and Polk)	Transit to services score	Florida Housing without Voucher	Florida Housing with Voucher	-3.94*	0.85	0.00
			Voucher in Market-Rate SF	7.89*	0.59	0.00
			Voucher in Market-Rate MF	-5.77*	0.54	0.00
		Florida Housing with Voucher	Florida Housing without Voucher	3.94*	0.85	0.00
			Voucher in Market-Rate SF	11.83*	0.96	0.00
			Voucher in Market-Rate MF	-1.83*	0.93	0.049
		Voucher in Market-Rate SF	Florida Housing without Voucher	-7.89*	0.59	0.00
			Florida Housing with Voucher	-11.83*	0.96	0.00
			Voucher in Market-Rate MF	-13.65*	0.70	0.00
		Voucher in Market-Rate MF	Florida Housing without Voucher	5.77*	0.54	0.00
			Florida Housing with Voucher	1.83*	0.93	0.049
			Voucher in Market-Rate SF	13.65*	0.70	0.00
	Transit to jobs score	Florida Housing without Voucher	Florida Housing with Voucher	-0.83*	0.21	0.00
			Voucher in Market-Rate SF	2.3*	0.15	0.00
			Voucher in Market-Rate MF	-1.84*	0.14	0.00
		Florida Housing with Voucher	Florida Housing without Voucher	0.83*	0.21	0.00
			Voucher in Market-Rate SF	3.14*	0.24	0.00
			Voucher in Market-Rate MF	-1*	0.23	0.00
		Voucher in Market-Rate SF	Florida Housing without Voucher	-2.3*	0.15	0.00
			Florida Housing with Voucher	-3.14*	0.24	0.00
			Voucher in Market-Rate MF	-4.14*	0.18	0.00
		Voucher in Market-Rate MF	Florida Housing without Voucher	1.84*	0.14	0.00
			Florida Housing with Voucher	1*	0.23	0.00
			Voucher in Market-Rate SF	4.14*	0.18	0.00
	Walking service destinations count	Florida Housing without Voucher	Florida Housing with Voucher	0.34*	0.10	0.00
			Voucher in Market-Rate SF	0.71*	0.07	0.00
			Voucher in Market-Rate MF	0.07	0.06	0.22
		Florida Housing with Voucher	Florida Housing without Voucher	-0.34*	0.10	0.00
			Voucher in Market-Rate SF	0.37*	0.11	0.00
			Voucher in Market-Rate MF	-0.27*	0.11	0.01
		Voucher in Market-Rate SF	Florida Housing without Voucher	-0.71*	0.07	0.00
			Florida Housing with Voucher	-0.37*	0.11	0.00
			Voucher in Market-Rate MF	-0.64*	0.08	0.00
		Voucher in Market-Rate MF	Florida Housing without Voucher	-0.07*	0.06	0.22
			Florida Housing with Voucher	0.27*	0.11	0.01
			Voucher in Market-Rate SF	0.64*	0.08	0.00
	LAI travel cost	Florida Housing without Voucher	Florida Housing with Voucher	251.58*	29.64	0.00
			Voucher in Market-Rate SF	-683.14*	20.56	0.00
			Voucher in Market-Rate MF	369.56*	18.72	0.00
		Florida Housing with Voucher	Florida Housing without Voucher	-251.58*	29.64	0.00
			Voucher in Market-Rate SF	-934.72*	33.54	0.00
			Voucher in Market-Rate MF	117.98*	32.44	0.00
		Voucher in Market-Rate SF	Florida Housing without Voucher	683.14*	20.56	0.00
			Florida Housing with Voucher	934.72*	33.54	0.00
			Voucher in Market-Rate MF	1052.7*	24.43	0.00
		Voucher in Market-Rate MF	Florida Housing without Voucher	-369.56*	18.72	0.00
			Florida Housing with Voucher	-117.98*	32.44	0.00
			Voucher in Market-Rate SF	-1052.7*	24.43	0.00

Region	Dependent Variable	(I) Housing type	(J) Housing type	Mean Difference (I-J)	Std. Error	Sig.
Orlando MSA	Transit to services score	Florida Housing without Voucher	Florida Housing with Voucher	1.14*	0.71	0.11
			Voucher in Market-Rate SF	4.03*	0.71	0.00
			Voucher in Market-Rate MF	-9.89*	0.64	0.00
		Florida Housing with Voucher	Florida Housing without Voucher	-1.14	0.71	0.11
			Voucher in Market-Rate SF	2.89*	0.98	0.00
			Voucher in Market-Rate MF	-11.03*	0.92	0.00
		Voucher in Market-Rate SF	Florida Housing without Voucher	-4.03*	0.71	0.00
			Florida Housing with Voucher	-2.89*	0.98	0.00
			Voucher in Market-Rate MF	-13.92*	0.92	0.00
		Voucher in Market-Rate MF	Florida Housing without Voucher	9.89*	0.64	0.00
			Florida Housing with Voucher	11.03*	0.92	0.00
			Voucher in Market-Rate SF	13.92*	0.92	0.00
	Transit to jobs score	Florida Housing without Voucher	Florida Housing with Voucher	0.67*	0.24	0.01
			Voucher in Market-Rate SF	4.53*	0.24	0.00
			Voucher in Market-Rate MF	-1.54*	0.21	0.00
		Florida Housing with Voucher	Florida Housing without Voucher	-0.67*	0.24	0.01
			Voucher in Market-Rate SF	3.87*	0.32	0.00
			Voucher in Market-Rate MF	-2.2*	0.31	0.00
		Voucher in Market-Rate SF	Florida Housing without Voucher	-4.53*	0.24	0.00
			Florida Housing with Voucher	-3.87*	0.32	0.00
			Voucher in Market-Rate MF	-6.07*	0.31	0.00
		Voucher in Market-Rate MF	Florida Housing without Voucher	1.54*	0.21	0.00
			Florida Housing with Voucher	2.2*	0.31	0.00
			Voucher in Market-Rate SF	6.07*	0.31	0.00
	Walking service destinations count	Florida Housing without Voucher	Florida Housing with Voucher	0.1*	0.04	0.01
			Voucher in Market-Rate SF	-0.04	0.04	0.26
			Voucher in Market-Rate MF	-1.1*	0.03	0.00
		Florida Housing with Voucher	Florida Housing without Voucher	-0.1*	0.04	0.01
			Voucher in Market-Rate SF	-0.15*	0.05	0.01
			Voucher in Market-Rate MF	-1.21*	0.05	0.00
		Voucher in Market-Rate SF	Florida Housing without Voucher	0.04	0.04	0.26
			Florida Housing with Voucher	0.15*	0.05	0.01
			Voucher in Market-Rate MF	-1.06*	0.05	0.00
		Voucher in Market-Rate MF	Florida Housing without Voucher	1.1*	0.03	0.00
			Florida Housing with Voucher	1.21*	0.05	0.00
			Voucher in Market-Rate SF	1.06*	0.05	0.00
	LAI travel cost	Florida Housing without Voucher	Florida Housing with Voucher	-4.33	20.42	0.83
			Voucher in Market-Rate SF	-949.58*	20.59	0.00
			Voucher in Market-Rate MF	107.38*	18.34	0.00
		Florida Housing with Voucher	Florida Housing without Voucher	4.33	20.42	0.83
			Voucher in Market-Rate SF	-945.25*	28.14	0.00
			Voucher in Market-Rate MF	111.71*	26.54	0.00
		Voucher in Market-Rate SF	Florida Housing without Voucher	949.58*	20.59	0.00
			Florida Housing with Voucher	945.25*	28.14	0.00
			Voucher in Market-Rate MF	1056.96*	26.67	0.00
		Voucher in Market-Rate MF	Florida Housing without Voucher	-107.38*	18.34	0.00
			Florida Housing with Voucher	-111.71*	26.54	0.00
			Voucher in Market-Rate SF	-1056.96*	26.67	0.00

Table A2. Post Hoc Least Significant Differences, Accessibility Score, Results for Housing Type Layered by Region, Units Built before 1989

Region	(I) Housing type	(J) Housing type	Mean Diff. (I-J)	Std. Error	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
Miami-Dade County	Florida Housing without Voucher	Florida Housing with Voucher	-.1537	.10782	.154	-.3651	.0576
		Voucher in Market-Rate SF	.8627*	.03051	.000	.8029	.9225
		Voucher in Market-Rate MF	-.7002*	.02360	.000	-.7464	-.6539
	Florida Housing with Voucher	Florida Housing without Voucher	.1537	.10782	.154	-.0576	.3651
		Voucher in Market-Rate SF	1.0164*	.10887	.000	.8030	1.2298
		Voucher in Market-Rate MF	-.5465*	.10714	.000	-.7565	-.3364
	Voucher in Market-Rate SF	Florida Housing without Voucher	-.8627*	.03051	.000	-.9225	-.8029
		Florida Housing with Voucher	-1.0164*	.10887	.000	-1.2298	-.8030
		Voucher in Market-Rate MF	-1.5628*	.02800	.000	-1.6177	-1.5079
	Voucher in Market-Rate MF	Florida Housing without Voucher	.7002*	.02360	.000	.6539	.7464
		Florida Housing with Voucher	.5465*	.10714	.000	.3364	.7565
		Voucher in Market-Rate SF	1.5628*	.02800	.000	1.5079	1.6177
Jacksonville/ Tampa MSAs	Florida Housing without Voucher	Florida Housing with Voucher	.1404	.07844	.073	-.0134	.2942
		Voucher in Market-Rate SF	.9909*	.02455	.000	.9428	1.0391
		Voucher in Market-Rate MF	.4798*	.02502	.000	.4308	.5288
	Florida Housing with Voucher	Florida Housing without Voucher	-.1404	.07844	.073	-.2942	.0134
		Voucher in Market-Rate SF	.8505*	.07749	.000	.6987	1.0024
		Voucher in Market-Rate MF	.3394*	.07764	.000	.1872	.4916
	Voucher in Market-Rate SF	Florida Housing without Voucher	-.9909*	.02455	.000	-1.0391	-.9428
		Florida Housing with Voucher	-.8505*	.07749	.000	-1.0024	-.6987
		Voucher in Market-Rate MF	-.5112*	.02185	.000	-.5540	-.4683
	Voucher in Market-Rate MF	Florida Housing without Voucher	-.4798*	.02502	.000	-.5288	-.4308
		Florida Housing with Voucher	-.3394*	.07764	.000	-.4916	-.1872
		Voucher in Market-Rate SF	.5112*	.02185	.000	.4683	.5540

Region	(I) Housing type	(J) Housing type	Mean Diff. (I-J)	Std. Error	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
Medium Counties (Alachua, Volusia and Polk)	Florida Housing without Voucher	Florida Housing with Voucher	-.2004	.12767	.116	-.4507	.0498
		Voucher in Market-Rate SF	.7899*	.03246	.000	.7263	.8535
		Voucher in Market-Rate MF	.1205*	.02960	.000	.0624	.1785
	Florida Housing with Voucher	Florida Housing without Voucher	.2004	.12767	.116	-.0498	.4507
		Voucher in Market-Rate SF	.9903*	.12809	.000	.7392	1.2415
		Voucher in Market-Rate MF	.3209*	.12740	.012	.0712	.5707
	Voucher in Market-Rate SF	Florida Housing without Voucher	-.7899*	.03246	.000	-.8535	-.7263
		Florida Housing with Voucher	-.9903*	.12809	.000	-1.2415	-.7392
		Voucher in Market-Rate MF	-.6694*	.03139	.000	-.7310	-.6079
	Voucher in Market-Rate MF	Florida Housing without Voucher	-.1205*	.02960	.000	-.1785	-.0624
		Florida Housing with Voucher	-.3209*	.12740	.012	-.5707	-.0712
		Voucher in Market-Rate SF	.6694*	.03139	.000	.6079	.7310
Orlando MSA	Florida Housing without Voucher	Florida Housing with Voucher	-.4672*	.11124	.000	-.6853	-.2491
		Voucher in Market-Rate SF	.9401*	.04218	.000	.8575	1.0228
		Voucher in Market-Rate MF	.3107*	.03706	.000	.2380	.3833
	Florida Housing with Voucher	Florida Housing without Voucher	.4672*	.11124	.000	.2491	.6853
		Voucher in Market-Rate SF	1.4073*	.11443	.000	1.1830	1.6317
		Voucher in Market-Rate MF	.7779*	.11264	.000	.5570	.9987
	Voucher in Market-Rate SF	Florida Housing without Voucher	-.9401*	.04218	.000	-1.0228	-.8575
		Florida Housing with Voucher	-1.4073*	.11443	.000	-1.6317	-1.1830
		Voucher in Market-Rate MF	-.6295*	.04575	.000	-.7191	-.5398
	Voucher in Market-Rate MF	Florida Housing without Voucher	-.3107*	.03706	.000	-.3833	-.2380
		Florida Housing with Voucher	-.7779*	.11264	.000	-.9987	-.5570
		Voucher in Market-Rate SF	.6295*	.04575	.000	.5398	.7191

Table A3. Post Hoc Least Significant Differences, Accessibility Score, Results for Housing Type Layered by Region, Units Built 1989-2003

Region	(I) Housing type	(J) Housing type	Mean Diff. (I-J)	Std. Error	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
Miami-Dade County	Florida Housing without Voucher	Florida Housing with Voucher	.0532	.06744	.430	-.0790	.1854
		Voucher in Market-Rate SF	1.1848*	.08320	.000	1.0217	1.3478
		Voucher in Market-Rate MF	-1.2139*	.06780	.000	-1.3468	-1.0810
	Florida Housing with Voucher	Florida Housing without Voucher	-.0532	.06744	.430	-.1854	.0790
		Voucher in Market-Rate SF	1.1316*	.10410	.000	.9275	1.3356
		Voucher in Market-Rate MF	-1.2671*	.09226	.000	-1.4480	-1.0863
	Voucher in Market-Rate SF	Florida Housing without Voucher	-1.1848*	.08320	.000	-1.3478	-1.0217
		Florida Housing with Voucher	-1.1316*	.10410	.000	-1.3356	-.9275
		Voucher in Market-Rate MF	-2.3987*	.10434	.000	-2.6032	-2.1942
	Voucher in Market-Rate MF	Florida Housing without Voucher	1.2139*	.06780	.000	1.0810	1.3468
		Florida Housing with Voucher	1.2671*	.09226	.000	1.0863	1.4480
		Voucher in Market-Rate SF	2.3987*	.10434	.000	2.1942	2.6032
Jacksonville/ Tampa MSAs	Florida Housing without Voucher	Florida Housing with Voucher	-.3378*	.03889	.000	-.4140	-.2616
		Voucher in Market-Rate SF	.2371*	.05224	.000	.1347	.3395
		Voucher in Market-Rate MF	-1.0131*	.05105	.000	-1.1131	-.9130
	Florida Housing with Voucher	Florida Housing without Voucher	.3378*	.03889	.000	.2616	.4140
		Voucher in Market-Rate SF	.5749*	.06245	.000	.4525	.6973
		Voucher in Market-Rate MF	-.6753*	.06145	.000	-.7957	-.5548
	Voucher in Market-Rate SF	Florida Housing without Voucher	-.2371*	.05224	.000	-.3395	-.1347
		Florida Housing with Voucher	-.5749*	.06245	.000	-.6973	-.4525
		Voucher in Market-Rate MF	-1.2501*	.07066	.000	-1.3886	-1.1116
	Voucher in Market-Rate MF	Florida Housing without Voucher	1.0131*	.05105	.000	.9130	1.1131
		Florida Housing with Voucher	.6753*	.06145	.000	.5548	.7957
		Voucher in Market-Rate SF	1.2501*	.07066	.000	1.1116	1.3886

Region	(I) Housing type	(J) Housing type	Mean Diff. (I-J)	Std. Error	Sig.	95% Confidence Interval	
Medium Counties (Alachua, Volusia and Polk)	Florida Housing without Voucher	Florida Housing with Voucher	-.2746*	.04769	.000	-.3680	-.1811
		Voucher in Market-Rate SF	1.0734*	.06604	.000	.9440	1.2029
		Voucher in Market-Rate MF	-.1388*	.06559	.034	-.2674	-.0102
	Florida Housing with Voucher	Florida Housing without Voucher	.2746*	.04769	.000	.1811	.3680
		Voucher in Market-Rate SF	1.3480*	.07737	.000	1.1963	1.4997
		Voucher in Market-Rate MF	.1358	.07699	.078	-.0152	.2867
	Voucher in Market-Rate SF	Florida Housing without Voucher	-1.0734*	.06604	.000	-1.2029	-.9440
		Florida Housing with Voucher	-1.3480*	.07737	.000	-1.4997	-1.1963
		Voucher in Market-Rate MF	-1.2122*	.08952	.000	-1.3877	-1.0367
	Voucher in Market-Rate MF	Florida Housing without Voucher	.1388*	.06559	.034	.0102	.2674
		Florida Housing with Voucher	-.1358	.07699	.078	-.2867	.0152
		Voucher in Market-Rate SF	1.2122*	.08952	.000	1.0367	1.3877
Orlando MSA	Florida Housing without Voucher	Florida Housing with Voucher	.0853*	.03260	.009	.0214	.1492
		Voucher in Market-Rate SF	1.1158*	.05261	.000	1.0127	1.2189
		Voucher in Market-Rate MF	-.2040*	.05238	.000	-.3066	-.1013
	Florida Housing with Voucher	Florida Housing without Voucher	-.0853*	.03260	.009	-.1492	-.0214
		Voucher in Market-Rate SF	1.0306*	.06074	.000	.9115	1.1496
		Voucher in Market-Rate MF	-.2892*	.06054	.000	-.4079	-.1706
	Voucher in Market-Rate SF	Florida Housing without Voucher	-1.1158*	.05261	.000	-1.2189	-1.0127
		Florida Housing with Voucher	-1.0306*	.06074	.000	-1.1496	-.9115
		Voucher in Market-Rate MF	-1.3198*	.07328	.000	-1.4634	-1.1762
	Voucher in Market-Rate MF	Florida Housing without Voucher	.2040*	.05238	.000	.1013	.3066
		Florida Housing with Voucher	.2892*	.06054	.000	.1706	.4079
		Voucher in Market-Rate SF	1.3198*	.07328	.000	1.1762	1.4634

Table A4. Post Hoc Least Significant Differences, Accessibility Score, Results for Housing Type Layered by Region, Units Built 2004 or Later

Region	(I) Housing type	(J) Housing type	Mean Diff. (I-J)	Std. Error	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
Miami-Dade County	Florida Housing without Voucher	Florida Housing with Voucher	-.6020*	.07126	.000	-.7417	-.4623
		Voucher in Market-Rate SF	1.7635*	.07723	.000	1.6121	1.9149
		Voucher in Market-Rate MF	.7124*	.06701	.000	.5810	.8437
	Florida Housing with Voucher	Florida Housing without Voucher	.6020*	.07126	.000	.4623	.7417
		Voucher in Market-Rate SF	2.3656*	.10015	.000	2.1692	2.5619
		Voucher in Market-Rate MF	1.3144*	.09250	.000	1.1331	1.4957
	Voucher in Market-Rate SF	Florida Housing without Voucher	-1.7635*	.07723	.000	-1.9149	-1.6121
		Florida Housing with Voucher	-2.3656*	.10015	.000	-2.5619	-2.1692
		Voucher in Market-Rate MF	-1.0512*	.09717	.000	-1.2417	-.8607
	Voucher in Market-Rate MF	Florida Housing without Voucher	-.7124*	.06701	.000	-.8437	-.5810
		Florida Housing with Voucher	-1.3144*	.09250	.000	-1.4957	-1.1331
		Voucher in Market-Rate SF	1.0512*	.09717	.000	.8607	1.2417
Jacksonville/ Tampa MSAs	Florida Housing without Voucher	Florida Housing with Voucher	-.4039*	.05555	.000	-.5127	-.2950
		Voucher in Market-Rate SF	.5287*	.05871	.000	.4136	.6437
		Voucher in Market-Rate MF	-.3185*	.05147	.000	-.4193	-.2176
	Florida Housing with Voucher	Florida Housing without Voucher	.4039*	.05555	.000	.2950	.5127
		Voucher in Market-Rate SF	.9325*	.07716	.000	.7813	1.0838
		Voucher in Market-Rate MF	.0854	.07180	.234	-.0553	.2261
	Voucher in Market-Rate SF	Florida Housing without Voucher	-.5287*	.05871	.000	-.6437	-.4136
		Florida Housing with Voucher	-.9325*	.07716	.000	-1.0838	-.7813
		Voucher in Market-Rate MF	-.8471*	.07427	.000	-.9927	-.7015
	Voucher in Market-Rate MF	Florida Housing without Voucher	.3185*	.05147	.000	.2176	.4193
		Florida Housing with Voucher	-.0854	.07180	.234	-.2261	.0553
		Voucher in Market-Rate SF	.8471*	.07427	.000	.7015	.9927

Region	(I) Housing type	(J) Housing type	Mean Diff. (I-J)	Std. Error	Sig.	95% Confidence Interval	
Medium Counties (Alachua, Volusia and Polk)	Florida Housing without Voucher	Florida Housing with Voucher	-.4737*	.05901	.000	-.5894	-.3580
		Voucher in Market-Rate SF	1.3721*	.05840	.000	1.2576	1.4867
		Voucher in Market-Rate MF	.7279*	.07891	.000	.5732	.8826
	Florida Housing with Voucher	Florida Housing without Voucher	.4737*	.05901	.000	.3580	.5894
		Voucher in Market-Rate SF	1.8459*	.07929	.000	1.6904	2.0013
		Voucher in Market-Rate MF	1.2016*	.09540	.000	1.0146	1.3887
	Voucher in Market-Rate SF	Florida Housing without Voucher	-1.3721*	.05840	.000	-1.4867	-1.2576
		Florida Housing with Voucher	-1.8459*	.07929	.000	-2.0013	-1.6904
		Voucher in Market-Rate MF	-.6442*	.09503	.000	-.8306	-.4579
	Voucher in Market-Rate MF	Florida Housing without Voucher	-.7279*	.07891	.000	-.8826	-.5732
		Florida Housing with Voucher	-1.2016*	.09540	.000	-1.3887	-1.0146
		Voucher in Market-Rate SF	.6442*	.09503	.000	.4579	.8306
Orlando MSA	Florida Housing without Voucher	Florida Housing with Voucher	.0942	.08247	.253	-.0674	.2559
		Voucher in Market-Rate SF	1.2768*	.08710	.000	1.1060	1.4475
		Voucher in Market-Rate MF	-.2967*	.08868	.001	-.4705	-.1228
	Florida Housing with Voucher	Florida Housing without Voucher	-.0942	.08247	.253	-.2559	.0674
		Voucher in Market-Rate SF	1.1825*	.11787	.000	.9515	1.4136
		Voucher in Market-Rate MF	-.3909*	.11904	.001	-.6243	-.1576
	Voucher in Market-Rate SF	Florida Housing without Voucher	-1.2768*	.08710	.000	-1.4475	-1.1060
		Florida Housing with Voucher	-1.1825*	.11787	.000	-1.4136	-.9515
		Voucher in Market-Rate MF	-1.5734*	.12229	.000	-1.8132	-1.3337
	Voucher in Market-Rate MF	Florida Housing without Voucher	.2967*	.08868	.001	.1228	.4705
		Florida Housing with Voucher	.3909*	.11904	.001	.1576	.6243
		Voucher in Market-Rate SF	1.5734*	.12229	.000	1.3337	1.8132