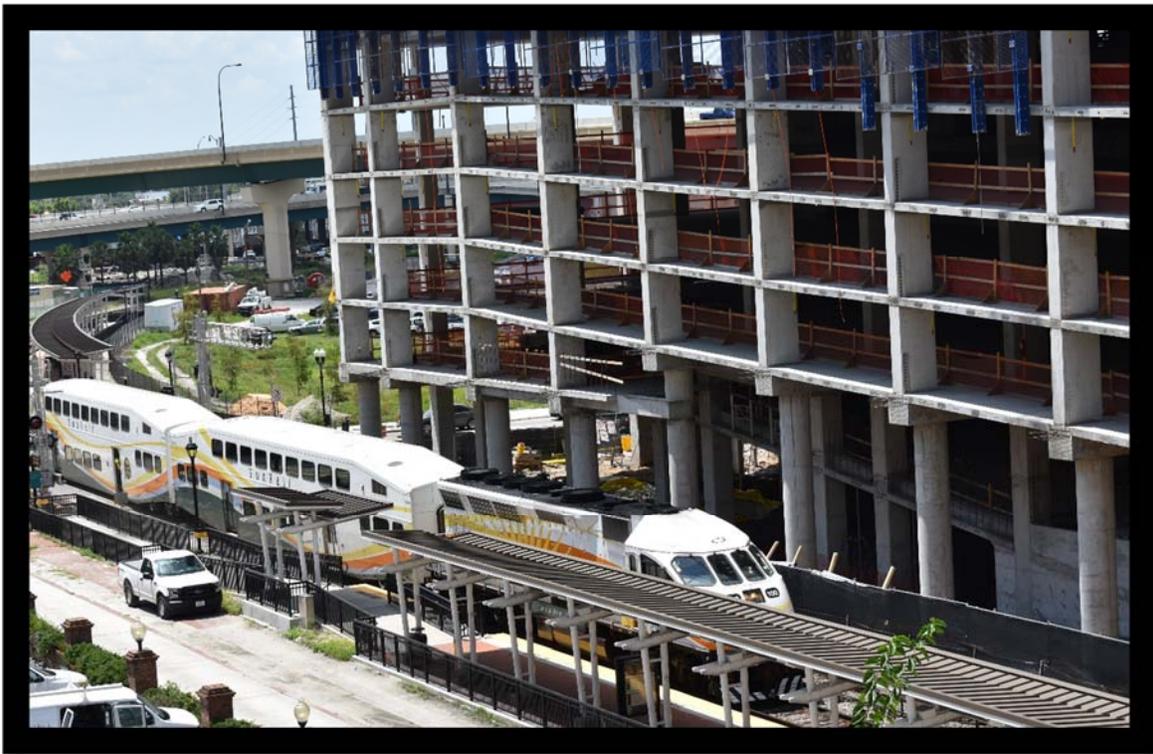


Transit-Oriented Development & SunRail Riders: *What's the Connection?*



November 2018

Acknowledgements and Dedication

Transit-Oriented Development and SunRail Riders: What's the Connection? would not be possible without help from numerous people. Chip Tatum and the Apartment Association of Greater Orlando opened significant outreach opportunities for us. Multiple people offered input at various stages of the research process. We would like to thank Sara Hammerschmidt from the Urban Land Institute, Nicola Liquori with FDOT/SunRail, Bob O'Malley with Brightline, Courtney Reynolds with reThink your commute, and the FDOT Transit Office for their thoughtful reviews and comments.

Dedication

We dedicate this report to Harry Barley, MetroPlan Orlando's recently retired Executive Director, who had the original vision for this line of research.

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Disclaimer: MetroPlan Orlando funded this research and is solely responsible for the report's contents. The Florida Department of Transportation/SunRail provided requested ridership data in cooperation with the study team; however, they are not affiliated with the research or its conclusions.

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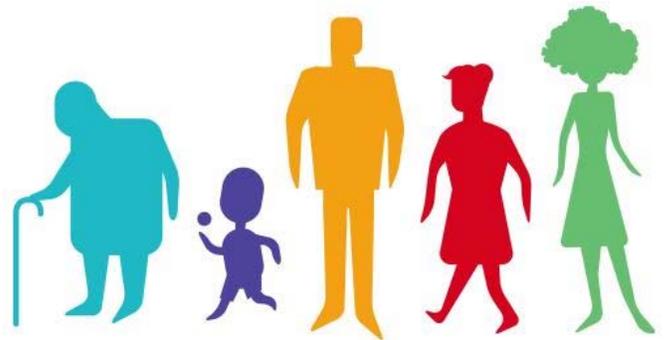
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Transit-Oriented Development and SunRail Riders: What's the Connection?

SunRail, Central Florida's commuter rail service, makes regional train travel possible. Operations started in 2014 and the train now moves people – commuters mostly – from DeBary in Volusia County to the Poinciana area in Osceola County. The rail line is changing land development patterns as it evolves from a freight railroad to a passenger-focused mass transit line. This switch to more compact development around previous industrial or underutilized properties is occurring at a fast pace. But what interplay do these changes have on who rides SunRail? This report is the first, but certainly not the last, research attempt to address the connections between the new transit-oriented development (TOD) at SunRail stations and riders. It identifies several takeaways, insights, and next steps for Central Florida's decision makers.

MetroPlan Orlando commissioned a multidisciplinary team from Florida State University to lead a three-step research process that would peel back the layers around the potential connections between transit-oriented development and commuter rail. As part of this process, the team wanted to identify who lives and works within the station areas while determining what factors might influence someone's decision to use SunRail. Walkability, connectivity, density, and employment were also exploratory topics for this research.



SunRail's initial operations only started four years ago. In many ways, the timing of the research study is ahead of the curve. The analysis, though, told us several things:

- SunRail is already capturing a sizable amount of possible commutes, but the addition of more service and destinations can enable more people to use mass transit.
- While a significant amount of residential development has occurred, workplaces have not relocated or expanded at a similar pace.
- SunRail is a regional transit service providing residents in TODs with a valued transportation option.

The insights offer us guidance as SunRail expands south and transitions from state to local control. There are several things for the region to do:

- A better understanding of commercial real estate and employment characteristics is needed.
- Housing affordability and its relationship to SunRail requires action.
- Policies are needed that make a true regional rapid transit map possible.
- Research is needed to identify how SunRail's Southern Expansion has impacted the TODs built at Phase 1 stations.

Real estate development that adds housing, jobs, and other necessary destinations around train stations often goes hand in hand with transit service. Land use and transit are intrinsically linked but establishing transit-supportive land uses is still fairly new in Central Florida. The push to more smart growth-type development, though, has accelerated with the addition of SunRail. And it is having

a significant financial return. The property values around SunRail stations have increased approximately \$810 million since the SunRail project was announced⁴.

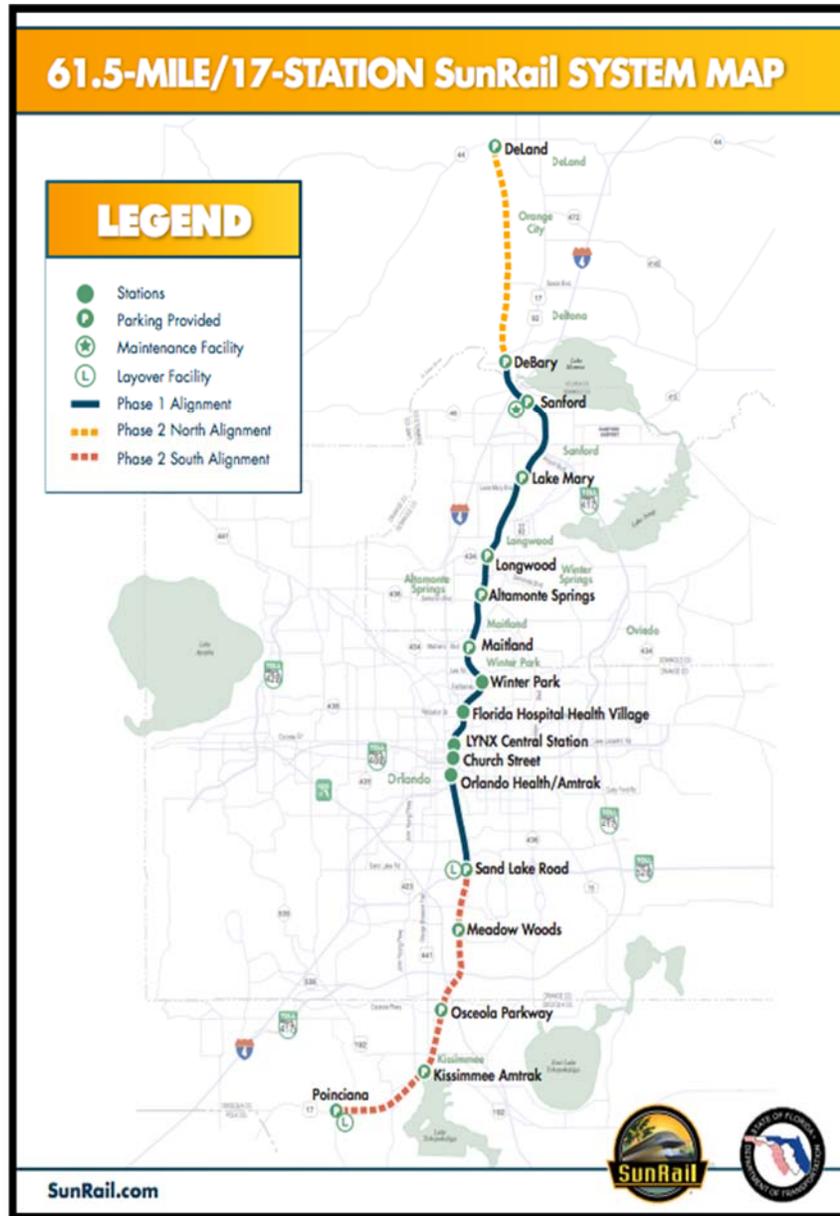
SunRail's first phase covers 31 miles and includes 12 stations. The train traverses exurban, suburban, and downtown landscapes, aligning with the service's commuter rail mission. Nearly all the stations are surrounded by at least one building considered to be transit-oriented development. What does this mean for Phase 1 ridership? This research starts to address that question.

TODs can be many things: office towers, high-rise condominium buildings, mid-rise apartment complexes, or anything that combines these elements and more. To date, the majority of transit-

oriented development constructed near SunRail stations is residential apartment complexes. This fact meant the research focused primarily on residents living near SunRail stations.

To arrive at the report's takeaways, the research team conducted three tasks. The first task involved analyzing three years of SunRail ridership data and origin-destination data from the US Census' Longitudinal Employer-Household Dynamics program. This analysis was critical for identifying any station-specific rider trends and where potential riders live and work.

The second step was a deep dive into the demographic, socioeconomic, and employment characteristics of those who live in the transit-oriented development around stations. This was achieved through a cost-based decay function and correlation analysis informed by an extensive literature review and community outreach. The demographic



Source: Florida Department of Transportation

decay function analysis estimated the characteristics of those with access to SunRail stations. These station area profiles were then used to identify demographic characteristics that are correlated with higher ridership.

The research team conducted open houses at specific stations to talk directly with nearby residents and employees. Additionally, a community survey was distributed to those who ride SunRail and those who live and work within a Census Block Group surrounding a station. The survey garnered more than 500 responses.



Data challenges limited this multi-faceted approach. Simply, not enough time has passed between the land development changes and now. This significantly limited the second step of the research and a complete demographic profile was not possible. The partial completion of SunRail is also a factor. The study's data collection pertained to SunRail Phase 1 and occurred prior to the Southern Expansion opening in July 2018. Still, the analysis yielded valuable insights that enable the region to understand what's working and what needs a course correction.

SunRail has spurred billions of dollars in development within a 10-minute walk of most stations. These mostly residential developments are leading to SunRail riders, but a robust regional rapid transit system – one that mixes rail, bus, bikes, scooters, and other sharing opportunities – is needed to fully support those that live and work near SunRail stations. SunRail is caught between

being a commuter-only rail line and a rapid transit service that serves Central Florida's varied workforce. With time and additional, coordinated investment in real estate development, community development, and transportation, Central Florida will see the changes it wants from SunRail and other transit projects.



Key Takeaways

1) SunRail stations draw riders from two distinct, and tiered, catchment areas.

SunRail serves outlying exurban areas and dense downtown neighborhoods while stopping at suburban hubs. This trajectory lends itself to two distinct ridership catchment areas: riders that live within a 5-10 minute walk of a station and those that live within a 5-10 minute drive.

2) SunRail currently captures as much as 31.7% of potential daily commutes among TOD residents.

According to the survey respondents, nearly a third of residents in the TOD catchment areas ride SunRail everyday and 46.4% said they ride SunRail more than once a week. These percentages, though, could be overestimated due to sampling and response bias (see page 25 for more details).

3) TOD residents value SunRail as a transportation option

It is clear that people who live and work within a 5-10 minute walk of a SunRail station value the choices that are available by virtue of living in dense mixed-use developments. SunRail, as a transportation option, is one of these choices. While they might not use SunRail daily, they value using the train for special events, would like it to operate on the weekends, and wish it served more locations.



4) More frequent mass transit service and multimodal connectivity will be necessary to better serve transit-oriented development

As new developments continue to be constructed in the TOD station areas, more frequent transit service may be necessary to adequately serve residents and employees. Phase 1 of SunRail only operated 18 roundtrips daily with headways between 30 minutes and 2 hours. Additionally, the first/last mile connections, particularly better pedestrian infrastructure, could make it easier to use SunRail.

5) A holistic approach is needed to increase ridership

More places to go, especially workplaces, are needed along the SunRail route. A holistic approach that simultaneously strives to improve service and connectivity, increase station areas' residential and commercial densities, and provide more destinations is needed to grow ridership among existing TOD residents.

6) It is time to reframe SunRail as regional rail service

SunRail is often referred to as commuter rail, but this is just a type of transit technology, much like light rail or bus rapid transit. The type of transit technology and the service provided are two different things, but in Central Florida, these two terms often are used interchangeably. This research points to a need for a new strategy that reframes SunRail for what it is – a regional-oriented rail service that can move people to work, school, sporting events, parks, restaurants, and healthcare facilities.

Key Takeaway 1: SunRail stations draw riders from two distinct, and tiered, catchment areas

SunRail attracts a variety of riders who access the station by different modes of transportation. These riders can generally be divided into two different categories: those who drive to the station (park-and-ride users) and those who typically walk or bike to the station (TOD riders). SunRail stations can generally be thought of as having two distinct station areas: a TOD station area including residents who live within a 10-minute walk of the station and a park-and-ride station area including those living within a 10-minute drive of the station.

While it varies significantly based on context, numerous studies have found that most people are not willing to walk more than a half mile, or 10 minutes, to a transit station^{2,3}. Not surprisingly, park-and-ride users often live significantly farther away from the station area; however, they typically are only willing to drive about 10 or 15 minutes to a station.⁴

This was confirmed by a survey of SunRail riders. Three-fourths of respondents who walk to a SunRail station every day live within a 10-minute walk of the station. Similarly, 68.0% of respondents who drive to a SunRail station more than once a week live within a 10-minute drive of a station.

The size and relative importance of the tiered station areas varies significantly from station to station. The Debarry station has very little surrounding residential development, so it functionally does not have a TOD station area. Several of the stations near downtown have no park and ride catchment area. Instead they offer more places within walking distance or along a LYMMO route.

Most of the suburban station areas attract two different types of riders and thereby have two different station areas. Recognizing that residents within each station area have different characteristics and travel needs, local planning agencies will need to develop transit and land use strategies that are tailored to the needs of each station area. These needs, particularly in terms of housing, need to be considered within a regional context.

Residents of the two station areas display very different rider characteristics, according to the community survey. Not surprisingly, TOD catchment area residents are much more willing to walk to the station. In fact, about two-thirds of all respondents who live within the TOD station area walk to the station, compared to only 3.1% of respondents who live outside of the TOD area. TOD residents who use SunRail regularly were even more likely to walk to a station as 100% of TOD respondents who use SunRail more than once a week walk to the station. Similarly, ridership in park and ride catchment areas was strongly correlated with the number of people 65+ years old, while ridership in TOD areas was correlated with less education.

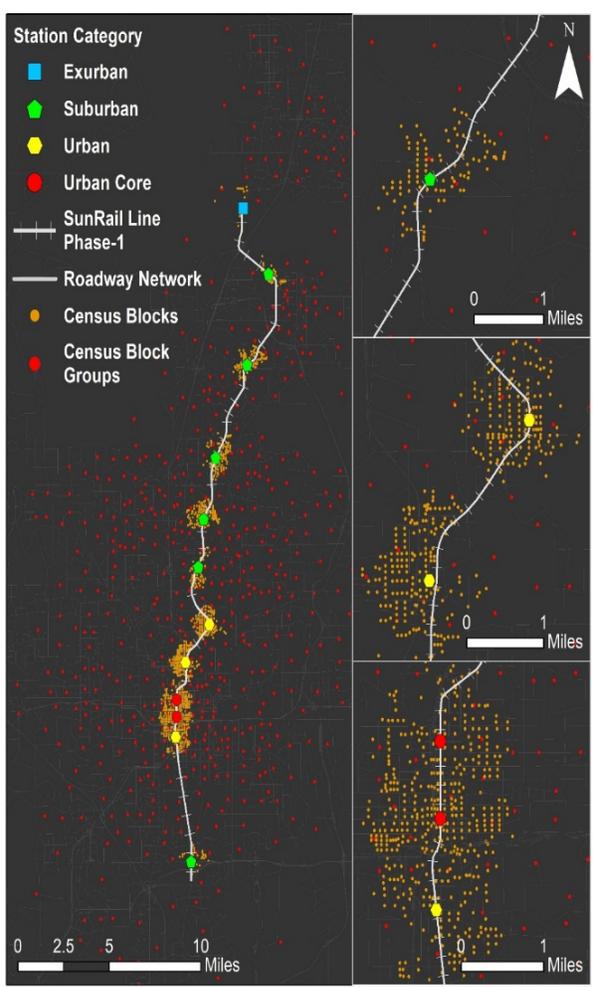
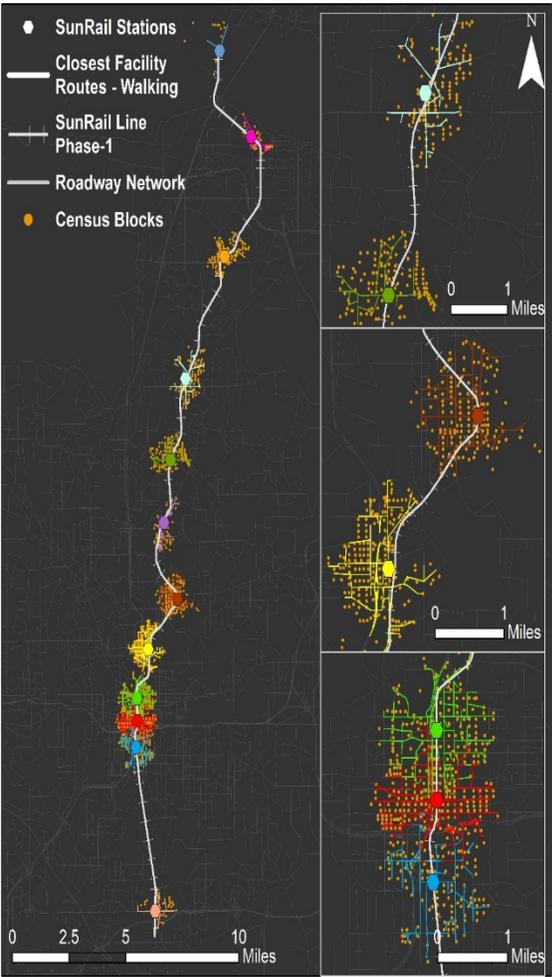
This research concentrated its analysis on TOD residents, which can be divided into two ridership characteristics: those who ride SunRail and those who do not ride SunRail. Within these two categories, there is a distinct difference in how residents chose where to live. For TOD residents who RIDE SunRail, access to the train was the most important factor in their location decision. The exact opposite is true for those who do NOT ride SunRail. This finding comes with significant caveats.

It is possible and very likely that many residents within a 10-minute walk to a station chose their location prior to SunRail's initial operations in May 2014. Additionally, the timing of the research could be premature. This research is prior to the start of SunRail's Southern Expansion and the completion of several TODs currently under construction.

TOD Area	Park and Ride Area
<p>People who can walk to a station in 5 to 10 minutes</p> <p><i>Resident Characteristics</i></p> <ul style="list-style-type: none"> • More likely to walk to the station • Larger elderly population • Slightly less ethnically diverse • Greater proportion are renters • More likely to use alternative modes of transportation 	<p>People who can drive to a station in 5 to 10 minutes</p> <p><i>Resident Characteristics</i></p> <ul style="list-style-type: none"> • More likely to drive to the station • Smaller elderly population • Slightly more ethnically diverse • Greater proportion are homeowners • Slightly more ethnically diverse • More likely to commute using personal vehicles

TOD Catchment Area – Phase 1

Park and Ride Catchment Area – Phase 1



Key Takeaway 2: SunRail currently captures as much as 31.7% of potential daily commutes among TOD residents

In 2015, there were 3,925 daily commutes that started in one TOD station area and ended in another. SunRail’s average daily ridership in 2015 fluctuated between 3,250 and 4,000, depending on the month. While these two numbers seem similar, they cannot be easily compared. It is assumed that many of SunRail’s riders in 2015 are from outside the TOD catchment area. They drive to the station from either the park and ride catchment area or farther away.

When divided by station, the number of potential TOD commutes is generally correlated with ridership. For example, LYNX, Church Street, and Sand Lake ranked in the top three in both ridership and potential TOD commutes, while Florida Hospital and Orlando Health were near the bottom in both categories. However, there were several exceptions. Debarry has more ridership than it has potential TOD commutes because of its low population and large number of park-and-ride riders. Maitland has a high number of potential commutes but relatively low ridership.



The Maitland TOD station area is in the midst of a transformation. Currently, within the 10-minute walk shed of the station, there are several small office buildings and a neighborhood with older, single-family housing. Prior to SunRail, this area closest to the station was home to Parker Lumber Yard. This change from a freight-oriented land use to a compact and walkable neighborhood epitomizes the changes underway throughout the rail line. Epoch Residential is building Maitland Station, which is a new apartment complex, and other developments, such as Maitland City Centre, are underway. Residents are still moving into this new complex and are not accounted for in this data.



Pictured at left:
A new residential and retail complex at SunRail’s Maitland station

SunRail is already capturing a significant portion of the potential commutes traveling from one TOD station area to another. Of survey respondents who live and work within a 10-minute walk of a station area (excluding those who live and work in the same station area), 46.4% ride SunRail more than once a week, with 31.7% riding it every day. These estimates likely overestimate the percentage of daily commutes being captured because the survey was primarily advertised to people who either ride SunRail or to people who live directly nearby to a station (sampling bias) and because people are more likely to take a survey about SunRail if they already use it (response bias). However, this finding still suggests that people who live and work within walking distance of stations are relatively likely to ride SunRail.

“Of survey respondents who live and work within a 10-minute walk of a station area, 46.4% ride SunRail more than once a week, with 31.7% riding it every day.”

A lot of other factors, including non-traditional work hours, negative stigma toward public transit, or, as one respondent put it, “laziness,” can prevent those who live and work along the rail line from using SunRail consistently. SunRail is providing a viable transportation option to those with easy access to it. This indicates that increasing residential and employment density within a 10-minute walk of the station area will help to increase ridership over time.



The Southern Expansion adds four new stations, including an employment center in downtown Kissimmee. This addition of service could change the numbers identified through this data collection and analysis, but now, we have a snapshot in time that can be combined with future analysis to identify the evolution of commute patterns as it relates to land development changes. While service is being added and new development is under construction, a last mile problem still exists.

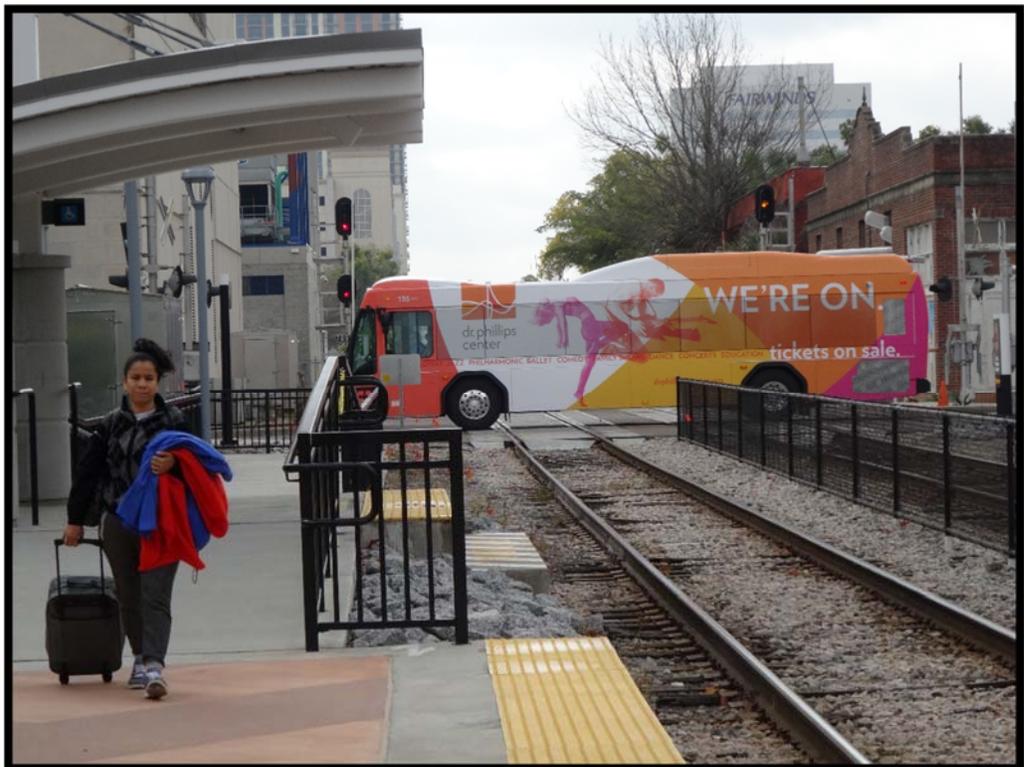
Key Takeaway 3: Transit-oriented development residents value SunRail as a transportation option

It is clear that people living and working in the station areas value options and view SunRail as one of their transportation options. They appreciate being able to use SunRail when it is convenient, but very few view it as a primary means of transportation. 20.3% of TOD resident survey respondents use SunRail more than once a week. Instead, most choose to use their personal vehicles and many view SunRail more as a recreational train than a commuter train. This is unlikely to change until SunRail and other modes of transportation are as convenient as driving.

Numerous open house and survey participants expressed the desire to use SunRail on the weekends and evenings for social or recreational trips, such as attending special events or enjoying the nightlife of downtown Orlando. Some participants also stated that they would like to use SunRail to visit the area's tourist attractions, such as Disney World. Consequently, the general consensus of open house and survey participants was that SunRail provides a "nice amenity," but it was not a "determining factor" in their decision to move to their current residence.

"Residents' view of SunRail as a desirable amenity suggests that ridership could increase over time as more jobs are located in the TOD station areas and more residents move to the area with the intention of using SunRail."

Roughly 36% of survey respondents who lived within a station area said that access to SunRail was somewhat or very important to their decision to live in their neighborhood. However, about 37% of TOD residents said that access to SunRail was neutral to their decision, with the remaining 27% stating that it was unimportant. Access to



SunRail was the second lowest rated factor, just above quality of schools. However, there were exceptions to this. For example, residents who already worked within a station area were more likely to move to be closer to SunRail. 41.5% of those who work in a station area said SunRail was an important factor in their housing decision.

Residents' view of SunRail as a desirable amenity suggests that ridership could increase over time as more jobs are located in the TOD station areas and more residents move to the area with the intention of using SunRail.

However, a culture that sees SunRail as an option, particularly for special events, instead of as a primary means of transportation, may hinder ridership growth as many riders may only use the system once or twice a week.

TOD residents may view SunRail as an amenity instead of a necessity because of the demographics of station area residents and the housing options available within walking distance of stations. The average household income of TOD residents was found to be \$55,000. This indicates that large portions of the TOD population are not transit-dependent and much of the recent TOD has not changed this pattern.

The new residential units surrounding the SunRail stations are almost all market-rate units. Two complexes downtown and one near the Altamonte Springs station are the exception. City View, near the Church Street Station, is one of these complexes. It is a mixed-income, 266-unit building, offering a selection of residential units across multiple income ranges. The region recently created an

Affordable Housing Framework to overcome the difficulties of addressing housing affordability, which includes a better connection to transit hubs (see Recommendation #3). This lack of affordable housing may be keeping those who need SunRail most from having easy access to the system.



Source: Cityview



Key Takeaway 4: More frequent mass transit service and connectivity will be necessary to better serve transit-oriented development

As new developments continue to be constructed in the TOD station areas, more frequent transit service may be necessary to adequately serve denser development. Studies have shown that frequency of service is a significant factor for determining ridership⁵ and results from the survey and open house discussions confirmed that frequency was a major concern among participants. For instance, the most commonly cited reason why open house participants did not ride SunRail and the most commonly cited feature that participants wanted to improve was the frequency of service. 39.5% of the survey respondents also cited frequency of service as a reason they do not ride the train more often.

Open house and survey participants were particularly interested in the addition of weekend and night service. A number of open house participants said they had no reason to ride SunRail during the current service hours because they did not work along the rail line. Similarly, 21.9% of survey respondents who never ride said they do not ride because they could not get to work via SunRail. This was the most commonly cited reason for why non-riders do not ride SunRail. Instead, they wanted to be able to ride SunRail to downtown Orlando or other destinations after work or during the weekends. Some participants also suggested that the frequency of service should be increased during the middle of the day as SunRail's current service hours are not compatible with their work schedule. (Author's note: The survey was conducted prior to the Southern Expansion opening and the addition of more mid-day service in July 2018.)

However, open house participants suggested that if service could not be improved, then improving access to stations could be another way of increasing SunRail's viability as an alternative to driving.



“As new developments continue to be constructed in the TOD station areas, more frequent transit service may be necessary to adequately serve denser development.”

One participant said that riding SunRail is significantly faster than driving, but a lack of access to the stations prevents more people from using the system. Another participant explained that she had to ride two buses to get to a station, making it faster for her to simply take the bus to her destination. Improving the connectivity between SunRail and the existing bus system could potentially address this problem. This was confirmed by the survey.

Thirty-six respondents said better integration between SunRail and LYNX would encourage them to ride more often.

One respondent said that “The train ride is WAY better than driving on I-4 but there is a 20+ minute wait once I arrive at the destination” that makes driving more convenient.

In addition to integration with LYNX, several participants suggested that other first/last mile solutions such as shuttles and partnerships with Transportation Network Companies (TNC) like Uber and Lyft may provide a more feasible means of accessing SunRail stations. Seminole County has tried to address the last-mile issue by conducting an Uber pilot project that offered 25% off rides that begin or end at a SunRail station to incentivize shared first/last-mile mobility.

Last-mile solutions are already available as 38% of TOD residents said a bus shuttle was available to transport them from work to the station and 2% were already taking Uber/Lyft to the station. However, these options often are more expensive or take longer than driving. One respondent even said “I would need a car at every stop to use SunRail. Other respondents simply said it was faster or easier to drive. This highlights that it is still hard for commuters to be car free or car-lite (i.e. one car per household). Another option to address the first/last mile problem might be improving the connectivity of infrastructure around stations (see Recommendation #6).

Studies have shown that connectivity of roadways and the provision of pedestrian amenities within employment or destination centers can

positively influence ridership.⁵ Additionally, pedestrian-friendly environments can increase the distance that commuters are willing to walk to reach their destinations.⁵ This is particularly true in TOD station areas where most riders already walk to the station and improving bicycle and pedestrian networks could remove barriers to using SunRail. Enhancing micro-mobility options, such as walking, biking, and electric scooters, can also promote public health outcomes by enabling a more active lifestyle⁷. This would help SunRail station areas to mature into neighborhoods that provide a better quality of life.

“Pedestrian-friendly environments can increase the distance that commuters are willing to walk to reach their destinations.”



Key Takeaway 5: A holistic approach is needed to increase ridership

SunRail is capturing a significant number of rides made by TOD station area residents, but a holistic approach is needed in order to increase overall ridership. This approach should include an effort to increase the number of jobs around the stations as well as more service, connectivity options, and destinations. This research focused on TOD residents, simply because that is the majority of what new development has occurred.

When asked why they do not ride SunRail, TOD residents gave a wide array of reasons and responses. Some respondents desired improved service and connectivity. Others simply did not live or work near a station area or believed their car was cheaper and faster.

Talking to station area residents at the open houses often revealed that most residents have more than one reason for choosing other transportation options. For example, one open house participant stated that she does not ride SunRail because it does not provide access to her daily destinations such as her job, but she would like to take SunRail downtown on nights and weekends if service was available. Consequently, ridership strategies that focus on one issue are unlikely to significantly increase ridership. For

example, better integration between SunRail and LYNX's bus network could encourage LYNX riders to use SunRail, but it would do little to affect mode choice among car-owners who work outside of a station area.

The importance of improving transit service and connectivity has already been discussed, but increasing residential and employment density within station areas is equally, if not more, important. Assessing the demographics of station areas revealed that many suburban stations had a surprisingly low population within a 10-minute walk of the station. Many of the TOD station areas in Volusia and Seminole Counties were estimated to have populations of a few hundred or less.

Many of these transit-oriented apartment complexes are only a few years old and the American Community Survey (ACS) data was collected between 2012 and 2016. It is likely that many of the TODs may not be fully represented in the data until the 2020 Census. A follow up study after the 2020 Census data is available may be necessary to accurately understand the demographics of station area residents.

Increasing the density of jobs and destinations within the station areas is a vital part of encouraging ridership. *Despite all the requests to increase the frequency and duration of SunRail service, the deciding factor for whether participants rode SunRail typically was whether their job was located*



near a station. Given SunRail’s catchment areas, riders could always drive to a station if they lived farther away, but no one seemed willing to travel far from a station to their workplace. As mentioned in the previous section, many open house participants and survey respondents complained about last-mile problems. Long waits for bus transfers and a lack of bicycle and pedestrian infrastructure made it a hassle to get from the station to their workplace. In contrast, only a 3.9% of respondents mentioned that they lived too far from a station. This was confirmed by the ridership numbers as only 10.5% of those who worked in a TOD station area rode SunRail regularly compared to 24.7% of those who lived outside of a TOD station area.

Many participants also pointed to the need for SunRail to connect to more destinations. One respondent said SunRail “stops don’t take you anywhere where you can walk to for activities.” While they often wanted SunRail to expand the network to connect to Disney or the airport, encouraging the development of more destinations within existing station areas could accomplish the same goal. Ultimately, providing more places to go through relocations, new development, or improved connectivity is needed for Central Florida to have the transit ridership it wants and needs.

“The deciding factor for whether participants rode SunRail typically was whether their job was located near a station.”

Some of what we heard

“Stops don’t take you anywhere where you can walk to for activities.”

“The train ride is WAY better than driving on I-4 but there is a 20+ minute wait once I arrive at the destination.”

SunRail “does not provide access to daily destinations such as my job, but I would like to take SunRail downtown on nights and weekends if service was available.”



Key Takeaway 6: It is time to reframe SunRail as regional rail service

SunRail makes train travel within Central Florida possible. The differences between light rail, heavy rail, and commuter rail technology are not perceptible to the majority of the population. While SunRail utilizes commuter rail technology on an existing freight rail track, the focus needs to be on providing more frequent service. It is clear that current and potential riders want SunRail to be part of a regional high frequency transit system with rail and bus rapid transit.

How to do this has proved elusive. Funding and existing agreements limit the frequency of service that can be provided. Currently, SunRail is caught between serving only people who live AND work near stations and providing the reliable rapid transit service that *encourages* people to live and work near stations. The transition from state to local control is an opportunity to create agreements that lead to more service.

A new strategy is needed that incorporates a portfolio view of all transit in Central Florida, with a focus on frequency of service, adding destinations in identified transit hubs, and the other takeaways mentioned in this report. This could enhance understanding among decision makers at the state and local levels about the role rapid transit could have in improving the quality of life in Central Florida.

Commuter rail lines are part of a regional transit system – one that offers connections to other rail and high frequency bus lines. Fronrunner is an example. The Salt Lake region’s commuter rail line is part of a regional system that includes a streetcar line and three light rail lines. All together these support local buses to form a regional transit network. Currently, SunRail’s best example for connectivity is Lymmo, the downtown BRT circulator.

The Massachusetts Bay Transportation Authority operates 12 commuter rail lines, complimenting five subway lines, and four bus rapid transit lines. NJ Transit is the country’s largest commuter rail system, which offers regional rail service complimented by commuter buses and light rail. It is unreasonable, though, to expect SunRail to operate like the MBTA lines or NJ Transit; Orlando’s metropolitan area is very different.

Survey respondents indicated they wanted SunRail to go more places, particularly in east-west directions. While east-west rail options might not be identified yet, there are several BRT alignments that would build out a truly regional high-frequency transit map. The US 192 BRT would connect SunRail to BRIDG (and Disney, indirectly). Along SR 50, the BRT line would connect UCF’s main campus to its downtown campus. Additionally, a study is underway to determine the best high-frequency transit option for SR 436.

LYNX and SunRail partner on the *Train to Plane* – local bus service that connects Sand Lake Rd station to Orlando International Airport (OIA) in 15 minutes. The new intermodal facility at OIA has the potential to be a regional transit hub. Brightline is scheduled to provide high speed rail service between South Florida and OIA in 2021. The private company has expressed interest in connecting OIA to Tampa; whether this potential route includes a connection to SunRail is still unknown. Additionally, connecting OIA to the Orange County Convention Center is a frequently discussed route.

While further research would be required, a regional rapid transit system could open new real estate markets for TOD in suburban areas that have previously been dominated by single-family housing. SunRail has sparked higher-density apartment complexes in areas like Maitland and Lake Mary. These were significant deviations from existing development patterns.

SunRail's multi-layered catchment areas may indicate that demand for rapid transit service is already present across much of the metropolitan area. Additional rail or BRT lines would significantly increase the number of people with easier access to SunRail, and it would improve the viability of existing station area TODs by providing residents with access to more destinations and employment opportunities.



Map courtesy of LYNX

Promoting a Transit-Oriented Central Florida: What can we do?

The findings of this research into TODs and SunRail riders provide direction for decision makers in Central Florida and across the state. In some ways, this analysis gives us more questions to answer than the answers themselves. Still, the information guides where we need to focus our efforts. The importance of smart growth-oriented land uses is clear, but what can be done to address the gaps identified through this study? Several recommendations, described below, can be implemented and there is still a lot of research that needs to be done.

Recommendations (in no particular order):

- 1) *Continue to incorporate transit-supportive land uses into local comprehensive plans and land development regulations*

This analysis reveals that Central Florida's efforts to have more compact development patterns are leading to results. The residents who live within a 5-10 minute walk of a SunRail station value transportation options – and pay a premium for the amenities associated with TODs, such as restaurants, nearby jobs, and – yes, transportation options.

Orange County, the region's largest local government, is updating its zoning code. The switch from a use-based code to a form-based code is a good example of what local governments can do to incorporate transit supportive land uses. Additionally, Orange County is developing a Sand Lake Rd Station Area Plan that features form-based code elements and encourages more density around the rapid transit stop.



- 2) *Advocate for parking policies compatible with rapid transit*

Parking policies on both a macro and micro scale need to change to be aligned with regional rapid transit and housing goals. Local governments – through their land use authority – determine parking policy and as a result, influence the market for parking spaces. Currently, these policies are designed for auto-oriented development patterns.

At the macro-level, a comprehensive assessment of parking policies around identified rapid transit routes and hubs is needed. This assessment may lead to reducing on-street parking, or eliminating parking requirements altogether, at least in certain locations. The elimination of minimum parking requirements lets the market decide how much space should be allocated to parking within new developments. Reducing parking at both the municipal (on-street) and private (new development) level may increase the density of development and the use of shared mobility, which will improve access and demand for SunRail.

At a micro level, the parking policies at nearly every workplace and TOD complex still reflect a bias towards auto-oriented travel. Changes to parking policies at buildings, particularly within the TOD station area boundaries, are necessary for SunRail's long-term sustainability.

These strategies may encourage walking, biking, transit use, and carpooling. Residential complexes, particularly those with parking garages, may consider unbundling the cost of parking, charging a fee for residents to park their car, or offering monetary incentives to residents who have no vehicle.

3) *Develop a workforce and affordable housing action plan for the SunRail TOD ridership boundaries*

SunRail primarily serves a moderate to upper income demographic. Consequently, for many riders, SunRail is just one of many available transportation modes. Promoting low and moderate income housing development within SunRail station areas, may increase ridership, with SunRail becoming a primary mobility choice.

Throughout SunRail’s planning, construction, and initial operating phases, the local governments worked to foster more transit-supportive land uses near the stations. Affordable housing tools are not incorporated fully into these land use changes, though. As a result, nearly all of the TODs built near SunRail stations are 100% market-rate residential units. This research focused on the connection between transit-oriented development and SunRail riders and identified housing affordability as an issue, but it did not evaluate potential solutions.



A proactive approach that combines government interventions with free market principles could increase the amount of residential units considered to be workforce or affordable housing. A first step would be to develop a SunRail TOD specific workforce and affordable housing action plan, modeled on the region’s Affordable Housing Framework. This plan would promote the use of affordable housing strategies, such as inclusionary zoning, regionally to support SunRail service areas.

Any action plan should consider recent research findings and best practices related to neighborhood and community development’s impact on upward mobility for residents. A SunRail and housing affordability effort can advance our knowledge of how some places improve an individual’s economic status while also addressing displacement risks. This is particularly true on the western edge of the Church Street and Lynx Central station areas, as well as the Altamonte Springs, Meadow Woods, and Sand Lake Rd stations.

4) *Develop a targeted economic development plan to increase the number of jobs located within the SunRail TOD catchment areas*

As this analysis shows, many residents in the SunRail TOD ridership area do not work near another SunRail station or they were unwilling to walk more than 10 minutes to their workplace, from a SunRail station. This highlights the need for more jobs to be in close proximity to the stations themselves in order to grow SunRail ridership.

The TODs approved by the local governments include commercial or retail spaces. Unfortunately, the market has not yet responded to these available spaces. In some cases, the retail spaces have converted to residential units. Decision makers, particularly transportation officials, need to improve their knowledge regarding these inefficiencies and identify actions that can lead to more employment opportunities near SunRail stations.

5) *Use a portfolio view to identify what a regional rapid transit map could be*

Riders and potential riders view SunRail as a regional train service. A next step would involve creating a rapid transit map that includes SunRail, planned Bus Rapid Transit routes, Brightline, and potential other rail routes, such as service to the Orlando International Airport or the Orange County Convention Center. To provide a regional perspective of all transit-services, this regional service map would also show supportive projects – like mixed use or neighborhood development. It would give the region a portfolio view of place-based infrastructure possibilities. Additionally, this comprehensive perspective furthers the conversation on how to best increase SunRail’s service hours. Miami-Dade – as a region - is utilizing a similar approach with its SMART Plan.

6) *Develop and utilize policies that improve micromobility options within SunRail’s TOD and Park and Ride catchment areas*

MetroPlan Orlando, in coordination with LYNX and the local governments along the SunRail route needs to develop a strategy and related actions for improving first/last mile connectivity to SunRail stations. A strategy for microtransit, bikeshare, walkability, and electric scooters along SunRail’s current 47 miles can address the connectivity issues identified through this research. The Uber pilot in Seminole County and the limited-term Neighborlink service in Maitland had limited results. These pilots, themselves, were a good thing to do, but were conducted somewhat in isolation. Their lessons learned can be incorporated into future micromobility policies and actions.



7) *Support additional data gathering and more data sharing*

MetroPlan Orlando should repeat this study in five years. This timing would allow for more data to become available, and the other data and coordination challenges faced by the research team to be overcome. This is especially true if MetroPlan Orlando, SunRail, LYNX, FDOT, and others can work across agencies to foster a more collaborative and open data sharing environment. This intergovernmental coordination will make it easier for each agency to conduct better research and incorporate data-informed decision making.



Data availability limited this research study. The research team overcame a lack of origin-destination data, which was unavailable due to restrictive data sharing agreements. More open data sets could prove more detailed analysis in a future study. The better the quality of data, the more data analysis can inform decision-making. None of these recommendations are mutually exclusive. MetroPlan Orlando, FDOT, LYNX, all local governments, universities, and private partners have a role to play in their implementation.

Future Research

The Central Florida region's significant investment in transit is starting to produce returns. But so much is still new. It takes years or even decades to know something's impact, what works, and what does not. The Florida Department of Transportation and Florida State University have analyzed SunRail's impact on property values through 2 studies. This report is the third research study related to SunRail and much more research is needed. Here are potential topics for future research:

1) *Conduct a representative survey of residents in the Central Florida region.*

A representative survey of residents in the metro area could build on the research conducted in this study by filling existing data gaps. This survey should target residents with access to SunRail living within a 10 minute drive of a station. Expanding the survey piloted in this study could enable a more extensive analysis of the interplay between station area demographics and ridership dynamics. A representative survey could also provide the following benefits.

- The survey would refine the catchment areas developed in this study.
- The decay functions used to estimate the station area demographics could be based on data from Orlando instead of a literature review.
- By pinpointing where riders are coming from and where potential riders live, ridership strategies could be tailored to the local context at the neighborhood level.
- If the survey was expanded to SunRail's Phase 2 stations, the results could be used to provide context-specific projections of expected ridership based on demographic factors, types of jobs available, etc.

If conducting a larger survey is not possible, an alternative could be to gain wider access to regional origin-destination data from mobile tracking data or other sources. While these sources would not allow MetroPlan Orlando to pinpoint ridership dynamics at the household level, they would enable further research to derive ridership patterns from regional commuting flows.

Cost Based Decay Function:
A method of estimating station area demographics where the effect of a census unit on the assessment of riders' characteristics decreases the farther from the station it is.

2) *Analyze changes in the real estate and commercial markets within SunRail TOD station areas.*

Construction seems to be everywhere, and particularly near SunRail stations. Nearly every SunRail TOD station area has brand new mixed-use development or building under construction. A deep dive into these new TOD markets has yet to be done. The following chart of questions could provide a starting place for conducting this market research.

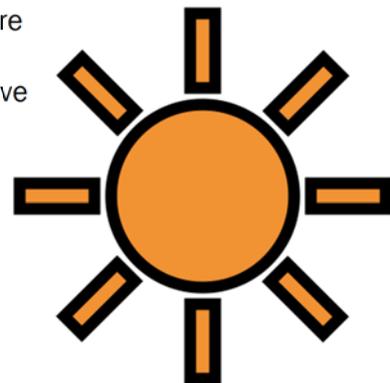
Real Estate	Commercial
<ul style="list-style-type: none"> ○ What are the companies building developments near SunRail stations? ○ What other TOD neighborhoods or communities across the country are they building or operating in? ○ How does Orlando’s real estate market compare to other TOD areas? ○ Is SunRail creating a new real estate market by building transportation options? ○ Has SunRail attracted new developers to come to Central Florida? 	<ul style="list-style-type: none"> ○ What are the commercial rents and length of the average lease in SunRail TOD station areas? ○ How often do businesses move? How long will it take more businesses to move to SunRail station areas? ○ What types of commercial spaces are available? ○ How long will it take SunRail’s impact to employer relocations to become measurable? When should a relocation impact study be conducted?

This research can be part of Recommendation #4. If developers and businesses do not invest in increasing the density and intensity of station areas, transit service improvements may do little to serve potential riders. Consequently, pursuing research on the real estate and commercial markets within the stations areas could provide a comprehensive understanding of the dynamics shaping the use of SunRail.

Commercial real estate with TODs is a broad area of study that has several research questions. A case study research methodology could help us answer some of these questions. Metropolitan areas across the state and country could be potential case studies with applicability to Central Florida.

3) *Evaluate the public health outcomes of TOD station area residents compared to the rest of Central Florida.*

This study showed that residents of the TOD station areas were more willing to walk to the station than park-and-ride area residents. Walking and biking to work have been shown to have a positive impact on public health. Conducting a study evaluating SunRail’s public health impacts could offer a better understanding of the benefits SunRail provides to the Central Florida community. However, it may be best to wait until after the 2020 Census before conducting a public health assessment. This allows for additional time as the region acclimates to SunRail and for the lag time associated between a public health intervention and data gathering.



4) Evaluate how SunRail's Southern Expansion impacts the Phase 1 catchment areas

SunRail's Southern Expansion added 17 miles of service and four new stations in southern Orange County and Osceola County. We need to know how this new service affects the ridership catchment areas identified through this research. Did it increase the percent of TOD residents who use SunRail? Did it expand the catchment areas? These are questions to answer in the near future.



Kissimmee SunRail station

Conclusion

Rapid transit and the development it brings is still something Central Florida is trying to figure out. This research is the first of its kind here to identify what is happening on a micro level at the station areas with current and potential SunRail riders. SunRail and TODs are still new and they need time to mature, but a lot of positive things are occurring. SunRail is capturing a significant number of possible commutes, and as more destinations, especially workplaces, are located within walking distance to a station, the number of riders will increase. This analysis, the recommendations, and additional research needs provide us with more information than we had before and direct us towards a more transit-oriented Central Florida.

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Methodology: How We Arrived at these Takeaways

The FSU research team had three major tasks: (1) to analyze SunRail ridership data in order to understand potential ridership trends and to define each station's catchment area, (2) to assess the demographic and socio-economic characteristics of each SunRail station area, and (3) to perform an extensive stakeholder engagement process with the goal of furthering our understanding of who lives around SunRail and how, if at all, they use SunRail. This section details the methodology used to complete each of these tasks and challenges faced along the way.

Task 1

The research team has pursued a multi-method approach of analyzing ridership trends and travel patterns to better understand the dynamics shaping SunRail's ridership. First, the team collected SunRail ridership data to provide a descriptive analysis of ridership patterns. Ridership was broken down and analyzed by station, month, time of day, and how the ridership patterns have changed since the system opened in 2015. The research team then utilized the US Census Bureau's Longitudinal Employer-Household Dynamics (LEHD) 2015 dataset to identify whether those who live near SunRail stations work near another station. This analysis served to identify the number of commutes that can be taken via SunRail. Commutes were also disaggregated by income level to identify how SunRail TOD commuting patterns vary by income level. The research team also analyzed the commute trips that begin and end in the same station area because the more TOD is in place, the greater the options for living and working in close proximity.

Challenges

Origin-destination (O-D) data is the best way to determine potential SunRail riders and who is actually riding SunRail. Unfortunately, comprehensive O-D data was not available to the research team. To date, a comprehensive SunRail rider survey has not been conducted. While several rider surveys have been conducted, none of them were comprehensive enough to assess the origin-destination patterns of SunRail riders including how far people are willing to travel to a station, what mode they use to access the station, how far they are willing to travel from the station to their destination, and what factors influence these decisions.

Initially, it was expected that two O-D datasets would be available – MetroPlan Orlando's April 2015 AirSage data and LYNX's O-D data. AirSage uses cell phone tracking data to identify the trips that are being made, no matter what mode is taken. Unfortunately, it was unable to be shared with the research team due to licensing agreements. LYNX has O-D data that includes SunRail, but it was not available to the research team.

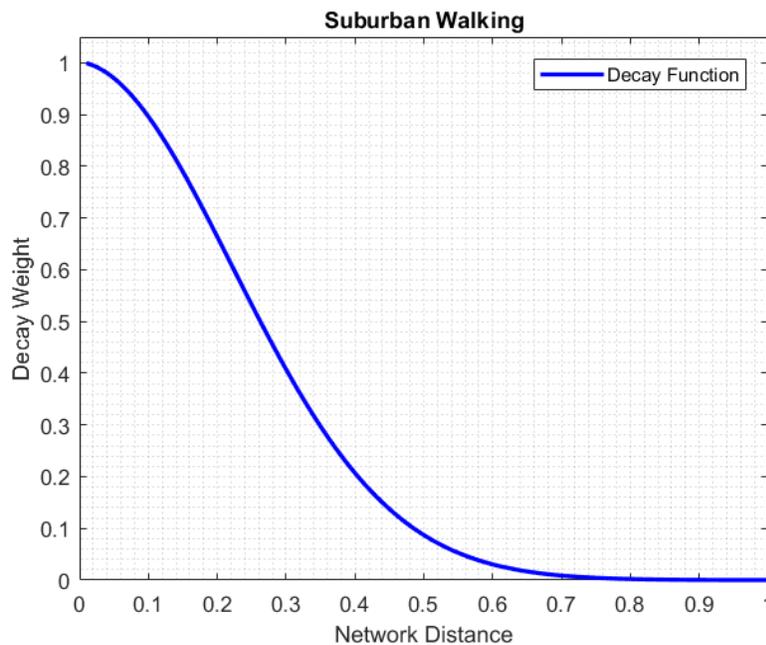
The research team overcame these challenges through a review of relevant literature and a commuting analysis of the LEHD origin-destination data, applying decay-functions to American Community Survey data, and conducting a pilot survey of TOD residents. While the team's approach does provide a thoughtful estimate of the station's catchment areas and demographic profiles, these estimates could be greatly improved by gaining access to more robust regional origin-destination data or by conducting a representative survey of residents within driving distance of a station.

Task 2

The purpose of the second task was to provide a better understanding of the demographic, socioeconomic, employment, and built environment factors that influence the ridership patterns of residents living in SunRail station areas. These factors were assessed based on the catchment areas created for each station in Task 1. A review of professional and academic literature as well as the results of the survey indicated that SunRail stations have two distinct catchment areas: one for TOD residents who walk to the station, and one for park-and-riders who drive to the station. Consequently, the research team assessed the demographics of two different station areas for each station.

Since those living closer to the station area are more likely to use SunRail, the station areas' demographic profiles were calculated using a cost-based decay function. Using this model, census data is weighted based on how far from the station is it. In this way, the effect of a census unit on the station area's characteristics decreases the farther away the census unit is. This calculation was used because it reflects real-life decisions any user of the transportation system would make. If the census unit were the resident lives in is farthest away from the station area, he or she might have less chances of using the train service. The decay functions were based on an extensive literature review of how far riders are willing to travel by foot and by car to a rail station. The decay functions, such as the ones used to estimate the station area demographics, were also tailored to each station area's context (urban, suburban, or exurban). Figure 1 provides an example of the decay function used to model how far suburban residents were willing to walk to a station area. Once a station area profile was calculated for each station, a correlation analysis was conducted to reveal the socio-economic factors influencing ridership. Moreover, statistical and econometric modeling approaches were utilized to identify significant factors affecting transit choice of people living around the SunRail stations.

Figure 1: Decay Function of How Far Suburban Residents are Willing to Walk to a Station Area



Challenges

The most accurate way to create context-specific decay functions that model the behavior of local residents would be to conduct a comprehensive survey of SunRail riders and residents to identify how far they are willing to travel to a station. In the absence of such a survey, the research team relied on available literature to inform the decay functions. This proved challenging as it is difficult to apply walking distances from different cities or countries to Orlando's context. For example, residents of larger metropolitan areas with more established transit systems, such as New York City, may be willing to walk farther to a transit. Conducting a representative survey of residents with access to SunRail would enable future researchers to more accurately model the station area demographic profiles.

The other challenge the research team faced was the availability of timely socio-economic data. Since several station areas have experienced a significant amount of new development since SunRail opened in 2015, the demographic data used to create station area profiles would ideally come from after 2015. However, the most recent data available at the census block group level was the 2017 ACS 5-year estimates which is an average of survey data from 2013-2017. Consequently, once data from the 2020 Census becomes available, assessing station area profiles will become more accurate.

Task 3

To effectively engage SunRail station area residents and businesses, the FSU research team pursued two public engagement strategies. First, the team developed and conducted a series of open houses to gather feedback from residents and users of the SunRail system. By engaging residents and riders in face-to-face discussions, the team sought to gain detailed feedback on how SunRail has impacted their community and what would need to change for them to ride SunRail more often. The FSU research team conducted three open houses in three different station areas. To ensure the feedback received was representative of the range of contexts that SunRail services, the open houses were conducted at stations in the urban core (Lynx Central Station), an inner suburb (Maitland Station), and an outer suburb (Lake Mary Station). They were held during the evening rush hour, at the following dates and times:

- Maitland Station Open House – June 12th, 4:30-6:30pm,
- Lynx Central Station Open House – June 13th, 4:00-6:00pm,
- Lake Mary Open House – June 14th, 4:30-6:30pm.

The FSU research team utilized an open, informal format where participants could come and go as they pleased. At each location, the Florida State team had a series of discussion stations where participants could engage with research staff and answer these seven targeted discussion questions:

- What do you like about SunRail?
- How has SunRail influenced the livability and character of Maitland/Downtown/Lake Mary?
- How did the presence of SunRail influence your decision to live/work in this area?
- What prevents you from riding SunRail more often?
- If you could change one thing about SunRail what would it be?
- How could the transit system be improved to encourage you and others to use transit more often?

- What changes could be made in your neighborhood to encourage you and others to ride more often?

These questions were designed to facilitate discussion on whether the presence of SunRail is transforming neighborhoods in the areas surrounding each station, whether SunRail is transforming the demographics of the station areas by influencing where people decide to live, and ultimately to uncover whether these transformations are likely to increase SunRail ridership in the future as more potential riders move to station areas.

To supplement the feedback received at the open houses, the research team also developed a survey to gather information on SunRail riders and TOD residents and business owners. Two versions of the questionnaire were developed, one for residents and one for business owners, as well as Spanish versions of both. The questionnaire was distributed in-person to open house participants and to station area residents through a variety of online means including MetroPlan Orlando's website, the social media outlets of MetroPlan Orlando and several municipalities, and emails to the residents of apartment buildings located near SunRail stations. Questions were included to gather information on ridership patterns, accessibility to stations, mode of transportation, and travel time to stations. The questionnaire also included questions concerning perceptions of development patterns and neighborhood change around SunRail stations, as well as the influence of SunRail and other factors (relating to housing, infrastructure, neighborhood amenities, etc.) on respondents' choice of home or business location.