

Market and Needs Assessment



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Executive Summary

The Market and Needs Assessment describes the geography and nature of transit demand and access in Orleans, Jefferson and St. Bernard Parishes by identifying strong transit markets and communities of need. It also explores origin-destination data in order to understand where people are traveling and to identify connectivity gaps in the system. Many of the variables discussed within the report have been synthesized into a Transit Propensity Index (TPI), which will serve as a tool to help guide the allocation of service. The TPI and all other elements presented in Market and Needs Assessment are being considered throughout the development of alternative scenarios for a system redesign. The purpose of the Market and Needs Assessment Report is to inform the general public, as well as stakeholders and community members contributing to the planning process of a network redesign.

Study Area

The study area encompasses the urbanized portion of three parishes that are served by the New Orleans Regional Transit Authority (RTA), Jefferson Transit (JeT), and St. Bernard Transit (SBURT). According to the Census Bureau's 2018 American Community Survey (ACS) 5-year estimates, the three-parish region has a population of 847,229 people.

Table 1: Study Area Population

	Orleans Parish	Jefferson Parish	St. Bernard Parish	Total Study Area
Population	375,123	427,058	45,047	847,229

For the purpose of analyzing transit markets and regional travel flows, the project team divided the study area into 18 neighborhood analysis districts, which were developed for this project based on agency service area boundaries, travel barriers, and the locations of major job centers. Map 1 shows the study area divided into neighborhood analysis districts along with current transit service and frequency (as of Spring 2019).





Findings

Underserved Areas:

Transit mode-share is very low in Jefferson Parish. There are some areas in Metairie and Kenner which show particularly high levels of transit propensity, but are not served by frequent transit, indicating that it is likely lack of service, rather than lack of demand, that results in the low mode-share.

Underserved Connections:

There is unmet demand for regional connections. Transportation planning data from the Census Bureau show that significant numbers of people cross parish lines to get to work. However, origin-destination data gathered on the system's transit riders show that very few people are making those trips on transit.

Under-connected people:

Some high-need communities have limited connections to job centers. Many people who are likely to need transit live further from downtown and further from frequent transit. While the largest regional employment hub is located in Downtown New Orleans and is well served by transit, there are other job centers in Metairie, Jefferson, Kenner and the West Bank that are effectively out of reach for most transit riders.



Introduction

Transit Agency Goals

Transit agencies are generally oriented toward two, sometimes complementary, but often competing, goals. These are 1) to carry as many passengers as possible as efficiently as possible, and 2) provide some level of service to all residents.

Ridership and Productivity:

The first goal, to carry as many passengers as possible, as efficiently as possible, is best achieved by providing frequent service in dense areas and increasing service on routes that already have high ridership. Service productivity is measured in terms of passengers per service hour.

Productive service allows agencies to maximize ridership relative to the amount of money they spend on transit. Maximizing ridership also contributes to other goals such as reduction in traffic and carbon emissions from people choosing to take transit instead of drive.

The following features are some of the indicators of productive transit markets:

- High population density
- Special generators such as universities, event centers, and retail
- High job density
- Pedestrian-friendly street design and stop accessibility

In addition, certain demographic and employment status factors affect the productivity of transit. The following factors have been shown to correlate how likely a person is to ride transit:

- Race and ethnicity
- Annual household income
- Disability status
- Employment status and job earnings

Some transit markets have other populations or destinations that generate a significant share of transit ridership. In New Orleans, a significant share of streetcar ridership comes form tourists visiting the city. In addition, a number of local public schools in Orleans Parish provide bus passes to students in grades 7-12 instead of operating yellow bus service.

Coverage:

A second goal of transit is to provide some amount of service to as many people as possible, even when it may be expensive and less productive for the agency to do so. Transit is a public service that provides access to jobs and essential services for many residents who do not have alternative means of transportation. While some of these communities may live in strong transit markets near the center of the city and already be served by frequent, high-ridership routes, many transit riders live far from the urban core where serving them via transit is inefficient from a productivity standpoint.



Routes that serve these more dispersed populations are sometimes referred to as "coverage" routes, and may run less frequently in order to balance the high cost with the low demand and fare revenue. However, coverage routes are still an important part of the transit system and can play an important role in ensuring that transit service is allocated equitably. Coverage service is especially important in the context of the "suburbanization of poverty" – since 2000, the rate of poverty in US suburbs has grown much faster than in cities. Many of these suburban neighborhoods are less likely to have existing transit access, and coverage routes are an important tool for serving lower-density neighborhoods with residents who need transit service.

Transit Propensity Index (TPI)

Attracting ridership and serving people in need are not mutually exclusive goals; some of the strongest transit markets exist where these factors overlap. Understanding transit markets requires us to look at the interaction between the two sets of measures. This analysis does that through the development of a Transit Propensity Index (TPI). The TPI considers the density of people and jobs, and then adjusts the weighting of those factors based on the socioeconomic characteristics of the residents and wages of the jobs. The result is a detailed map representing a synthesis of activity density and need. Using this information and a calculation of walking distance from main roads, we can estimate a level of transit service that would be appropriate along different corridors throughout the study area.

Travel flows

In addition to estimating demand based on type and intensity of land use, the Market and Needs Assessment also looks at how and where riders are currently using the system through an origin-destination (OD) analysis. The OD analysis is based on the New Links Origin-Destination Survey of weekday RTA, JeT, and SBurt riders that was conducted for the project¹.

The survey data was compared with other regional OD data sources to analyze unmet, or latent, travel demand. This analysis identifies local and regional connections that are frequently and easily made via car but make up a significantly smaller proportion of transit trips.

¹ For more information, refer to the New Links Origin-Destination Data and Rider Demographics Report



Population and Employment Density

Residential Density

Residential density is a good starting point for identifying strong transit markets, as nearly 90% of local residents riding transit begin or end their trip at home.²

Table 1 provides an estimate of the average residential densities required to support different levels of transit. A population of 8-16 residents per acre is generally the density required to support transit with 60-minute frequency operating within a corridor, while 10-minute frequency requires densities of 47-92 residents for a line to meet most agencies' productivity standards.

Table 2: Transit-Supportive Population Densities³

Transit Service Level	Population/Acre	
Flex Bus	0.5	
Community Circulator	2	
Local Bus		
6o-minute frequency	8-16	
30-minute frequency	16-31	
15-minute frequency	31-47	
10-minute frequency	47-92	
5-minute frequency	> 92	

Source: Nelson\Nygaard compiled from various national sources

Many areas in the region meet this standard for 6o-minute service, including most of the central area of the New Orleans East Bank, North of I-10 in New Orleans East, and much of the area surrounding I-10 in Jefferson Parish, as well as parts of the West Bank (Map 2).

Higher density areas are scattered throughout the region, with the two highest density block groups in Metairie located near Veterans Blvd and W. Napoleon Blvd. The largest contiguous areas of medium to high density include Uptown New Orleans, the Garden District/ Central City, and Mid City/ Seventh Ward.

Much of the East Bank of New Orleans is currently served by medium to high frequency transit, and the service level more or less aligns with the standards presented in Table 1. According to the standards presented in the table, there are clusters of density in Metairie and on the West Bank that may merit more service based on their residential density alone, including some high-density corridors such as W. Napoleon Blvd between N. Causeway Blvd and Clearview Blvd that do not currently have any transit service.

³ Note that these densities broadly indicate demand across a community and are not meant to predict precise demand at the block or Block Group level. For example, a geographically isolated census block with high density would not in and of itself provide sufficient demand to support high-level service; however, a significant cluster of similarly dense blocks would indicate an area of potential demand.



² New Links Spring 2019 Origin-Destination Survey



Employment Density

The location and number of jobs is another strong indicator of transit demand, as traveling to and from work accounts for the largest single segment of transit trips in most markets. As shown in Table3, a density of four to eight jobs per acre typically produces demand for hourly bus service. Employment densities higher than 16 jobs per acre produce demand for a bus every 15 minutes or less.





Table 3: Transit-Supportive Employment Densities

Transit Service Level	Jobs/Acre
Flex Bus	—
Community Circulator	_
Local Bus	
6o-minute frequency	4-8
30-minute frequency	8-16
15-minute frequency	16-24
10-minute frequency	24-48
5-minute frequency	> 48

Source: Nelson\Nygaard compiled from various national sources



Map 4: Dense areas of employment, delineated



Jobs in the New Orleans region are more concentrated than residences. Map 3 symbolizes census block group by density of jobs. Low- and middle-income jobs (earning less than \$1,250 and \$3,333 per month, respectively) have much the same distribution.

Notable high-density clusters, outlined in Map 4, include:

- Downtown New Orleans (CBD and French Quarter) (66,794 jobs)
- Along I-10 and Veterans Blvd in Metairie, especially between Causeway Blvd and Clearview Pkwy (42,134 jobs).
- Elmwood (31,134 jobs)
- In Old Jefferson, around the Ochsner Medical Center campus (14,736 jobs)

Downtown New Orleans, including the CBD and the uptown part of the French Quarter, makes up the largest employment hub in the region. The other areas immediately surrounding the CBD and French Quarter also have a high density of jobs, especially along the Canal Street corridor that runs from Downtown through Mid City. There are also several other large employers that are not located in these high-density job centers, which may serve as transit destinations on their own. These include the NASA Assembly Facility in Michoud, Touro Infirmary and Children's Hospital in Uptown, and the Colleges and Universities further discussed in a later section.



The job centers in Jefferson Parish appear to merit higher transit frequency than is currently offered, while the New Orleans CBD is comparatively well served by transit.

Socioeconomic Characteristics

Population density in an area does not tell the full story of where transit is needed or whether residents will use it. In the spring of 2019, there were approximately 38,000 bus and 23,000 streetcar trips taken per weekday in Orleans, Jefferson and St. Bernard Parishes. Given that the study area has a population of approximately 850,000 people, many of whom make multiple trips per day, and hosts over 10 million tourists per year, transit trips make up just a tiny fraction of all trips made on a given day.

To more accurately estimate the strength of the transit market, and to assess whether we are serving populations in need, we need to know not only how many people are living and working in the area, but who those people are. National research shows that some population groups tend to use transit more than others, including people of color, individuals living in low-income house-holds, and people without access to a car. People who are disabled may also rely more heavily on fixed route or paratransit services. These correlations are discussed in more detail in the Transit Propensity Index section.

When significant numbers of these populations cluster together, they can influence the transit demand to an extent that is not captured when only considering the total population. Similarly, transit demand may be relatively low in areas with fewer of these populations, even where density is relatively high. Table 4 lists selected socioeconomic characteristics that correlate with a person's likelihood to use transit.



Table 4: Socioeconomic characteristics correlated with transit use, by neighborhood analysis districts.

Analysis Area	Households without access to a vehicle	Population Living Be- low Poverty level	Civilians 18 and over with a disability	Population of Color, incl. Hispanic Origin
Orleans Parish Total	19%	25%	17%	70%
Jefferson Parish Total	7.3%	15%	17%	47%
St. Bernard Parish	6.7%	20%	19%	37%
Total Study Area	13%	20%	17%	57%
Downtown (CBD/FQ)	32%	15%	13%	24%
Algiers	16%	22%	18%	79%
Garden Dist - Central City	24%	25%	17%	52%
Gentilly	15%	21%	17%	85%
Lakeview	2%	6%	10%	17%
Lower 9th Ward	25%	39%	23%	90%
Mid City - 7th Ward	27%	28%	18%	65%
New Orleans East	16%	30%	16%	97%
Upper 9th Ward	21%	31%	19%	80%
Uptown	15%	23%	15%	51%
Elmwood - Harahan	4%	9%	17%	23%
Gretna - Harvey	9%	18%	16%	64%
Jefferson	9%	15%	18%	34%
Kenner	7%	17%	15%	55%
Marrero - Westwego	9%	20%	20%	60%
Metairie East	7%	9%	15%	25%
Metairie West	6%	13%	15%	35%
St. Bernard Parish	7%	20%	19%	37%

(Source: U.S. Census Bureau (2018). 2014-2018 ACS 5-yr estimates.)

Race

Minority residents, including African Americans, Hispanics, Asian Americans, and people of multiple races, make up about 55% of the population in the study area and approximately 70% of the population of Orleans Parish (Table 5).

More than 40% of study area residents are Black or African American, including nearly 60% of the residents of Orleans Parish. Black and African American residents are more likely to be transit riders than residents of other races: in March 2019, about 75% of weekday RTA and JET bus riders were Black, while about 19% were white and about 6% were of another race.

Many Black residents live in the urban core of New Orleans within walking distance of transit, particularly in Central City, Hollygrove, Gentilly, the 7th Ward and the Upper 9th Ward. However, as can be seen in Map 5 and Table 5, many minority residents also



live further from downtown, where more travel is required to get to major job centers and where transit is more limited and less frequent. Notable areas with high minority populations include New Orleans East (where the population is just 3% white non-Hispanic), the Lower 9th Ward (86% Black), and Algiers (68% Black). The West Bank of Jefferson Parish, where transit routes are more spaced out and have lower than 30-minute frequencies, also has a much higher proportion of Black residents than the East Bank (43% compared to 15%). The New Links Origin-Destination Survey found that the percentage of minority riders was also higher for routes on the West Bank, with non-white residents making up 81% of RTA and 84% of JeT riders on West Bank bus routes.

Many Hispanic and Asian American residents live in Jefferson Parish in Metairie and North Kenner, in many cases tracking closely with areas of higher residential density. In New Orleans, many Asian American residents live in the Village de l'Est neighborhood of Eastern New Orleans.

Analysis Area	Population in Housing	White, non-Hispanic	Black, non-Hispanic	Asian, non-Hispanic	Multi-racial or Other	Hispanic or Latino
Orleans Parish Total	375,123	30%	59%	3%	2%	6%
Jefferson Parish Total	427,058	53%	26%	4%	2%	15%
St. Bernard Parish	45,047	63%	22%	2%	3%	10%
Total Study Area	847,229	43%	41%	4%	2%	10%
Downtown (CBD/FQ)	6,726	76%	14%	3%	2%	6%
Algiers	56,950	21%	68%	3%	1%	6%
Garden Dist - Central City	54,764	48%	43%	1%	2%	6%
Gentilly	34,681	15%	78%	1%	2%	4%
Lakeview	20,508	83%	6%	3%	2%	6%
Lower 9th Ward	7,941	10%	86%	1%	2%	1%
Mid City - 7th Ward	54,613	35%	54%	1%	3%	8%
New Orleans East	74,243	3%	86%	7%	1%	3%
Upper 9th Ward	18,582	20%	74%	1%	2%	4%
Uptown	46,115	49%	36%	3%	4%	8%
Elmwood - Harahan	26,921	77%	12%	1%	2%	7%
Gretna - Harvey	79,804	36%	40%	5%	3%	16%
Jefferson	10,950	66%	22%	1%	2%	10%
Kenner	66,432	45%	24%	4%	2%	25%
Marrero - Westwego	99,887	40%	45%	5%	3%	7%
Metairie East	51,014	75%	7%	3%	2%	13%
Metairie West	92,051	65%	12%	4%	2%	17%
St. Bernard Parish	45,047	63%	22%	2%	3%	10%

Table 5: Race and Ethnicity of the Study Area population, by neighborhood analysis districts

Source: U.S. Census Bureau (2018). 2014-2018 ACS 5-yr estimates.





Income

For low-income households, the cost of owning one or more private vehicles can be burdensome, which makes transit a more attractive option.

Map 6 shows where residents living in households below the poverty line reside. This analysis uses the Census definition of poverty, which is based on a combination of household income and household size.

Twenty percent of the region's residents (25% of Orleans Parish and 15% of Jefferson Parish residents) live below the census-defined poverty level. The largest clusters of residents in poverty by population density are in Central City, Hollygrove, the Seventh Ward, and along Hayne Blvd and Morrison Rd in New Orleans East. Aggregated by neighborhood analysis district, the Lower 9th Ward has the largest percentage of residents in poverty (39%).



Map 6: Density of population with household incomes below the Census-defined poverty level



Zero-Car Households

Car ownership correlates closely with transit usage, and households without cars will support higher levels of transit service than similar densities of households with cars, since these residents are far more likely than the average resident to ride transit.

About 19% of Orleans Parish households and 7% of households in both Jefferson and St. Bernard do not have access to a car. As of March 2019, more than half (53%) of weekday transit riders who are residents do not have access to a car, and a similar share do not hold a valid driver's license.

From an equity standpoint, residents without cars are especially important to consider, as they may have limited other means of transportation for reaching jobs and essential services. In some large cities with good transit, residents choose not to own a car and instead opt to travel by transit, bike or taxi. However, in urban and suburban areas that are oriented toward cars and where transit options are much more limited, people without automobiles largely consist of those with low incomes or those who do not drive.

The correlation between poverty and access to a vehicle can be seen in Map 7, which displays the percentage of households without access to a car, as well as the percentage of the population living below the poverty line in each Census block. The pale blue color represents a carless rate higher than the Jefferson Parish average of 7%, and the brighter blue indicates a carless rate higher than the New Orleans average of 19%. The two shades of pink represent the average poverty rates in Jefferson and Orleans Parish (15% and 25%, respectively). Where poverty and carelessness overlap, varying shades of purple are created, indicating some combination of poverty rate and zero-car households.





Car-free households are concentrated in the neighborhoods surrounding Downtown New Orleans, where many jobs and services are located, where frequent transit service is accessible and where walkability is generally high. In many areas, especially Central City, the high car-lessness correlates with poverty rate. However, the bright blue blocks in the CBD and French Quarter suggest that some higher income households may also be forgoing car ownership when they live within walking distance or an easy transit trip of most of their destinations, especially where parking is more limited. "Conversely, in New Orleans East, the West Bank, Metairie and Kenner, there are more areas with higher poverty rates and lower rates of zero-car households. This suggests that low-income residents are opting to own cars despite the cost when transit does not meet their travel needs.

Disability Status

Transportation, including regular fixed-route bus service as well as on-demand or paratransit service, is an essential resource to ensure people with disabilities can remain active, productive, and part of their communities. Individuals with disabilities are scattered relatively evenly throughout the region (Map 8). Among people for whom disability status is known, about 17% have one or more disabilities.





Walksheds

Studies often estimate the number of people that have access to a bus stop using a circular, "as-the-crow-flies" buffer around each stop. This method can give a general idea of the number of people in the area surrounding a stop, but it ignores walking barriers such as highways, canals, and rail lines, and does not consider the layout of the street grid. Often, it significantly overes-timates the number of people within walking distance of a point, in some cases ignoring pedestrian barriers that cut off access for whole neighborhoods.

A walkshed (or ped shed) is a more precise measurement that uses the pedestrian-accessible street network to represent the distance a person is able to walk within a given amount of time. For transit, walking access is usually measured within either ¼ or ½ mile walking distance of a bus stop, representing the typical distance most pedestrians can travel in 5 or 10 minutes, respectively. Since we calculate transit propensity (discussed in the following section) based on who can access the service, smaller walksheds will result in lower transit propensities for those stops or road segments. For this project, walksheds were calculated around road segments at ¼, ½, ¾, and 1-mile distances.



The street grid and built environment play a strong role in determining how many people are able to access a transit stop and whether they feel safe doing so. A disconnected street grid, long blocks, and cul-de-sacs can result in longer, less direct walks for pedestrians trying to access transit stops. Map 9 illustrates the "walkability" of an area by showing the ¹⁄4-mile walkshed shapes for three different points (circled in white) along the street grid near City Park and Bayou St. John in Mid City. The light gray circle signifies a guarter-mile buffer, as the crow flies, around each point. The dark gray shows an estimation of how much of that area is reachable on foot via the street grid. If we do a calculation to find the percentage of the light gray circle that is covered by the dark gray polygon, we can use it to describe the walkability around a given point. Map 10 shows the study area with this calculation performed for points along all of the roads that transit vehicles could feasibly be operated on. Dark green indicates a highly walkable street grid, while red shows that very little of the surrounding area can be reached within a ¼-mile walk.

Algiers Point and the central areas of the East Bank of New Orleans, mostly developed before cars were dominant in cities, perform well on this metric. Areas developed after the early 1900s - Lakeview, Lake Shore, Pontchartrain Park, New Orleans East, much of Algiers, most of Jefferson Parish – are more car-oriented and have a less-developed street grid. Stops along Jefferson Highway, Veterans Boulevard and parts of New Orleans East show varying levels of walkability, while much of the West Bank and areas farther out

in New Orleans East tend to have smaller access sheds.

Map 9: Illustration of walkability, or walkshed size compared to buffer size



The walkability metric shown here factors in only the ¼ mile walk shed. Another barrier to pedestrian access, which more heavily affects the ½ mile and mile walk sheds in some places, is the prevalence of uncovered drainage canals in Jefferson Parish, Algiers and New Orleans East. Some of these canals run down the middle of key corridors, such as Morrison Blvd, creating extended barriers that prevent pedestrians from crossing into other neighborhoods, and making it more difficult to serve the areas on either side of the canal with a single transit route.

The presence and condition of the sidewalk, the types of surrounding land uses, and the amenities available at the stop (shade, benches, etc.) also play a role in whether residents will feel comfortable walking to a stop and are not represented in this map. Transit routes serving areas with poor walkability or unsafe conditions will likely require more closely spaced stops to best serve riders.



Map 10: Transit stops represented by the percentage of the quarter-mile buffer that is accessible within a quarter mile walk along the pedestrian street grid





Transit Propensity Index

The next step to using the residential and employment density and socioeconomic factors discussed above is to combine them into one score that can be visually represented in a single map, and can be used to calculate the likelihood of transit use, or transit propensity, of an area, corridor, or proposed transit route.

The RTA's Strategic Mobility Plan (SMP), published in 2017, developed a Transit Propensity Index (TPI), which was refined and expanded upon for the New Links project to create a quantitatively functional planning tool. The SMP's TPI was based on race and ethnicity, income, disability, and vehicle ownership and was developed in the following way:

- First, transit index factors were developed for each socioeconomic characteristic for employed people who are 16 and older. 1. These factors measure the likelihood to use transit relative to the region's general population.
- These factors were then applied to the total population in each Census block group, a statistical area with between 600 and 2. 3,000 residents. This yielded a transit propensity factor for each Block Group and produced an "adjusted" population density based on the population's transit propensity.
- Based on this adjusted population density, the study team analyzed the frequency of transit that each neighborhood could 3. support.

on Transit Cooperative Research Program Report 28: Transit Markets of the Future (TCRP 28). As part of the TCRP report, researchers calculated a transit use index for demographic and other characteristics in metropolitan areas across the country. Each characteristic was assigned a factor, which indexed the likelihood of transit use relative to the average rate of transit use for the United States. Groups with an index factor greater than one are considered more likely than average to use transit, while those with a factor less than one are less likely to use transit. The SMP project team updated the TCRP methodology using recent data for Jefferson, Orleans, St. Bernard, and St. Tammany Parishes, in order to tailor the index to actual, present-day transit use in the New Orleans region.

The New Links project team built further on the SMP methodology by refining the geographic level of analysis⁴ and adding employment data to the index. In addition to the adjusted residential density, the New Links TPI counts the number of low-, medium-, and high-income jobs (<\$1250/month, \$1250 - \$3333/ month, >\$3333/month) in area. These are then weighted to correspond to the weights of the equivalent income levels from the demographic index, multiplied by two. (This is in accordance with Table 1 and Table 2, which show that a given job density supports twice the transit frequency of an equivalent

The methodology used to create the index was based Table 5.1: TPI Demographic Factors

Category	Factor	Weight
	White (not Hispanic or Latino)	0.29
Race and	Black or African-American (Not Hispanic or Latino)	2.31
Ethnicity	Hispanic or Latino	1.33
_	Asian (Not Hispanic or Latino)	0.57
Vehicle	No Car	9.95
Ownership	One or More Cars	0.55
Disphility	With a Disability	1.27
Disability	Without a Disability	0.98
	Less than \$10,000	2.37
	\$10,000 - \$15,000	1.69
Annual	\$15,000 - \$25,000	1.59
Income	\$25,000 - \$35,000	0.78
	\$35,000 – \$50,000	0.55
	\$50,000 or Higher	0.30

Source for demographic factors: Nelson Nygaard (2017) RTA Strategic Mobility Plan.

⁴ In order to more precisely locate populations, the New Links TPI refined the SMP methodology to apply the demographic index factors to populations at the Census Block level, rather than Block Group. Additionally, within each Block, parcel data was used to exclude areas without buildings. See Appendix X for a detailed description of the methodology and sources for the block- and parcel-level weighting of TPI data.



residential density.) The final result is a single number that represents the likelihood for transit to be used in a given area.

Table 5.1 shows the transit index factors calculated for the New Orleans region. These factors illustrate the general trends described above. People of color have higher transit propensity than the general population. Residents without a vehicle are close to 10 times more likely to use transit than the general population. People with a disability are slightly more likely than the general population to use transit. Annual income is inversely related to transit propensity.

Area representations of transit propensity (for a given Census Block Group or neighborhood, for example) are very useful. However, they do not fully capture the physical requirements of operating transit service, or the realities of who can access that service. Transit service is restricted to the use of certain roadways, rail infrastructure,

Table 5.2: TPI Employment Factors

Employment Factors				
	<\$1,250 per month	3.87		
Jobs (salary)	\$1,250 – \$3,333 per month	2.00		
. ,.	> \$3,333 per month	0.72		

Table 6: Discount rates for TPI score based on distance

Walkshed Distance (within)	% of TPI Used	
¼ Mile	100%	
¼ Mile	50%	
¾ Mile	25%	
1 Mile	12.5%	

or waterways. For the purposes of planning, it is therefore more useful to represent transit propensity in the form of road segments along which transit vehicles could be routed.

The New Links project team examined all possible roads transit could feasibly be run on, excluding elevated and restricted access roads. The roads were divided into segments, and walksheds for each road segment were created for a ¼ mile, ¼ mile, ¾ mile, and 1-mile walking distances.

The transit propensity for a given corridor was calculated by summing the TPI-adjusted population and employment within each census block that could be reached in a ¼, ½, ¾, and 1-mile walk. A discount rate was applied to the propensity scores for each block based on which walkshed distance the area was located within. These rates can be found in Table 6.

The result of these calculations can be seen in Map 11. A corridor that has a higher Transit Propensity Index can support a higher level of transit service.







Travel Flows

Work Commutes

While the density and characteristics of residents and workers can provide a lot of information about how successful a transit line might be in a particular corridor, these are static measures. Transit is a dynamic system whose purpose it is to move people from place to place. If a system does not provide convenient connections between common origin-destination pairs, then it will be less useful for the people needing to make those connections.

The origin-destination intercept survey conducted for the New Links project (New Links OD Survey) provides valuable information about where current riders are coming from and going to on transit. For this survey, the project team asked transit riders for their trip origin, destination, and purpose, among other questions. The responses were then weighted to estimate the total number of weekday trips represented by that rider's response. Meanwhile the U.S. Census Bureau provides detailed information about work travel patterns for the population at large through the Longitudinal Employer Household Dynamics (LEHD) Origin-Destination Employment Statistics (LODES) datasets.

If we compare work trips made by all modes to work trips made by transit, we can see where there is travel demand that is not being met. There are many reasons why there might be higher or lower shares of people commuting by transit, including the propensity indicators discussed earlier. However, examining the connections that are most commonly made by transit can give some insight into which trips can be made more easily by transit, and which are more difficult or virtually impossible.

The chord diagrams on page 24 show the proportion of commuters traveling between areas within the region for work. The colored segments in the outside ring represent the different neighborhood analysis districts, and the chords connecting these represent home-to-work travel flows, with the chord taking on the color of the home location segment. Approximately 36% of total weighted trips recorded as part of the survey were between work and home.

The diagram on the left shows all commutes made by any mode by workers earning under \$40,000 per year, based on LODES primary jobs data. The diagram on the right shows the work trips made by transit, based on responses to the New Links OD Survey, weighted according to the survey methodology. While the full analysis examines travel patterns between 18 different neighborhood analysis areas, these are aggregated into just seven here in order to simplify the visualization (Map 12).





The first diagram (Figure 1) shows a spider web of travel flow chords, representing many disparate origin-destination pairs. In the second diagram (Figure 2) showing transit commutes, there are fewer thin lines and several more dominant flows that stand out, namely, workers traveling from various locations into the New Orleans CBD for work. The largest portion of these is made by commuters coming from the surrounding areas in East Bank New Orleans (Garden District/Central City, Uptown, Mid City, the Upper 9th, Gentilly, and Lakeview), but significant sums of commuters also travel on transit to the CBD from New Orleans East, Algiers, and the West Bank of Jefferson and Orleans Parishes.

Further comparison of the diagrams shows that trips made to and from Jefferson Parish make up a significant percentage of overall work trips, but a much smaller proportion of the trips made by transit. You can see this easily if you note that the segments of the outer ring devoted to Jefferson Parish locations make up about half of the LODES diagram, but less than a quarter (around 17% of trips) of the transit diagram. Conversely, Downtown, East Bank New Orleans, and (to a slightly lesser extent) New Orleans East all make up a larger percentage of the ring in the transit diagram, indicating that transit share is higher in those areas than the study area average. Given that the system is highly radial in nature, with more than 70% of service operated by the RTA and JET connecting to the CBD, it makes sense that a large proportion of transit trips would begin or end there.



Figure 1: Commute patterns for all commuters earning <\$40k per year

Figure 2: Commute patterns for commuters traveling by transit to and from work



Source: U.S. Census Bureau (2017) LODES.

Source: NORPC (2019). New Links Origin-Destination Survey.

Missed Connections - Regional

While there are significant numbers of transit commuters coming from the West Bank to East Bank New Orleans and Downtown, regional trips are generally under-represented in the Transit Commute diagram. Trips between the East Bank and West Bank of Jefferson Parish are virtually non-existent for transit riders.

As previously noted, commutes from New Orleans East are over-represented in the transit diagram. However, the trips taken by transit are mainly to the CBD, East Bank New Orleans, or within New Orleans East, while the commutes made by all modes are much more spread out over the region. Since transit use and propensity indicators are both high in New Orleans East, there is likely latent demand for travel to other destinations. There are multiple routes connecting New Orleans East to downtown and central New Orleans, but most routes terminate there, and riders must transfer to reach any other place in the region. As a result, transit share falls off dramatically for more regional trips. Figure 3 shows where the largest disparities are. The top bar shows the distribution of commute destinations for all commuters, and the bottom bar shows destinations for those commuting on transit. Notice that trips to Jefferson Parish make up 30% of work trips from New Orleans East, but make up just under 8% of work trips made by transit.



Figure 3: Work destinations for New Orleans East residents commuting by all modes (top) and by transit (bottom). Percentages represent the proportion of total trips made to that location.



Sources: U.S. Census Bureau (2017), LODES; New Links Origin Destination Survey (2019).

The lack of regional travel via transit is not surprising given the lack of regional routes. However, the existence of regional commute patterns being made by other modes indicates that if there were more routes that connected regional job centers without stopping in downtown New Orleans, transit might become an option for more commuters. It would also open up more job possibilities for low-income residents.

Figure 4, below, provides a similar breakdown, but for commuters from all neighborhoods. A similar pattern can be seen to the commute patterns for those living in New Orleans East. Just 19% of work commutes are to Downtown New Orleans, but 48% of commutes made by transit terminate there.





Sources: U.S. Census Bureau (2017). LODES; NORPC (2019). New Links Origin Destination Survey.

Missed Connections - Local

In addition to the lack of regional commutes made by transit, there also appear to be very few transit trips made between locations within Jefferson Parish. There are significant LODES flows within the East Bank of Jefferson Parish; about half of the jobs in Metairie, Kenner and Jefferson are held by residents of those areas, and a quarter are held by New Orleans residents. However, New Orleanians make up about half of transit commuters. This tracks with the ACS data, which show that only about one percent of workers living in Jefferson Parish commute to work by transit. Given the indicators of transit propensity along the I-10 and Veterans corridors, it's likely that increased transit service in those areas could be supported by the surrounding jobs and residents.





It's also notable that no transit trips are visible between the Jefferson and Orleans portions of the West bank even though these locations are geographically close to each other and the thin yellow and red lines connecting that pair of locations on the LODES diagram indicates that there is demand. Inter-parish trips on the West Bank are exceedingly inconvenient due to the lack of connection between JeT and RTA routes on the West Bank – most RTA buses do not stop at Wilty Terminal, JeT's primary transfer center on the West Bank. Most of the time, the fastest route involves crossing the Crescent City Connection bridge and transferring to another bus in the CBD. Thus, a 15-minute car trip can easily take 2 hours via transit.

Educational Commutes

Colleges and Universities

Colleges and Universities, especially public and non-residential community colleges whose students commute from around the region, may serve as special generators of transit demand that would not show up if we only looked at population and job distribution. Map 14 shows all of the colleges and universities in the Study Area, symbolized by total enrollment. Most of these institutions are located near some transit, but some, such as Nunez, Southern, and Delgado-West Bank, are served only by infrequent routes, and may present opportunities for stronger partnerships with the RTA. Additionally, Delgado's River City Campus is not accessible by any transit.



The RTA, in partnership with the University of New Orleans Transportation Institute, has compiled data on the home locations and destination campuses of students commuting to UNO, Dillard, Delgado, and Nunez campuses. Student addresses indicate that there is significant cross-parish travel for all of these campuses.

The City Park Campus of Delgado Community College has the highest enrollment of any higher education institution, with almost 10,000 students. Home address data show that students are traveling to the City Park campus from all over the region, including many from Jefferson Parish, New Orleans East, and the West Bank. Delgado's West Bank campus in Algiers also has about 2500 students attending. Many of those students live on the West Bank, on both sides of the Harvey Canal. As noted in the travel flows section, traveling by transit between Orleans and Jefferson Parish on the West Bank is not convenient.

Primary and Secondary Schools

Depending on the circumstances, public primary and secondary schools can also serve as transit generators. Due to the charter school system that has been in place in New Orleans since Hurricane Katrina, students can travel anywhere within Orleans Parish to attend school. The average distance that students travel to school increased from 1.9 miles before Katrina, to 3.4 miles in 2012⁵. Eighty Six percent of students do not attend the school nearest to their home. Schools must provide transportation for children below seventh grade, and many schools spend a significant amount of money (\$500-\$1000 per student) transporting students all the way through high school. However, some schools do not provide bus service, and there may be opportunities for collaboration between RTA and secondary schools in the region. Map 14 shows that Elementary and High Schools are spread out relatively evenly throughout the parish. Much like jobs, those in Uptown and in Mid City are accessible by transit, but those further from the city center are served only by infrequent transit, if any.







Other Considerations

In addition to the characteristics discussed above, which are factored into the TPI based on correlation with transit use, there are several other supplementary variables available from the Census Bureau that the project team is tracking (Table 7). While these additional characteristics are not part of the Transit Propensity Index, they provide valuable information about the service area and are important to consider when planning new routes or making changes to existing service. Data on receipt of cash public assistance or food stamps, limited English households, and Internet access may influence the placement of coverage routes or indicate areas of need that are not large enough or dense enough to have a high transit propensity. Data on Means of Transportation to Work provide additional information on the functioning of the current system, and enhance the findings of other elements of the Market and Needs Assessment.

Table 7: Supplementary Variables

Analysis Area	Households receiving cash public assistance or food stamps	Limited English Households 	Population with no internet access (including smartphones)	Means of transportation to work - public transit	Means of transportation to work - bike or walk
Orleans Parish Total	19%	2.3%	26%	7.5%	8.2%
Jefferson Parish Total	13%	5.4%	20%	1.1%	1.8%
St. Bernard Parish	17%	1.5%	22%	1.2%	1.3%
Total Study Area	16%	3.8%	23%	3.9%	4.6%
Downtown (CBD/FQ)	7%	1.9%	19%	1.6%	35.5%
Algiers	19%	2.8%	29%	6.5%	2.5%
Garden Dist - Central City	16%	1.7%	23%	8.9%	11.1%
Gentilly	20%	0.7%	22%	8.2%	2.9%
Lakeview	1%	0.8%	6%	0.9%	0.2%
Lower 9th Ward	33%	0.2%	42%	8.0%	3.9%
Mid City - 7th Ward	21%	2.8%	34%	10.4%	13.5%
New Orleans East	28%	3.4%	29%	7.4%	1.4%
Upper 9th Ward	26%	1.9%	31%	8.9%	11.4%
Uptown	12%	2.3%	21%	7.0%	14.2%
Elmwood - Harahan	6%	1.2%	13%	0.5%	0.6%
Gretna - Harvey	15%	7.1%	22%	1.6%	1.9%
Jefferson	12%	3.2%	27%	2.8%	3.3%
Kenner	14%	7.2%	24%	1.0%	2.0%
Marrero - Westwego	19%	3.6%	21%	1.6%	0.8%
Metairie East	7%	5.6%	16%	0.8%	3.0%
Metairie West	10%	6.2%	18%	0.4%	2.1%
St. Bernard Parish	17%	1.5%	22%	1.2%	1.3%

Source: U.S. Census Bureau (2018). 2014-2018 ACS 5-yr estimates.





Limited English Proficiency

The agency must ensure that transit is understandable and accessible to foreign-language speaking populations, and as part of Title VI, changes to the system must be screened for disparate impact on communities with limited English proficiency. There are sizable Spanish-speaking and Vietnamese-speaking populations in the New Orleans region (Map 15) especially in Kenner, New Orleans East, and the West Bank of Jefferson Parish.

Internet Access

The Census Bureau provides estimates on the number of people without access to any Internet in their households, including smart phones. Approximately 23% of the population (26% in Orleans Parish and 20% in Jefferson Parish) lives in households without Internet access. The Lower 9th Ward has the highest proportion, at 42%. It is essential to be aware of this widespread lack of Internet access in all phases and areas of planning, from public outreach strategies to fare media technology, to minimize barriers to access for low-income and elderly populations who rely on transit.



Means Of Transportation to Work

While the TPI provides a data-driven approach to identifying and predicting strong transit markets, Census data on Means of Transportation to Work tell us something about where residents are currently using existing transit. According to 2014-2018 ACS estimates, 7.5% of Orleans Parish residents who commute to work do so by transit. The Mid City - 7th Ward district has the highest rate of transit commuters, at over 10%. The Garden District and Central City, Gentilly, and the Upper and Lower 9th Ward all have greater than 8% transit commute mode-share. Lakeview has the lowest transit share in Orleans Parish, and the lowest share of people walking and biking to work in the region. The CBD and French Quarter have a low transit share, but over 35% of commuters walk or bike to work, suggesting that many people who live Downtown also work in the vicinity.

The share taking transit is much lower in Jefferson and St. Bernard Parish, with just over 1% of commuters using public transit. Most workers drive alone to work, although Orleans Parish also sees a relatively high portion (8.2%) of people walking or biking to work.

