

**Better
Bus
Project**

Final Better Bus Network and Resilience Plan

For Miami-Dade County and Transit Alliance

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TransitAlliance

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1 Introduction & Executive Summary

Better Buses Through Community Conversation

Beginning in April 2019, Transit Alliance and Miami-Dade County began a conversation with stakeholders, riders, community members and elected officials about whether and how to revise the county’s bus network, to make it useful for more people to go to more places all over the county.

The county’s fleet of over 750 buses serves two out of every three transit trips in Miami. While Metrorail is a key part of the county’s transit network, buses are the most flexible component of a transit system and have the highest potential for immediate improvement. **If Miami-Dade wants to improve access to opportunity by transit quickly, changing the bus network is the fastest way to make a difference.**

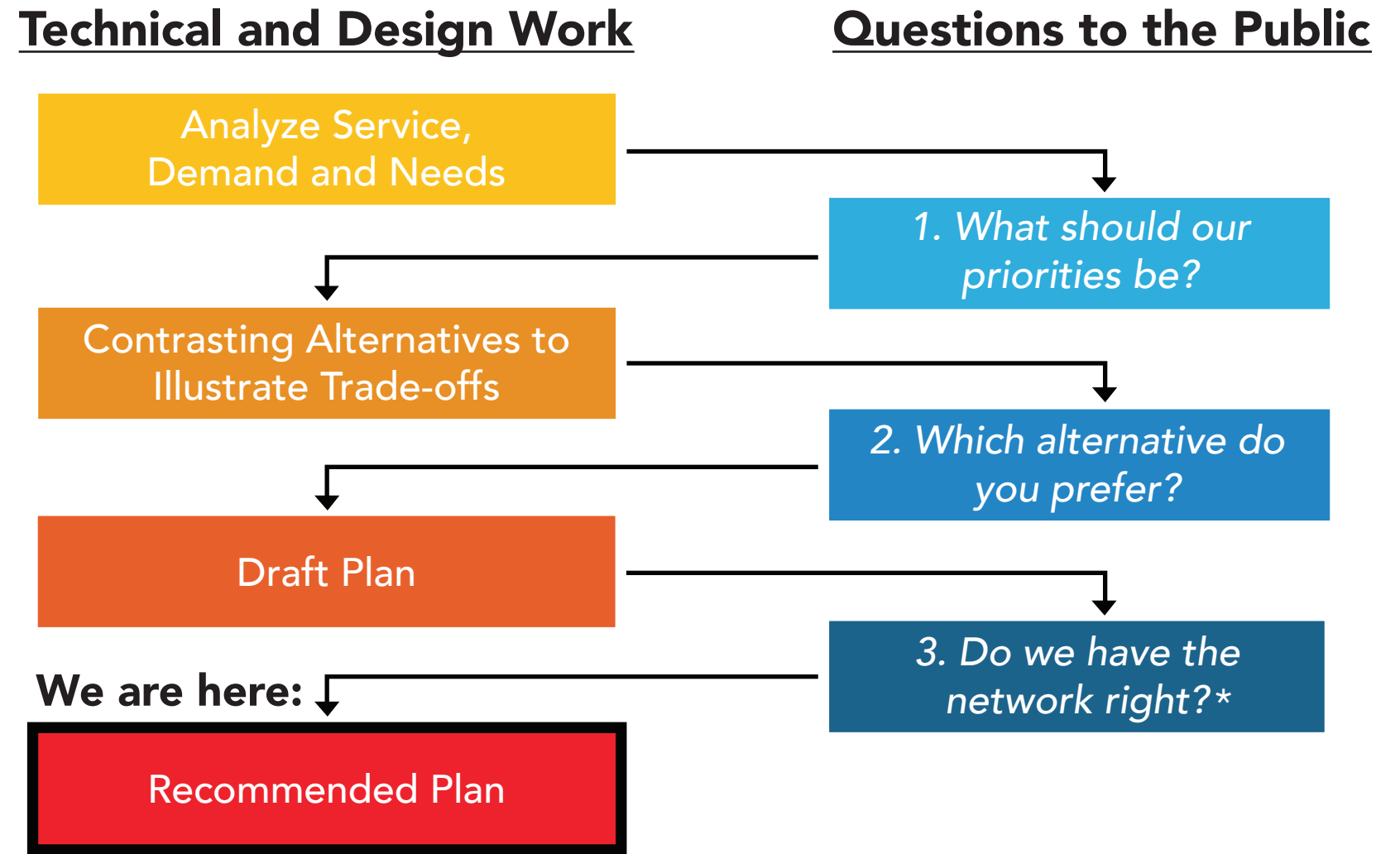
The Miami-Dade bus network has not been thoroughly re-thought for decades. In that time, ridership has risen and declined, investment in service has risen, dropped, and risen again. Through all of this, much of the network structure has not changed substantially, and many of its features do not seem to be serving the county and its residents well. The Better Bus Network project was designed to bring the network up to date to best serve the county as it is now.

This report presents two key conclusions of this work.

- The **Recommended Better Bus Network** is the recommended network design that arose from the year-long planning and public conversation process. If the County can fund the level of service it was operating before the pandemic, this is the network it should operate.
- The **Resilience Plan** addresses what to do if the pandemic, and related changes in the economy, prevent the County from returning to the pre-pandemic level of service. The Resilience Plan sorts the Recommended Network into tiers of priority, specifying what services must be retained if service reductions turn out to be financially unavoidable.

This project is not just a technical analysis. The plan has been forged through an extensive public discussion, in three major cycles. In each cycle we asked people to think about what they would do if they were in the transit agency’s shoes. What would their priorities be, if they had to make the decisions that the County has to make? The public’s answers to those questions, as well as their detailed comments, steered the plan at every stage.

Figure 1: The study process was a conversation between technical work and public input.



*Due to the Covid-19 pandemic, opportunities for public engagement were limited in the final phase. Prior to implementation, the County’s public hearing process should be used as the final opportunity for residents to offer feedback on the recommended network.

Transit Alliance staff engaged more than 2,800 people in person, received more than 5,000 survey responses, and had more than 1,700 text conversations during the Better Bus Project.

Buses Are Essential for Miami-Dade

Public transit is essential to a place the size and density of Miami-Dade, because there is simply not enough room for everyone's car on the road, and ever larger parking garages are extremely expensive. Like most dense places, many parts of Miami-Dade presents features that make transit essential, and require that it be highly efficient.

- **Severe road space limitations:** Across much of the core of Miami-Dade, especially in the cities of Miami, Miami Beach, and Coral Gables, the road-width is fixed and will never be wider. Efforts at widening roads or creating double-decker highways in built-up areas are extremely costly, frequently destructive, and counterproductive. Curb space is also limited and cannot be readily expanded.
- **Intensification of land use:** In response to growing demands for housing and commercial space, both central and outlying areas are growing more dense. More and more people are living within the same limited area. Thus the space limitations are only going to get more severe.

Figure 2 shows that buses and bikes use exponentially less space than cars. Even autonomous cars will not change this basic geometric challenge, as they take up almost the same amount of space as today's cars and even carrying three to four persons per car, they cannot be anywhere near as space efficient as buses or bicycles.

The only alternative to congestion is for a larger share of the public to rely on public transit and other alternative modes that carry many people in few vehicles. This requires services that most efficiently respond to the city's changing needs, as well as corridor improvements to give buses a level of priority over cars that reflect the vastly larger numbers of people on each bus.

Rail transit can do some of this, but is costly and can take a long time to build. Rethinking our bus network is a solution that can be implemented quickly and is relevant all over the county.

In addition to the use of space, of course, transit serves an essential function in providing transport to people who cannot drive, for a wide range of reasons. Those reasons can include low income, disability, and age, among other things. A good transit system includes all of these people in the society, and the economy.

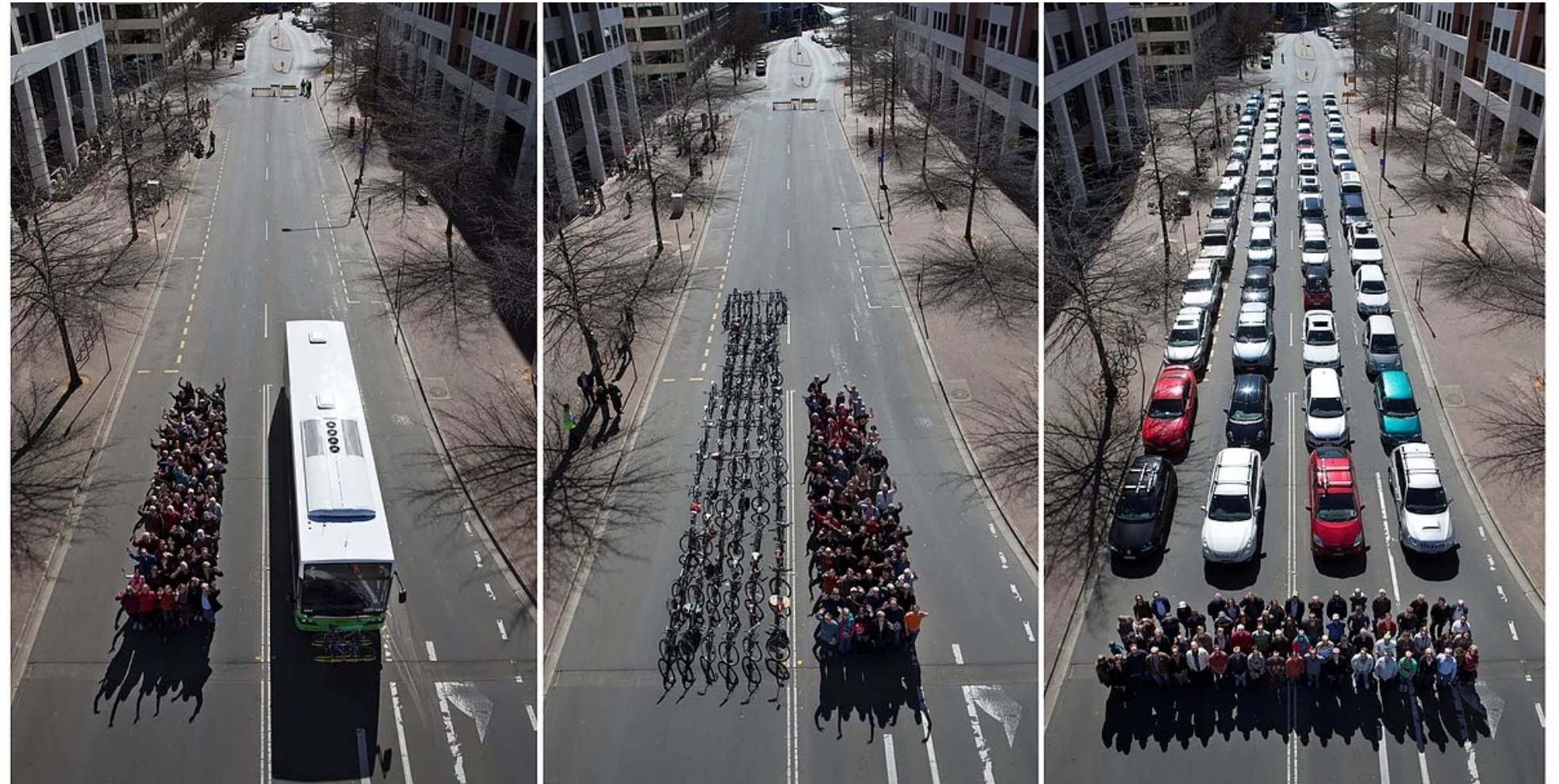


Figure 2: The road space required to move the same number of people using public transit, bicycles, and cars.

Photo copyright We Ride Australia

Transit and bikes are two of the most space-efficient modes and are essential in dense places, where there is very little road space per person.

Transit's Product: Access to Opportunity

What is Access?

The core goal of the Better Bus Network is to help more people get to more places, in the limited amount of time that they have. Figure 3 shows how we calculate this.

What Access Achieves

When we expand access for as many people as possible, we achieve many important things:

- We **make service more useful** for the trips people are already making and for many other trips that people might want to make by transit. When transit is more useful, more people use it.
- We **increase ridership potential**, as a result of service being more useful.
- We increase transit's potential to help with **pollution** and **congestion**. Ridership is the key to how transit achieves these things, and improving access is the path to ridership.
- We **expand access to opportunity** (jobs, education, shopping, services) for people who need transit for that purpose.
- We **increase the economic attractiveness** of the urban area. Connecting people with opportunities is the whole point of cities, so improving those connections makes any city more effective.

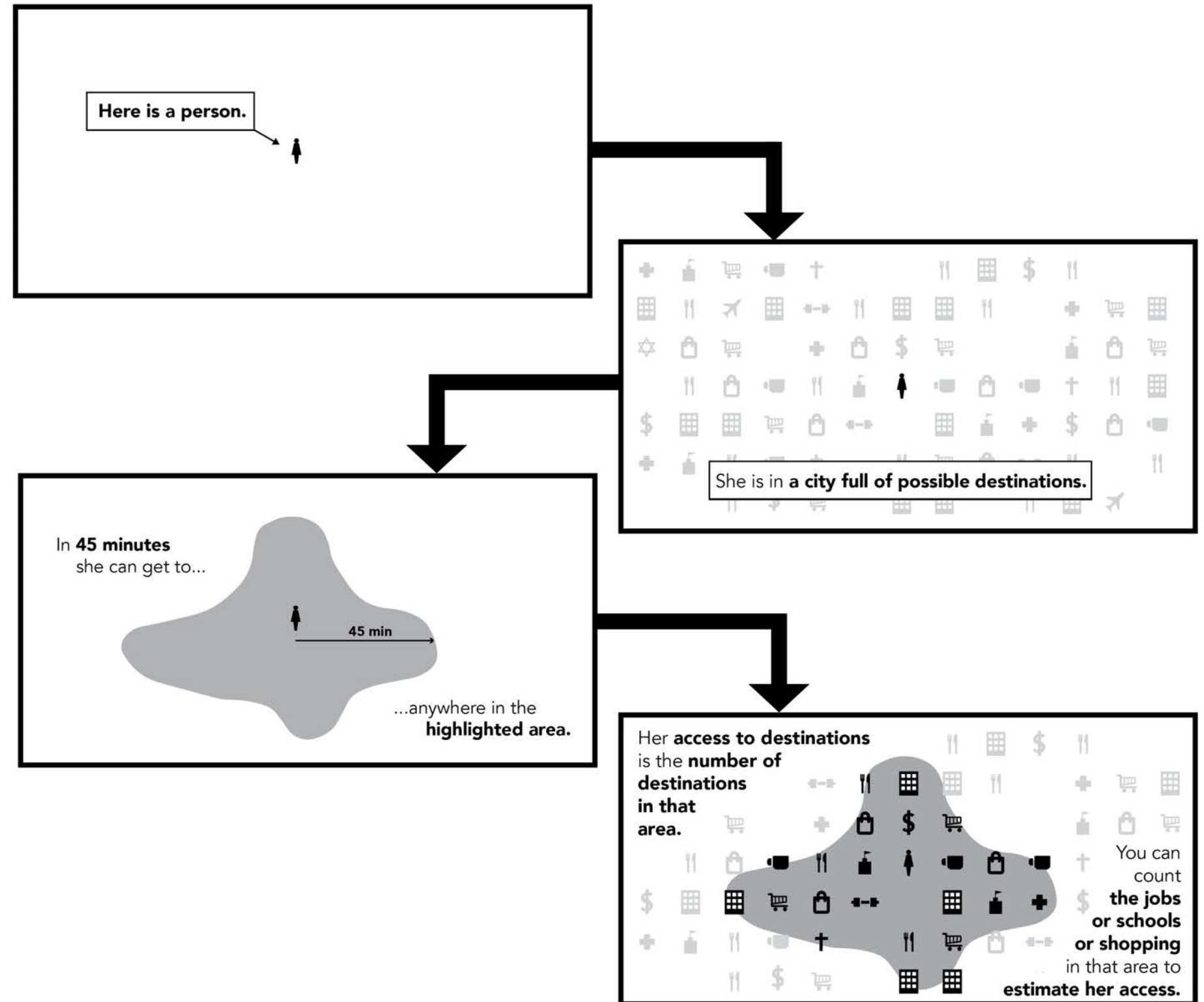
That's why the Better Bus Network looks as it does.

The Better Bus Network increases access to jobs and opportunities for most people and places in Miami-Dade. The average Miami-Dade resident could reach nearly 40,000 more jobs, a 31% increase over today's network.

Finally, the network is also designed to achieve access **equitably**. Low-income people and people of color each experience, on average, a 32% increase in access, as opposed to 31% for the whole population.

Figure 3: How transit service creates access to opportunity.

WHAT IS ACCESS?



How the Plan Expands Access

Frequency is Freedom

Transit travel time has three elements: **walking**, **waiting**, and **riding**. If a trip requires changing buses, the steps may be repeated. When we talk about how far you can go in a particular amount of time, we are counting all parts of the trip, from the time you leave home to the time you reach a destination.

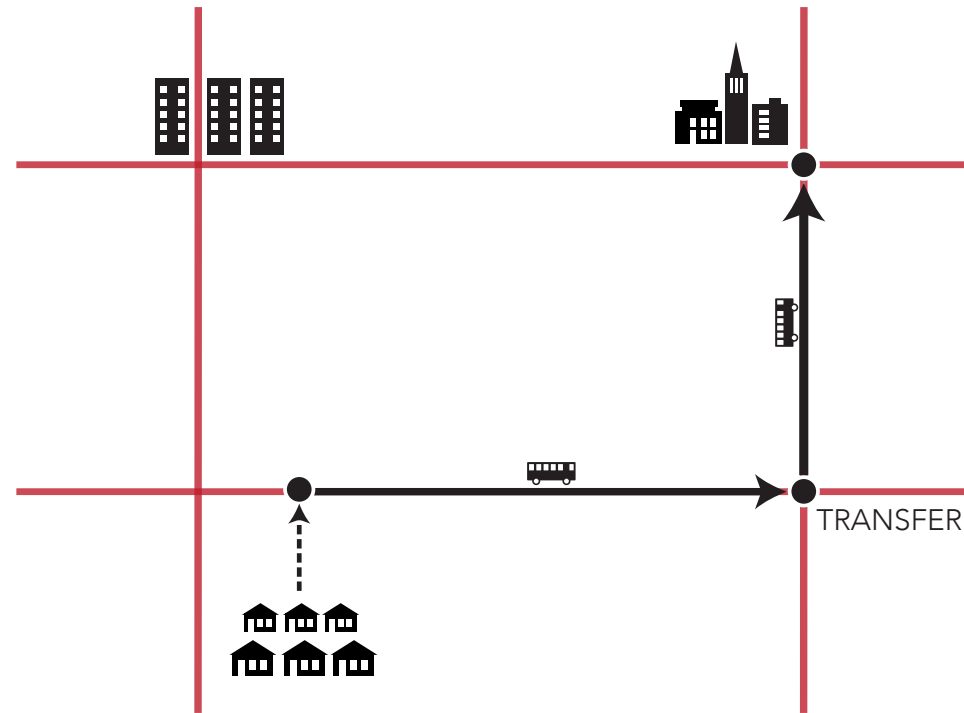
Waiting is often the most onerous part of a transit trip. Some people can wait for an infrequent bus at home or in a cafe, but for everyone, waiting is time spent not where you want to be. For some riders, waiting may involve being in a place where they don't feel safe, or exposed to severe weather.

The solution to the problem of waiting is frequency. Frequency—the amount of time between one bus and the next on a route—is a dominant factor in determining travel time, so it's a core focus of any plan that tries to expand where people can go in a reasonable time.

Frequency does three good things:

- It **reduces waiting**, the most onerous part of a transit trip.
- It **makes it easy to transfer**, from one route to another, so that you can go all over the network instead of just to other places on the route you live on.
- It **improves reliability**. (If a bus breaks down, the next will be along soon.)

Figure 4: In a frequent grid pattern of bus lines (red) any trip can be made with only one transfer, such as the one in black. This makes frequent grids a powerful tool for a network that must connect homes to many destinations, not just to one downtown.



without checking a schedule or making an advanced plan. However, they depend on high frequency, because they depend on transfers. Only five Miami-Dade Transit routes are every 15 minutes or better all-day.

The Better Bus Network would dramatically simplify the County bus network, expanding a frequent grid across the densest parts of the county. The maps in Figure 5 show snippets of the Existing and Better Bus Networks and show how much simpler the Better Bus Network is and how many more frequent routes would be provided. Full maps appear later in this summary, with more detail in Chapter 2, starting on page 18.

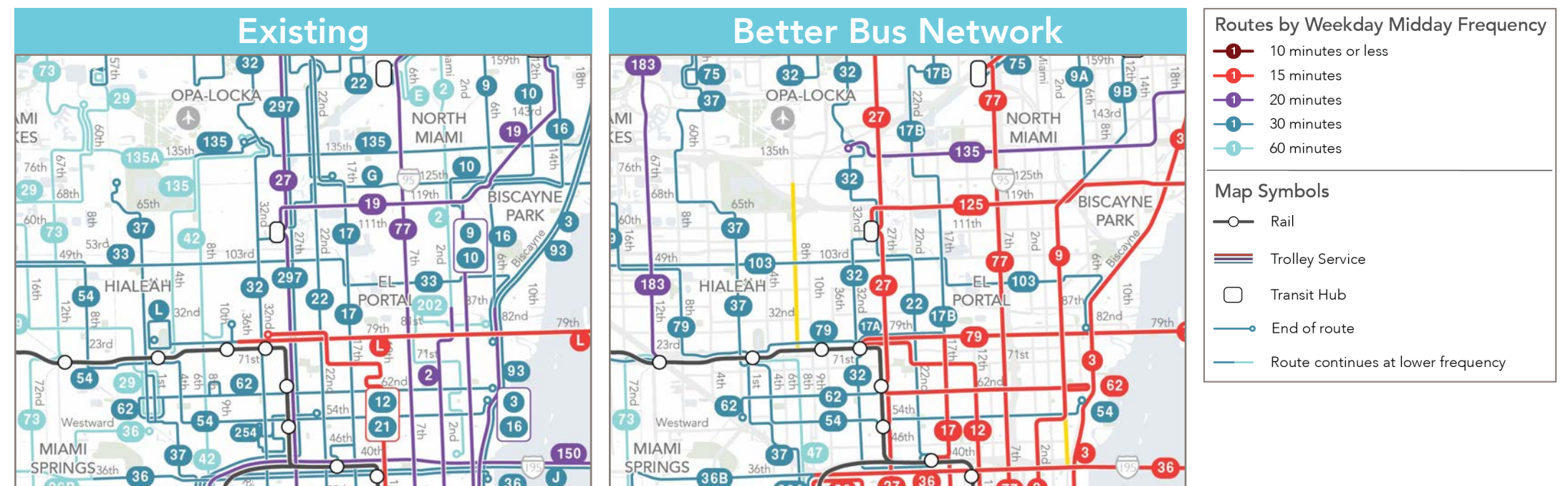
The Power of the Frequent Grid

If you want to maximize access across an area where there many destinations, not just one downtown, the most effective form is a frequent grid (Figure 4). In this pattern, frequent north-south lines intersect frequent east-west lines. Each place where they cross, it's easy to make connections to go many different directions, which makes it easy for anyone to get to more places quickly.

While Miami-Dade has a network that is mostly designed as a grid, it lacks the frequency to create easy and reliable connections between the grid routes. Thus, making connection between grid routes requires long and uncertain transfers.

In cities with many centers (such as LA, Chicago or Houston) a frequent grid allows people to travel from-anywhere to-anywhere with a single fast transfer. A frequent grid offers the simplicity and reliability of a street network—you can use it just about anytime,

Figure 5: Comparison of the Existing Network and Better Bus Network in northern parts of Miami-Dade. Service every 15 minutes or better is in red.



The Ridership-Coverage Trade-off

Within a limited budget, MDT must make difficult choices between competing goals that people care about. These kinds of decisions should not be the result of a consultant's recommendation. Instead, our role has been to lay out the choices and encourage public discussion of them. Figure 6 illustrates the problem.

A network designed to a goal of **ridership** will maximize access to destinations for the *average* resident, as this maximizes the chance that transit will be useful for any particular trips. It does this by providing high frequency service in areas where there are many people and jobs to benefit from it. But it does not go everywhere or serve everyone. Some people who need transit will not be served, because they live in places that are too hard for efficient transit to reach. These problems are typically:

- Low Density. There are few people to benefit from each transit stop.
- Low Walkability. It's too hard for many people to walk to the transit stop, which further limits who finds it useful.
- Poor Linearity. The street pattern doesn't let the bus run in an efficient straight line.
- Poor Proximity. Service must cross a large, low-demand gap to reach a destination.

So should transit go to those places anyway even though they are providing access to relatively few people, and low ridership will be the result?

If so, you want a **coverage** goal. A coverage goal starts with a commitment to going almost everywhere, so that almost everyone has a little service.

Some transit goals are served by focusing on high ridership. For example, the environmental benefits of transit only arise from many people riding the bus rather than driving. Subsidy per rider is lower when ridership is maximized. We call such goals "ridership goals" because they are achieved through high ridership.

Other goals are served by the mere presence of transit. A bus route may provide important lifeline service, even if few people ride it. A route may fulfill political or social obligations, for example by getting service close to every taxpayer or into every political district. We call these types of goals "coverage goals" because they are achieved by covering geographic areas with service, regardless of ridership.

How should we balance these competing goals? Which should be more important? That's the most important question we asked in our extensive public conversation.

Figure 6: Fictional Example of the Ridership-Coverage Trade-off

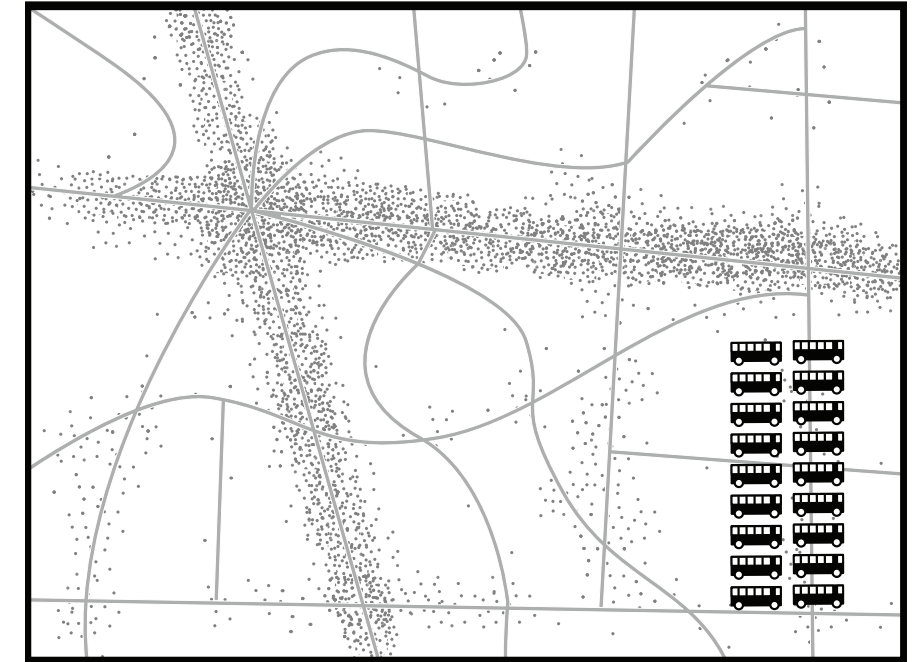
Here's a simple fictional town.

The dots are people and jobs. Dots close together mean high density.

Suppose you can afford to run 18 buses.

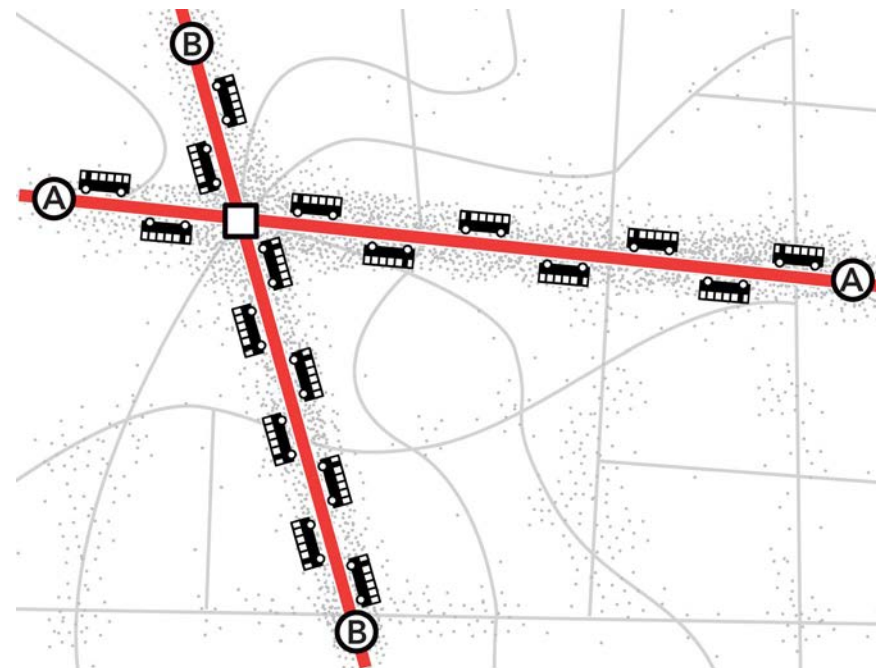
What should the network design be?

It depends on what the goal is!



Ridership Goal

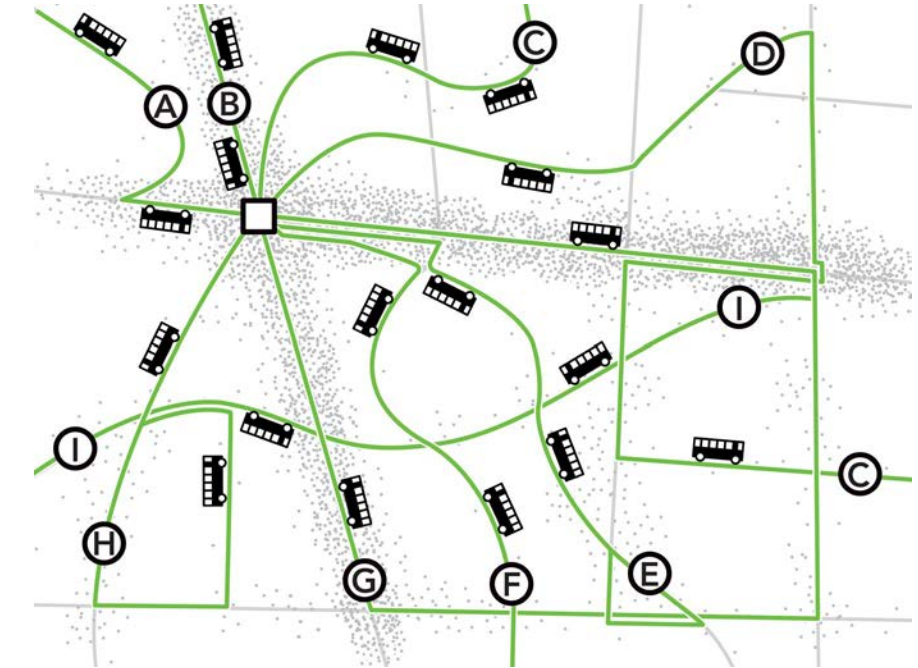
"Useful service for most people."



This option provides excellent access to *most* people, but not everyone. It does this by concentrating frequency where there are the most people and destinations to benefit from it. This is the higher ridership option, because it offers so much access to the people it serves.

Coverage Goal

"Some service for everyone."



This network is designed to provide some service to everyone. The transit agency has divided its resources among many routes, none very frequent, but everyone has some minimal service nearby. Because the resource is spread so thin, frequency is low. Waits are long, so people don't have much access to destinations in a reasonable time. Ridership will be low because few people will find this infrequent service useful.

How Was this Plan Developed?

A network redesign must fuse knowledge with values. Knowledge includes data about the community and the expertise of transit professionals. Values come only from the community. The Better Bus Project has been engaging with and surveying the community and decision-makers about the values and goals that transit should prioritize. Figure 7 describes the three major phases of the Better Bus Project: Evaluation, Concepts, and Final Network.

Phase 1: Evaluation

In Phase 1 of the Better Bus Project, we released the [Choices Report](#) that laid out relevant facts about transit and development in Miami-Dade, and drew the reader’s attention to difficult choices that these facts force us to consider.

During this first of three phases of engagement, the study team:

- held a Priorities Workshop with over 50 representatives of key groups;
- presented to the Miami-Dade Commission and numerous community groups;
- met with bus operators at three Miami-Dade Transit garages;
- produced a series of online [videos](#) explaining key trade-offs; and
- surveyed the public and existing riders (in English, Spanish, and Creole) online and in person on the bus.

In the first round of public engagement for the Better Bus Project, we asked three key questions around the Ridership-Coverage trade-off.

- Would you rather have a longer walk for a shorter wait, or a shorter walk with a longer wait?
 - **Most respondents favor shorter waits, even if it means longer walks—and these are usually the results of Ridership goals.**
- Should we remove buses on the least popular routes to increase service on the most crowded routes?
 - **Respondents were split over whether to shift resources away from low productivity routes towards high productivity routes, which is a method to achieving Ridership goals.**
- Should we run more buses where we have the most bus riders in Miami-Dade County and less service everywhere else?
 - **A majority respondents (see Figure 8) favored shifting service to focus transit on denser areas, which is a method to achieving Ridership goals.**

Evaluation phase input suggested that Miami-Dade residents wanted a more ridership focused bus network. Thus, the Better Bus Project team developed concepts for Phase 2 to help the public better understand what that would mean.

Should we run more buses where we have the most bus riders in Miami-Dade County, and less service everywhere else?

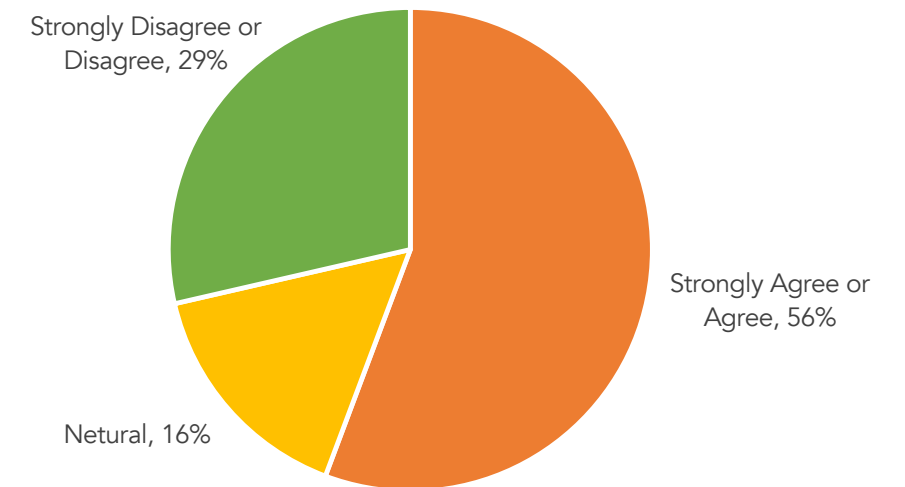


Figure 8: Responses to shifting resources to highest density areas

Most survey respondents said that Miami-Dade should run more buses in areas with the most bus riders—dense and busy places.

PHASE 1	PHASE 2	PHASE 3
<h3>Evaluation</h3> <p>June – August</p> <p>We evaluated the current bus system and released the Choices Report.</p> <p>We surveyed riders across the bus system on the key choices that will help determine the design of the new bus network.</p>	<h3>Concepts</h3> <p>September – November</p> <p>We have released two different network concepts for discussion and debate.</p> <p>Take our survey, attend a workshop, or connect with us to shape the final network plan.</p>	<h3>Final Network</h3> <p>December – May</p> <p>The draft new network is being finalized and will be released at the end of February.</p> <p>Stay tuned for the results from our concepts survey, our upcoming presentation schedule, and the final network report.</p>

Figure 7: This Final Better Bus Network Report is part of Phase 3 of the Project

Engagement on Concepts

In Phase 2, we released the [Concepts Report](#). This report raised four key questions for the public to consider and showed two contrasting concepts, the Ridership and Coverage Concepts, to help people understand the outcomes of different choices.

We asked the public and riders about these two concepts, and specifically about four key value choices and design solutions (described further in Figure 9):

- How Much Change?
- Should the network emphasize Ridership or Coverage Goals?
- Whether and how to change trolley services?
- How far apart should bus stops be?

The table to the right shows the four big questions at the center of the Concepts phase of the Better Bus Project, the pros and cons of those questions, and how the public responded.

During the Concepts Phase of engagement, the study team held 108 public events from August 26 to December 12, 2019, including the following engagement opportunities:

- held a Priorities Workshop with over 50 representatives of key groups;
- presented to the Miami-Dade Commission and 16 municipalities;
- held 21 portable workshop at major bus transfer locations;
- met with residents and presented at 37 community meetings.

In all, the study team reached over 2,600 people in person during these community outreach events in the Concepts Phase.

Additionally, the study team engaged with the bus operators and TWU Local 291 leadership to get input from those who operate most transit on the street. Two presentations were held at each of the three bus garages:

- Central Garage on August 12 and October 4
- Northeast Garage on August 13 and September 20
- Coral Way Garage on August 14 and September 13

The study team used many other tools to broaden the overall outreach and get input from across the community. Ads were deployed in all County buses, City of Miami trolleys and Miami Beach trolleys linking to the Concepts Survey and directing people to a text message line where riders can voice concerns and ask questions. Over 4,200 text messages were exchanged in more than 1,000 conversations.

Figure 9: Table of the Key Questions at the Concepts Phase

The Big Questions	The issues	Possible solutions	Downsides	The questions	How did the public respond?
1. How Much Change?	The network design is old, and may not be the best way to serve the Miami-Dade County of today, or tomorrow.	We could redesign the network to reflect today's needs and priorities, BUT many people are used to the service as it is, and will complain if we change anything.	Should we consider changing the network at all? By how much?	84% of respondents agreed that MDT should change the bus system so people can get more places more quickly.
2. Ridership or Coverage?	Designing a transit system requires choosing between different goals that are both popular.	If we planned the network for higher ridership, it would be useful to more people for more purposes, BUT ...	it would have to focus on places with lots of people and jobs, so it wouldn't go absolutely everywhere, or serve absolutely everyone.	How do we balance the competing goals of ridership (attract more riders by being useful to more people) and coverage (get a little bit of service to everyone)?	59% of respondents preferred the Ridership Concept. 26% preferred the Coverage Concept.
3. Rethink the Trolleys?	City trolleys have not been designed to work together with county buses. Sometimes a trolley and a county bus compete along the same street.	We could have more useful service if the trolleys and county buses worked together and did different things.	Trolley routes are the result of a community-driven process. They are controlled by cities, not the county, and they have different fares and vehicles.	Is it worthwhile to consider redesigning the trolleys and county routes together, to get the most possible transit service for everyone?	74% of respondents agreed that the county bus network and city trolleys should be designed together so people can get more places more quickly.
4. Move stops farther apart?	Bus stops are often very close together, which makes service very slow.	If we space stops every 1,000–1,300 feet, people may walk a little further but they reach destinations sooner, because the buses run faster.	Some people have physical limitations on walking. Some places are unpleasant to walk in, especially in summer.	Should we move stops a little further apart?	72% of respondents said that bus stops should be at least ¼ mile apart.

The online survey was the primary tool for gathering input on the four key questions. Over 2,000 people responded to the online survey providing direction on where the community wants transit to go in the future.

More than 2,600 people were engaged in person, over 1,000 by text message, and more than 2,000 responded to the Concepts Survey.

High Desire for Change

The first key question to the public in the Concepts Phase was whether we should make big changes at all. The Coverage and Ridership Concepts both contrasted substantially with the Existing Network because both made major changes to both the MDT network and trolley systems. Thus, a basic question to the public was whether it is worth making such a big change.

Both the Coverage and Ridership Concepts would change the network significantly to increase the freedom and access people have by transit, but many people are used to the service as it is, and will complain if we change anything. Thus, the study team asked: **Should we consider changing the network at all? By how much?**

What did the public say?

After seeing the Concepts on page 10 and their outcomes, **84% of people agreed that we should change the bus system so more people can get to more places more quickly.** Less than 10% of respondents disagreed and 6% were neutral (see Figure 10).

Figure 10: Most respondent said we should change the bus network.

Should we change the bus system so more people can get to more places more quickly?

84% Agree



Figure 11: Study team staff engaged the community through presentations, stationary workshops, and portable workshops.



A Preference for the Ridership Goal

The second key question in the Concepts Phase was **Ridership or Coverage?** The County has limited resources for transit that need to be used strategically. There is a spectrum of choices about how to use those resources:

- They can be **concentrated** in the county's densest and most walkable areas to provide high frequency service to large numbers of people.
- They can be **spread out** throughout the county to reach more people but with service that is infrequent, and thus less people find it useful.

In the Concepts Phase, two networks were developed to illustrate the spectrum of possible ways to redesign the bus network. The figures below show the trade-offs between these networks. The Coverage Concept kept service near everyone that has service today. The Ridership Concept provided much higher frequency along the County's strongest corridors, but some people in lower density areas would lose bus service.

By showing the public, stakeholders, and decision-makers the range of possibilities, the Better Bus Project asked: "Now that you see the outcomes of emphasizing one goal over another, how do you balance the Ridership and Coverage goals? In other words, if you want better service, what is your definition of better?"

What did the public say?

When asked which of the network concepts they preferred, **59% of respondents preferred the Ridership Concept**, while 26% preferred the Coverage Concept and 19% were neutral. This suggests a general but not overwhelming preference for the Ridership Concept. Many respondents who indicated they were neutral specifically asked for more coverage, particularly in South Dade.

Many stakeholders and elected officials also expressed concern about cutting coverage in unincorporated parts of Miami-Dade County. Since municipalities are eligible to receive portions of the half penny sales tax funding to support trolley services within their boundaries, a reduction in coverage in a municipality is likely to be less severe than a reduction in coverage in unincorporated Miami-Dade. Thus, the project team was instructed to maintain current coverage levels in unincorporated Miami-Dade in designing the Better Bus Network.

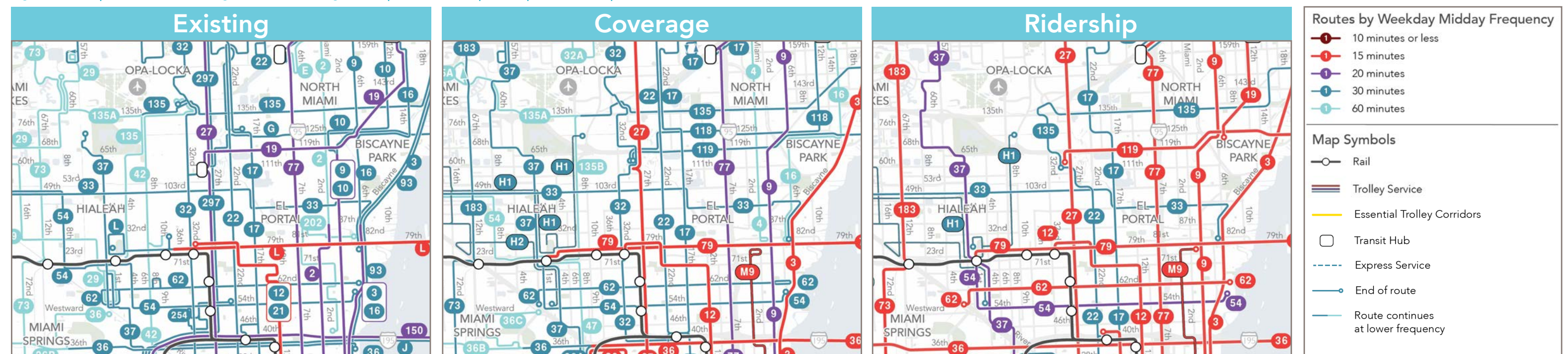
Figure 13: Most respondents preferred the Ridership Concept.

Which network concept do you prefer?

59% Chose Ridership



Figure 12: Comparison of the Existing Network, Coverage Concept, and Ridership Concept in northern parts of Miami-Dade



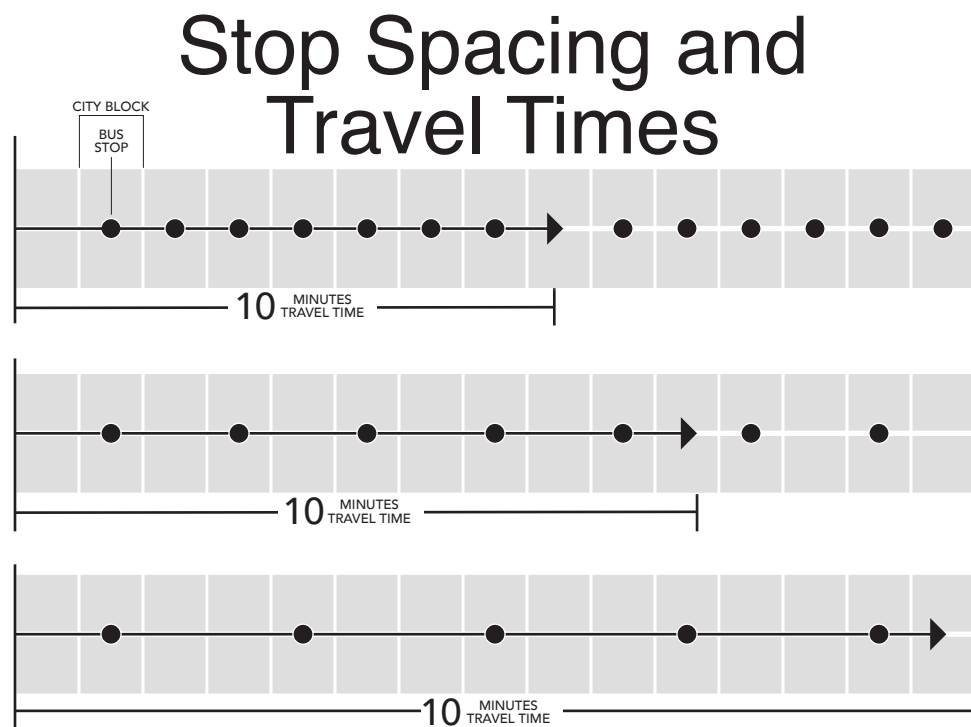
Most Prefer Wider Stop Spacing

On most local routes in Miami-Dade, stops are about every 850 feet apart. For most people, it is easy to walk to any of several stops on a route. But a customer does not need several stops; they need one stop. There is a geometric trade-off between closer stop spacing and faster bus speeds. Figure 14 shows the basic trade-off in conceptual terms. As stops are placed farther apart, buses can travel faster and cover more distance in the same time.

This is because most of the time required at a stop is not proportional to the number of passengers served. When there are many stops, passengers spread themselves out among them, so the bus stops more for the same number of people. When passengers gather at fewer stops, stopping time is used more efficiently, resulting in faster operations.

This increased speed has two benefits. First, riders can get farther faster and reach their destinations sooner. Also, as speeds increase across the entire transit system, more service can be provided for the same cost. Since the primary cost of transit service is the cost for labor which is paid based on time worked, the faster buses operate, the more service that can be provided for the same cost. So, higher frequency can be provided or routes can be extended to go farther for the same cost.

Figure 14: Trade-off between stop spacing and travel time



What did the public say?

After seeing the Concepts and their outcomes, **72% of people said that bus stops should be at least every two blocks, or about 1/4 mile apart.**

The Better Bus Network assumes consistent 1/4-mile spacing and, therefore, faster bus speeds across the network. The outcomes shown in this report are possible in part because of this improvement in speed. One key to a successful revision of stop spacing is for it to be a consistent policy applied in all comparable circumstances across the county, and tied to a clear county-wide benefit in travel times. Many transit agencies have successfully widened stop spacing where these benefits were clear.

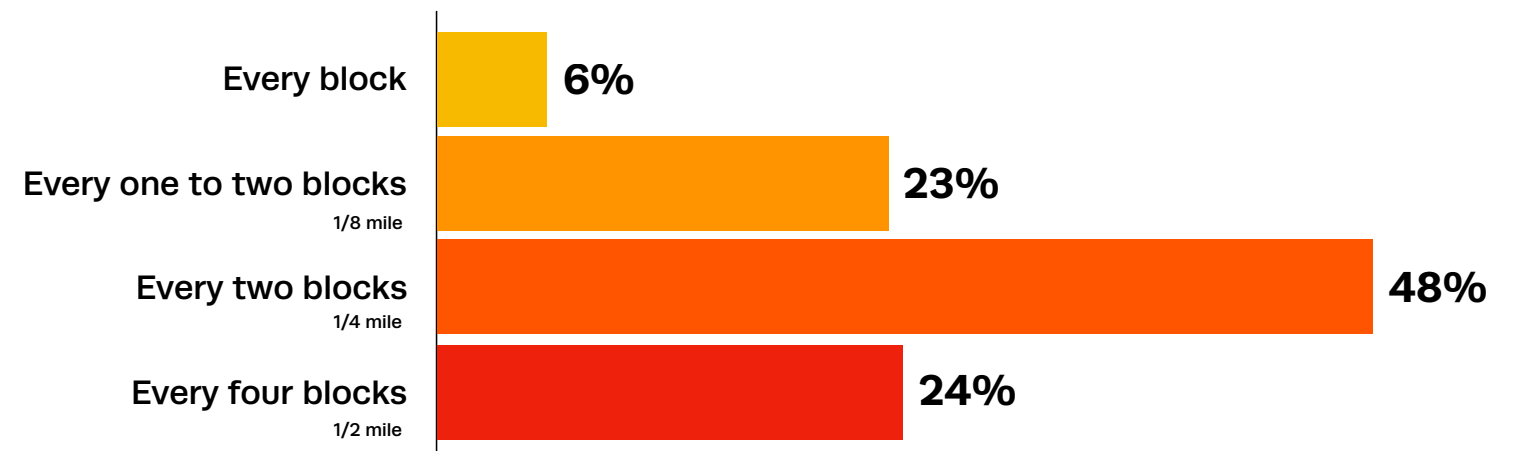
What about Trolleys?

As described in the [Concepts Report](#), most people said they would prefer to redesign trolley routes to maximize access and that is the design approach taken in the [Draft Plan](#). With Covid-19, and the need for social distancing and ensuring financial challenges for local governments, it seems unlikely that trolleys can play a major role in the network going forward. Therefore, this Final Better Bus Network recommends route and frequency levels for the County bus network and points out where trolleys can play a supporting role. It does not specify the exact trolley routing or frequency, as the Draft Plan did.

Bus stops are often very close together. Buses stop very often, so they run slower and most trips take longer. We can make the buses go faster by having bus stops farther apart.

How far apart should bus stops be?

72% say every two blocks or more



The Big Picture: Existing Network

The map on the right (Figure 15) shows the big picture of Miami-Dade's existing bus network. The map on the following page shows the same for the Better Bus Network.

In this map, every route is color-coded based on its frequency during the midday on a weekday. This should be noted to compare and understand how the Better Bus Network is different from today's network.

In the network maps, colors make all the difference:

Dark red lines represent routes that operate every 10 minutes or better (the Existing Network does not have any);

Bright red lines represent routes that operate every 11 to 15 minutes.

Purple lines are routes that run every 16 to 24 minutes;

Dark blue lines every 25 to 30 minutes; and

Light blue lines every 31 to 60 minutes.

More detail on the frequency of service by time of day and day of the week is available in Chapter 2, starting on page 31.

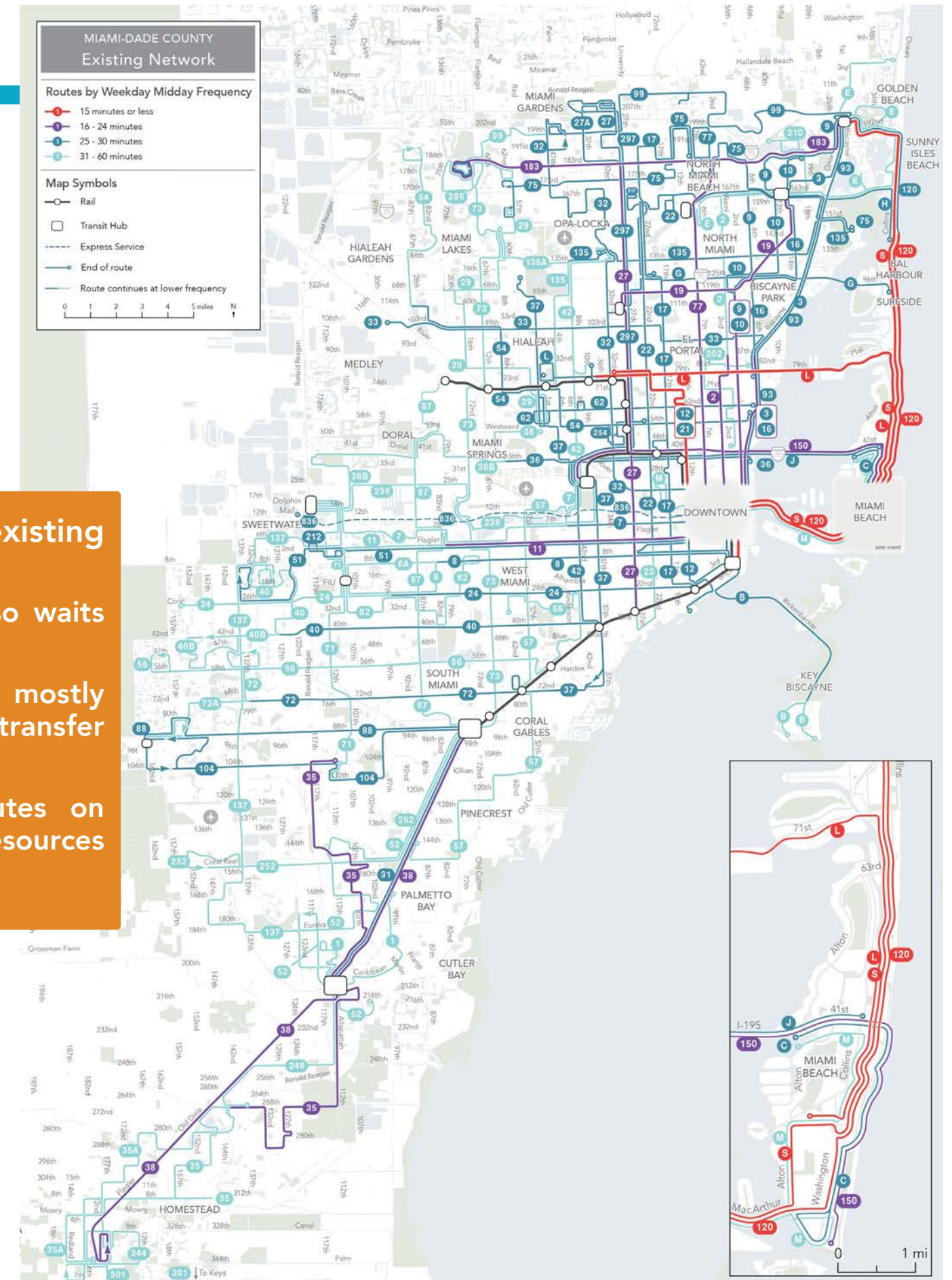
The Existing Network uses 70% of resources towards service that can achieve high ridership and the remaining is spent on coverage goals or duplication with trolleys.

Policy Direction

Based on the public feedback, the Better Bus Network has been designed to follow these guidelines:

- 85% of resources are devoted to service that is expected to get higher ridership relative to cost.
- The other 15% of resources are going to service that is not likely to get high ridership, but will provide service in areas where it is needed the most.
- Since cities in Miami-Dade receive transportation money to have their own trolley system, coverage has been focused in unincorporated areas, particularly in southern Miami-Dade County.
- Trolleys have not been designated in the Better Bus Network, but key corridors for trolley service are identified.
- Stop spacing will be every ¼ mile, on average, to increase the average speed of bus service. Actual stop spacing will vary and will consider the location of major activity centers including senior centers.

Figure 15: Existing Network in Miami-Dade



The Big Picture: Better Bus Network

The map on the right (Figure 16) shows the Better Bus Network. This network uses the same resources as the existing network meaning that running this network does not cost Miami-Dade Transit any additional money.

Big Ideas

This network builds on the policy direction to create a vastly more useful network across the dense and walkable parts of Miami-Dade.

- **A grid of frequent routes**, with 17 frequent County routes providing service across the most dense and busiest parts of the county. With this network almost 353,000 more county residents will be within ¼ mile of a frequent route, and many more will be able to use the frequent routes to make connections in any direction across large parts of the county.
- **More suburban connections for infrequent routes.** Key transit centers have been designed to bring more routes together in outlying areas where frequency cannot be improved with the limited budget. New or expanded suburban transit hubs would include: Florida International University, Douglas Road Metrorail Station, 112th Avenue Busway Station, and Red Road and NW 176th Street. Existing transit hubs like West Kendall and Miami-Dade Community College North will continue to be key connection points in the New Network.

What about Rush Hour?

People need to travel at all times of day and week. A route that doesn't exist on weekends is particularly useless to low-income service workers. To help everyone visualize the network that is there for people all of the time, the map at the right, and most maps in this report, show the midday frequency of service. More detail on peak services is available in Chapter 2, beginning on page 31.

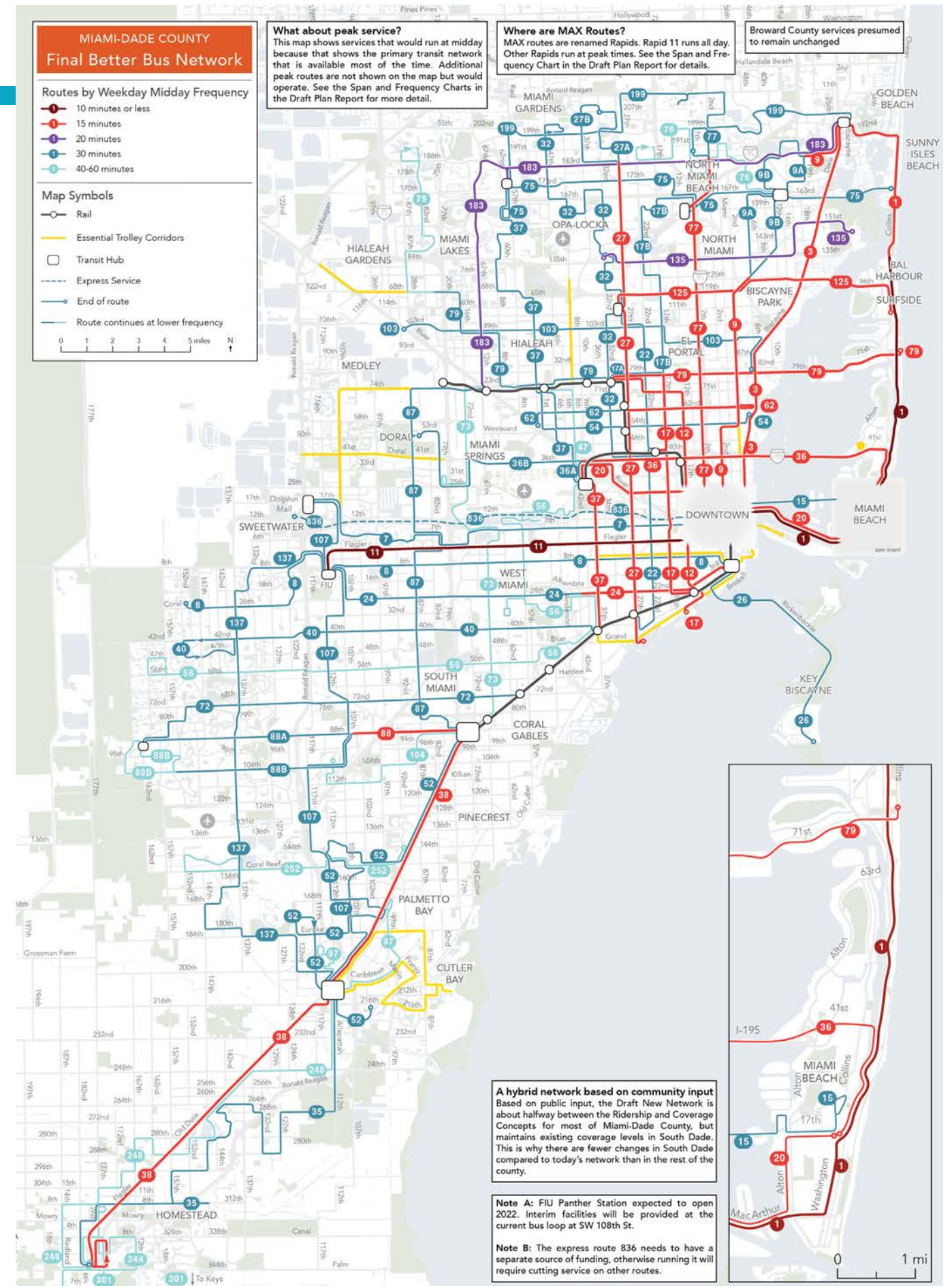
To better serve the trips of people who need to travel throughout the whole day, seven days a week, **the Better Bus Network frequent grid extends to weekday evenings and Saturdays, vastly expanding when useful service is available across large parts of the county.**

Figure 16: Better Bus Network for Miami-Dade

Reminder: This map shows midday frequency of service. Some routes run at higher frequency at peak times and additional routes operate at peak time that are not shown here. For more details on peak service, see the Span and Frequency Charts beginning on page 31.

The Better Bus Network provides a high frequency grid that lets people get to more places in less time.

Note: Route 836 is included in the Better Bus Network map as it is an existing route, recently added to the system. Yet, Route 836 does not have a defined funding source. It was originally planned to be funded through MDX (Miami-Dade Expressway Authority) toll revenues. Recent legislation may change the structure of MDX, and leave Route 836 without a funding source. If another funding source is not found, significant cuts to other routes would be necessary to continue operating Route 836.



The Better Bus Network Increases Job Access

For most people and most places in Miami-Dade County, the Better Bus Network substantially improves access to jobs, people, and opportunities across the county by transit. It does this by providing more frequent service along the busiest and densest corridors and by rearranging service in some areas to consolidate duplicative routes into higher frequency service.

Change in Job Access

The Better Bus Network Network allows the average person in Miami-Dade to reach 163,000 jobs within 60 minutes by walking and taking transit—31% more jobs than are reachable with the existing network.

For the average person in poverty, the number of jobs accessible by transit within 60 minutes would increase by 32%. For the average household without a car, jobs accessible in 60 minutes would increase by 29%.

This analysis measures jobs, but it reflects a wide range of opportunities that a person can reach. An increase in jobs accessible means a person can get to more shopping, education, recreational areas, social events, places of worship, and any other opportunities that Miami-Dade can offer.

Proximity to Frequency Service

The Better Bus Network provides frequent transit (15 minutes or better) to 23% of residents and 36% of jobs. This is a significant increase from today, where only 10% of residents and 20% of jobs are near frequent transit.

This network also provides frequent transit near 28% of residents in poverty (12% in the Existing Network) and 23% of residents of color (9% today).

Almost 353,000 additional county residents would be within ¼ mile of a bus route that arrives every 15 minutes or less.

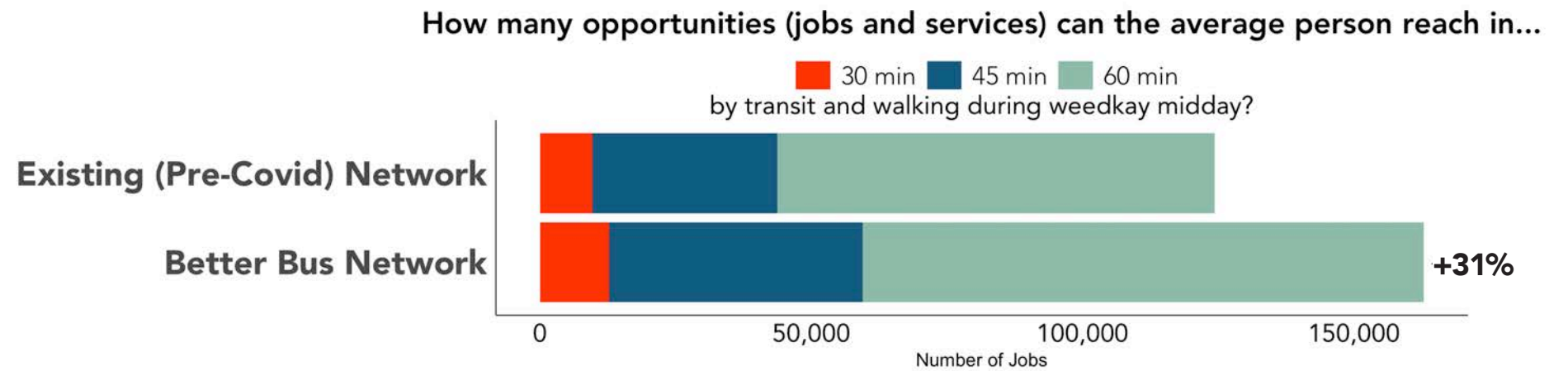


Figure 17: Jobs accessible in 30, 45, and 60 minutes by walking and transit for the average resident in Miami-Dade County

The average resident in Miami-Dade County could access 31% more jobs in 60 minutes by walking and transit.

Access to Transit - Weekday

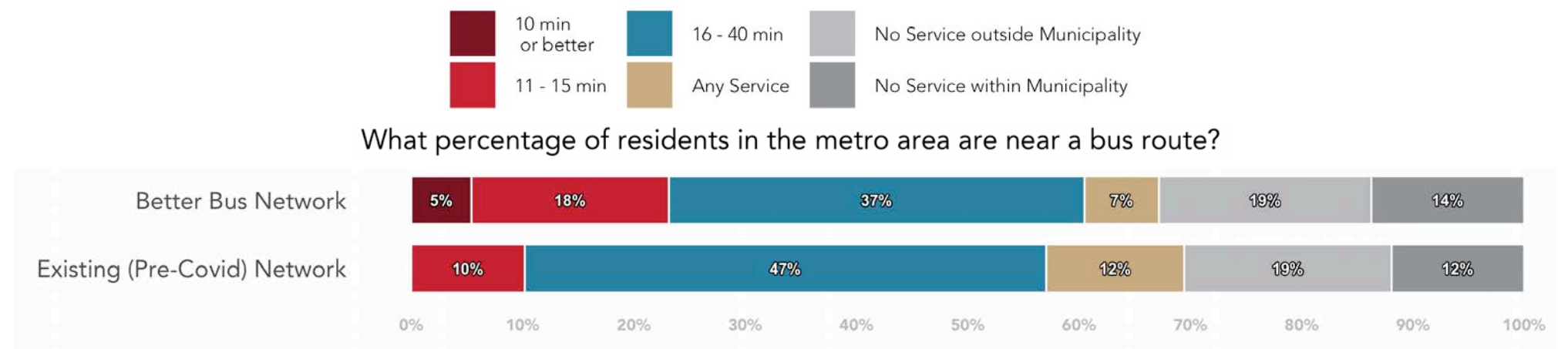


Figure 18: The total number of people near transit service in Miami-Dade

A Resilient Network

The Covid-19 pandemic interrupted the Better Bus Project as the emergency arose as the final round of public outreach was wrapping up in late March. The pandemic is having enormous short-term effects on transit ridership and the larger economy, creating significant uncertainty about the future.

Therefore, in this moment, Miami-Dade needs more than a plan for a new network next year. We cannot easily predict the challenges that transit will face in the next year. So, this report includes a Resilience Plan that lays out priorities to guide the County on how to provide the best possible service with whatever budget turns out to be available in the future. Developing this Resilience Plan also informed final adjustments to the full Better Bus Network. Also, the new network and the Resilience Plan provide a framework for adapting to social distancing requirements and the lower bar for overcrowding during the pandemic so that pass-ups are less likely and less harmful to riders.

The Resilience Plan organizes the services of the Better Bus Network into a series of priority tiers which would guide the County in what to do if service must be reduced. Possible causes for temporary or permanent service reductions could include

- driver availability problems due to Covid-19;
- decline in revenues that fund transit service; and
- other temporary situations such as hurricane recovery periods.

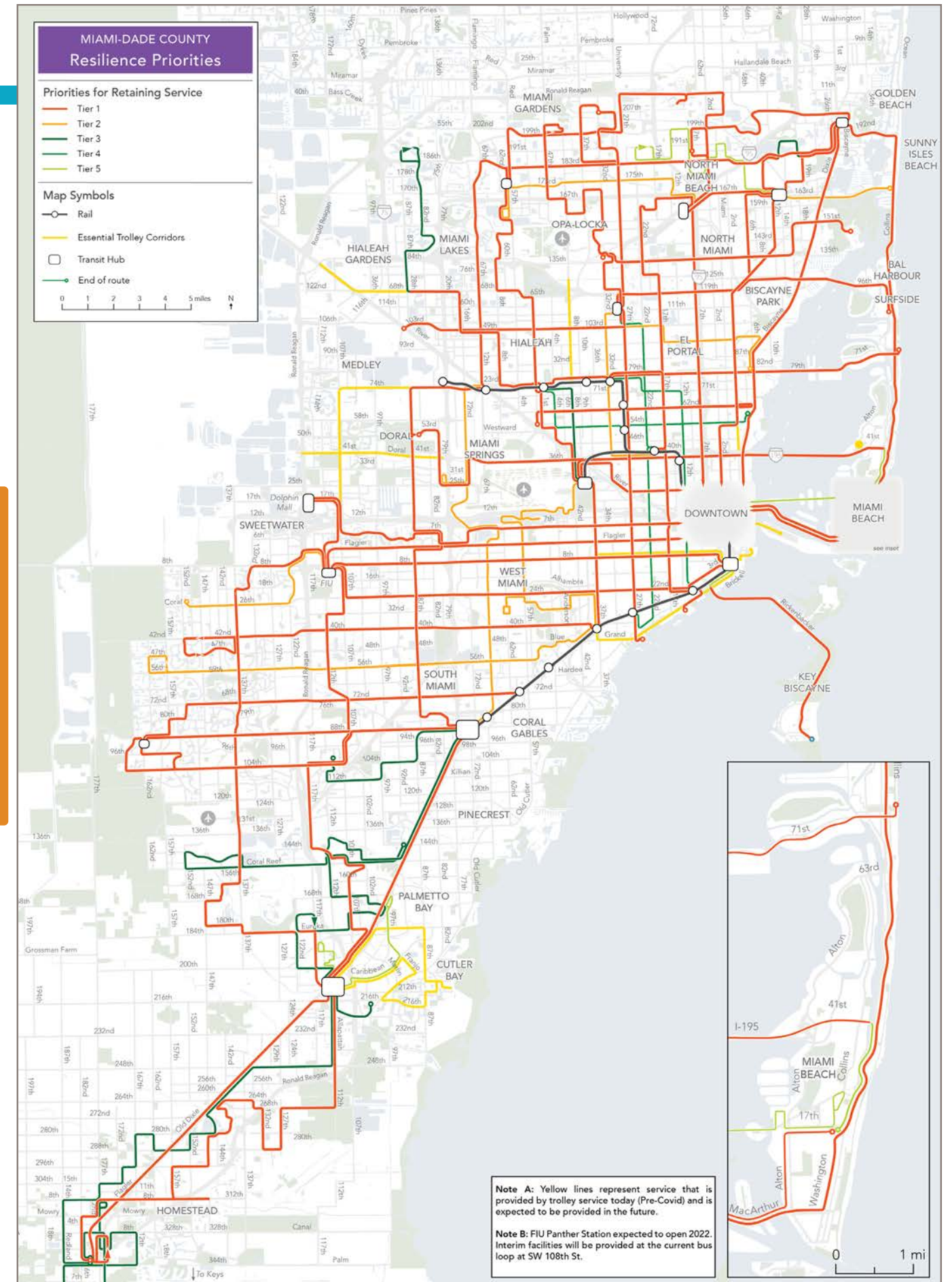
The map in Figure 19 shows the priorities of each corridor in the Better Bus Network. The darkest orange corridors are the highest priority and, if service must be cut, these corridors should be kept and service frequency maintained as much as possible. Lighter shades of orange indicate Tier 2 corridors. Dark green are third tier priorities and lighter shades of green indicate fourth and fifth tier priorities.

The priority of the Tier 1 corridors reflects their importance in maintaining access to the most dense and active places. Most Tier 1 corridors are on the one-mile grid in the urban core of the county, which would provide maximum access to the largest number of people and jobs in a lower funding scenario.

If the County could only operate the Tier 1 corridors, it would represent a 35% reduction in service. Yet, **the Tier 1 Network** (described in more detail on page 52) **would still provide greater job access than today's network, and 51% better job access than a hypothetical Reduced Existing Network.**

Figure 19: Resilience Plan Priorities

A benefit of the Better Bus Network is that, if service must be changed, it can be done with less damage to people's access to opportunity than cutting the Existing Network would do.



How To Use This Report

This report shows the new Miami-Dade bus network in detail. To understand the Better Bus Network and how it affects you and your community, we suggest you:

- Look at the maps starting on page 18, find the places you care about and note the nearby routes and their frequencies (as indicated by the color). Route numbers in the Better Bus Network may not match existing route numbers.
- Consider how all the routes connect various parts of the whole county. Remember that no bus network can provide direct service to and from every origin and destination, so look at how routes connect with each other. Remember, where two red routes cross, that means frequency is high, so the connection will be easy.
- Frequencies (how often) and spans (how long) of every route in the Better Bus Network can be found in the tables starting on page 31. This tells you when the route(s) you care about run and at what frequencies.
- If you care about proximity to transit, look at the charts beginning on page 47, which show how many people and jobs are near any transit service and near frequent service.
- For travel times, look at the maps of travel time change starting on page 41.
- For more information about how the Better Bus Network would affect access to jobs, look at the job access maps starting on page 44.

What is in the rest of this report?

In Chapter 2, we describe the Better Bus Network compared to the Existing Network.

In Chapter 3, we review the outcomes of the Better Bus Network, including the number of people and jobs near transit, the amount of jobs and opportunities residents can reach by transit, and other outcomes.

In Chapter 4, we describe the Resilience Plan, the network priorities, and potential outcomes.

In Chapter 5, we describe the next steps to implement the Better Bus Network.

Appendix A provides additional maps that show travel time change for multiple locations around the county.

What's next?

The Recommended Network will now go to the County for final review and implementation. The County may provide additional opportunities for public input on these bus network change. Given that the County is responding to an emergency, it may be necessary to proceed to implementation without a large public engagement process. Ultimately, the County Board has the power to decide where and how the bus network should operate.

For more information and to stay involved in the project, go to www.betterbus.miami.



Better Bus Project

To learn more, contact the Better Bus Project team at www.betterbus.miami

2 Better Bus Network

Existing Network

The maps on the following pages show the Existing Network (as it was in February 2020 before Covid-19 related changes) and the Final Better Bus Network in detail. Use consecutive pages to compare the network in different parts of the County. The map on the right shows the entire County.

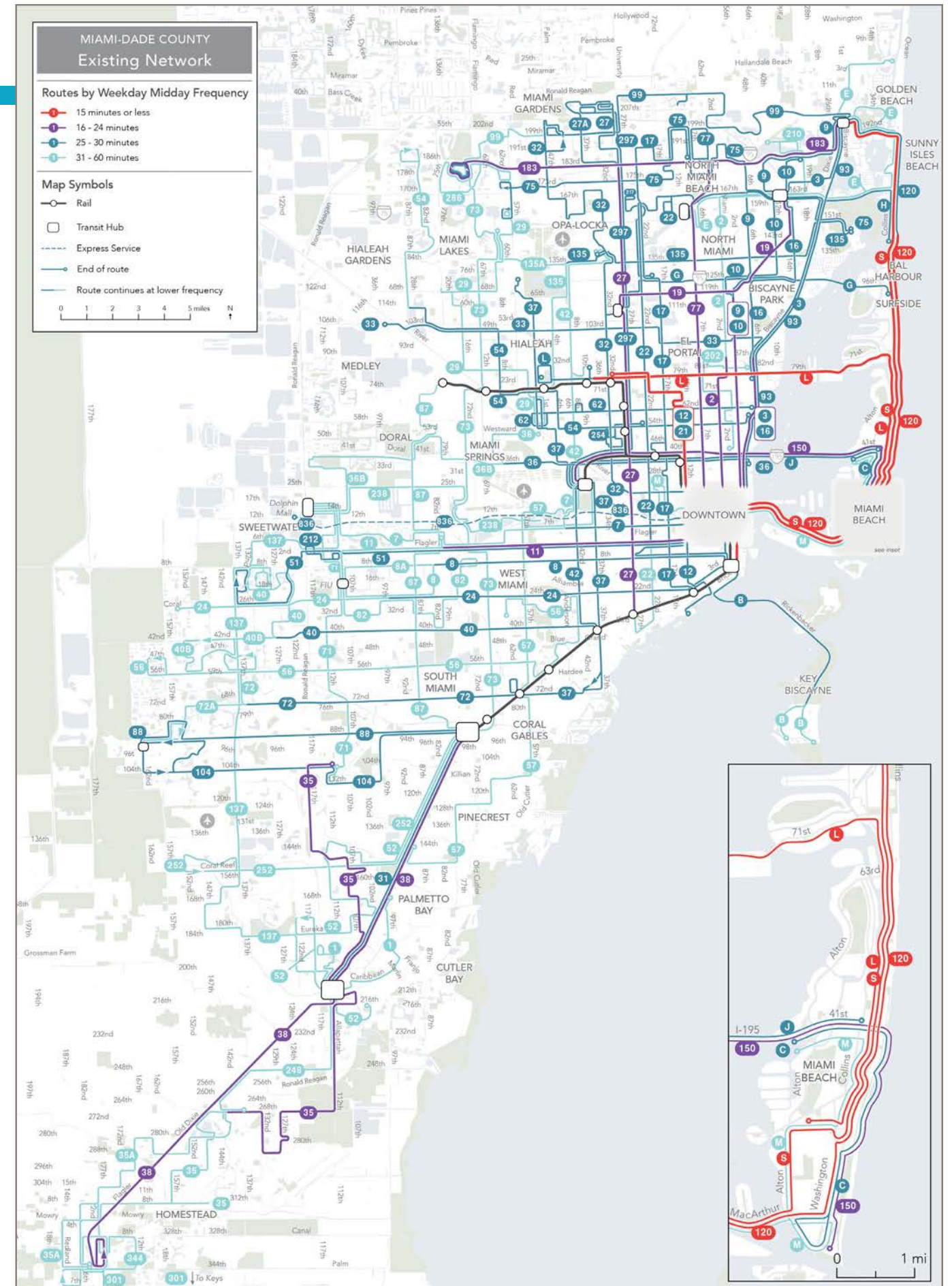
Miami-Dade's existing bus network has a lot of duplicative service. Areas close to the core of the County often have two or more bus lines running down the same street. In many places, this is redundancy of two MDT routes, but sometimes a municipal trolley route is running similar service to MDT routes. Transit users worry more about their ability to get places than about what agency running the bus they are getting on. In the Final Better Bus Network, this duplicity is consolidated into a simpler network that has more frequent routes.

Miami-Dade County has a grid street network and the transit network primarily follows that same structure, but most bus service is infrequent. The County has five frequent MDT routes (15 minutes or better) and five frequent municipal trolley routes. Low frequency service makes it very hard for people to transfer, vastly limiting their ability to move throughout the County.

- The Existing Network allocates approximately 70% of its resource towards service with the goal of achieving high ridership relative to cost.
- Another 20% of resources are assigned to provide coverage in places where transit is important but is not likely to get high ridership relative to cost.
- The remaining 10% of the resources are spent on duplicative service.

Figure 20: The Existing Network in Miami-Dade
Reminder: This map shows midday frequency of service. Some routes run at higher frequency at peak times and additional routes operate at peak time that are not shown here. For more details on peak service, see the Span and Frequency Charts beginning on page 31.

Low frequency service makes it very hard for people to transfer, vastly limiting their ability to move throughout the County.



Better Bus Network

The Better Bus Network assigns 85% of resources to goals that can achieve high ridership and 15% to provide service in areas where transit is important but is unlikely to yield many riders. This is done by consolidating duplicative resources and moving some resources from coverage service to ridership (or high frequency) service. Particularly, coverage service has been kept in unincorporated Miami-Dade. This reflects the results from the public outreach and the input of stakeholders and elected officials.

Some key differences compared to the existing network include:

- North of Downtown Miami, service has been consolidated or simplified to provide frequent service on five corridors: Routes 3, 9, 77, 12, 17, and 27. Route 2 has been eliminated and part of NW 2nd Avenue is now served by the more frequent Route 9.
- The Better Bus Network has frequent service on five bridges across Biscayne Bay, including 7.5 minute service on Route 1 from Miami to Miami Beach. The current network only has 15 minute service on two bridges.
- The frequent services on east-west corridors include
 - Route 24, on Coral Way, with every 15-minute service from Brickell to LeJeune Road and 30-minute service farther west.
 - Route 11, on Flagler, with every 10-minute service from downtown to FIU.
 - Every 15-minute service north of downtown Miami into northern parts of the county on 20th Street, 36th Street, 62nd Street, 79th Street, and 125th Street.
- Southern parts of Miami-Dade have kept their current coverage. Every resident that has bus service within ¼ mile today, keeps bus service in this network.
- Service on the South Dade Busway has been consolidated so that a bus comes every 15 minutes from Florida City to Dadeland South.
- Due to the uncertainty about trolley services in the future, the Better Bus Network does not provide specific network recommendations, but key corridors for trolley services are highlighted in yellow. These are corridors that trolleys serve today and are critical to serve in the future to maintain coverage, provide additional capacity, or both.

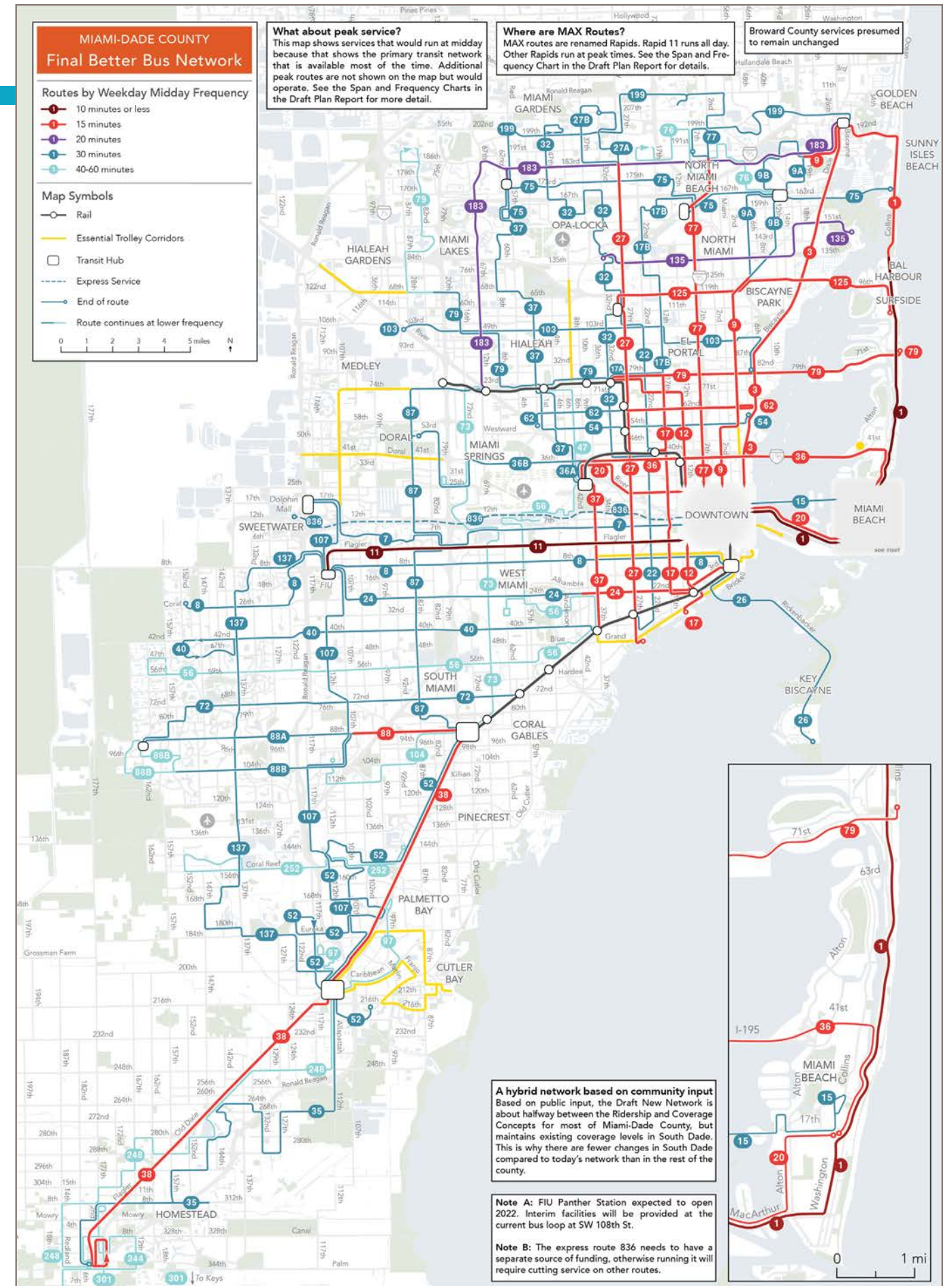
The following pages show different parts of the network in more detail.

Figure 21: Better Bus Network in Miami-Dade

Reminder: This map shows midday frequency of service. Some routes run at higher frequency at peak times and additional routes operate at peak time that are not shown here. For more details on peak service, see the Span and Frequency Charts beginning on page 31.

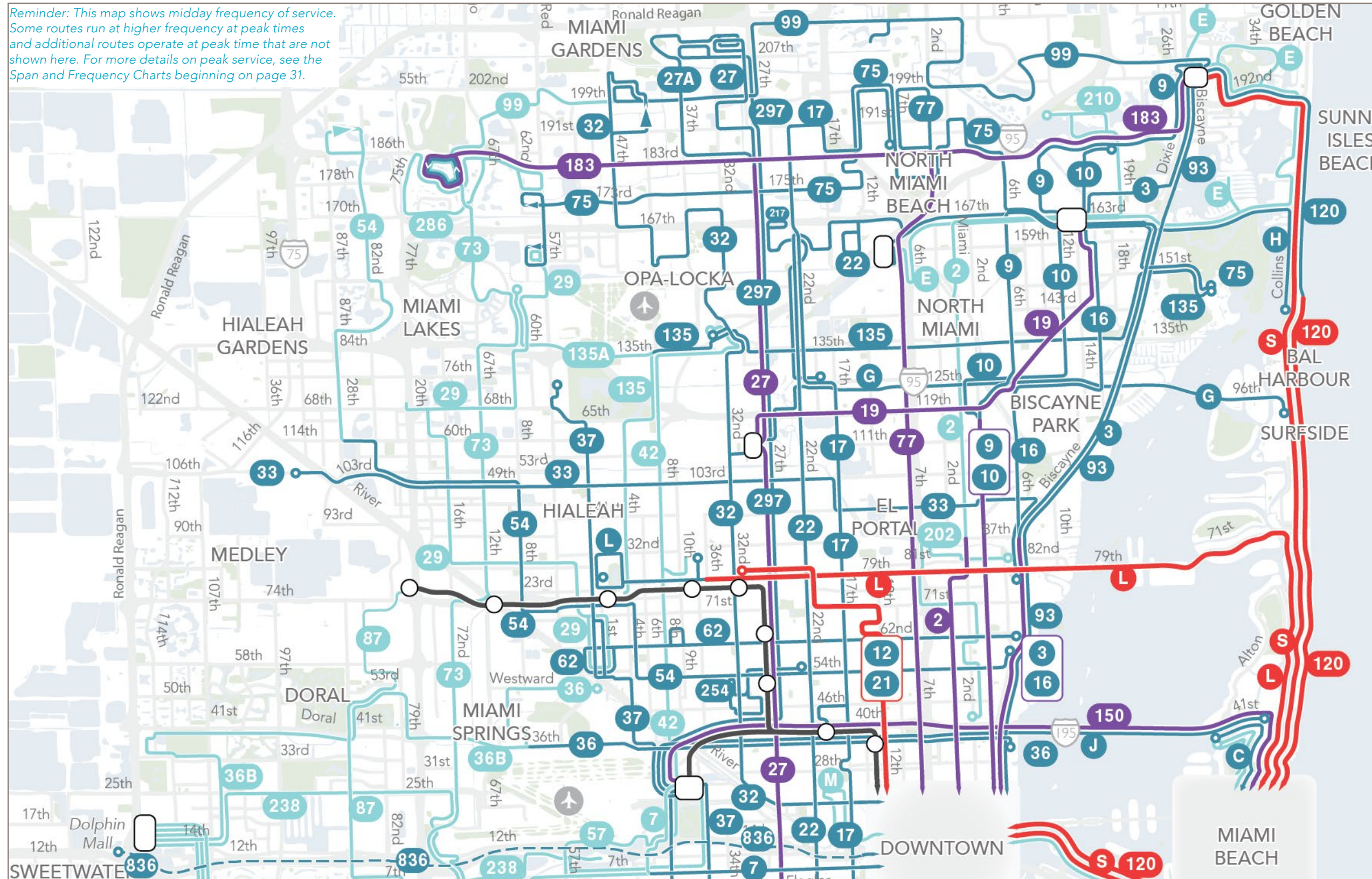
The Better Bus Network provides a much larger frequent grid for faster travel across much of the county.

Note: Route 836 is included in the Better Bus Network map as it is an existing route, recently added to the system. Yet, Route 836 does not have a defined funding source. It was originally planned to be funded through MDX (Miami-Dade Expressway Authority) toll revenues. Recent legislation may change the structure of MDX, and leave Route 836 without a funding source. If another funding source is not found, significant cuts to other routes would be necessary to continue operating Route 836.



Existing Network - North Miami-Dade County

Reminder: This map shows midday frequency of service. Some routes run at higher frequency at peak times and additional routes operate at peak time that are not shown here. For more details on peak service, see the Span and Frequency Charts beginning on page 31.



MIAMI-DADE COUNTY
Existing Network

Routes by Weekday Midday Frequency

- 15 minutes or less
- 16 - 24 minutes
- 25 - 30 minutes
- 31 - 60 minutes

Map Symbols

- Rail
- Transit Hub
- End of route
- Express Service
- Route continues at lower frequency

0 1 2 miles N



Figure 22: The Existing Network in northern Miami-Dade

Better Bus Network - North Miami-Dade County

Reminder: This map shows midday frequency of service. Some routes run at higher frequency at peak times and additional routes operate at peak time that are not shown here. For more details on peak service, see the Span and Frequency Charts beginning on page 31.

Note: Route 836 is included in the Better Bus Network map as it is an existing route, recently added to the system. Yet, Route 836 does not have a defined funding source. It was originally planned to be funded through MDX (Miami-Dade Expressway Authority) toll revenues. Recent legislation may change the structure of MDX, and leave Route 836 without a funding source. If another funding source is not found, significant cuts to other routes would be necessary to continue operating Route 836.

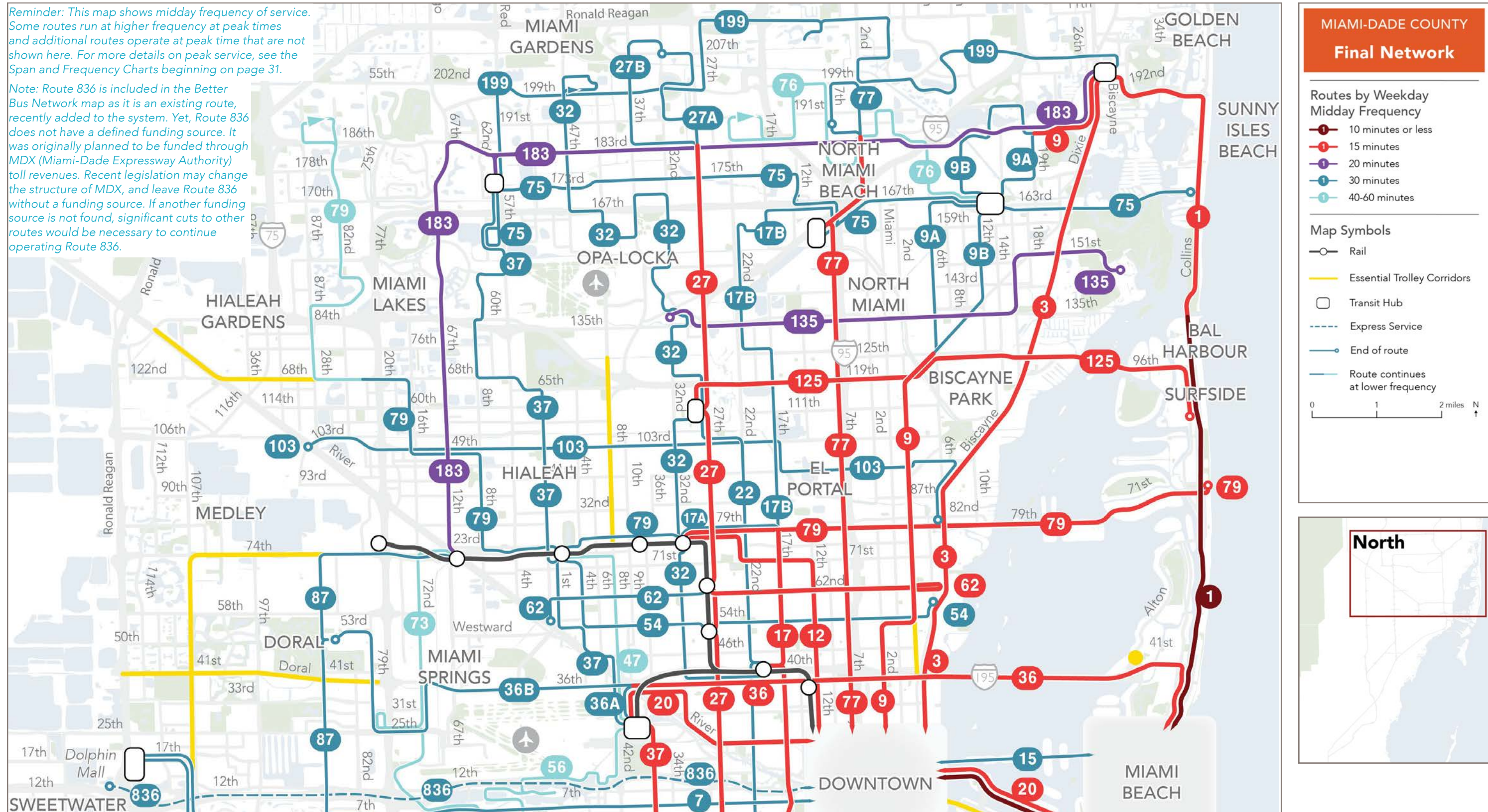


Figure 23: The Better Bus Network in northern Miami-Dade

Existing Network - Central to South Miami-Dade County

Reminder: This map shows midday frequency of service. Some routes run at higher frequency at peak times and additional routes operate at peak time that are not shown here. For more details on peak service, see the Span and Frequency Charts beginning on page 31.

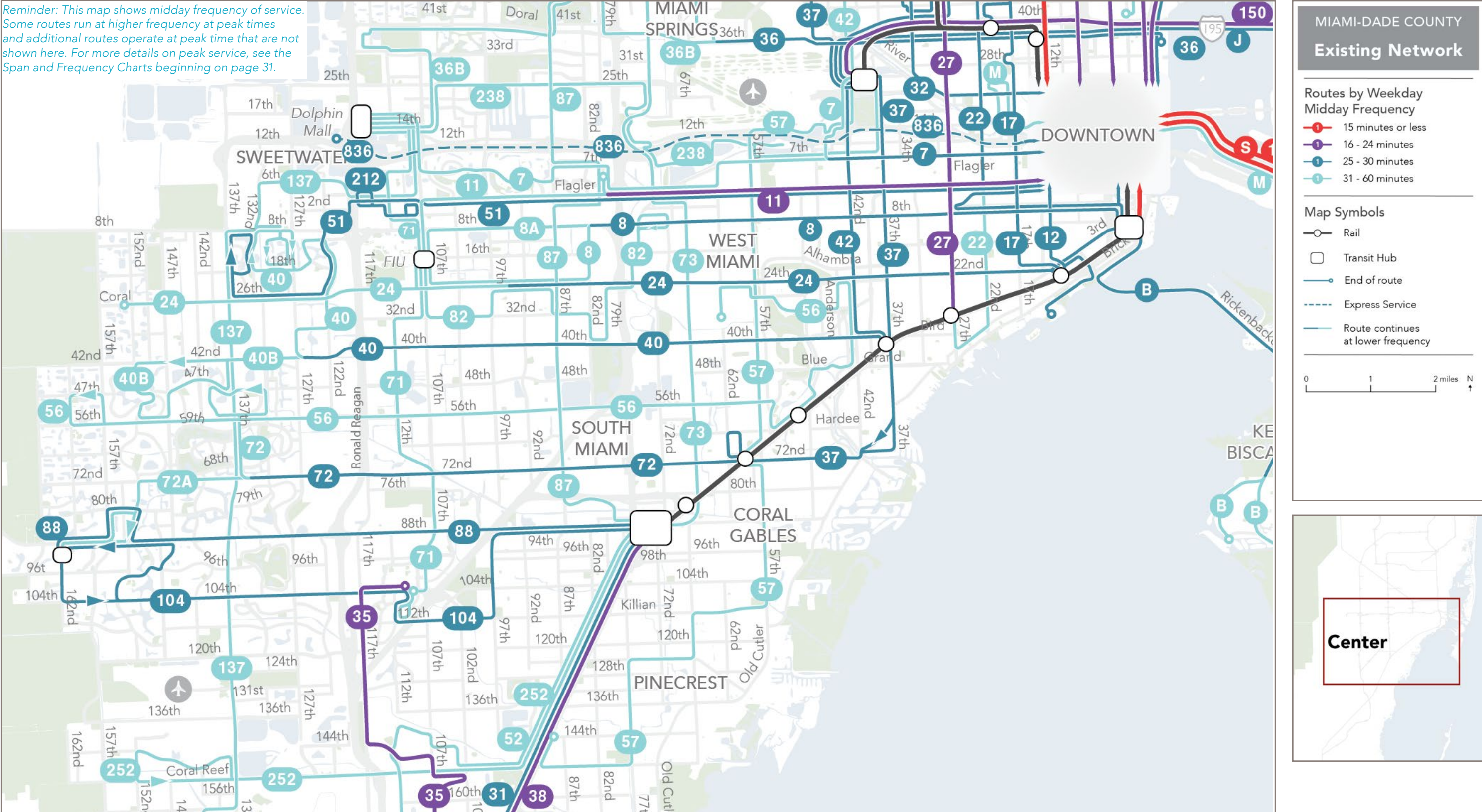


Figure 24: The Existing Network in central Miami-Dade

Better Bus Network - Central to South Miami-Dade County

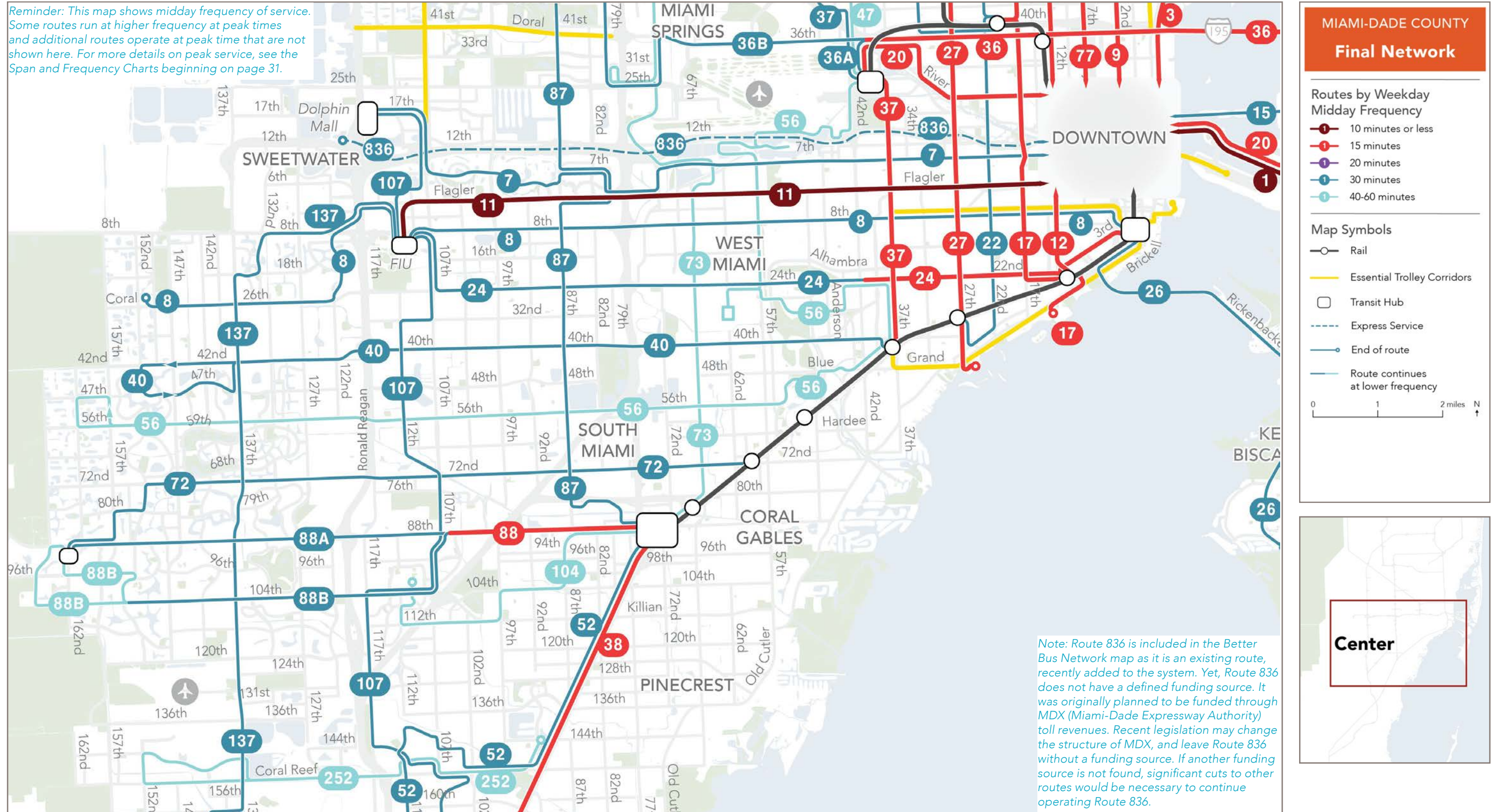
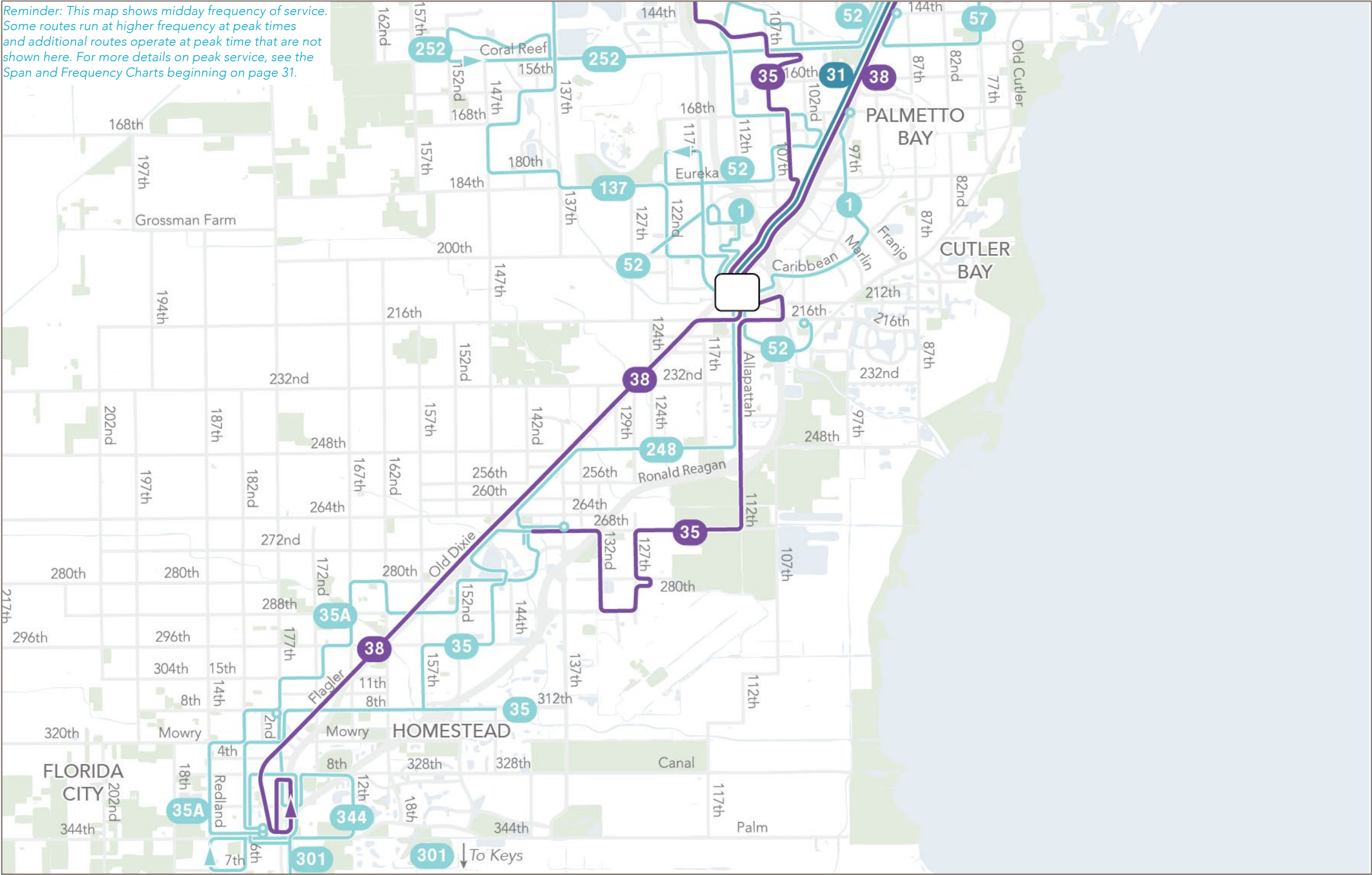


Figure 25: The Better Bus Network in central Miami-Dade

Existing Network - South Miami-Dade County

Reminder: This map shows midday frequency of service. Some routes run at higher frequency at peak times and additional routes operate at peak time that are not shown here. For more details on peak service, see the Span and Frequency Charts beginning on page 31.



MIAMI-DADE COUNTY
Existing Network

Routes by Weekday Midday Frequency

- 15 minutes or less
- 16 - 24 minutes
- 25 - 30 minutes
- 31 - 60 minutes

Map Symbols

- Rail
- Transit Hub
- End of route
- Express Service
- Route continues at lower frequency

0 1 2 miles N

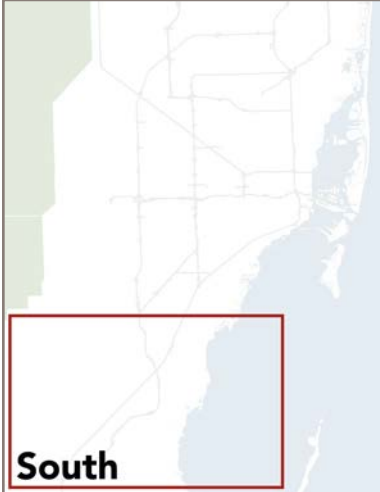
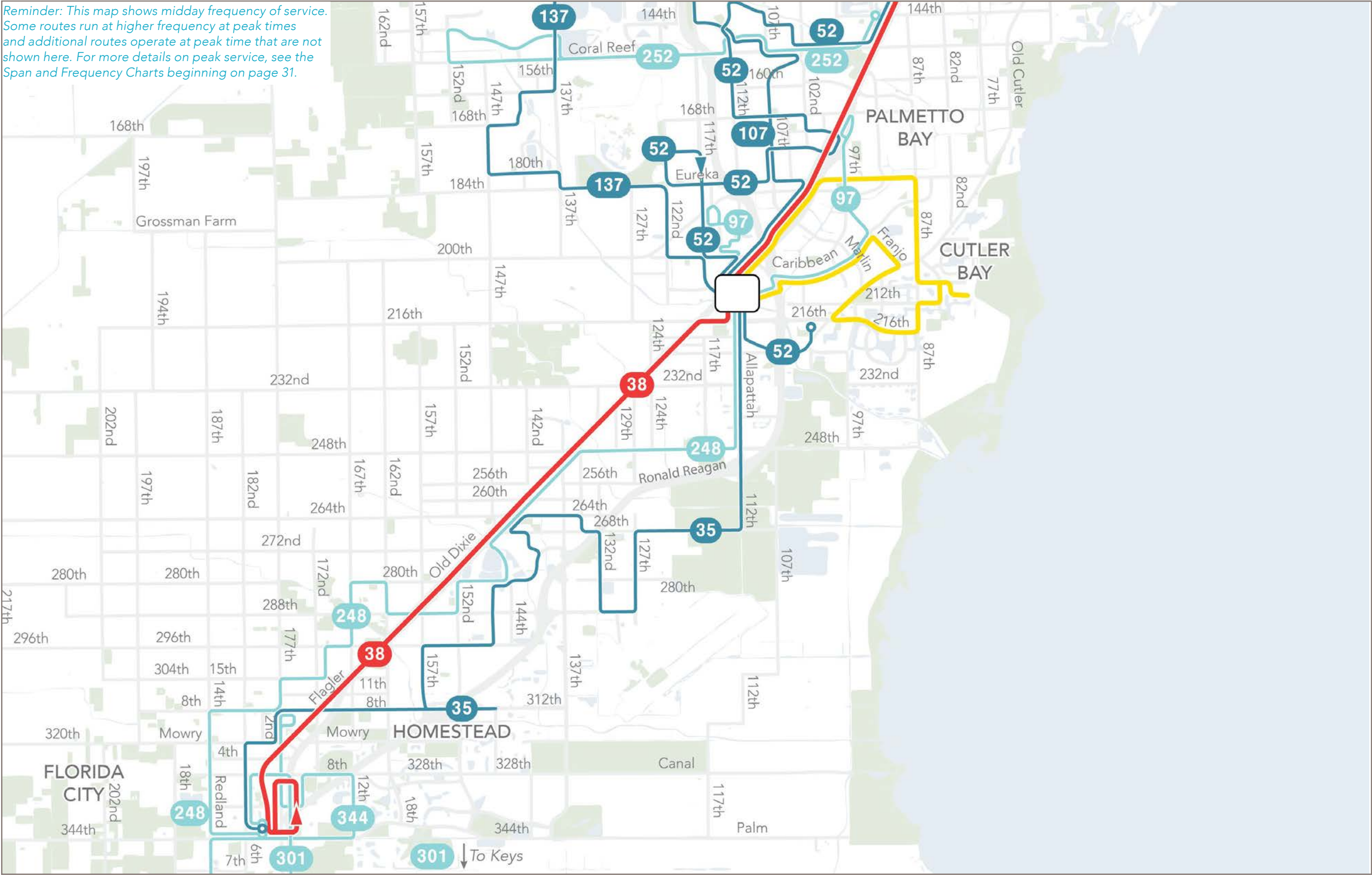


Figure 26: The Existing Network in southern Miami-Dade

Better Bus Network - South Miami-Dade County

Reminder: This map shows midday frequency of service. Some routes run at higher frequency at peak times and additional routes operate at peak time that are not shown here. For more details on peak service, see the Span and Frequency Charts beginning on page 31.



MIAMI-DADE COUNTY Final Network

- Routes by Weekday Midday Frequency
- 10 minutes or less
 - 15 minutes
 - 20 minutes
 - 30 minutes
 - 40-60 minutes

- Map Symbols
- Rail
 - Essential Trolley Corridors
 - Transit Hub
 - Express Service
 - End of route
 - Route continues at lower frequency
- 0 1 2 miles N ↑



Figure 27: The Better Bus Network in southern Miami-Dade

City of Miami Existing Network

The existing network (pre-Covid) for the City of Miami includes a combination of Miami-Dade Transit Routes and Municipal Trolley routes.

In many places and many corridors, municipal trolleys have generally been overlaid on county routes, resulting in extensive duplication that may not be the best overall use of tax dollars. Areas like Civic Center have a lot of duplicative service. In the area around the Metrorail station, there are two Miami Trolley routes and three MDT routes, none of them frequent.

Additionally, some routes like the Little Havana Trolley (M2) provide service in one direction along a corridor. This requires users to take a longer ride in one direction than the other, making the overall service less useful. The Existing Network in Miami has four frequent MDT routes and two frequent City of Miami trolley routes.

During the Covid-19 emergency, service on many Miami Trolley routes was temporarily reduced or eliminated. Service has since been restored to pre-Covid levels on all routes except the Overtown and Liberty City Trolley routes, where weekend service is no longer provided.

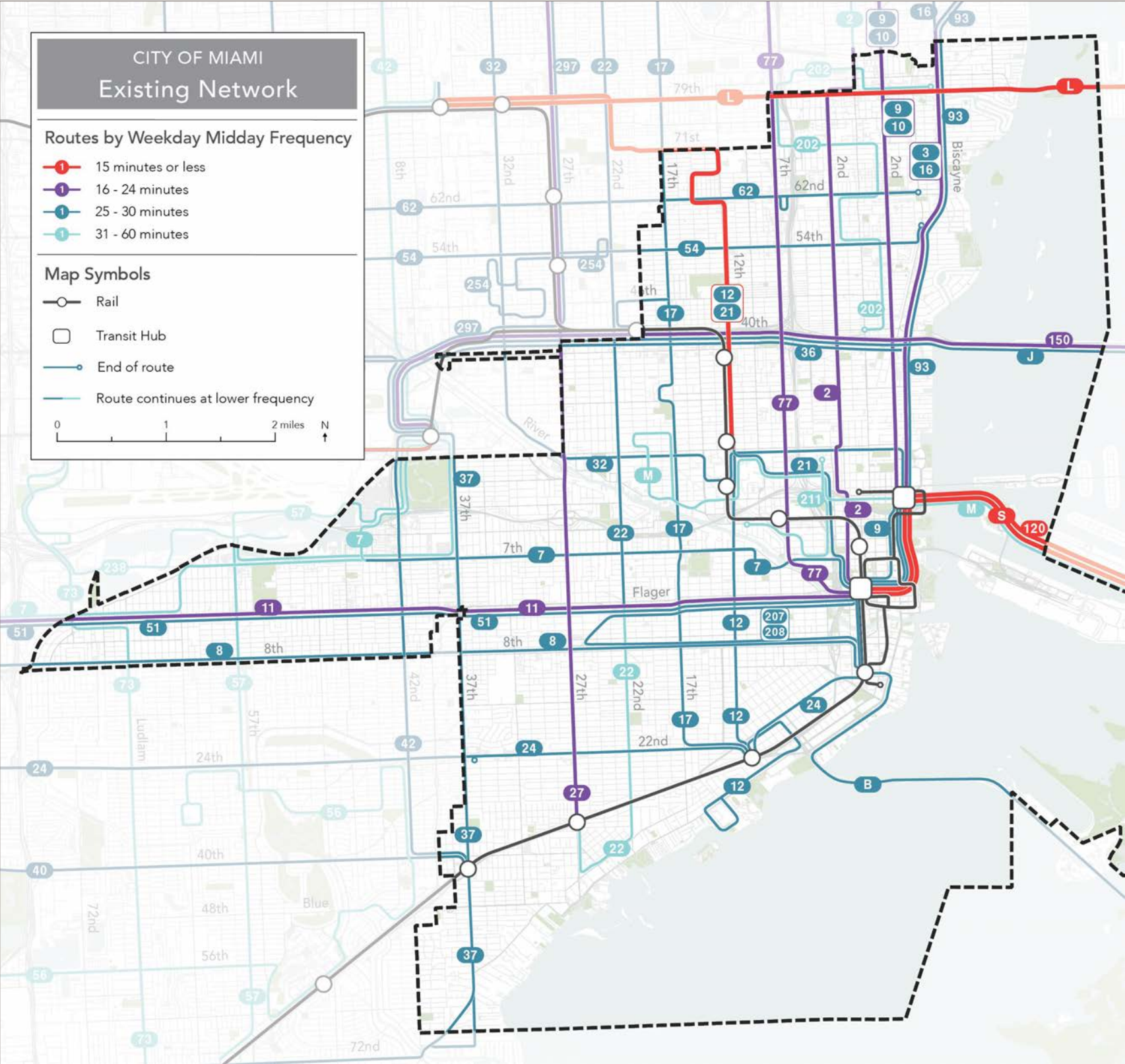


Figure 28: Existing Network in the City of Miami

Reminder: This map shows midday frequency of service. Some routes run at higher frequency at peak times and additional routes operate at peak time that are not shown here. For more details on peak service, see the Span and Frequency Charts beginning on page 31.

Downtown Existing Network

Figure 30 shows the map of the Existing Network within and near Downtown Miami.

Only four frequent routes serve Downtown. Routes 12 and 21 provide frequent service where they overlap, but they branch near Downtown.

The Existing Network is quite complex in Downtown. For example, many routes provide a one-seat ride to Government Center, but along different circuitous paths. On SW 7th/8th and SW 1st/W Flagler, routes 207, 208, and the Little Havana Trolley provide service, but they are all one-way loops, with 207 and 208 running in opposite directions. Route 8 also serves SW 7th/8th, while routes 11 and 51 add more service to SW 1st/W Flagler. Near Santa Clara and Civic Center Metrorail stations, trolleys, like the Health District, Stadium, and Overtown, run in circuitous one-way loops, restricting their usefulness to very limited trips.

This complexity can make it difficult for new riders and visitors to understand and use the system. There are many short infrequent routes that are not very useful for many trips. Thus someone trying to get to destinations within or near downtown would have a long wait, and would likely choose an alternative.

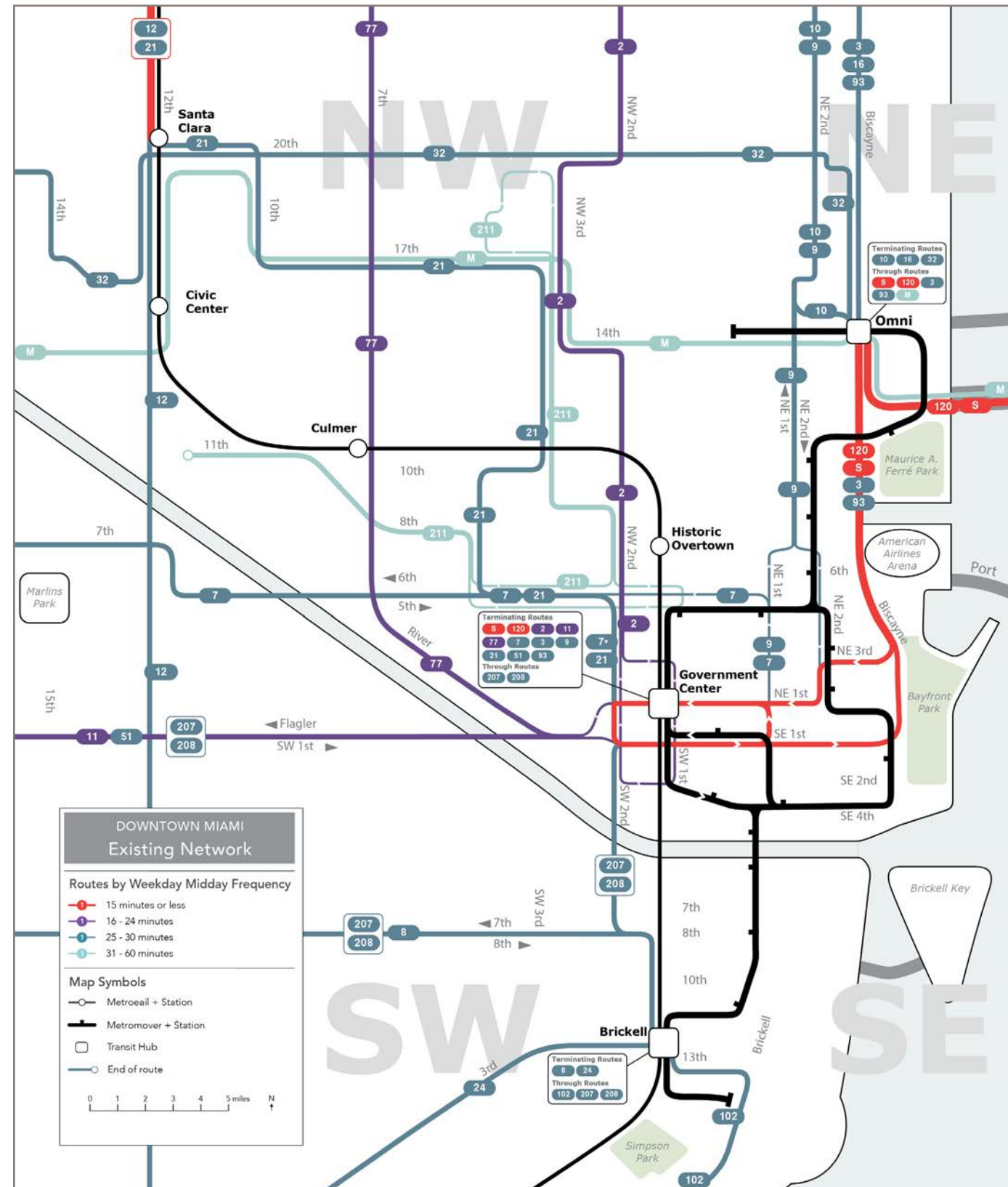


Figure 30: Existing Network in Downtown Miami and surrounding areas

Reminder: This map shows midday frequency of service. Some routes run at higher frequency at peak times and additional routes operate at peak time that are not shown here. For more details on peak service, see the Span and Frequency Charts beginning on page 31.

Downtown Better Bus Network

The map to the right shows the detail of how routes in the Better Bus Network would serve Downtown Miami and surrounding areas. In comparison to the existing network, circuitous and duplicative service was consolidated to provide high frequency service along the most major corridors. The downtown network is laid out in a high frequency grid to facilitate connections and increase access across most of the downtown and surrounding areas.

Some key differences compared to the Existing Network include

- Routes 12 and 21 have been consolidated so that Route 12 is frequent along NW/SW 12th Avenue all the way to Vizcaya Station.
- Route 77 operates every 15 minutes, better than today.
- Routes 9 and 10 are consolidated into an every 15 minute Route 9 along NW 2nd Avenue from downtown to 54th Street. Previously Route 10 ended at Omni Terminal, leaving only half the frequency from points north into the core of downtown.
- Routes 3 and 93 are consolidated into the more frequent Route 3.
- Routes S and 120 are consolidated into Route 1, which is now more frequent and is the only route from Downtown to the Beach. It does not go through Omni Terminal, instead going directly to the MacArthur Causeway. Service from Omni Terminal to the Beach is provided via Route 20.
- Route 20 runs from the Airport, across 20th Street NW/NE to Omni Terminal and then to the Beach, every 15 minutes, consolidating service on NW/NE 20th Street.
- Route 15 provides service from Omni Terminal, across the Venetian Causeway to Lincoln Terminal in Miami Beach every 30 minutes.
- Frequency of service on Route 11 is higher, meaning shorter waits for service to reach destinations along the Flagler corridor.
- Key corridors where trolleys can provide unique coverage and additional capacity are highlighted. In particular, improved, two-way trolley service along SW 7th and 8th Streets through Little Havana would be critical to provide additional capacity along that corridor.

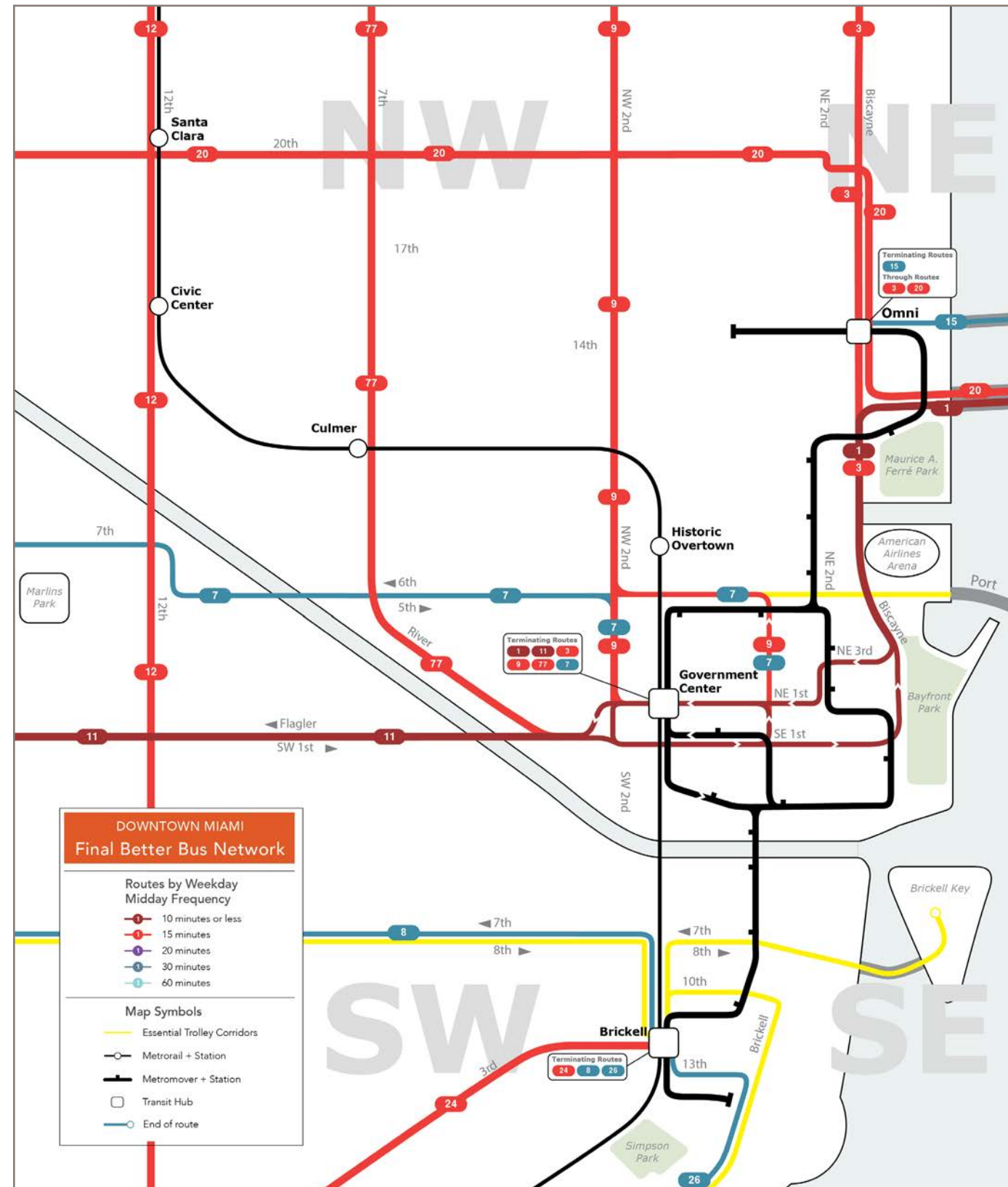


Figure 31: Better Bus Network in Downtown Miami and surrounding areas

Reminder: This map shows midday frequency of service. Some routes run at higher frequency at peak times and additional routes operate at peak time that are not shown here. For more details on peak service, see the Span and Frequency Charts beginning on page 31.

Miami Beach

The two maps on the right show the Existing and Better Bus Networks for Miami Beach. The Existing Network shows a lot of complex duplicative service while the New Network has a simpler, more frequent network.

Key differences include:

- Routes S and 120 have been combined into the very frequent route 1 that comes every 7.5 minutes along Washington and Collins Avenues. This new route has stop spacing that is wider than the S but not as wide as the 120.
- Route 20 provides 15 minute service from 20th Street and Omni Terminal on the mainland to Alton Road and 17th Street on the beach, ending at Lincoln Terminal.
- Route 36 provides 15 minute service from the mainland to Collins Avenue and south to Lincoln Terminal.
- Route 15 provides service across the Venetian Causeway, every 30 minutes, and serves the Collins Park neighborhood.
- Miami Beach Trolley routes are not specified, but key destinations where trolley service would be valuable include Mount Sinai Hospital and the South Beach Loop of Washington, Alton, and 17th.

Service patterns on the beach are much simpler, and more frequent, providing more access and less waiting.

Reminder: This map shows midday frequency of service. Some routes run at higher frequency at peak times and additional routes operate at peak time that are not shown here. For more details on peak service, see the Span and Frequency Charts beginning on page 31.

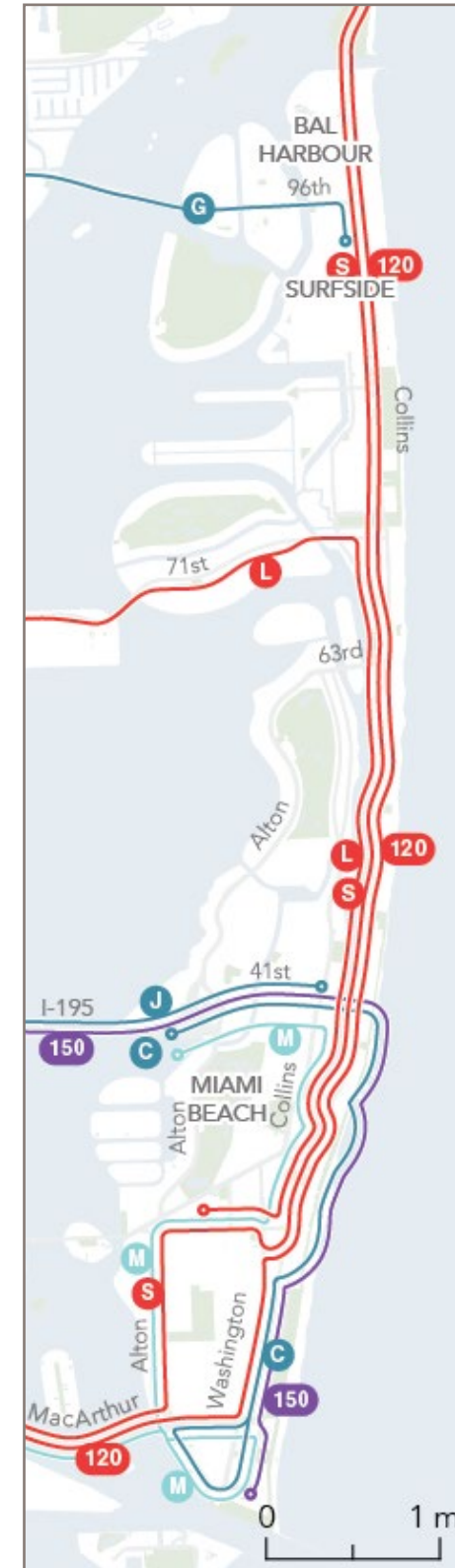


Figure 32: Existing Network in Miami Beach

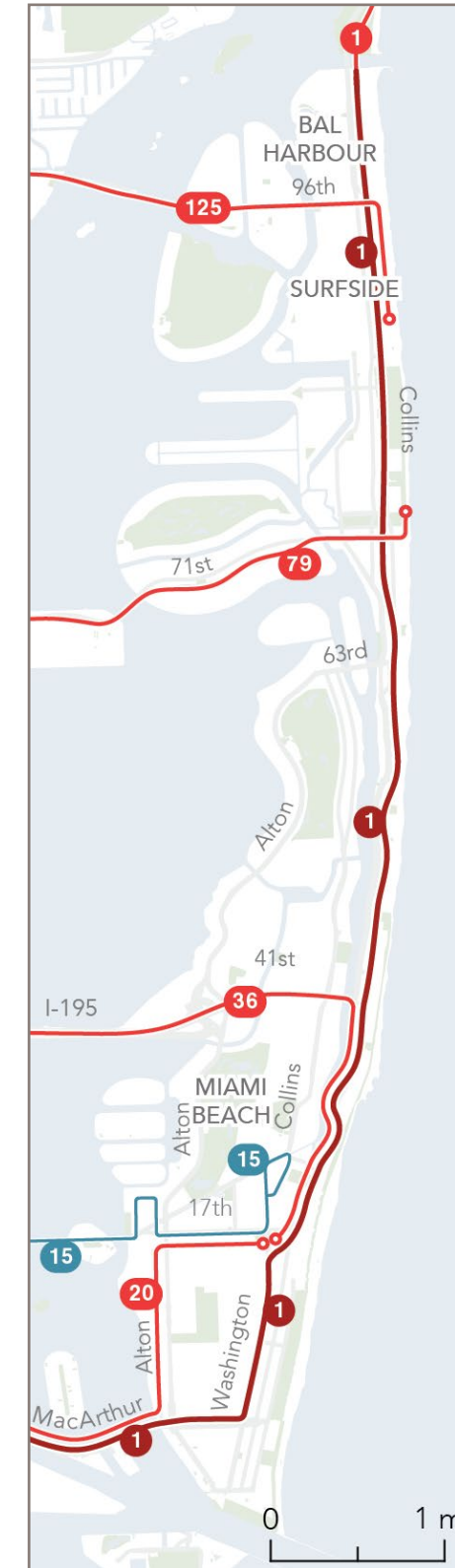
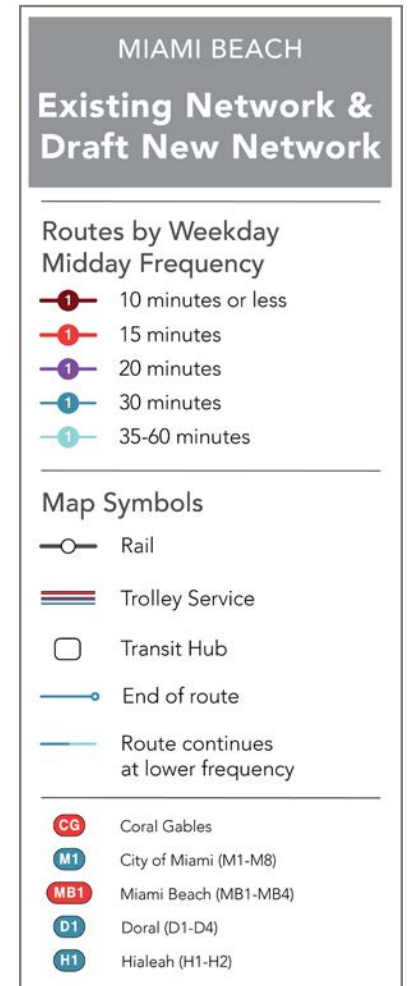
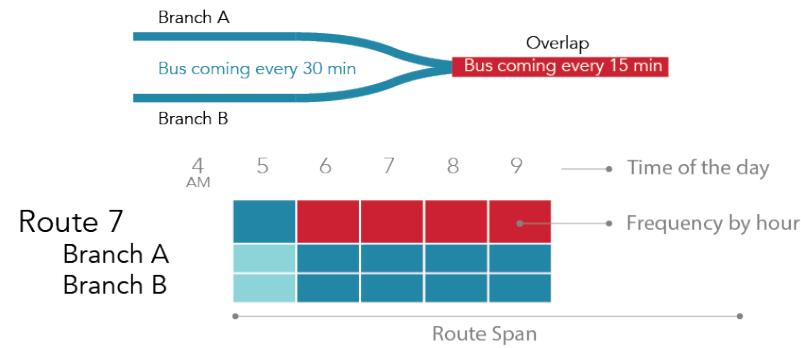


Figure 33: Better Bus Network in Miami Beach



Existing Network Spans of Service

Figure 34 shows the frequency by time of day for the most frequent routes in the Miami-Dade Transit network and the municipal trolleys. The example below shows how to use the network map and these charts to understand the span and frequency of service for every route.



The example shows a route with a bus every 15 minutes on the “Overlap” portion and a bus every 30 minutes on “Branch A” and “Branch B”. The span chart shows how to read the frequency by time of day. Route 7 starts operating at 5am, with service every 30 minutes on the “Overlap”—the dark blue square under 5am. Each branch operates hourly during this time. At 6am the branches are every 30 minutes and the “Overlap” is every 15 minutes.

For transit to be useful, it must be there at the times of day you need it. The times of day transit operates is called “Span of service”. For the county routes in the high frequency groups on this page, service is provided late into the night, and often overnight, and seven days a week. Many municipal trolley services, however, do not run in the evenings or parts of the weekend.

- Miami’s Little Havana and Allapattah trolleys are frequent, but do not run after 8pm on weekdays and the Allapattah trolley does not run Sundays.
- Miami’s Biscayne and Brickell trolleys run every 20 minutes, but run weekends and evening hours. The Flagami, Health District, Stadium, and Wynwood trolleys have shorter hours and no Sunday service.
- The Coral Gables Trolley is frequent, and runs weekday evenings, but does not run on Saturday on Sunday.
- Miami Beach Trolleys are primarily every 15 or every 20 minutes and have evening and weekend service.

The lack of consistency in service levels into the evening and on weekends limits the ability of riders to rely on trolley services as dependable parts of the overall transit network.

Existing Network Route Frequencies and Spans



Figure 34: Existing Network frequency and span of routes with 20 minute or better frequency at midday

Existing Network Spans of Service

Figure 35 shows the frequency by time of day for routes that operate about every 30 minutes at midday in the Miami-Dade Transit network and the municipal trolleys. Of note is that many routes have higher frequency of service at peaks. As discussed in the [Choices Report](#), this can cause inefficiencies in service delivery due to the extra costs of peak service. Also of note is how the frequency of service declines substantially in the evenings starting at 6pm or 7pm and many trolley routes disappear on weekends. Evening and weekend service is relatively inexpensive to operate compared to peak period service, and it is also crucial to a large segment of transit riders.

Evening and weekend service is relatively inexpensive to operate compared to peak period service, and is crucial to a large segment of transit riders.

Existing Network Route Frequencies and Spans



Figure 35: Existing Network frequency and span of routes with 30 minute at midday

Existing Network Spans of Service

Figure 36 shows the frequency by time of day for routes that operate about every 30 minutes or every 60 minutes at midday in the Miami-Dade Transit network and the municipal trolleys. Of note is that many of the circulator routes in the county route network, such as routes 155 and 212, do not operate on weekends, making them less useful to many potential riders.

Route 836 is included in the Better Bus Network as it is an existing route, recently added to the system. Yet, Route 836 does not have a defined funding source. It was originally planned to be funded through MDX (Miami-Dade Expressway Authority) toll revenues. Recent legislation may change the structure of MDX, and leave Route 836 without a funding source. If another funding source is not found, significant cuts to other routes would be necessary to continue operating Route 836.

Existing Network Route Frequencies and Spans

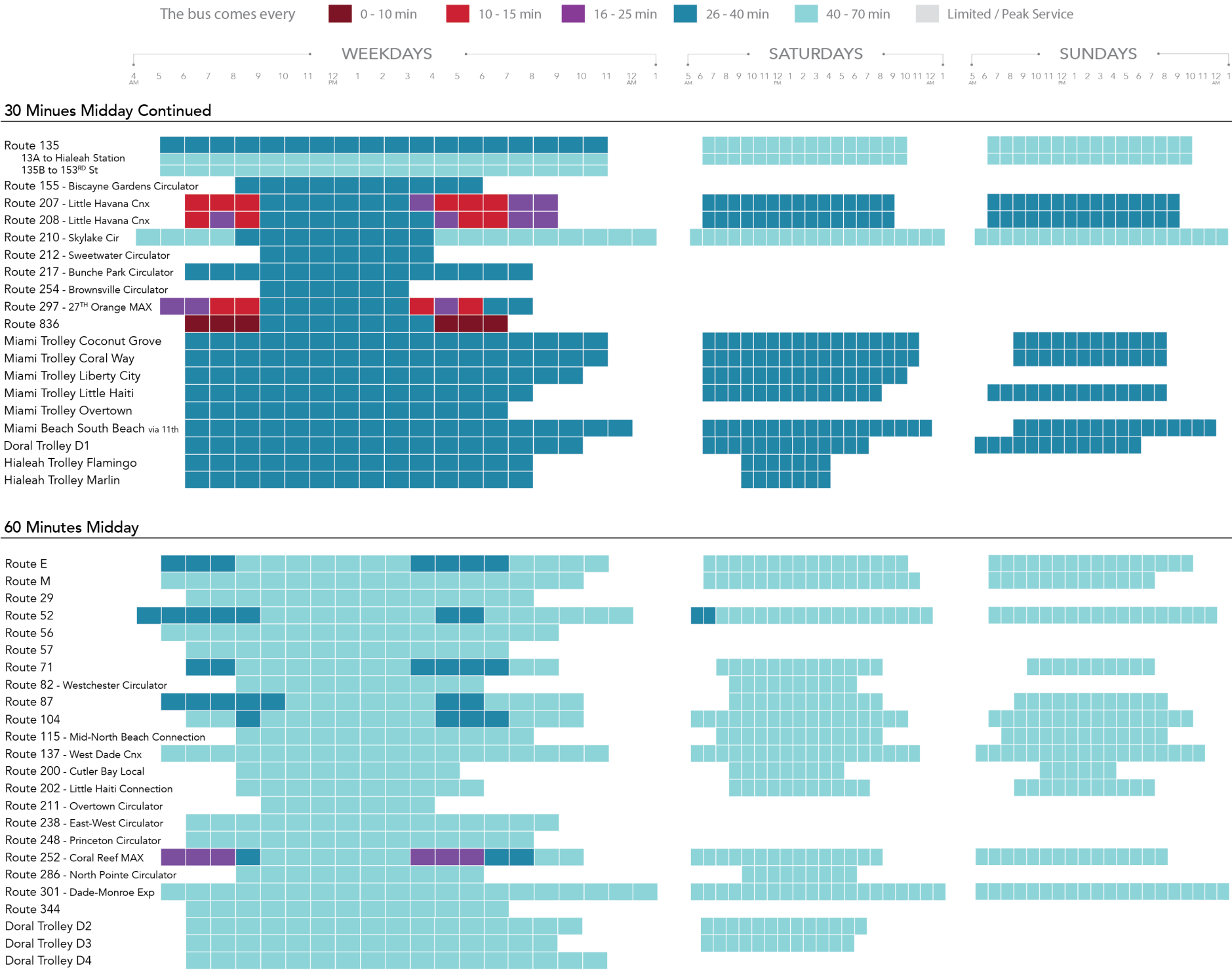


Figure 36: Existing Network frequency and span of routes with 30 and 60 minute frequency at midday

Existing Network Spans of Service

Figure 37 shows the frequency by time of day for peak-only or limited trip routes in the Miami-Dade Transit network and the municipal trolleys. Note the many peak-only routes that operate at relatively high frequencies. This requires a lot of resources to be deployed in a relatively inefficient manner, as discussed in the [Choices Report](#).

Today, there are 19 peak-only routes. These fall into a few major categories:

- Peak-only express routes in South Dade:
 - Routes 34 and 39 serving the Busway.
 - Route 136 serving Cutler Bay from Douglas Road Station via Old Cutler Road to SW 136th Street and US 1.
 - Route 204 (Killian Kat): Service from Dadeland North to SW 104th Street.
 - Route 272 (Sunset Kat): Serving SW 72nd Street from Dadeland North Metrorail Station.
 - Route 287 (Saga Bay MAX): Serving Cutler Bay via the Busway and SW 87th Avenue from Dadeland South Metrorail Station.
 - Route 288 (Kendall Cruiser): Serving SW 88th Street from Dadeland North Metrorail.
 - Route 302 (Card Sound Express): Peak-only express service from Florida City to North Key Largo.
- Northern Dade and Broward peak routes via I-95
 - Route 95 Express Routes from northern Miami-Dade via Golden Glades to Downtown Miami and Civic Center.
 - Routes 195 and 196 connecting Broward County and Downtown Miami.
 - Routes 295 and 296 connecting Broward County with the Civic Center area.
- Other Northern Dade Peak-Only Services
 - Route 46 (Liberty City Connector): Hourly peak-only service on NW 46th Street and 10th Avenue to Brownsville Metrorail and 7th Avenue.
 - Route 132: Doral to Hialeah Tri-Rail a low frequency connection.
 - Route 267 (Ludlam Limited): Serving Hialeah and Miami Lakes via NW 67th Avenue to Okeechobee Metrorail Station.

Existing Network Route Frequencies and Spans

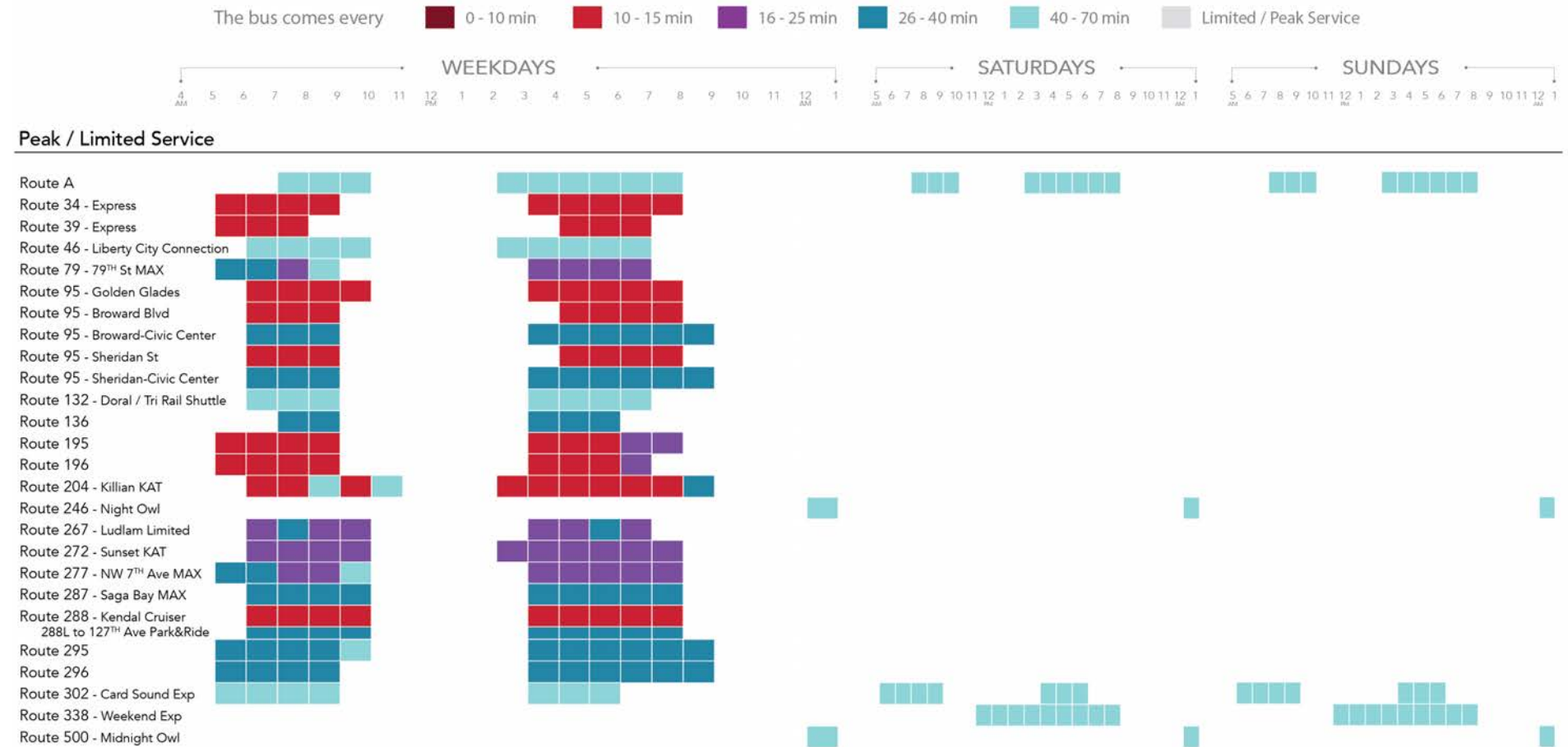


Figure 37: Existing Network frequency and span of peak-only/limited trip routes

- Peak-only Rapid Services
 - Route 79: Rapid service along 79th Street from the mainland to Miami Beach.
 - Route 277: Rapid service on NW 7th Avenue from Golden Glades to Downtown Miami.

Route A (101) from Omni Terminal to Miami Beach via the Venetian Causeway is the only route that does not fit into a typology. The Venetian Causeway is a unique case. It would naturally be a useful link for higher frequency service connecting the mainland to the Beach, but the weight limits of the Causeway mean that only smaller vehicles can be used for any service over the Causeway and thus any service along the Causeway will always be of limited capacity and usefulness.

Existing Service Productivity

As described in the [Choices Report](#), on page 42, productivity is a key measure of the success of a route in terms of its ridership relative to cost. Figure 38 shows the productivity of each route in the county network by frequency, with peak-only routes on the right half of the plot.

People sometimes assume that targeting transit service at the peak of demand, in particular at rush-hours, will be most “efficient.” Yet peak-only services have some limitations that leads to lower ridership relative to cost compared to all-day services.

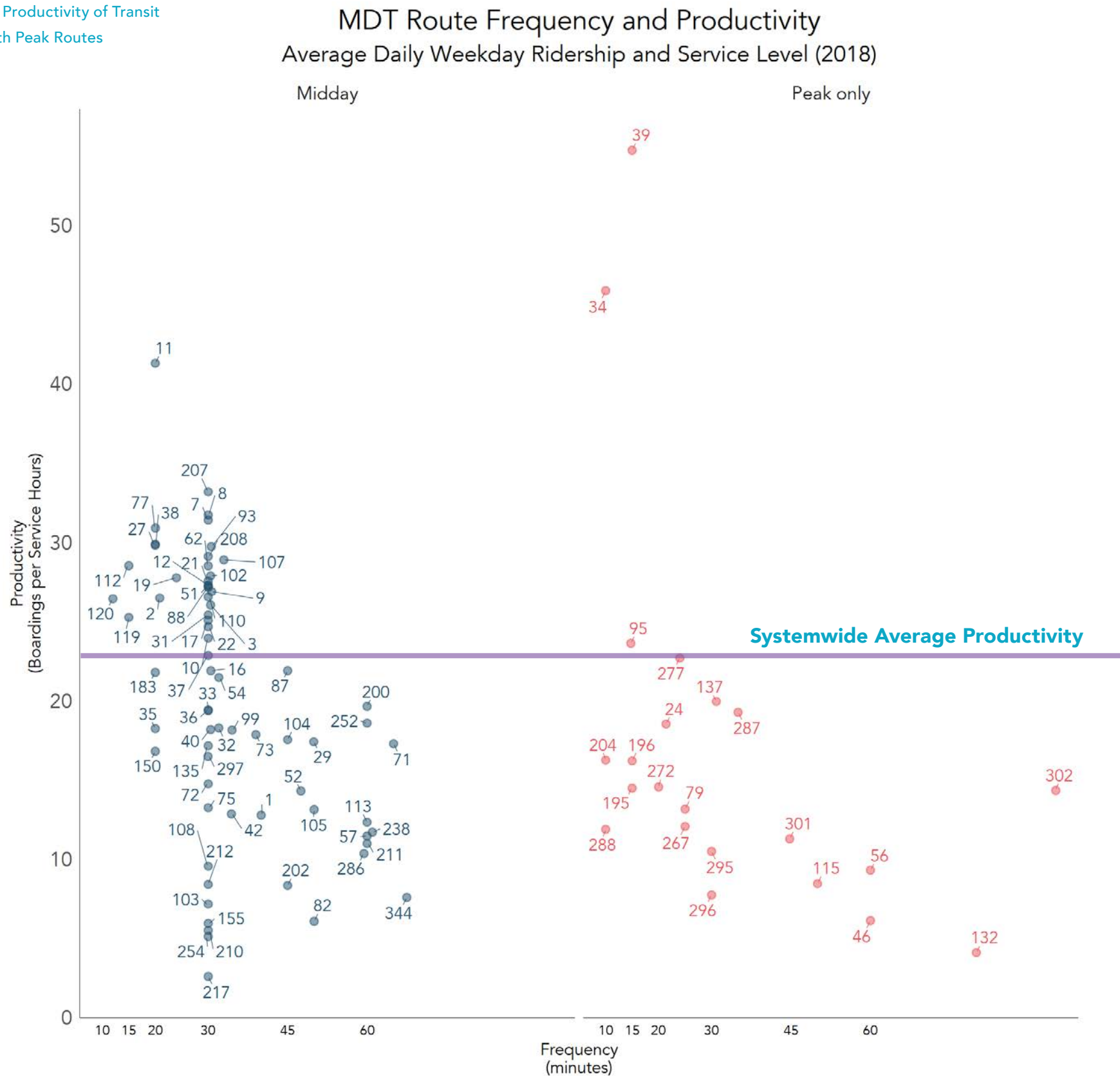
- Peak services tend to be used in only one direction, toward downtown or a major destination, and run empty or nearly empty in the opposite direction.
- Peak services are less useful to low income workers, who tend to work in industries that have less traditional shift times. Thus one of the largest markets for transit is not served well by peak services.
- There are many hidden and obvious extra costs to peak services that reduce their ridership relative to cost, such as the need for more vehicles that must be purchased, stored, and maintained but only used a few hours a day.

All but three peak-only routes have lower productivity than the systemwide average of 23 boardings per hour. The two most productive peak-only routes are Routes 34 and 39, which operate on the South Dade Busway, where buses have a significant speed advantage over private automobiles, where transfers to Metrorail at the north end are easy, and trip distances are relatively long. Therefore, these routes provide competitive trip times compared to the private automobile for a typical peak period commuter.

Therefore, in a network redesign that is trying to increase the ridership-focus of the overall network, many lower productivity peak-only services would be removed and the service hours put to use in all-day frequency on corridors that better fit the Ridership Recipe.

Currently, there are the two peak-only MAX routes (79 and 277) that are relatively low frequency and low productivity. This suggests that the resources for these routes might be better used to increase the frequency of local service on the same corridors. This trade-off is further discussed in the [Choices Report](#), on page 48.

Figure 38: Frequency and Productivity of Transit Service in Miami-Dade with Peak Routes



Better Bus Network Spans of Service

Figure 39 shows the frequency by time of day for the most frequent routes in the Better Bus Network. Many more routes are frequent at midday both on weekday and Saturdays. Also, service is more consistent across routes, so that the network of frequent routes is consistent across the day.

Unfortunately, the budget limitations in Miami-Dade mean that Sunday service cannot be equally as generous. Thus most frequent routes run every 20 minutes on Sunday, though for most corridors this is an improvement from today's service.

Public transit has traditionally been planned on the assumption that most travel happens on weekdays and during peak time. The everyday experience of traffic seems to confirm this. Nevertheless, there are good reasons to question whether transit should still be planned primarily around weekday daytimes.

- More and more jobs are on nontraditional schedules requiring occasional or regular weekend shifts. These shifts often start in the midday and end later than 6 PM.
- This trend is especially pronounced for lower-wage jobs in retail, healthcare, restaurants and personal services, so improving weekend and evening service helps improve the lives of people with lower incomes.
- These sectors also drive significant and growing numbers of weekend and evening trips for shopping, socializing, recreation, and other purposes, many of which could also be made by transit.
- Many people may be reluctant to use transit because of its inconsistent availability. If you need to drive to get to work on weekends (or to return home in the evening without waiting a long time), you are much less likely to take transit at all, even if your bus comes every 15 minutes during your regular commute times.

The Better Bus Network is designed with more consistent and more frequent service in the evening and on weekends across the entire system. A key place where additional investment would make a large difference in access and opportunity for the County is to improve Sunday frequency and other off-peak times across the frequent network.

New Better Bus Network - Frequencies and Spans

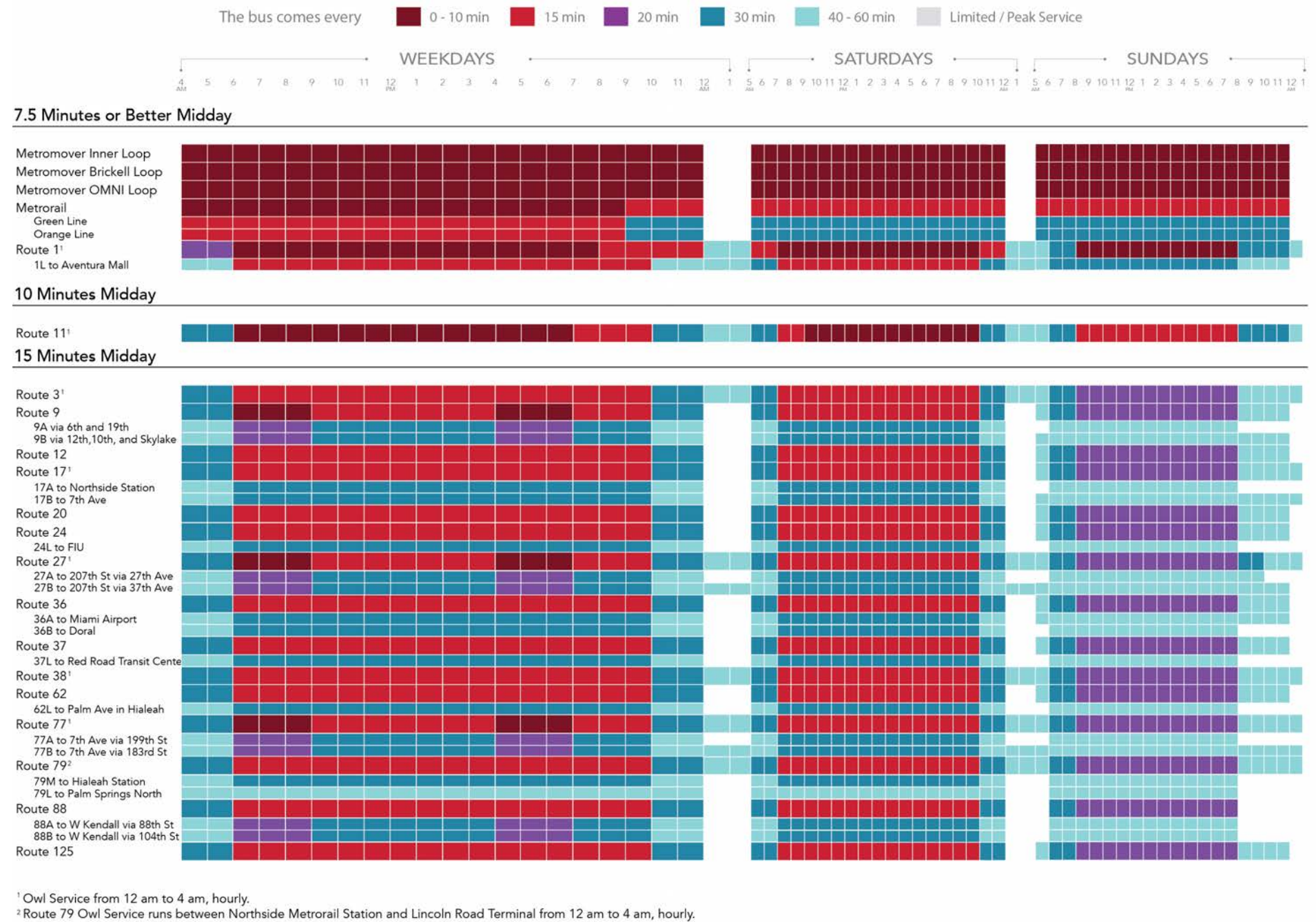


Figure 39: Better Bus Network frequency and span of routes with 15 minute or better frequency at midday

Better Bus Network Spans of Service

Key corridors with 20 minute service include Routes 135 and 183. These routes are prime candidates for improved midday and weekend frequency if additional funding were available.

Most remaining routes in the Better Bus Network have a 30 or 60 minute frequency in order to have enough routes to continue provide access to people that have service nearby today.

Nonetheless, this concept shows an improvement in frequency for the main corridors during weekdays and on the weekend, a significant increase improvement in service from what it is running today in the evening and weekends. Figure 40 shows the span and frequency of routes that operate every 20 or 30 minutes at midday on weekdays.

New Better Bus Network - Frequencies and Spans

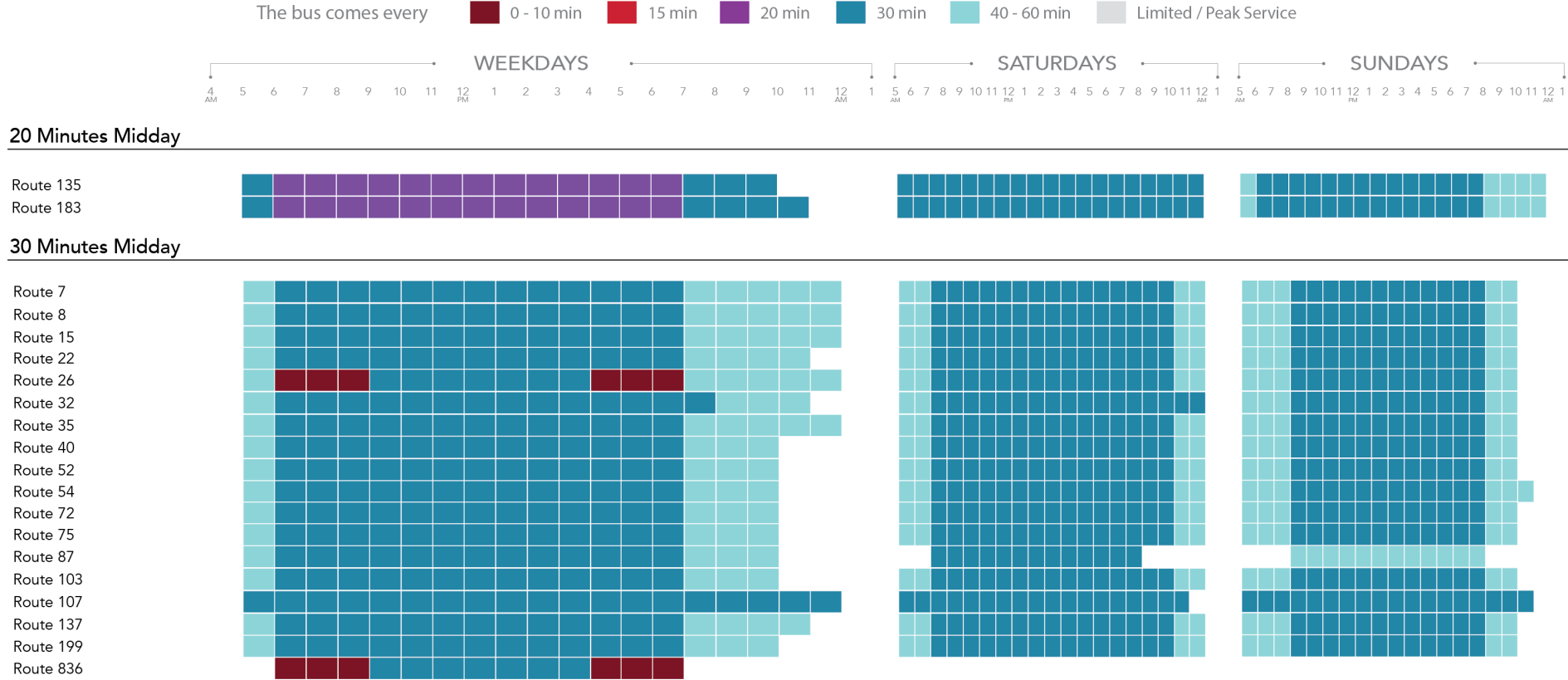


Figure 40: Better Bus Network frequency and span of routes with 30 minute frequency at midday

Better Bus Network Spans of Service

Figure 41 shows the span and frequency of routes in the Better Bus Network that operate every 60 minutes at midday, operate only at peaks, or have limited service on weekdays.

Given the extra costs of peak-only services and the lower productivity of many peak-only routes described on page 35, the Better Bus Network reduces the number or frequency of many peak-only services to reinvest those resources in more productive parts of the network.

In the Better Bus Network there are 13 peak-only routes.

- Peak-only express routes in South Dade:

- Routes 34 and 39 serving the Busway remain with higher frequency of service given their high productivity.
- Route 136 is partially replaced with a peak extension of Route 73.
- Route 204 (Killian Kat): Service from Dadeland North to SW 104th Street is retained with a shorter span of service.
- Route 272 (Sunset Kat): Serving SW 72nd Street from Dadeland North Metrorail Station remains with lower frequency and shorter span of service.
- Route 287 (Saga Bay MAX): Serving Cutler Bay via the Busway and SW 87th Avenue from Dadeland South Metrorail Station remains with a shorter span of service.
- Route 288 (Kendall Cruiser): Serving SW 88th Street from Dadeland North Metrorail remains as is, since it is grant funded.
- Route 302 (Card Sound Express): Peak-only express service from Florida City to North Key Largo remains as is since its funding is shared with Monroe County.

- Northern Dade and Broward peak routes via I-95:

- Routes 95, 195, 196, 295 and 296 remain in their current form.

- Other Northern Dade Peak-Only Services:

- Route 46 (Liberty City Connector) is removed due to low productivity and limited access benefits.

New Better Bus Network - Frequencies and Spans

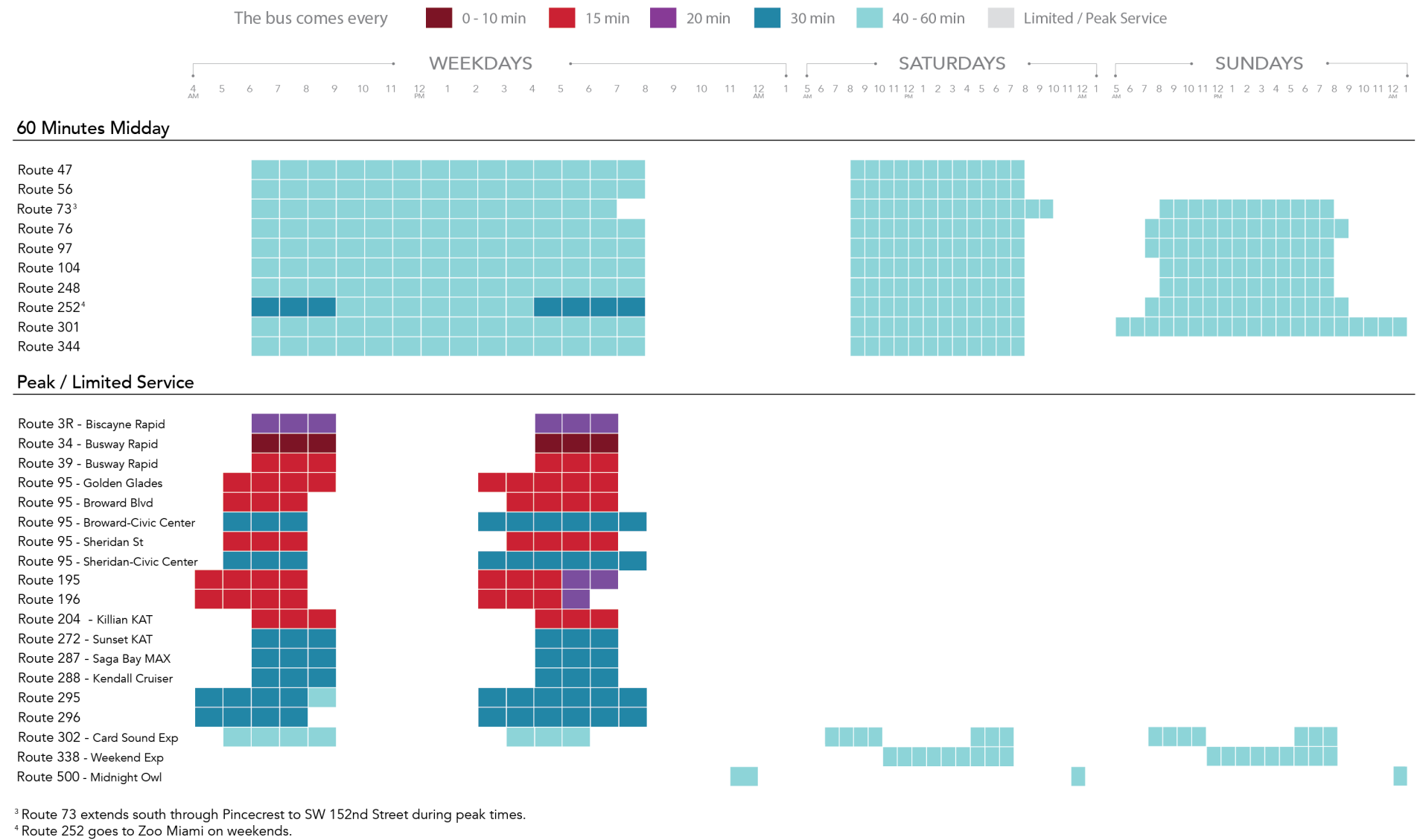


Figure 41: Better Bus Network frequency and span of routes with 60 minute frequency at midday and peak-only/limited trip routes

- Route 132: Doral to Hialeah Tri-Rail a low frequency connection remains as is.
- Route 267 (Ludlam Limited) is removed due to low productivity and limited access benefits.
- Peak-only Rapid Services (Route 79 and 277) are removed to support more frequent midday and weekend service.

Evening & Weekend Service Comparison

All of the maps in this report up to now have shown the midday frequency because that represents the service that is available most of the time. The maps on this page show the frequency of routes during other times of the week. These are the Existing and Better Bus Networks during the evenings on a weekday (9pm), midday on a Saturday, and midday on a Sunday. The availability of service all-day, all-week is extremely important for transit users. While travel often peaks at rush hour, many people need to travel during other times of the week. The frequency charts show span and frequency information in more detail, starting on page 31.

The difference between the Existing and Better Bus Networks in the evening is clear. The New Network has a grid of frequent service that the Existing Network lacks. While the Existing Network has less service in the evenings than during the midday, the New Network mostly keeps the midday network. This is very useful for people that have service jobs that don't follow rush hour travel patterns. It is also useful for people that have office jobs but have to work late or have things to do after work.

On Saturdays, the Better Bus Network mostly keeps the midday network with the same high frequency grid that can be very useful to many people. On Sundays, the Better Bus Network turns the frequent grid down to 20 minute frequency. Unfortunately, the resources currently available do not allow the high frequency grid to remain on Sundays. If additional funding is available, this is a great place to invest in higher frequency.

The Better Bus Network frequent grid extends to weekday evenings and Saturdays, vastly expanding when useful service is available across large parts of the county.

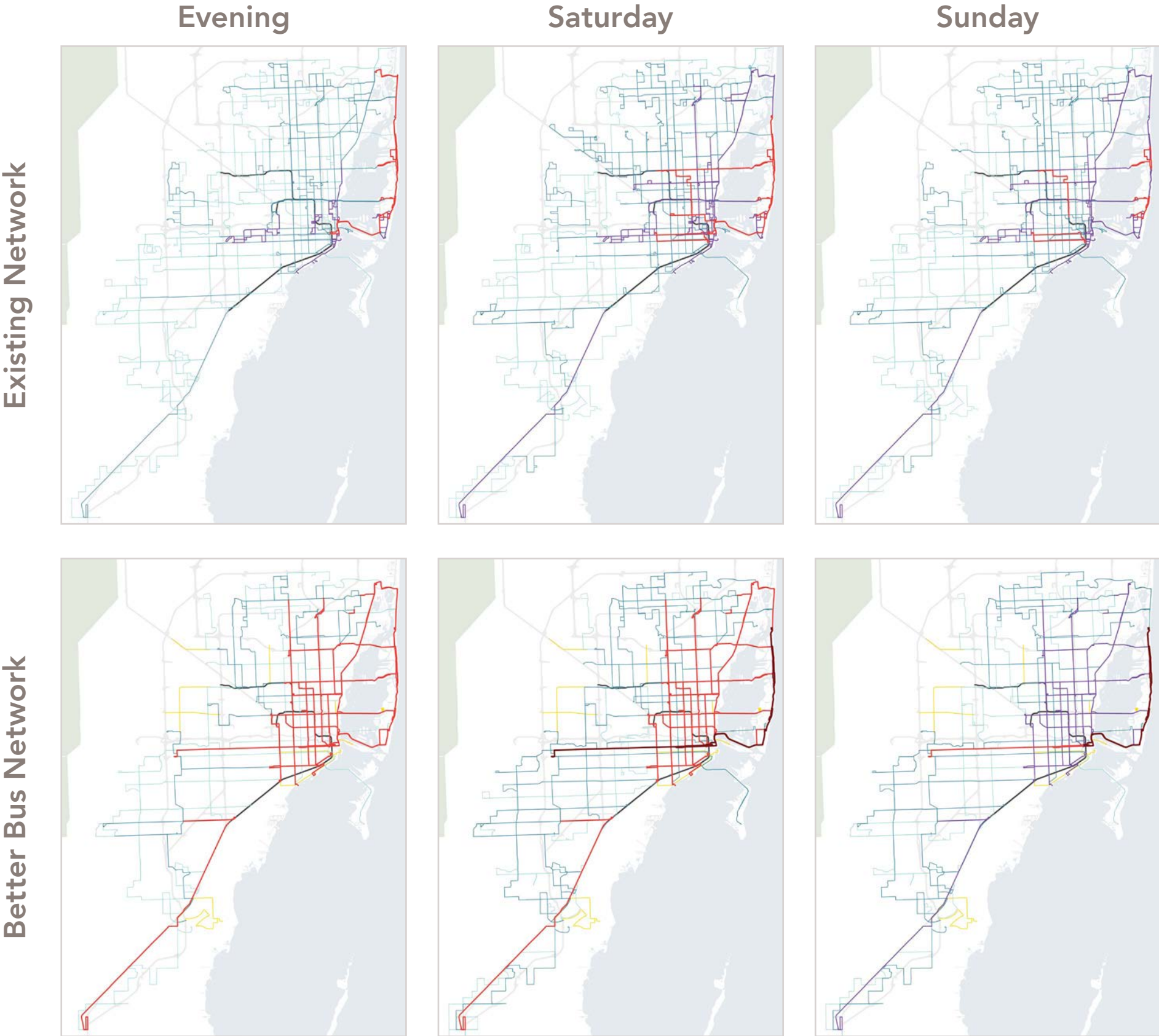


Figure 42: Existing and Better Bus Networks showing service during the evening on a weekday (9pm), midday on a Saturday, and midday on a Sunday

3 Comparing Outcomes

Freedom = Access = Usefulness

Public transit can be described from many points of view, but there are some basic geometric facts about how transit works and how it interacts with the layout of a city. Public transit ridership arises from the combination of three things:

- **Access (or Freedom):** Where can you get to on public transit in a reasonable amount of time, compared to your alternatives?
- **Pricing:** What does transit cost given its alternatives?
- **Preferences:** These include everything else, all the subjective factors that govern decisions about how to travel, as well as reactions to other aspects of the transit experience.

Network design and planning mostly determine access, and access is central to the usefulness of service for any given trip.

Access

Wherever you are, there is a limited number of places you could reach in a given amount of time. These places can be viewed on a map as a blob around your location. Figure 43 shows an example of this type of visualization of transit access for Little Havana (Flagler and 17th Avenue), in the Existing Network.

Think of this blob as “the wall around your life.” Beyond this limit are jobs you can not hold, places you can not shop, and a whole range of things you can not do because it simply takes too long to get there. The technical term for this is accessibility, but it’s also fair to call it freedom, in the physical sense of that word. The extent of this blob determines what your options are in life: for employment, school, shopping, or whatever places you want to reach. If you have a bigger blob, you have more choices, so in an important sense you are more free.

Access is a Matter of Geometry

Freedom is about what you could do, not what we predict you will do. Access is how network design generates ridership, because it measures how likely it is that any particular trip will be viable on transit. Yet, it also represents something that many people will see as a worthy goal in itself. For example:

- **Access to jobs** is a key concern for keeping people employed.
- **Access from a particular location** is something that gives a location value. Real estate firms routinely study where you can get to by car from a particular parcel, and this is the same analysis for transit. In dense cities, transit access can be an important factor in land value.

- Access describes an outcome in terms that many people will care about. **If you are deciding where to live based on whether you’ll be able to get to your job, school, or relatives, you are asking a question about access.**
- The whole reason people live in urban areas is to have access to the opportunities that arise from being near other people. **So access is a fundamental measure of whether a city is functional.**

How Transit Expands Access

On transit, the extent of access is determined by:

- **A network**, including transit lines with their frequency, speed, and duration. These features determine how long it takes to get from any point on the network to any other point.
- **The layout of the city.** For each transit stop on the network, this determines how many useful destinations are located there or within easy walking distance.¹ For example, if density is higher, that means there are more people or useful destinations at a given stop, which means that good access from that point is of more value to more people.

Building Access: The Network and Frequency

A transit network is a pattern of routes and services, in which each line has:

- a path;
- a duration, or span—what hours and days it runs;
- an average speed; and
- a frequency—how often a transit vehicle serves a stop, which determines how long a riders waits for a vehicle.

Of these, frequency is the one that is often invisible and easy to forget. Yet frequency is usually the dominant element of travel time, and therefore significantly affects access in a given amount of time.

To maximize liberty and opportunity for the greatest possible number of people requires a network of routes that optimizes (in order) Frequency, Span, Connections, Speed, Reliability, Capacity, and that follows favorable patterns in the built environment.

¹ There are other ways to get to transit other than walking, but walking is by far the most common, so we use it here for simplicity as we explain the basic concepts.

How far can I travel in 30, 45, and 60 minutes from Little Havana - Flagler & 17th Ave at noon on a weekday?

- In 30 minutes, I can reach the areas in dark purple
- In 45 minutes, I can reach the areas in light purple
- In 60 minutes, I can reach the areas in pink

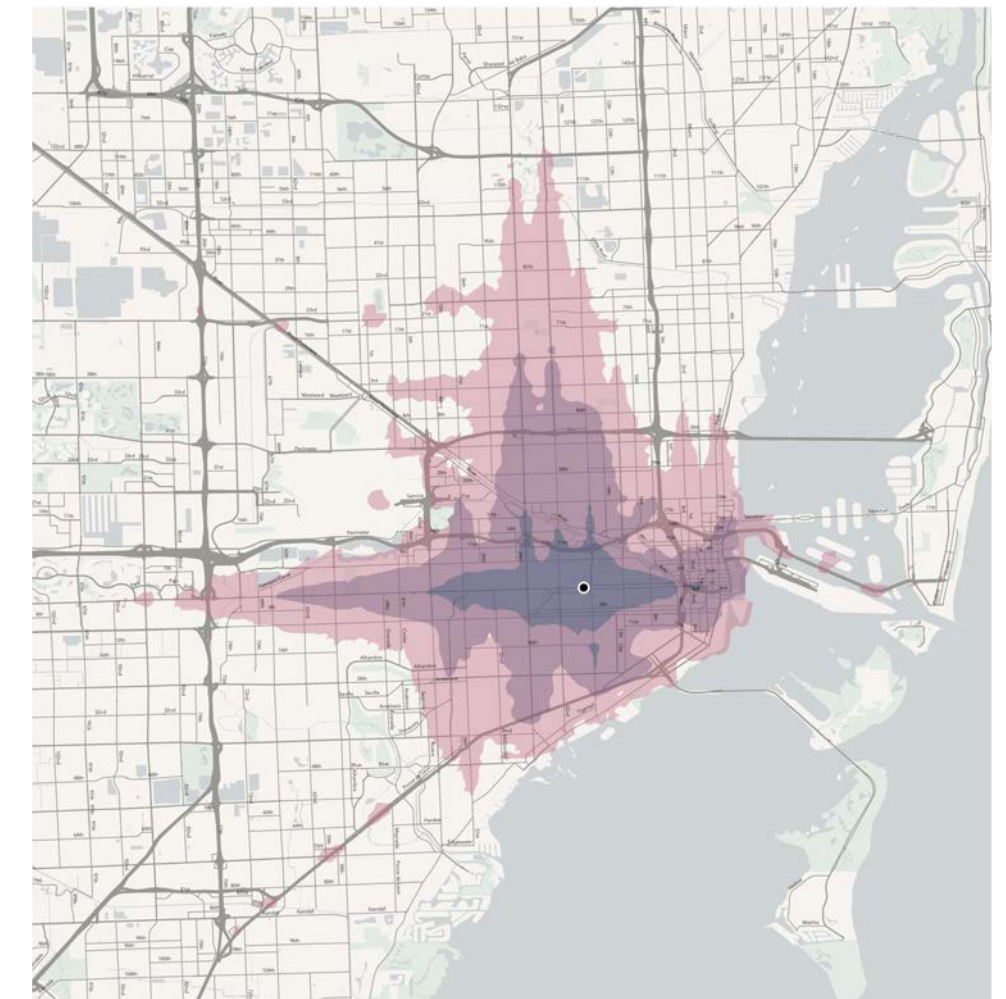


Figure 43: The blobs on this map effectively show the liberty and opportunity available to someone living in Little Havana if they rely on walking and transit.

Measuring Access to Opportunities

Frequency Comes First

Ridership responds to many features of a service, including speed and reliability, but the dominant factor is frequency. Frequency is the elapsed time between consecutive buses (or trains, or ferries) on a line, which determines the maximum waiting time.

People who are accustomed to traveling by private vehicle often underestimate the importance of frequency, because there isn't an equivalent in their experience. A private vehicle is ready to go when you are, but public transit isn't available until it comes.

High frequency means public transit is coming soon, which means that it approximates the feeling of liberty you have with a private vehicle – namely that you can go anytime. Frequency has three independent benefits for the passenger.

- **Frequency reduces waiting**, which is everyone's least favorite part of a trip. Being able to go when you want to go is the essence of frequency. A smartphone can tell you when the bus is coming, but still does not reduce the wait or get you where you want to be.
- **Frequency makes connections easy**, which makes it possible for a cluster of transit lines to become a network. A transit line without good connections is useful for travelling only along that line. A network of frequent lines can make it easy to travel all over the city. This massively expands the usefulness of each line.
- **Frequency is a backup for problems of reliability.** If a vehicle breaks down or is late, frequency means another will be along soon.

Measuring Access and Freedom

To measure freedom and access outcomes, we measure the change in access to jobs. Since retail and services also account for jobs, access to jobs is a good indicator of the usefulness of transit for many other opportunities that the region offers. So we ask the question: **Could more people access more jobs (and other opportunities) by transit, in less time?**

To answer this question, we explore how a transit network changes people's freedom to travel and access more jobs and opportunities. We measure how far one could go in 45 minutes on transit (door-to-door, including walking, waiting, and riding) from anywhere in the region, and calculate how many jobs are located in the area that is reachable.

Not Just the Area – Also What is Inside the Area

The real measure of usefulness is not just how much geographic area we can reach, but how many useful destinations are in that area.

Ridership arises from service being useful, for more people, to get to more busy places. That's why predictive models of ridership do this very same analysis behind-the-scenes.

The example in Figure 44 shows how access changes for Little Haiti with the Better Bus Network, showing areas reachable with both networks in dark blue, newly reachable areas in light blue, and areas no longer reachable in grey. The table below reports the change in jobs and people reachable.

The isochrones on page 43 show the same for three other example locations around the county. Many more isochrone examples are in Appendix A, showing how different parts of the county are affected by the New Network.

When reviewing these maps remember that *waiting time counts*, and in most cases, a longer walk to a high-frequency route can get people farther and faster, than a shorter walk to an infrequent route. Also remember that some of the access shown in these maps isn't reached on a single route, but requires a transfer.

With the Better Bus Network, residents in Little Haiti can reach nearly 20,000 more jobs and opportunities in 45 minutes.

How far can I travel in 45 minutes from Little Haiti 2nd and 54th NE at noon?

Better Bus Network

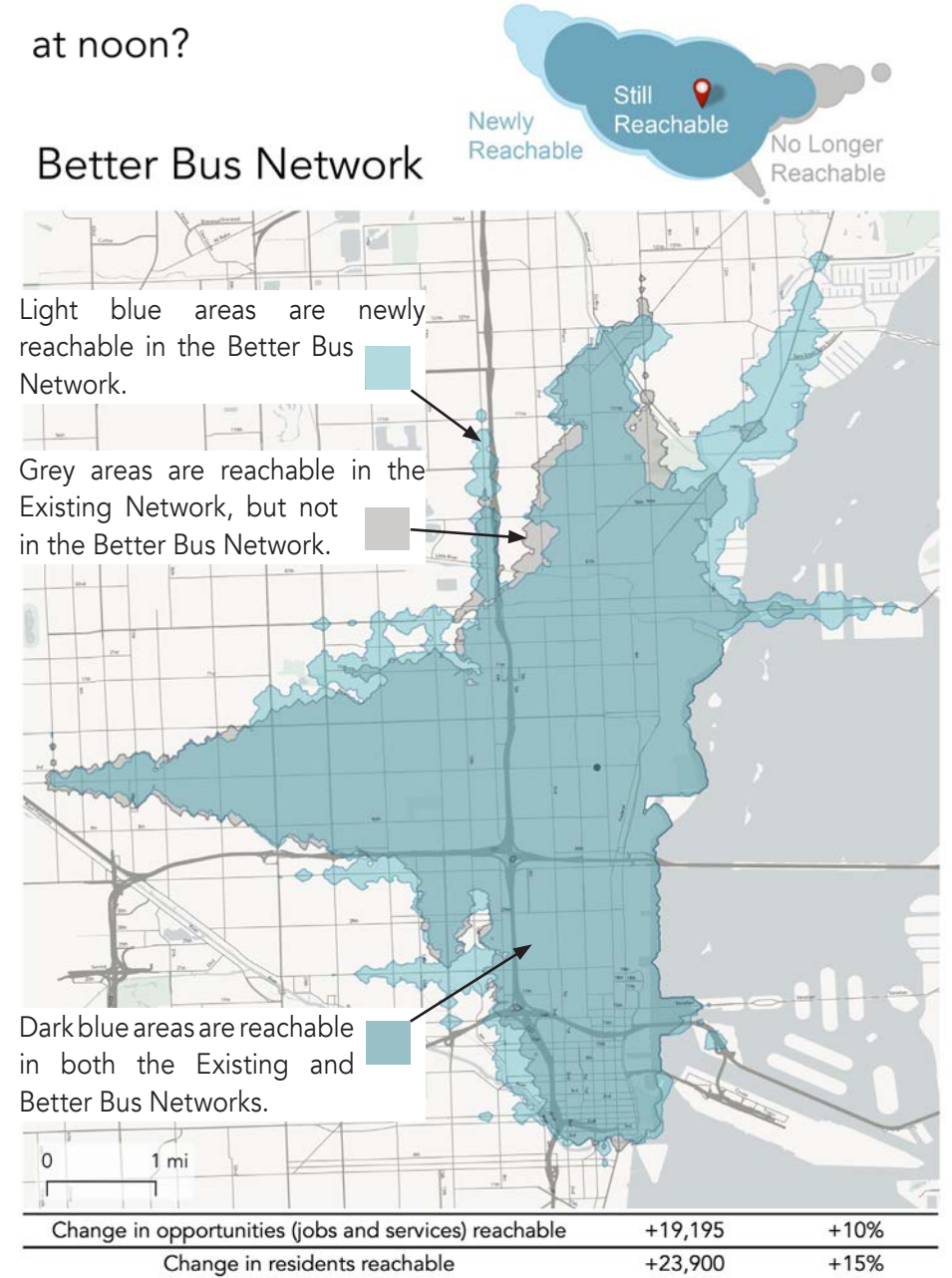


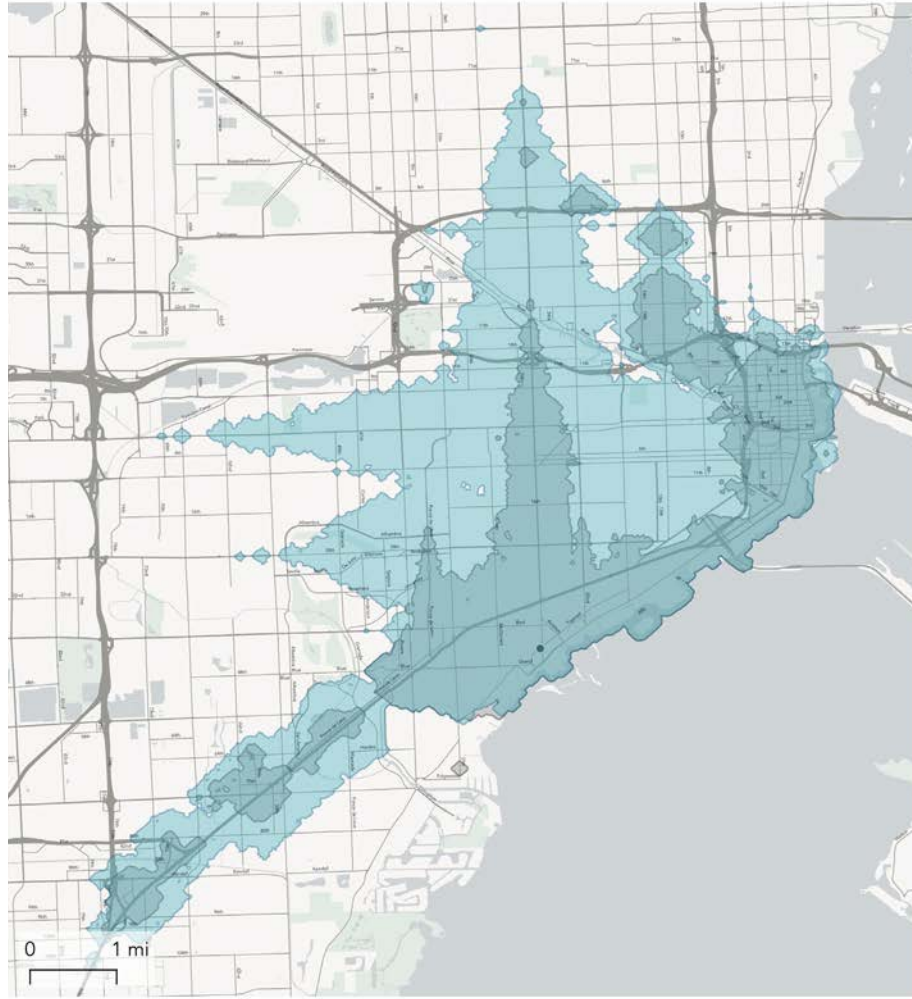
Figure 44: Places reachable in 45 minutes from Little Haiti (NE 2nd Ave and 54th St) in the Better Bus Network, compared to the Existing Network

Sample Isochrones

How far can I travel in 45 minutes from Coconut Grove at noon?



Better Bus Network

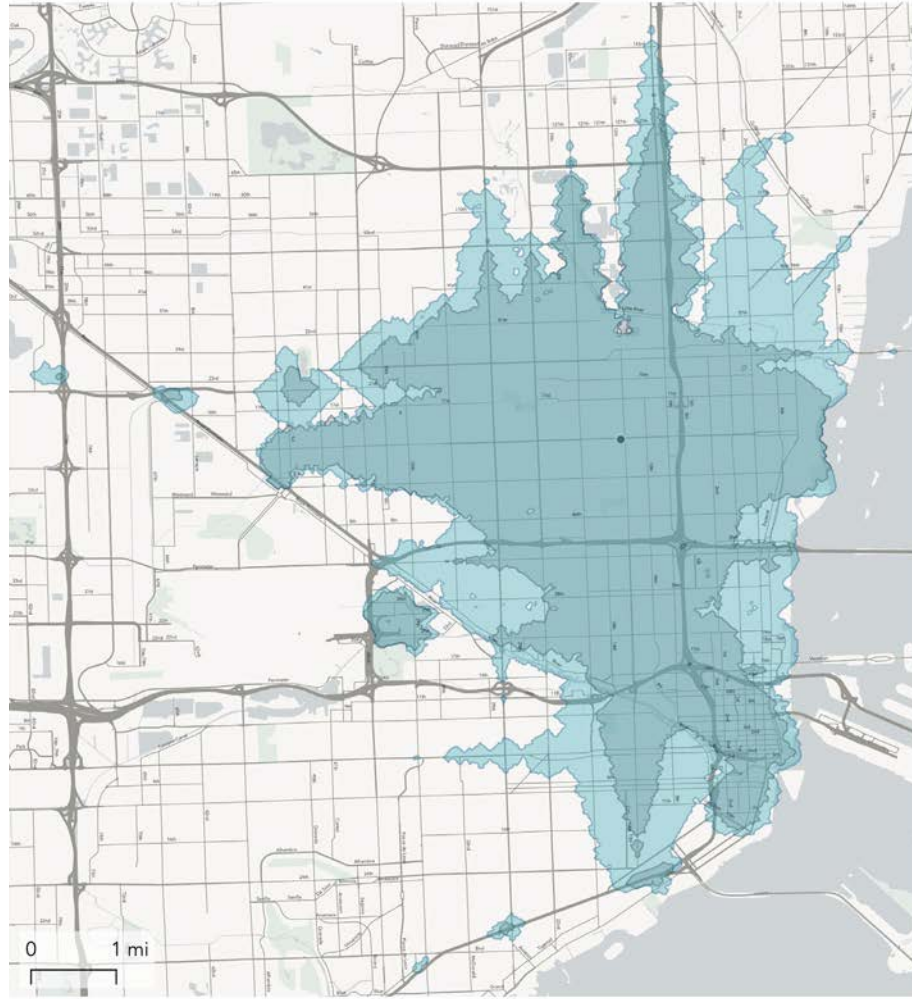


Change in opportunities (jobs and services) reachable	+105,550	+60%
Change in residents reachable	+216,405	+165%

How far can I travel in 45 minutes from Liberty Square - 12th and 62nd at noon?



Better Bus Network

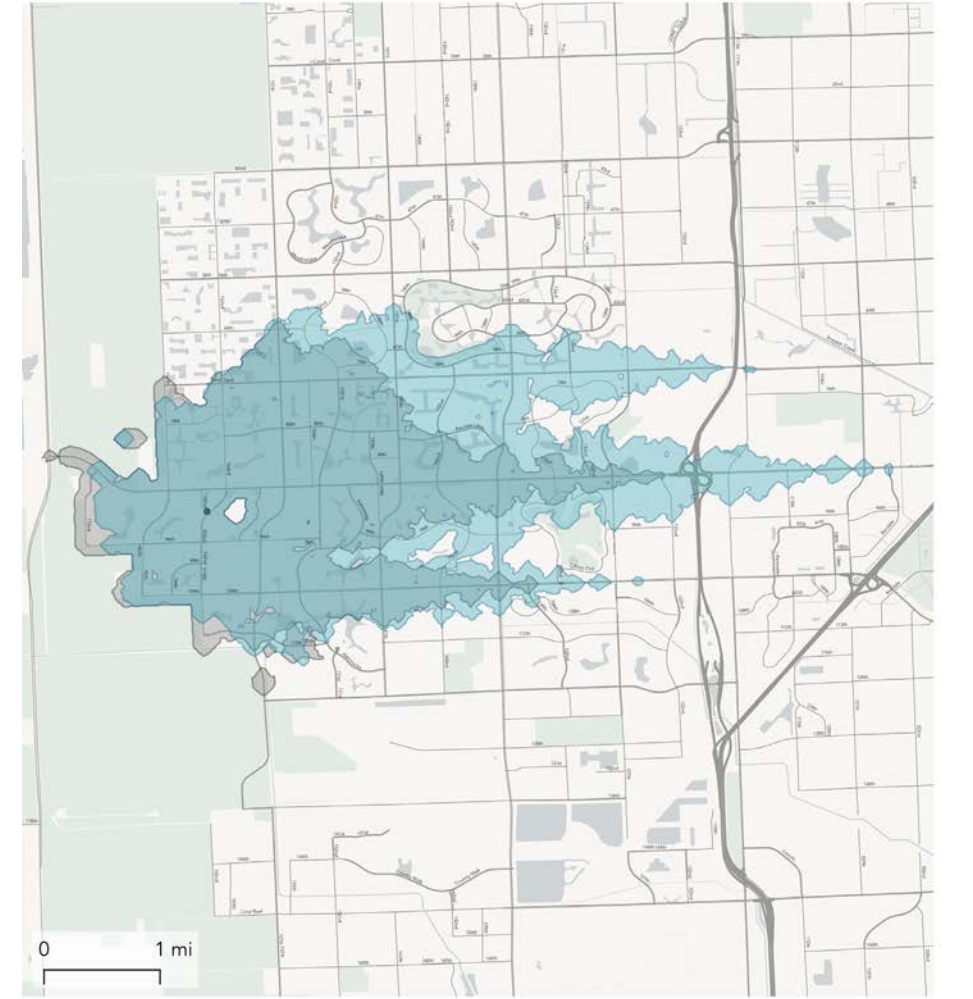


Change in opportunities (jobs and services) reachable	+96,985	+60%
Change in residents reachable	+123,110	+50%

How far can I travel in 45 minutes from West Kendall Transit Terminal at noon?



Better Bus Network



Change in opportunities (jobs and services) reachable	+5,130	+60%
Change in residents reachable	+32,490	+45%

Figure 45: This isochrone map from Florida International University shows change in access in 45 minutes for the Better Bus Network.

Figure 46: This isochrone map from Liberty Square shows change in access in 45 minutes for the Better Bus Network.

Figure 47: This isochrone map from West Kendall Terminal and Baptist Hospital shows change in access in 45 minutes for the Better Bus Network.

With the Better Bus Network, 216,000 more people can reach Coconut Grove in 45 minutes.

From Liberty Square, you could reach 97,000 more jobs in 45 minutes.

With the Better Bus Network, 32,000 more people can reach West Kendall Baptist Hospital in 45 minutes.

Change in Access to Opportunities

The previous maps show how the Better Bus Network expands where people could go in a given time, from certain places. Figure 48 summarizes the same thing for every part in the county. In this map, every dot represents 10 residents. Where many dots are very close together, the overall density of residents is higher. The color of the dot represents how many more (or fewer) jobs could be reached in 45 minutes on transit on weekdays at noon, from anywhere in the County, door-to-door, including walking, waiting, and riding.

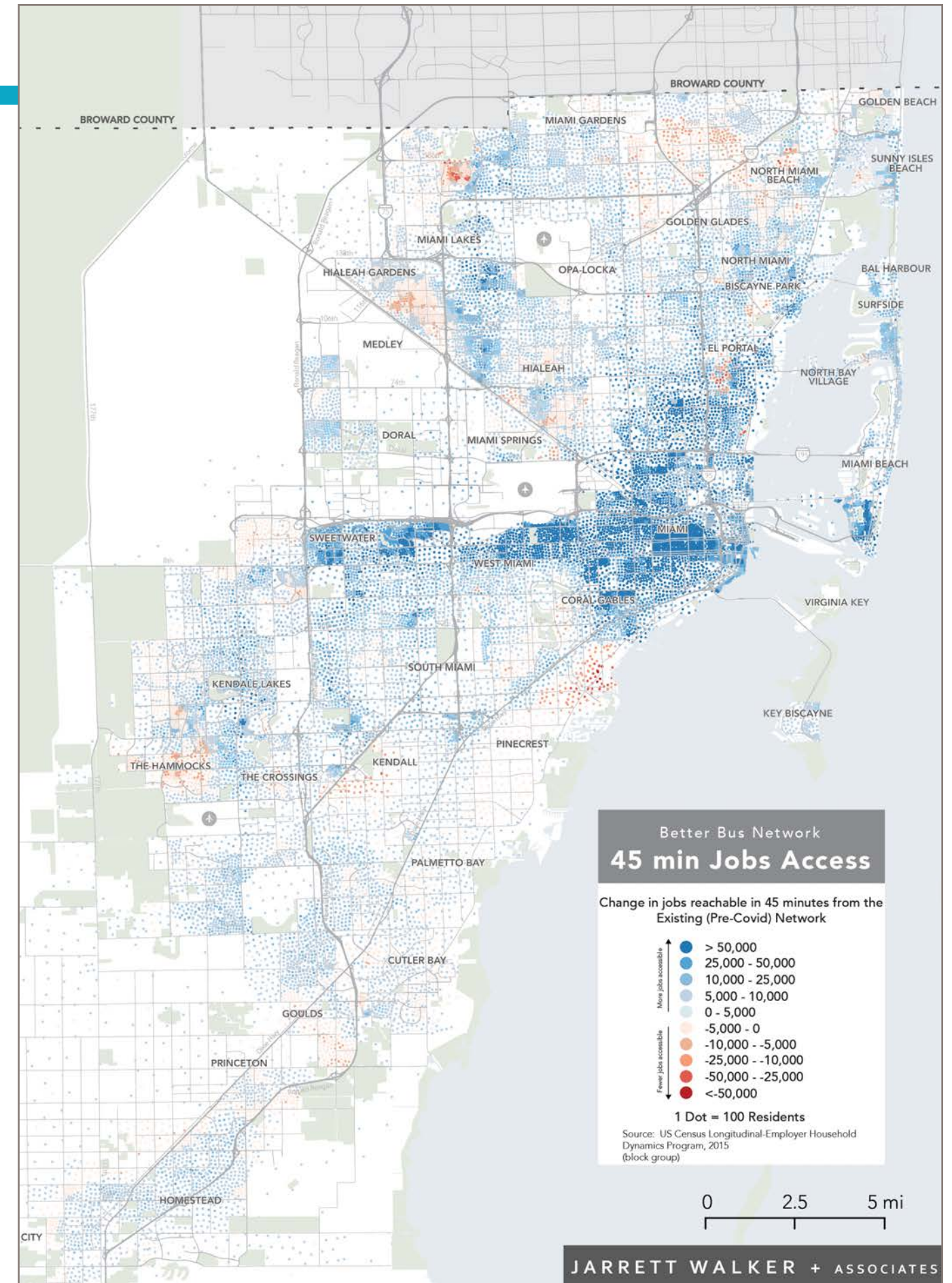
Where blue dots predominate, more people are benefiting from the Better Bus Network. Where red dots predominate, more people are bearing the cost, in this case a decline in access to jobs. The darker the shade, the greater the increase or decrease in access. Again, access to other opportunities, like education or shopping, would likely change in a similar way.

The Better Bus Network shows an increase in job access in many parts of the county without much decrease in access. Places where large numbers of people live would experience substantial increases in job access. The greatest increase is within the core of the county and along main corridors that have more frequent service than in the existing system such as Flagler, 27th Avenue, 12th Avenue, and Biscayne Boulevard. For example, in the City of Miami and surrounding municipalities near the core, the colors are dark blue, and the dots are very close together.

In suburban areas the Better Bus Network does some shift of service toward busier corridors, meaning some areas have a decline in job access. Most areas that have dark red dots do not have many people living there. Places like Pinecrest and Palmetto Bay experience a reduction in access to jobs. Yet, since the density of those places is low, far fewer people see a reduction in access than see a gain. Thus, the average county resident sees a substantial increase in job access.

The average county resident could reach 36% more jobs in 45 minutes with the Better Bus Network.

Figure 48: Change in jobs reachable in 45 minutes for the Better Bus Network compared to Existing Network.



Change in Access to Opportunities: Disadvantaged Populations

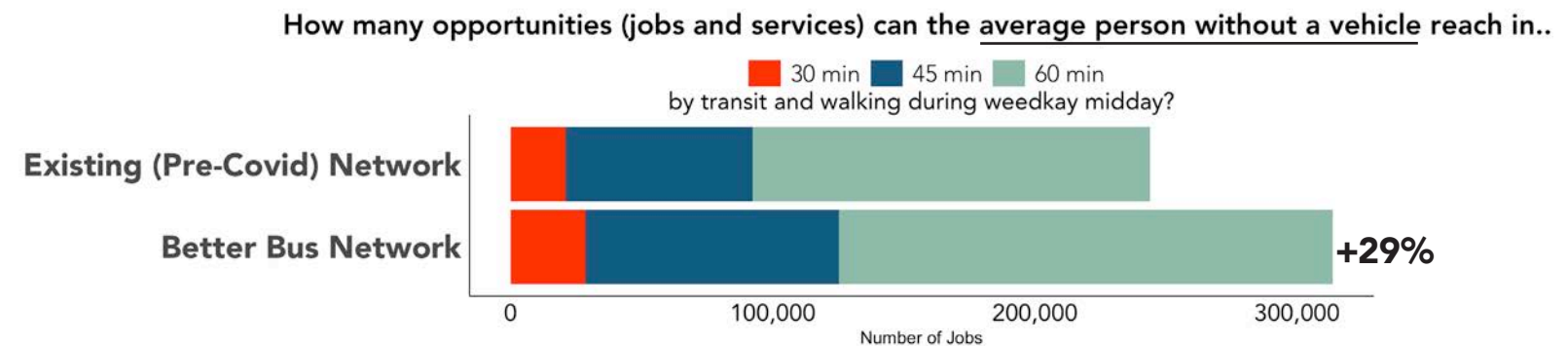
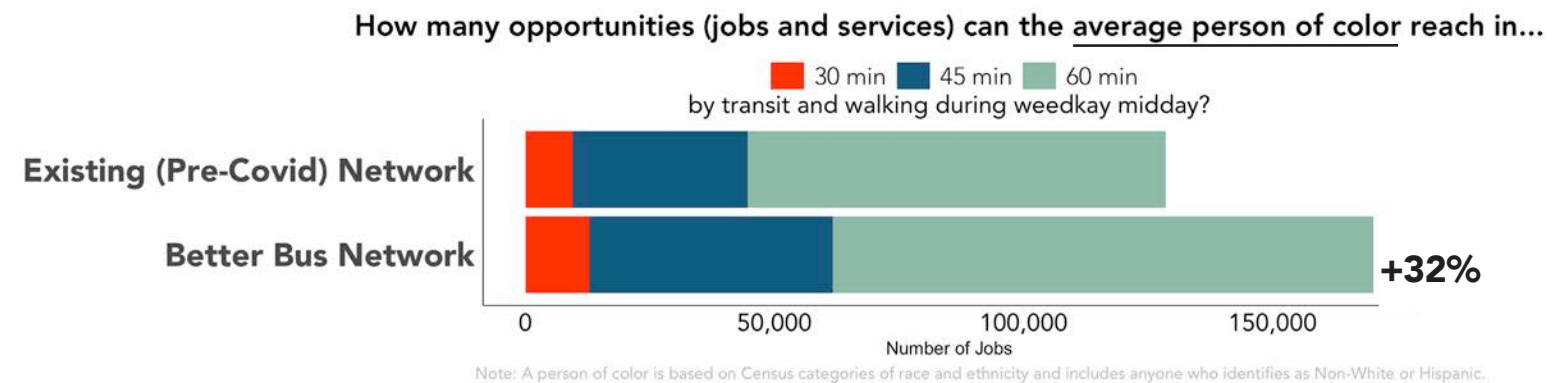
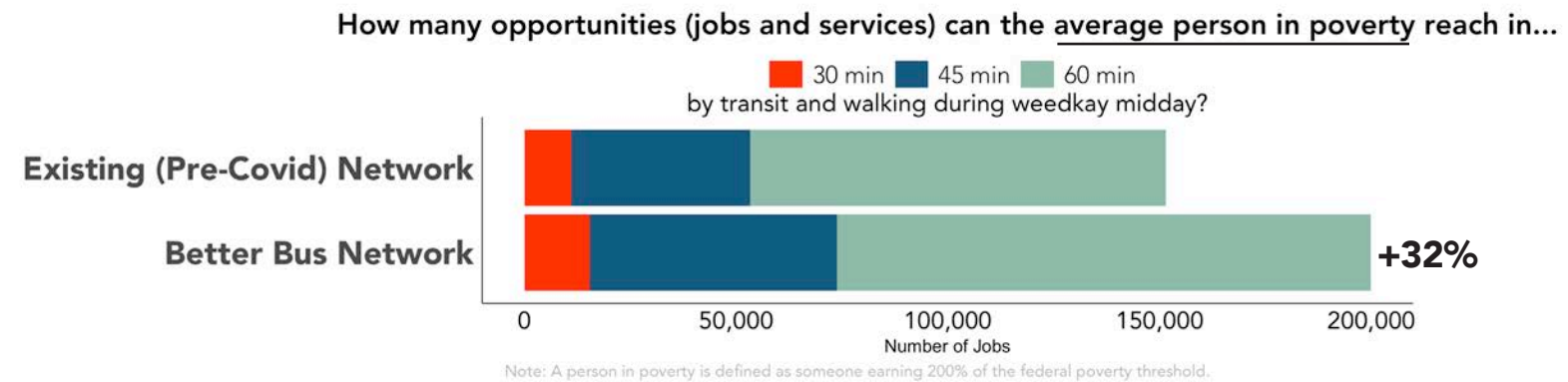
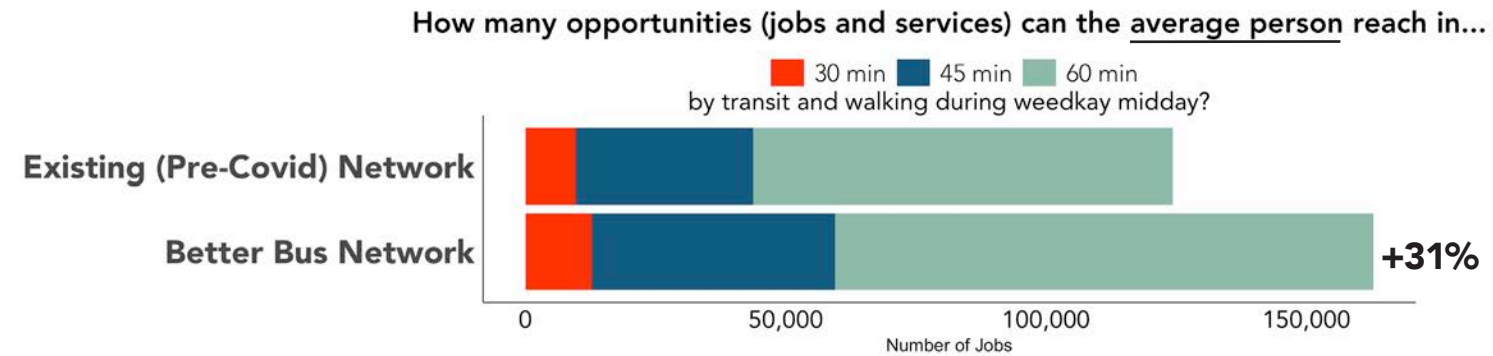
The Better Bus Network has a large increase in the number of jobs accessible to the average person in Miami-Dade. Figure 49 shows the average number of jobs reached on transit at midday on weekdays, for the average person in the county and for different subgroups. The average resident can reach 31% more jobs within 60 minutes.

We also reviewed the specific impact on communities of special concern for civil rights or equity. Low-income people and people of color experience a similar increase in access than the average resident, with both groups seeing a 32% increase in jobs accessible in 60 minutes, indicating that the improvements in access are broadly shared.

As previously discussed, measuring access to jobs is a proxy for measuring freedom. Expanding the jobs and opportunities you can reach expands the options you have in life: for employment, school, shopping, or whatever places you want to reach. If you have more jobs and opportunities within a reasonable travel time, you have more choices, so in an important sense you are more free. Freedom is about what you could do, not what we predict you will do.

With the New Network, the average person in poverty could reach 32% more jobs in one hour.

Figure 49: Jobs accessible in 30, 45 and 60 minutes by walking and transit for different groups in Miami-Dade



Workforce and Customer Access

Access isn't just about getting places from home. For businesses and destinations of all kinds, access analysis shows how many customers can get to you. Therefore, it is also useful to consider how many residents can reach each jobs location in the county and how that changes under the Better Bus Network.

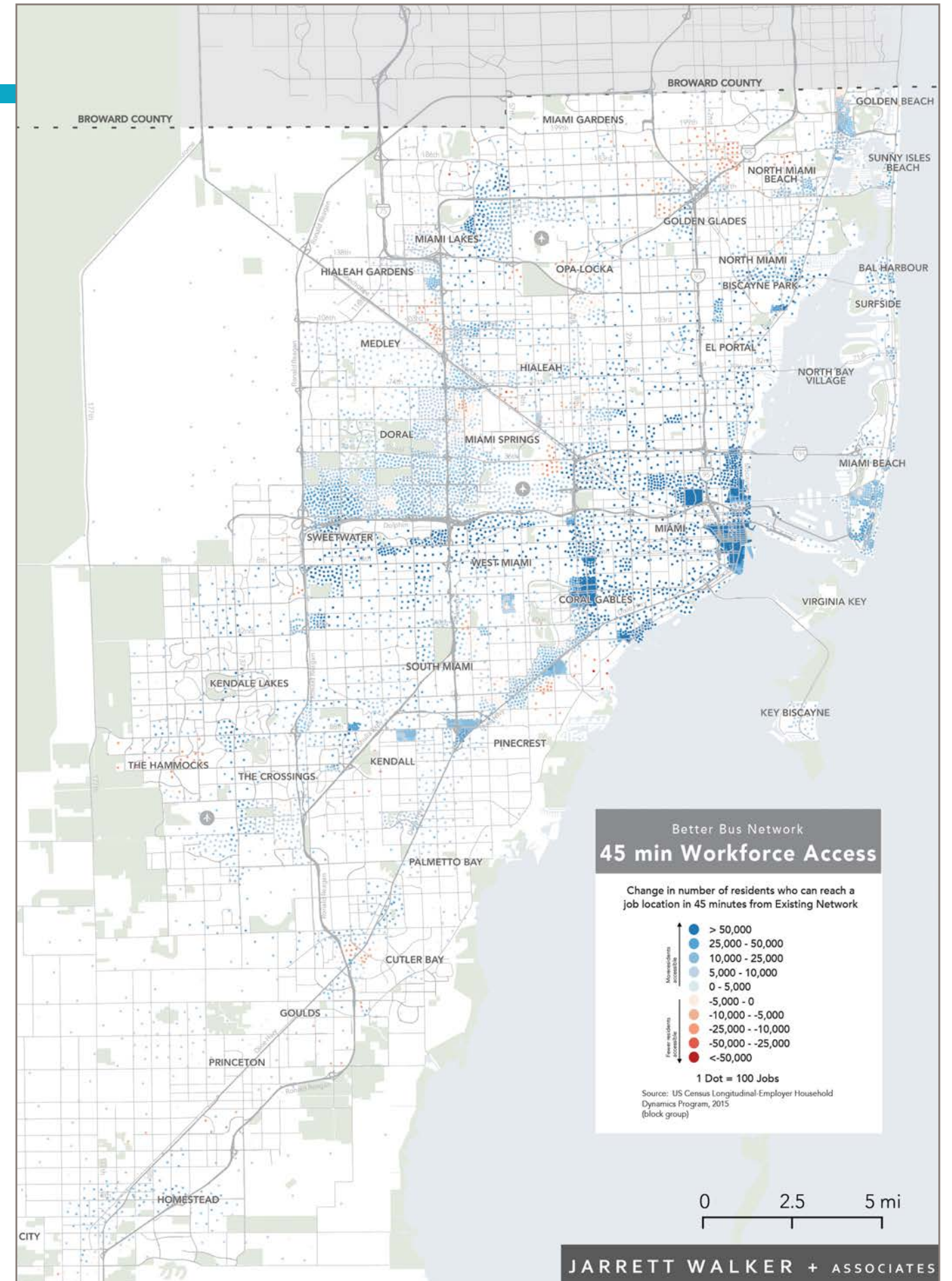
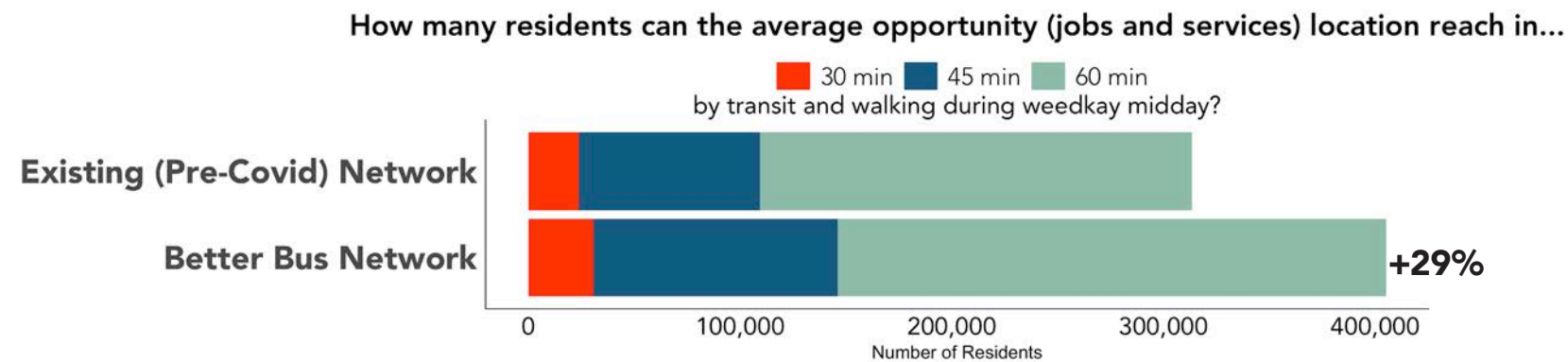
Figure 50 shows the change in how many residents can reach each job location in the county. In this map, every dot represents 100 jobs. Where many dots are very close together, the overall density of jobs is higher. The color of the dot represents how many more (or fewer) residents could be reached in 45 minutes on transit on weekdays at noon, from anywhere in the County, door-to-door, including walking, waiting, and riding. Where blue dots predominate, more residents can reach that jobs location under the Better Bus Network. Where red dots predominate, fewer residents can reach that job location with the Better Bus Network. The darker the shade, the greater the increase or decrease in access.

The Better Bus Network shows an increase in workforce and customer access across most parts of the county. Places where large numbers of jobs are would experience substantial increases in workforce access. The greatest increase is within the core of the county and along main corridors that have more frequent service than in the existing system such as Flagler, 7th Avenue NW, Collins Avenue, and Biscayne Boulevard. For example, in the City of Miami and surrounding municipalities near the core, the colors are dark blue, and the dots are very close together. Many outer corridors also see increases in access, such as SW 88th Street towards Kendall and NW 67th Avenue/Ludlum Road in Miami Lakes and Hialeah.

Figure 50: Change in residents who can reach job locations in 45 minutes for the Better Bus Network compared to Existing Network.

With the New Network, 29% more residents could reach the average job location in the county in 60 minutes.

Figure 51: Change in residents who can reach job locations in 30, 45, and 60 minutes for the Better Bus Network compared to Existing Network.



Proximity to Transit

The number of people and jobs within a certain distance from transit is the simplest measure of transit outcomes. In this report we call this measure “proximity to transit”.

The bar charts in Figure 52 show how many residents (at top) and jobs (at bottom) would be “close enough” to any service for the Existing Network and the Better Bus Network. These charts assume that someone is near transit service if they are within ¼ mile of a bus stop as the crow flies. Walking ¼ mile over flat ground takes the average person about 5 minutes.

Overall the Existing Network reaches most people and most jobs, with 69% of people and 73% of jobs within ¼ mile of a transit stop. Yet because service is spread so thinly, only 10% of people are near a frequent route. Since jobs are more concentrated in the core, they are much more likely to be close to frequent service, with 20% of jobs near a frequent bus or train.

The Better Bus Network would significantly increase the number of people and jobs near frequent service, as more routes would be running every 15 minutes or better.

Compared to Existing, the Better Bus Network would

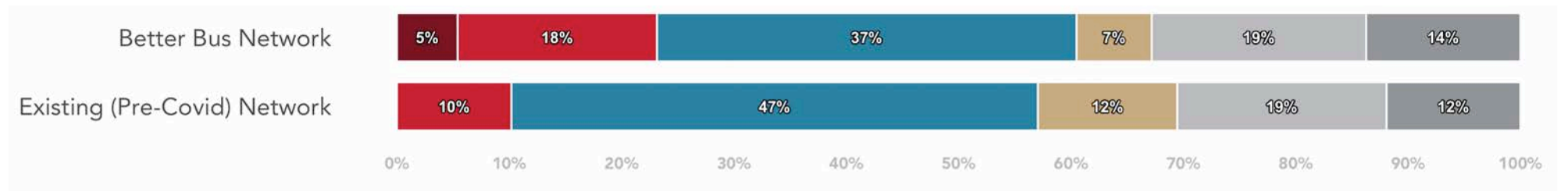
- increase the number of residents near frequent service from 10% to 23%, **bringing frequent service to 353,000 more residents.**
- increase the number of jobs near frequent service from 20% to 36%, **bringing frequent service to 175,000 more jobs.**
- reduce the percent of residents that are within ¼ of any transit service from 69% to 67%.
- reduce the percent of jobs that are within a ¼ mile of any transit from 73% to 71%.

Proximity does not tell us how useful the service is to people—only that it is nearby. Proximity to frequent service is a key measure of ridership potential. Frequent service is more expensive relative to the area it covers, but it is more useful and therefore tends to attract higher ridership. Thus, the more people and jobs near frequent service, the more a network is achieving a ridership goal.

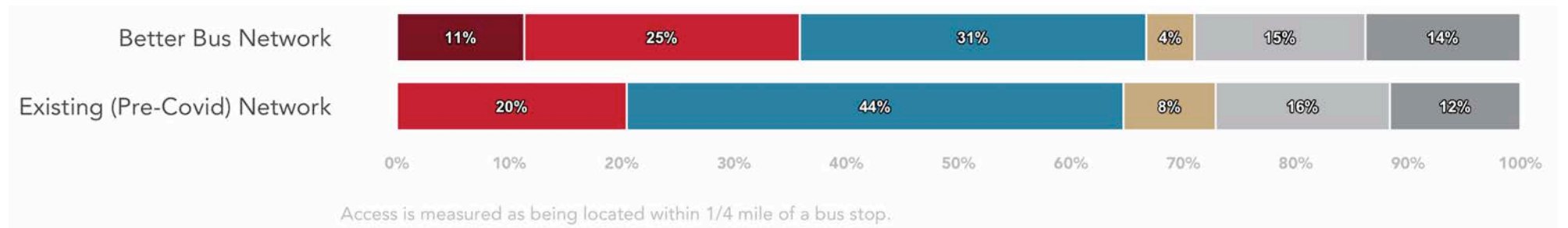
Access to Transit - Weekday



What percentage of residents in the metro area are near a bus route?



What percentage of opportunities (jobs and services) in the metro area are near a bus route?



Access is measured as being located within 1/4 mile of a bus stop.

Figure 52: The total number of people or opportunities (jobs and services) near any service is higher in the Existing Network, but the number of people and jobs near frequent service is much higher in the Better Bus Network

The Better Bus Network puts frequent service near 23% of residents, compared to 10% today.

Proximity to Transit: Disadvantaged Populations

Proximity to service of any type is a good measure of an agency's success toward a coverage goal, though more specific investigations are essential to determine whether vulnerable people and important destinations are covered. Transit is often tasked with providing affordable transportation for low-income residents, which is why agencies provide service to some people and areas, regardless of ridership potential. Federal laws also protect those with low incomes from disparate transportation impacts, which is why agencies sometimes provide transit service in places where poverty is high, even if this does not maximize ridership. Similarly, federal civil right laws require that transit agencies assess the impacts of changes to service on racial and ethnic minority residents to ensure there are no disproportionate negative impacts.

The charts in Figure 53 show the differences in proximity to service for residents of color, residents in poverty, and seniors. The most important takeaway from these charts, is that the changes in proximity to any service from the existing network to the Better Bus Network appears to have a similar effect on people of color, people in poverty and seniors as on the general population. For all residents, the Better Bus Network reduces the percent of people near any service by 2%. For residents of color and residents in poverty, the reduction is also 2%. For seniors the reduction is slightly more, at 3%.

The percent of people near frequent service goes up by 13% for all residents, people of color, and for seniors. The percent of people in poverty near frequent service goes up by 16%. So the Better Bus Network brings frequent service to people in poverty at a higher rate than for residents overall.

This analysis and the job access change results suggest that the Better Bus Network is, at least, not disproportionately burdensome to protected groups, like minority residents and people in poverty, and would therefore meet Title VI Service Equity Policy standards. **Moreover, since people in poverty and people of color see larger gains in job access than the average resident, the Better Bus Network might be considered more equitable than the Existing Network.**

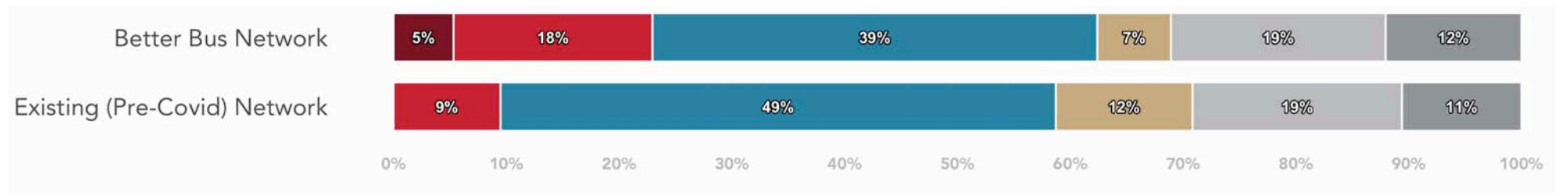
What about Title VI?

Title VI of the 1964 Civil Right Act requires that no program receiving federal funding discriminate against people on the basis of their race, color or national origin. This and other Federal laws make clear that transit service changes may not result in disparate impacts on people of color. Federal Transit Administration (FTA) guidelines for Title VI also require that transit service changes seek to limit disproportionate burdens on low-income people.

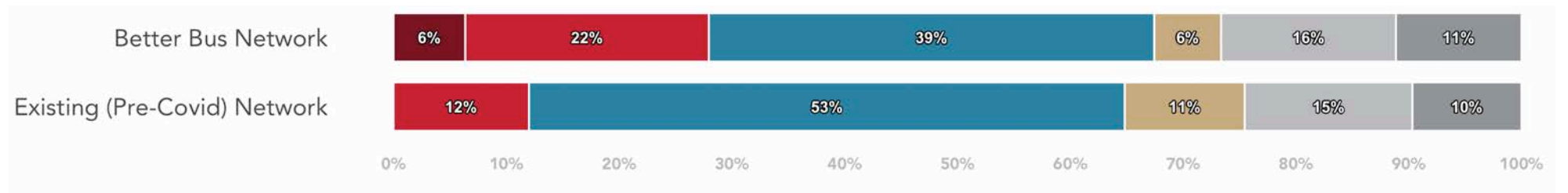
Access to Transit - Weekday



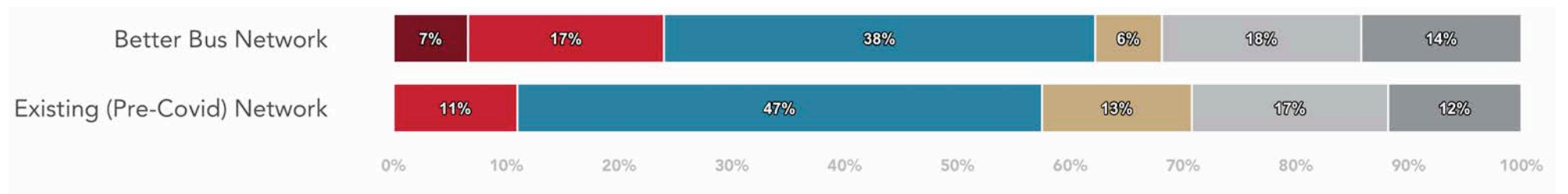
What percentage of people of color in the metro area are near a bus route?



What percentage of people in poverty in the metro area are near a bus route?



What percentage of seniors in the metro area are near a bus route?



Access is measured as being located within 1/4 mile of a bus stop.

Figure 53: As with all residents, more people of color and people in poverty have access to any service in the Existing Network, but far more have access to frequent service with the Better Bus Network

The analysis above and on page 45 shows that low-income residents and minority residents would benefit as much or more than the average resident under the Better Bus Network. Furthermore, at the Draft Network Phase, the study team did a more thorough analysis, included in Appendix B, that indicated that the Draft Network would likely pass a Title VI Service Equity Analysis. Since the networks are very similar, it is highly likely that this Final Network would meet Title VI requirements.

The official Title VI Service Equity Analysis for any service change must be completed using the final, scheduled network changes. Those final, scheduled changes will not be available until MDT staff have completed the implementation work described at the end of this report. Therefore, while the evidence strongly suggests that the Better Bus Network would pass a Title VI Service Equity Analysis, the final determination cannot be made until the final, scheduled network is analyzed by MDT staff.

4 Resilience Plan

An Uncertain Future

As we write this in September 2020, the future of public transit in Miami-Dade County is uncertain; Covid-19 has reduced ridership, and for a while it made fare collection impossible. It has become harder to provide enough bus drivers, as some are out sick or stuck at home caring for children. More critically, the large increase in unemployment means that the sales tax and other local funding for transit will likely fall, because people reduce their spending when they lose their income.

In normal times it is hard enough to predict budgets and funding; during the Covid pandemic it is effectively impossible. It all depends on the course of the pandemic, how the economy responds to whatever the virus does, and how the state and federal governments respond. In the short-term, federal relief funding from the CARES Act means that Miami-Dade Transit has enough funding to keep running pre-Covid service levels, at least for a few more months. Other factors may limit the ability to provide the same service and safety guidelines like social distancing mean that Miami-Dade Transit needs to run more service in places where buses are often full during the crisis, which leaves fewer buses and operators to serve other parts of the county.

The pandemic interrupted the Better Bus Project as the emergency arose as the final round of public outreach was wrapping up in late March. In this moment, Miami-Dade needs more than a plan for a new network next year. Nobody knows how much transit the county will be able to afford in a year's time. Therefore, this Final Better Bus Report includes a Resilience Plan that lays out priorities to guide the County on how to provide the best possible service with whatever budget turns out to be available in the future. An effective plan for hard times can also form the basis for bringing back an even better network in the future, as finances improve.

It is important to be very clear: **the Resilience Plan is NOT a proposal to reduce bus service.** The county bus service budget was already stretched very thin, with many areas not adequately served. Any service reductions will eliminate service that somebody needs. Instead, **this plan lays out a strategy for adapting service in different conditions while doing the least possible damage, IF that turns out to be necessary.**

Adopting this plan would enable staff to make quick decisions in very uncertain times, where sudden drops in revenue are a real possibility. In times of crisis, the time required for public outreach about a decision often is just not available. Decisions need to be made fast. So the best way to ensure good decisions is to lay out the priorities that will govern those decisions, and have a conversation to ensure that those priorities reflect what is best for the county.

This chapter lays out a proposed set of priorities for transit service. It is

intended to start a conversation, and the final decision about priorities, which should be adopted by the County Commission, may be different. The important thing is to have some statement of priorities, so that County leaders and staff know what to do when they have to act fast.

This chapter:

- Reviews the challenges of the current situation. County-wide transit needs and the performance of the pre-Covid system have already been documented by the Better Bus Project.
- Proposes a set of priorities for what services are most crucial. If service cuts were necessary, lower-priority services would be reduced first.
- Justifies these priorities by looking at how they provide better access to opportunity, across the county, compared to other approaches.

What has changed?

Since the Draft New Network was published in February 2020 the Covid-19 emergency has created a great deal of uncertainty for transit service. In particular, uncertainty arises from

- An unknown end to social distancing—not just the mandate but the individual level of comfort with proximity to others.
- Unknown changes in patterns of demand depending on how economic activity resumes. We can suspect, for example, that hospitality demand will return more slowly than many other economic activities, but an agency needs to be flexible in response to what actually occurs.
- Unknown but likely declines in financial capacity across all local governments.
- The possibility of reversals in the opening of business and institutions due to new outbreaks.

Some of these uncertainties will pass quickly once the pandemic is over while others may linger for an extended period.

What has not changed?

While we can speculate about the course of the pandemic and the economic recovery to follow, nothing is predictable. Yet, **if access to opportunity is the goal**, there are some principles you would bring to anything you would do in whatever situation you are in.

As described in the last chapter, on page 43, wherever you are, there is a limited number of places you could reach in a given amount of time. Whatever the economic conditions after Covid-19, we can reasonably assume that most people in Miami-Dade will still want to maximize their access to opportunity. If we focus on designing a network and prioritizing services that maximize access to opportunities for most people, then we can create a resilient network that does its best to serve most people and jobs under whatever funding conditions exist in 2021 or beyond. This is the basis for the Final Better Bus Network and the accompanying Resilience Plan.

Priority Corridors

Resilience Priority Corridors

Maximizing access in scenarios with less funding means making hard choices, and asking people to accept longer walks to maintain a useful frequent grid. **Consolidating routes to make them more frequent can actually make people's trips faster, despite the longer walks.** If routes are spaced every ½-mile, most people can walk to a stop in 5 minutes. If service is only every 30 minutes, then the average wait is 15 minutes, and it takes 20 minutes before you get on your way. If routes are spaced every mile, with service every 15 minutes, most people can walk to a stop in 10 minutes, their average wait is 7.5 minutes, and you get on your way in 17.5 minutes.

The map in Figure 54 shows the priorities of each corridor in the Better Bus Network. The darkest orange corridors are the highest priority and, if service must be cut, these corridors should be kept and service frequency maintained as much as possible.

The core idea in this structure is the one mile grid. Normally, ideal walking distance to transit is ¼ mile so routes are spaced ½ mile apart. But in a dire service cut, we do the least damage to access if we ask people to walk further so that frequencies do not have to be cut. As the walking-waiting description above indicates, a one-mile grid of routes every 15 minutes delivers much better access than a ½-mile grid of routes that come only every 30 minutes.

The priority of the Tier 1 corridors reflects their importance in maintaining access to the most dense and active places. Most Tier 1 corridors are on the one-mile grid in the urban core of the county, which would provide maximum access to the largest number of people and jobs in a lower funding scenario. The one-mile grid includes key north-south routes like the 3, 9, 77, 17, and 27 and key east-west routes like the 24, 8, 11, 7, 20, 36, 62, 79, 125, 135, and 183.

In addition to the one-mile grid, Tier 1 priorities include key corridors, like SW 40th and 72nd Streets and the Route 35 corridor in South Dade that provide access to low-income populations to ensure reasonable coverage of needy populations. At the lowest funding scenarios, these corridors would operate at low frequency, perhaps hourly, to provide lifeline service.

Tier 2 priorities include suburban corridors that would expand the one-mile grid coverage to more of the county, such as 56th Street in South Dade and the 175th/163rd Street corridors in North Dade.

Tier 3 priorities would extend coverage to relatively needy, but relatively low density corridors that are within two miles of higher tier corridors. These corridors include NW 82nd Avenue in Miami Lakes, SW 152nd

Street, and the Route 248 corridor in South Dade.

Tier 4 priorities would bring back the half-mile grid within the urban core, returning service to NW 12th and 22nd Avenues.

Tier 5 priorities would provide coverage-oriented service to places where higher tier corridors are within one mile. This includes Routes 15, 76, and 97.

Tier 6 priorities, not shown on the map, are express services that serve commuter markets. This would include routes like the 95 Golden Glades and 288 Kendall Cruiser.

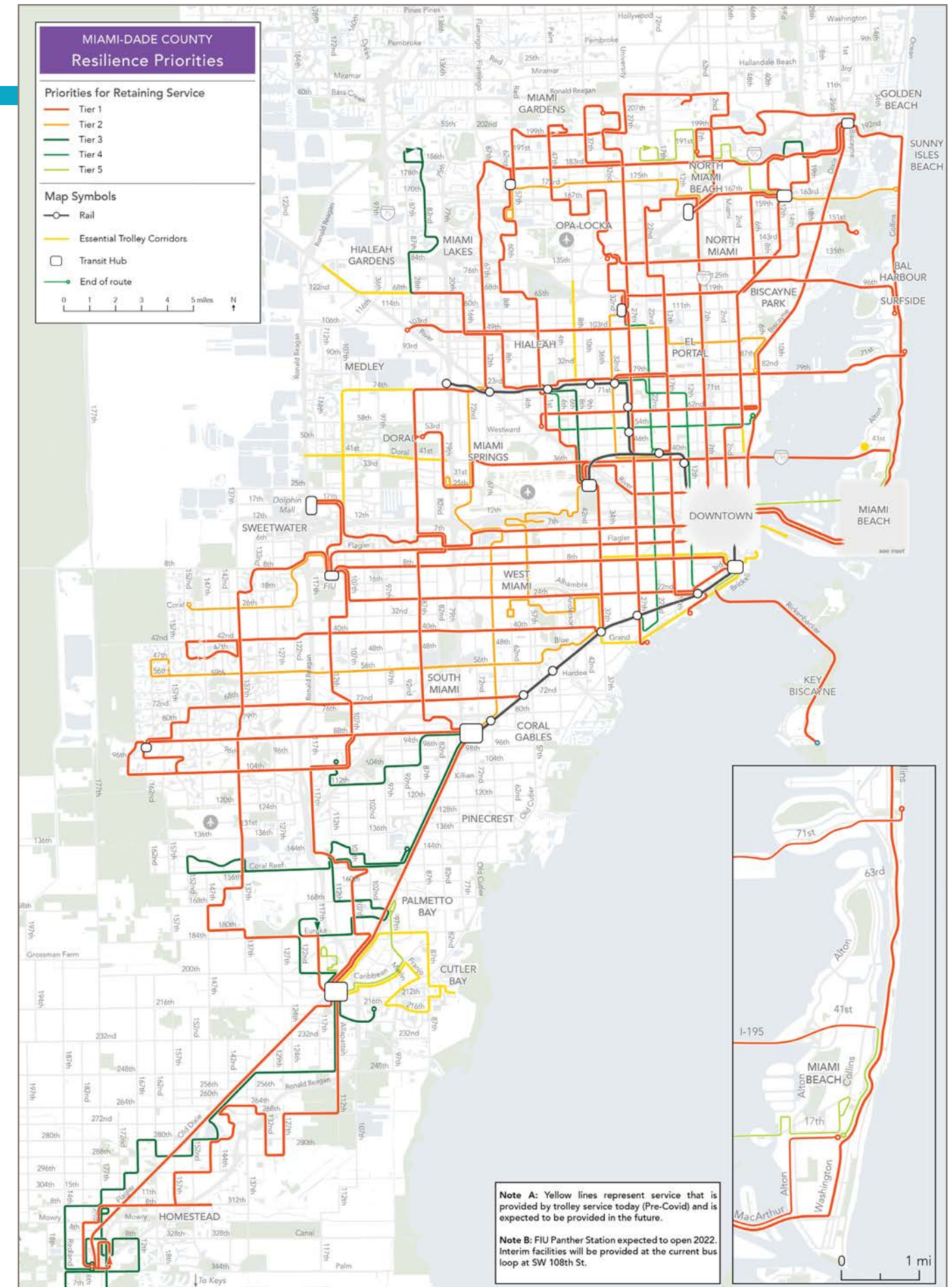


Figure 54: Resilience Plan Priorities

Resilience Decision-Making

Contemplating an uncertain future, it is helpful to imagine a worst case scenario. Figure 55 shows what the network would look like, under this policy, in a dire situation where service has been reduced by 35% and only the Tier 1 corridors can be served.

No matter how you cut it, this level of reduction would result in dramatic reductions in access to jobs, service, and opportunities for most bus riders. **This map is intended as a guide to what the absolute minimum useful network for the county might look like, under a worst-case funding or operating scenario.** It is not a recommendation for reducing service.

In a Tier 1 Network, the County would ask people to walk farther, sometime much farther, to reach more frequent service. By doing so, this network delivers much better access outcomes than a hypothetical alternative where all routes are kept, but frequency is reduced across the board. While this Tier 1 Network would reduce coverage, it would maintain a reasonable level of access for most of the county by keeping frequent service on a one-mile grid across much of the urban core.

In a scenario where this level of service reduction is necessary, the case for this Tier 1 Network is that:

- If resources shrink, retaining more routes than these would mean cutting frequencies to the point that access to opportunity would plummet while overloading would be unmanageable.
- A network with fewer routes can provide more frequency and even out loads throughout the network. If pass-ups still happened, they would be less disruptive because it is more likely that another bus is coming along soon.
- It is the way to maximize total access across the region, in the context of more walking, cycling, and scooter use.

It is likely that if the County had to retreat to running just this Tier 1 Network, it would result in many more pass-ups. **So the top priority for additional service above this network would be sufficient frequency to reduce the chance of pass-ups for riders.** Figure 56 shows the decision-making process for restoring service from Tier 1, prioritizing frequency additions to manage pass-ups in between the process of adding each tier to the network.

Figure 55: Tier 1 Network by Frequency

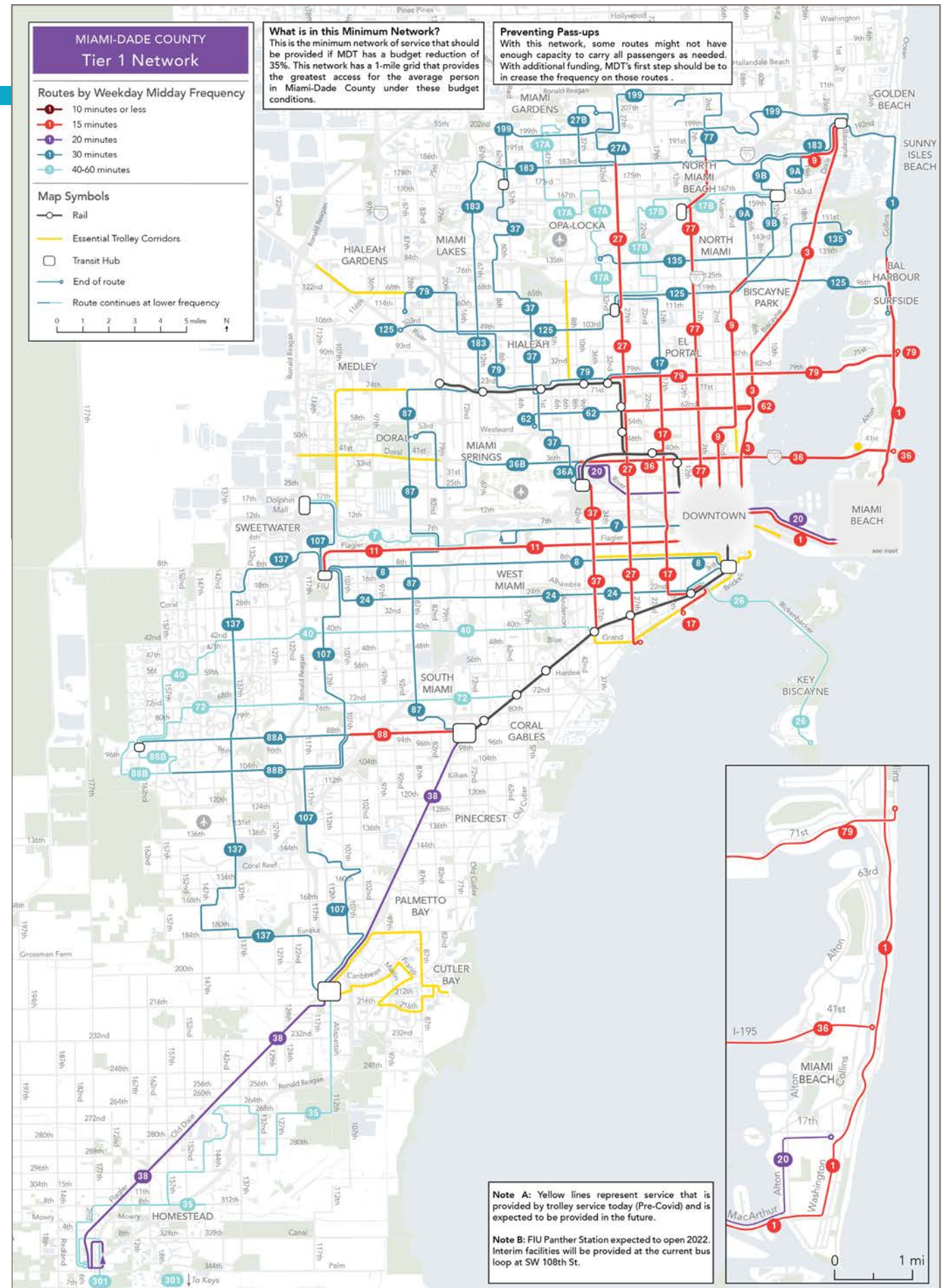


Figure 56: Resilience Corridor Decision Flow Chart

Service Decision-Making

1. Implement Tier 1 Corridors

2. Increase frequency of Tier 1 corridors to address pass-ups

3. Implement Tier 2 Network

4. Adjust frequency of Tier 1 & Tier 2 corridors to address pass-ups

5. Continue implementing remaining tiers and adjusting for pass-ups

Tier 1 Network Access and Coverage

The Tier 1 Network sacrifices coverage compared to a hypothetical Reduced Existing Network so that frequency can be maintained on the key corridors, particularly the one-mile grid. Figure 57 shows that **in a dire crisis requiring a 35% service cut, people could get to 51% more jobs on the Tier 1 Network** than they could on the existing network with a 35% cut in frequency.

In fact, under the Tier 1 Network, the average person could still reach 136,000 jobs in an hour. That is more than the 124,000 jobs that the average person can reach on the Existing (Pre-Covid) Network. This may seem counter-intuitive, but it is a result of the enormous value of frequency in reducing wait time and therefore overall travel time, particularly for trips that involve a transfer. While walking time is increased for many people in the Tier 1 network, for most people waiting time drops significantly with the improved frequency on the one-mile grid.

Figure 58 shows the difference in coverage of people and jobs. In the Reduced Existing Network, 70% of people are still covered by service, but only 1% have access to frequent service. In the Tier 1 Network, only 57% of people are near service, but 18% are near frequent service. Compared to the Reduced Existing Network, 375,000 fewer people would be within ¼ mile of the Tier 1 Network. While the Tier 1 Network asks people to walk farther, and does not serve some parts of the county, it maintains a high level of access to opportunity for most county residents.

How many opportunities (jobs and services) can the average person reach in...

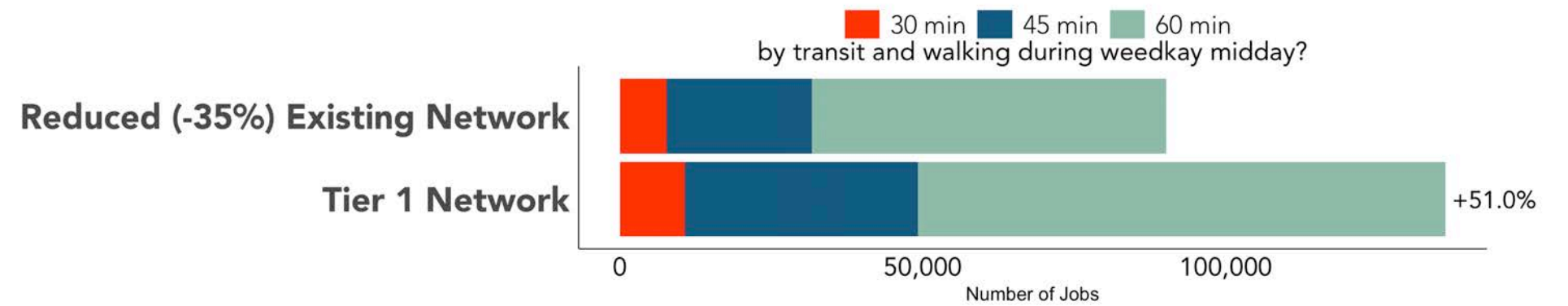


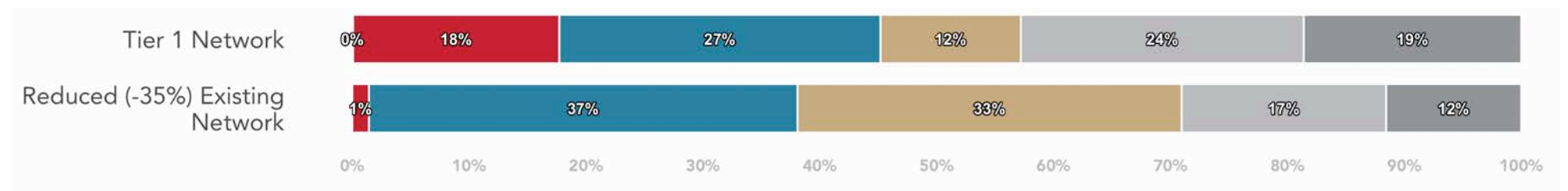
Figure 57: The Tier 1 Network provides drastically better job access than the Reduced Existing Network.

Figure 58: The Tier 1 Network would reduce coverage of people and jobs relative to a Reduced Existing Network, but would preserve frequent service access for many.

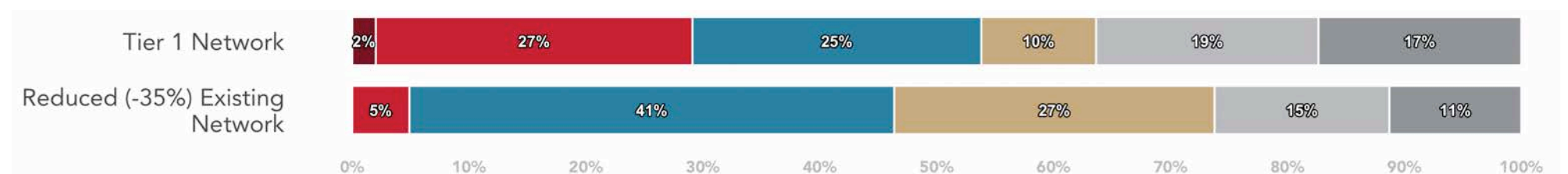
Access to Transit - Weekday



What percentage of residents in the metro area are near a bus route?



What percentage of opportunities (jobs and services) in the metro area are near a bus route?



Access is measured as being located within 1/4 mile of a bus stop.

5 Next Steps

Next Steps

What happens next?

This Better Bus Network will go before the Board of Commissioners for their review and endorsement and Miami-Dade Transit staff will begin the process of scheduling the new routes and informing the public and riders of the upcoming changes. Ultimately, the County Board has the power to decide where and how the bus network should operate.

Given the pandemic emergency, public outreach around this final network recommendation may be difficult, since normal in-person engagement may not be safe. Yet, the County should attempt to engagement the public to get feedback about final adjustments to this network, particularly on issues like final adjustments to bus stop placement.

The next steps for implementation of a new network would include

- finalizing bus stop changes;
- developing new schedules, system maps, and other public materials;
- final Title VI Service Equity Analysis and outreach on the outcomes of that analysis;
- media and public outreach campaign to inform people of the new routes, new network, and new schedules; and
- training of operators on new route alignments.

A later step that County staff should likely take is to update the Transit Service Standards to align them with the design of this network.

What about the long term?

While this plan is about the immediate redesign of the existing transit network, it can and should affect long term planning of the county and its transit system. In this process, the County has taken the step of defining high frequency transit corridors. This can help guide future discussions about where major new developments, and especially affordable housing and job centers, should be encouraged.

In most cities, permanent and frequent transit corridors are places where higher density development can be accommodated, which contributes to transit's ridership success and to economic vitality.

This network plan is one step in an iterative land use and transit planning conversation for the county, which can and should continue indefinitely, helping to build a more prosperous, fair and livable Miami-Dade.



Better Bus Project

PHASE 1

Evaluation

June – August

We evaluated the current bus system and released the [Choices Report](#).

We surveyed riders across the bus system on the key choices that will help determine the design of the new bus network.

PHASE 2

Concepts

September – November

We have released two different network concepts for discussion and debate.

Take our survey, attend a workshop, or connect with us to shape the final network plan.

PHASE 3

Final Network

December – May

The draft new network is being finalized and will be released at the end of February.

Stay tuned for the results from our concepts survey, our upcoming presentation schedule, and the final network report.

Learn more about the Better Bus Project process and more at www.betterbus.miami

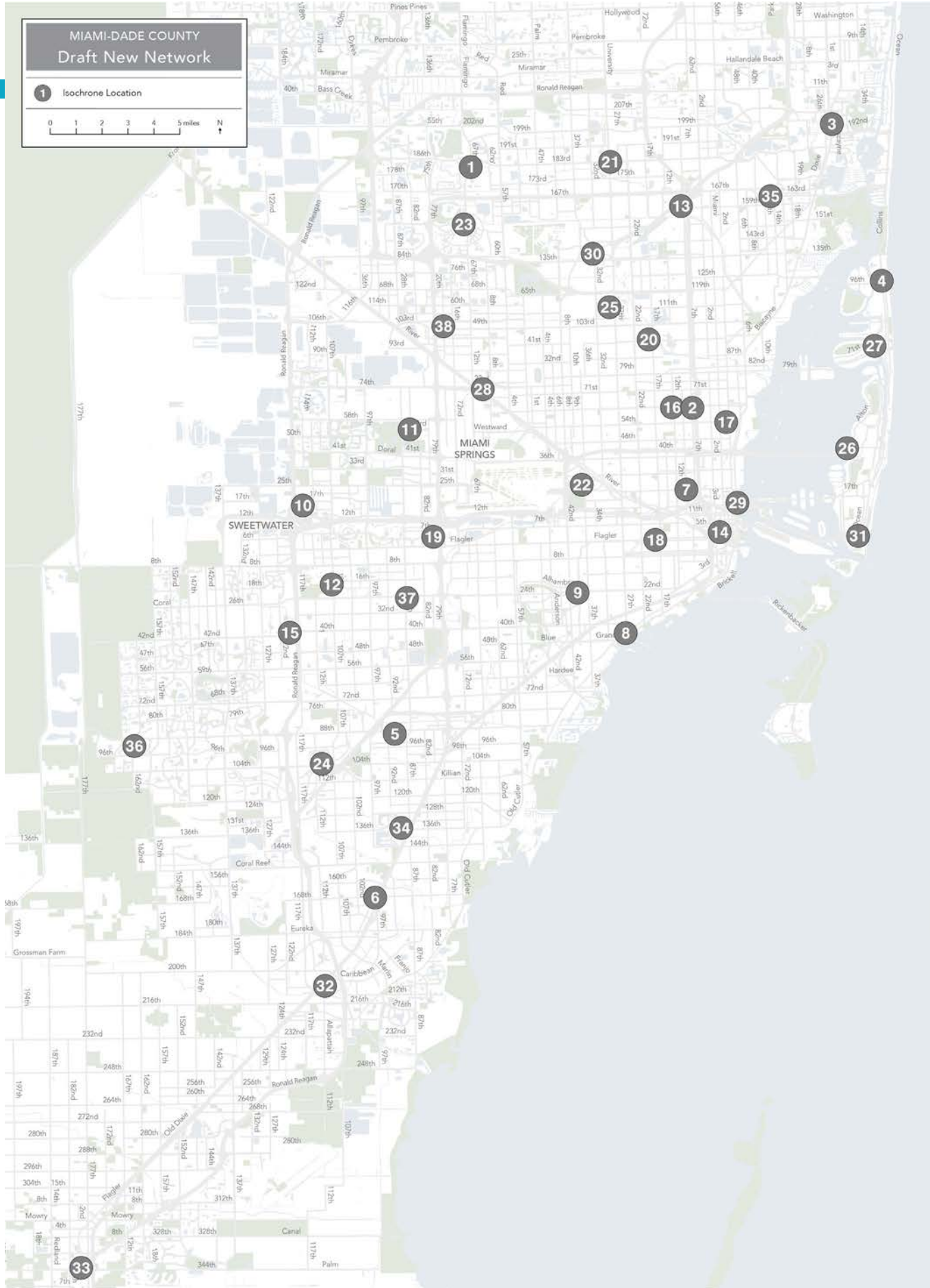
Appendix A: Isochrones

Index of Isochrone Locations

The Better Bus Network is about expanded access to opportunity, and the measure of that is how many useful destinations someone can get to in a fixed amount of time. This appendix shows that analysis for 38 locations around the county.

When reviewing these maps remember that *waiting time counts*, and in most cases, a longer walk to a high-frequency route can get people farther and faster, than a shorter walk to an infrequent route. Also remember that some of the access shown in these maps isn't reached on a single route, but requires a transfer.

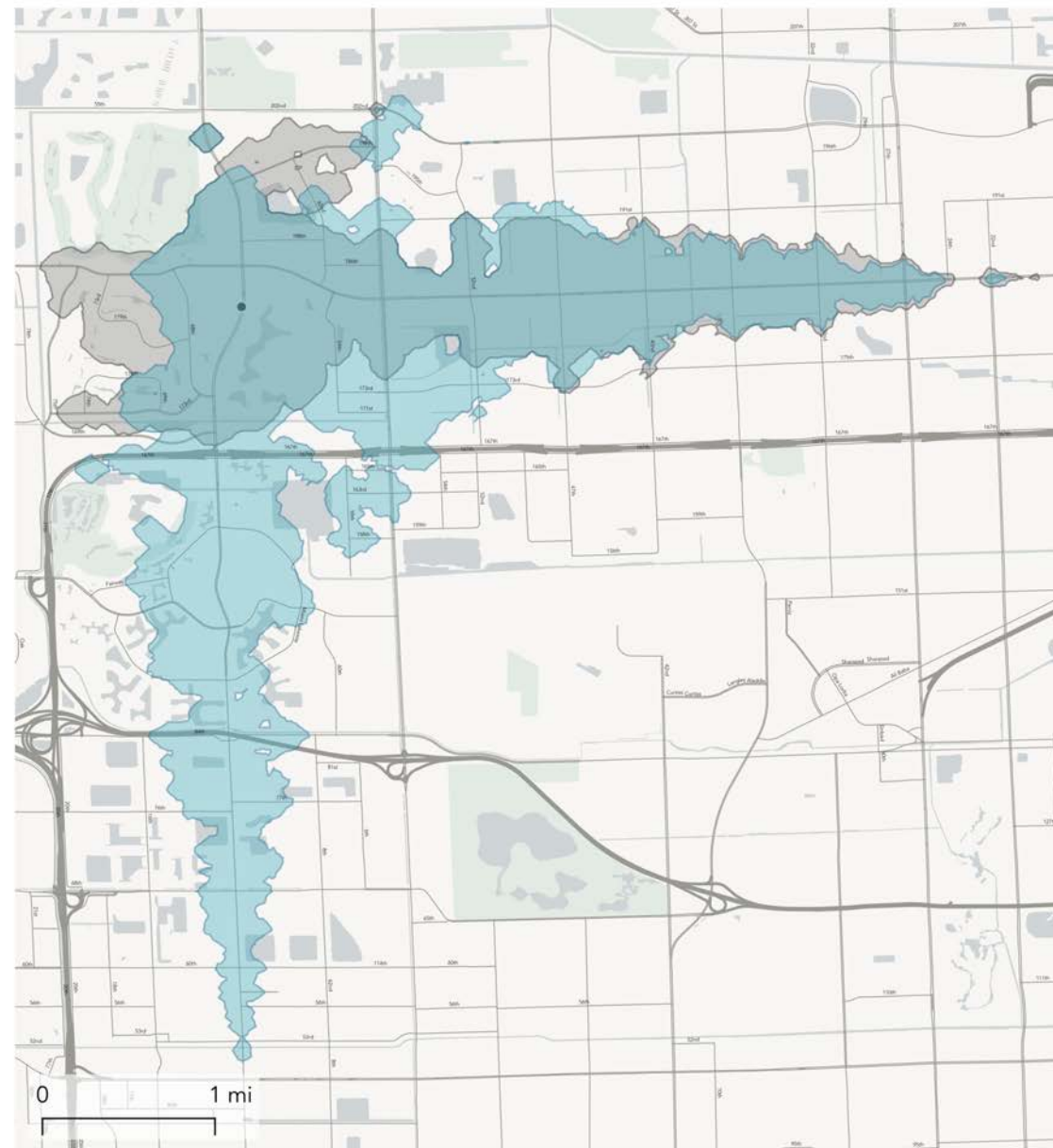
Location #	Name	Location #	Name
1	American Senior High School	20	Miami Central High School
2	Audrey Edmonson Transit Village	21	Miami Gardens Dr and NW 27th Ave
3	Aventura Mall	22	Miami Intermodal Center (Airport)
4	Bal Harbor Shops	23	Miami Lakes Downtown
5	Baptist Hospital of Miami	24	Miami-Dade CC Kendall
6	South Dade Busway and 168th	25	Miami-Dade CC North
7	CIC Miami, Allapattah	26	Mt Sinai Hospital
8	Coconut Grove	27	North Beach Bandshell
9	Coral Gables Downtown	28	Okeechobee Metrorail Station
10	Dolphin Mall	29	Omni Bus Terminal
11	Doral City Hall	30	Opa Locka Tri-Rail Station
12	Florida International University	31	South Beach - Washington and 5th St
13	Golden Glades	32	Southland Mall
14	Government Center	33	SW 344 Street Park and Ride Lot
15	Kendall Regional Medical Center	34	The Falls Shopping Center
16	Liberty Square - 12th and 62nd	35	The Mall at 163rd St
17	Little Haiti 2nd and 54th NE	36	West Kendall Transit Terminal
18	Little Havana - Flagler & 17th Ave	37	Westchester Shopping Center
19	Mall of the Americas	38	Westland Mall



How far can I travel in 45 minutes from American Senior High School at noon?



Better Bus Network

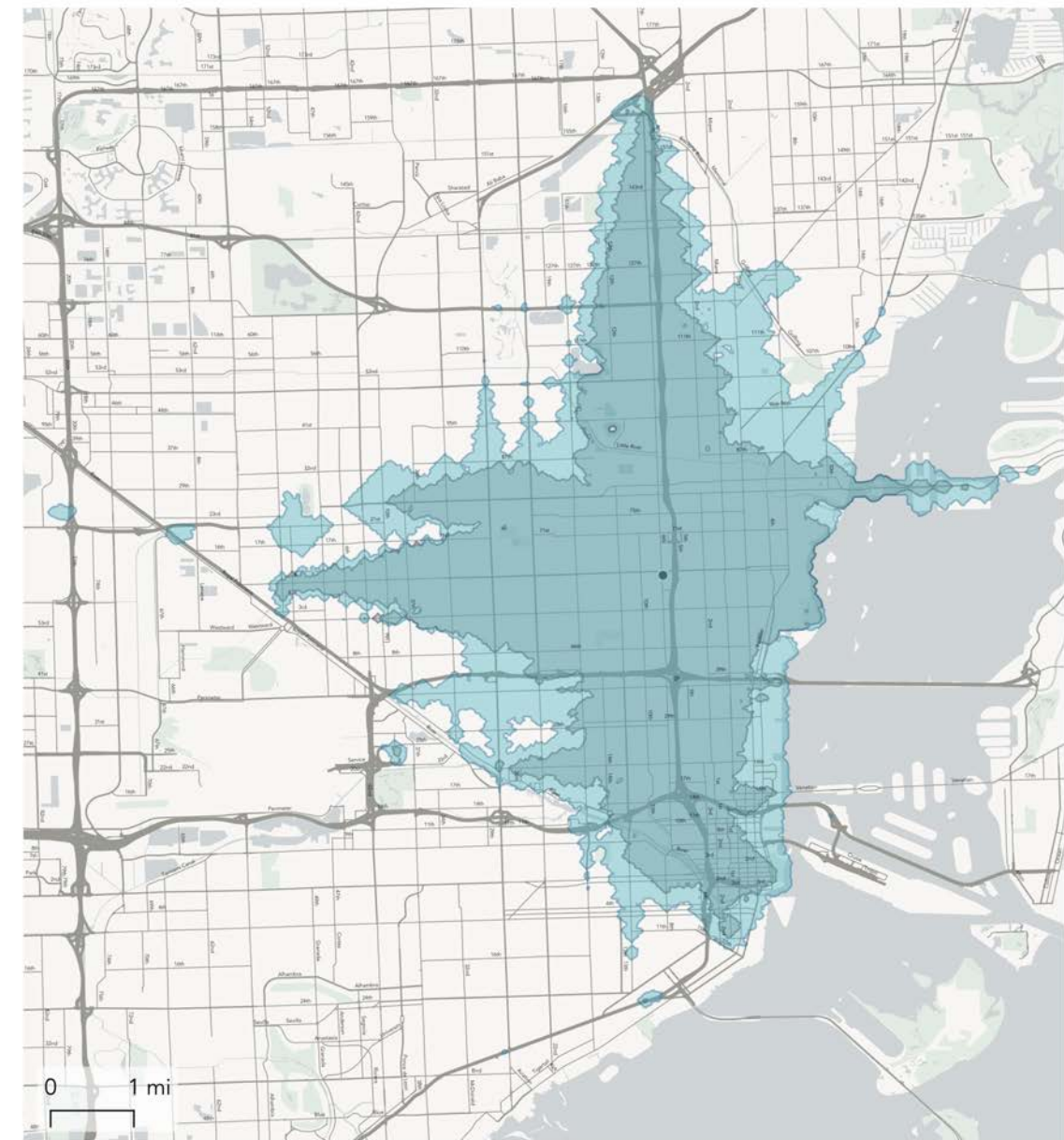


Change in opportunities (jobs and services) reachable	+10,650	+190%
Change in residents reachable	+10,480	+20%

How far can I travel in 45 minutes from Audrey Edmonson Transit Village at noon?



Better Bus Network

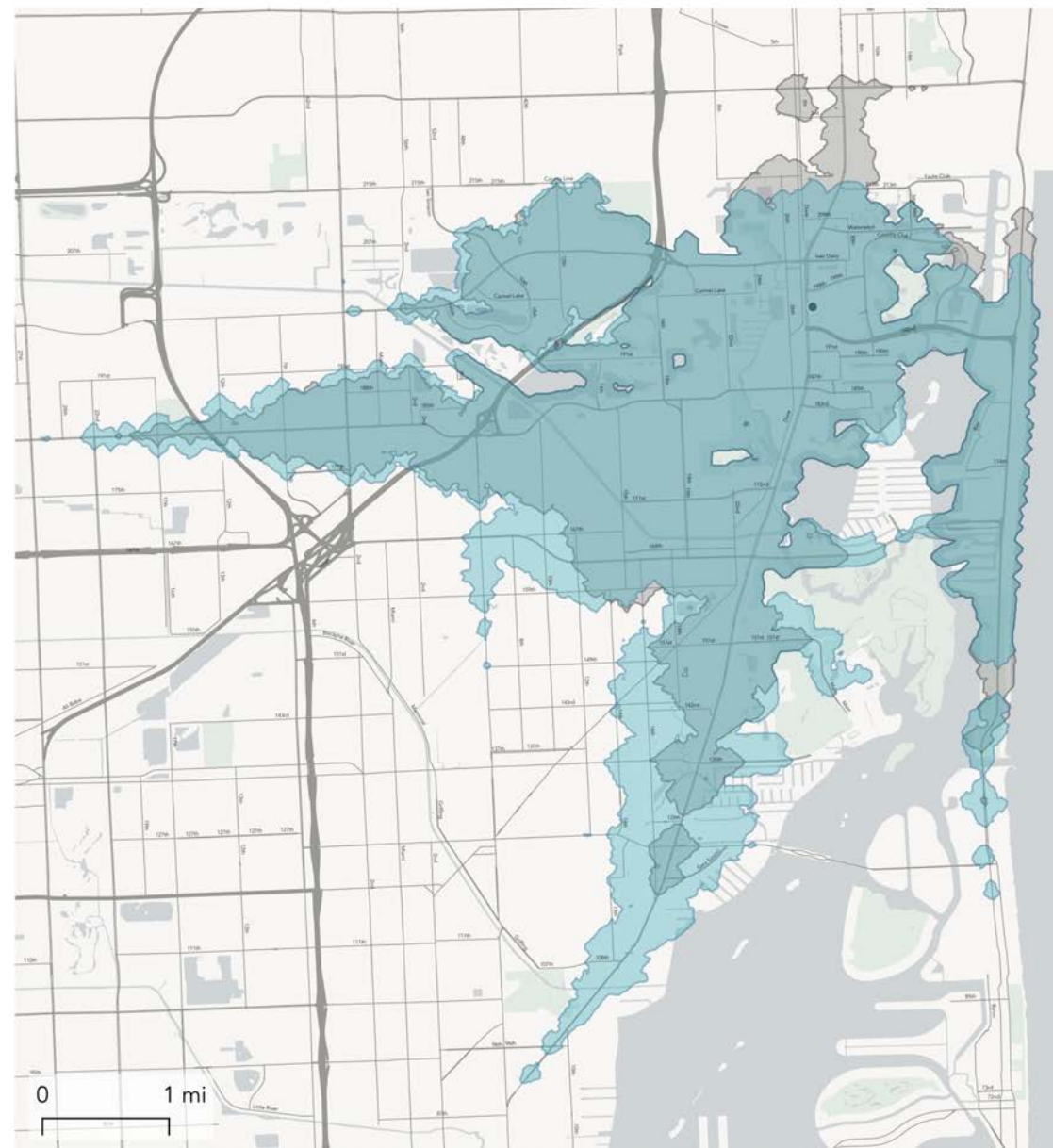


Change in opportunities (jobs and services) reachable	+85,975	+55%
Change in residents reachable	+110,335	+50%

How far can I travel in 45 minutes from Aventura Mall at noon?



Better Bus Network

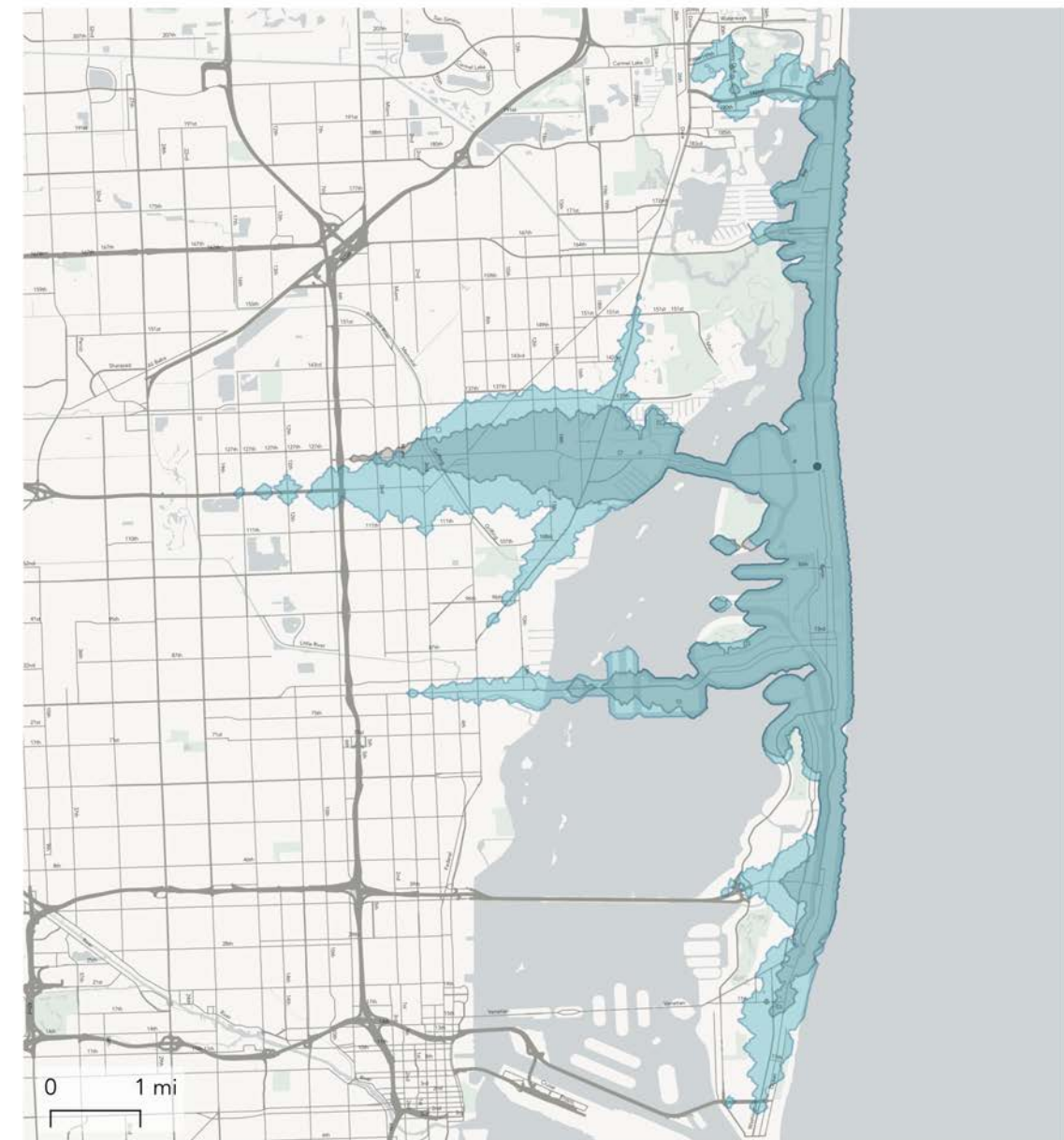


Change in opportunities (jobs and services) reachable	+6,710	+15%
Change in residents reachable	+26,100	+20%

How far can I travel in 45 minutes from Bal Harbor Shops at noon?



Better Bus Network

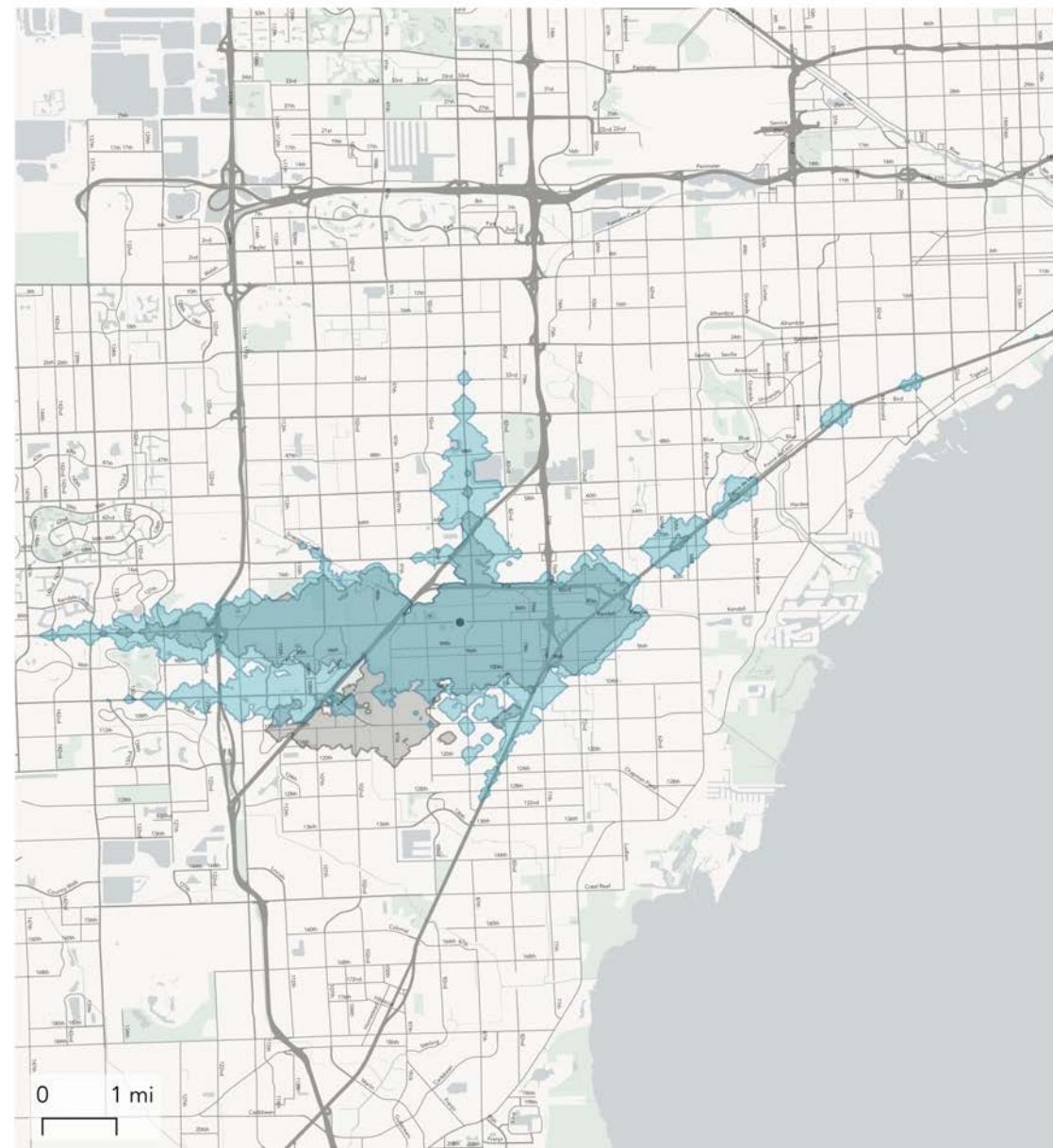


Change in opportunities (jobs and services) reachable	+23,035	+70%
Change in residents reachable	+45,900	+50%

How far can I travel in 45 minutes from Baptist Hospital of Miami at noon?



Better Bus Network

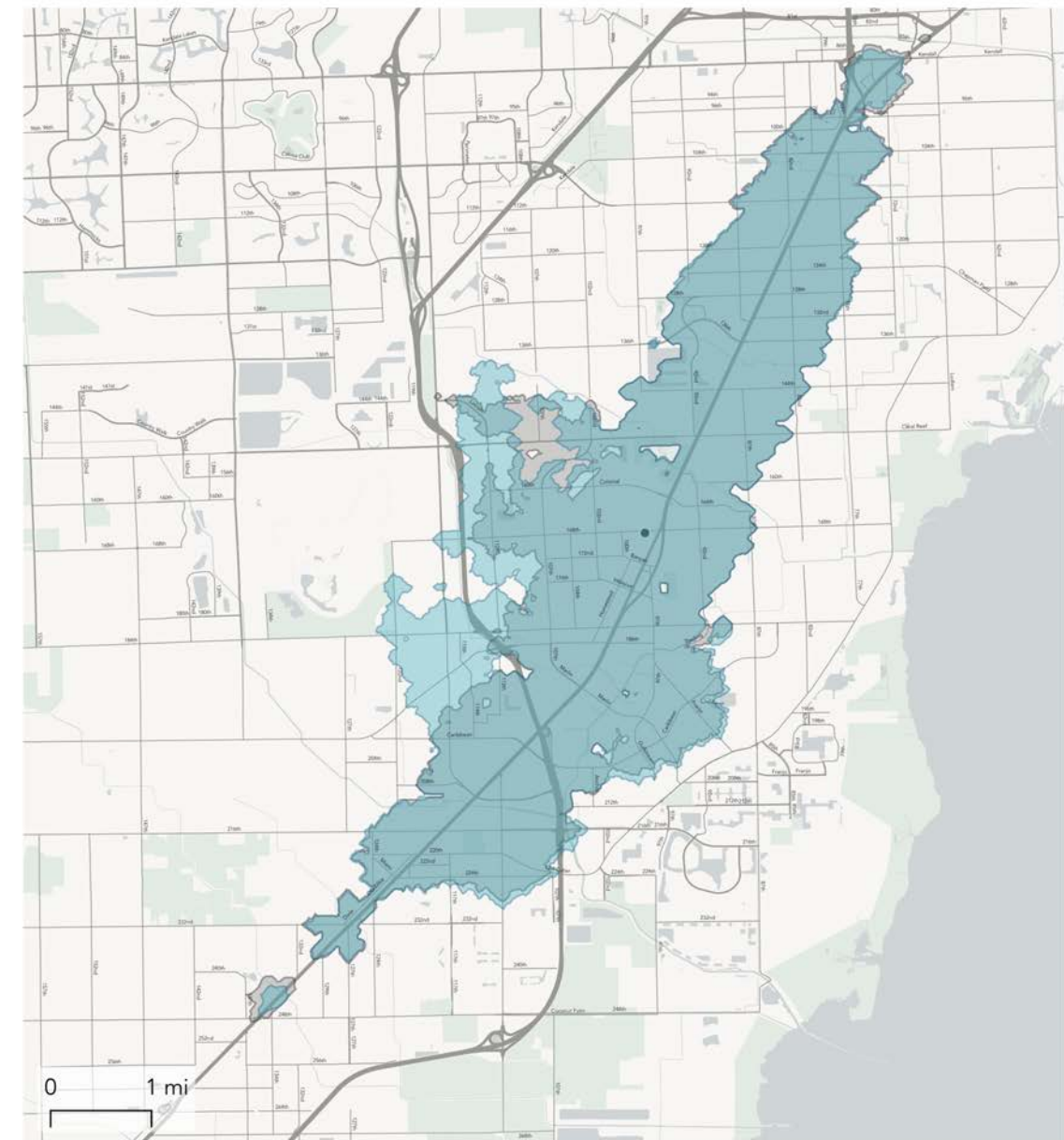


Change in opportunities (jobs and services) reachable	+18,280	+50%
Change in residents reachable	+26,150	+50%

How far can I travel in 45 minutes from Busway and 168th at noon?



Better Bus Network

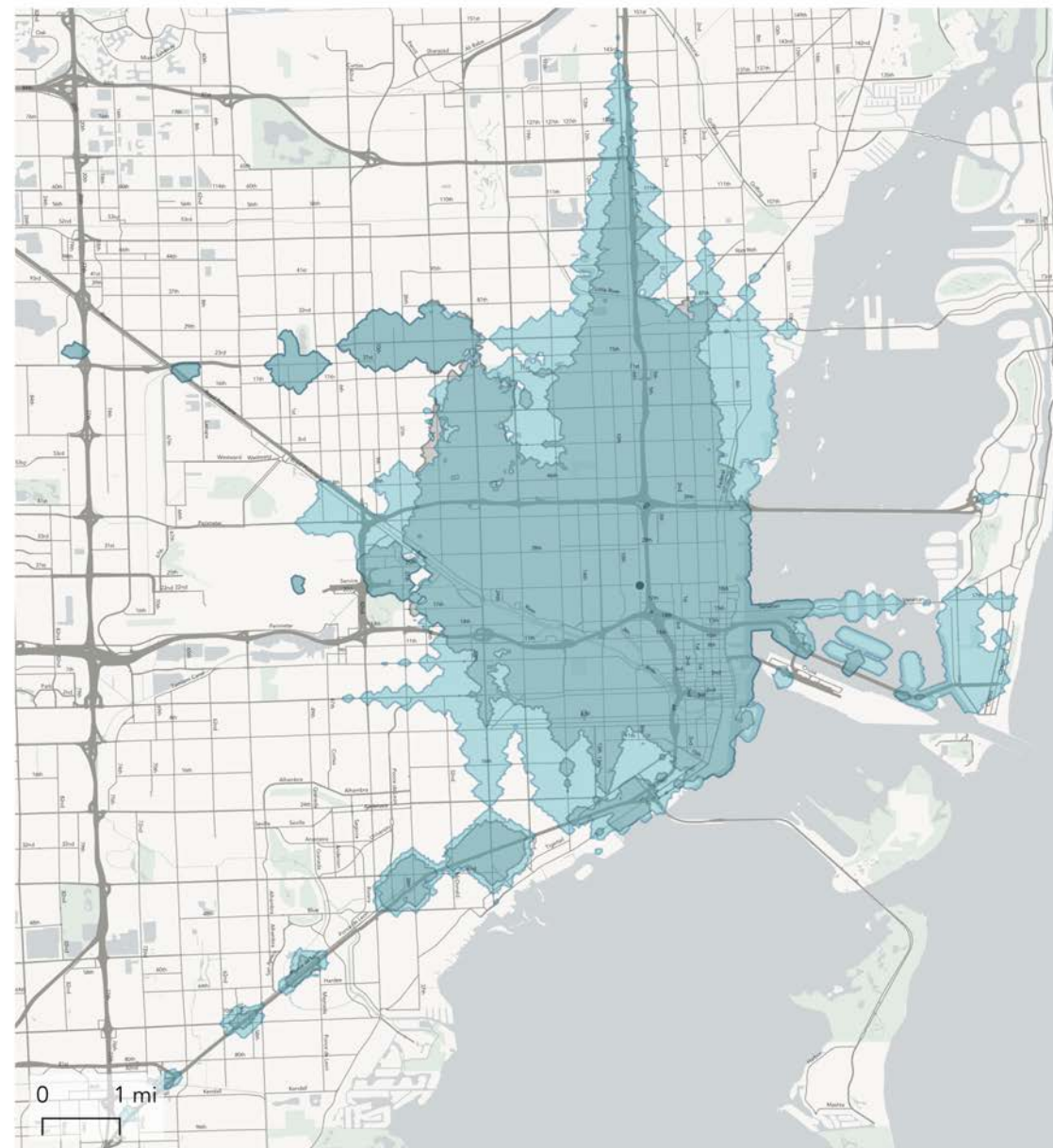


Change in opportunities (jobs and services) reachable	-100	0%
Change in residents reachable	+14,555	+15%

How far can I travel in 45 minutes from
CIC Miami, Allapattah
at noon?



Better Bus Network

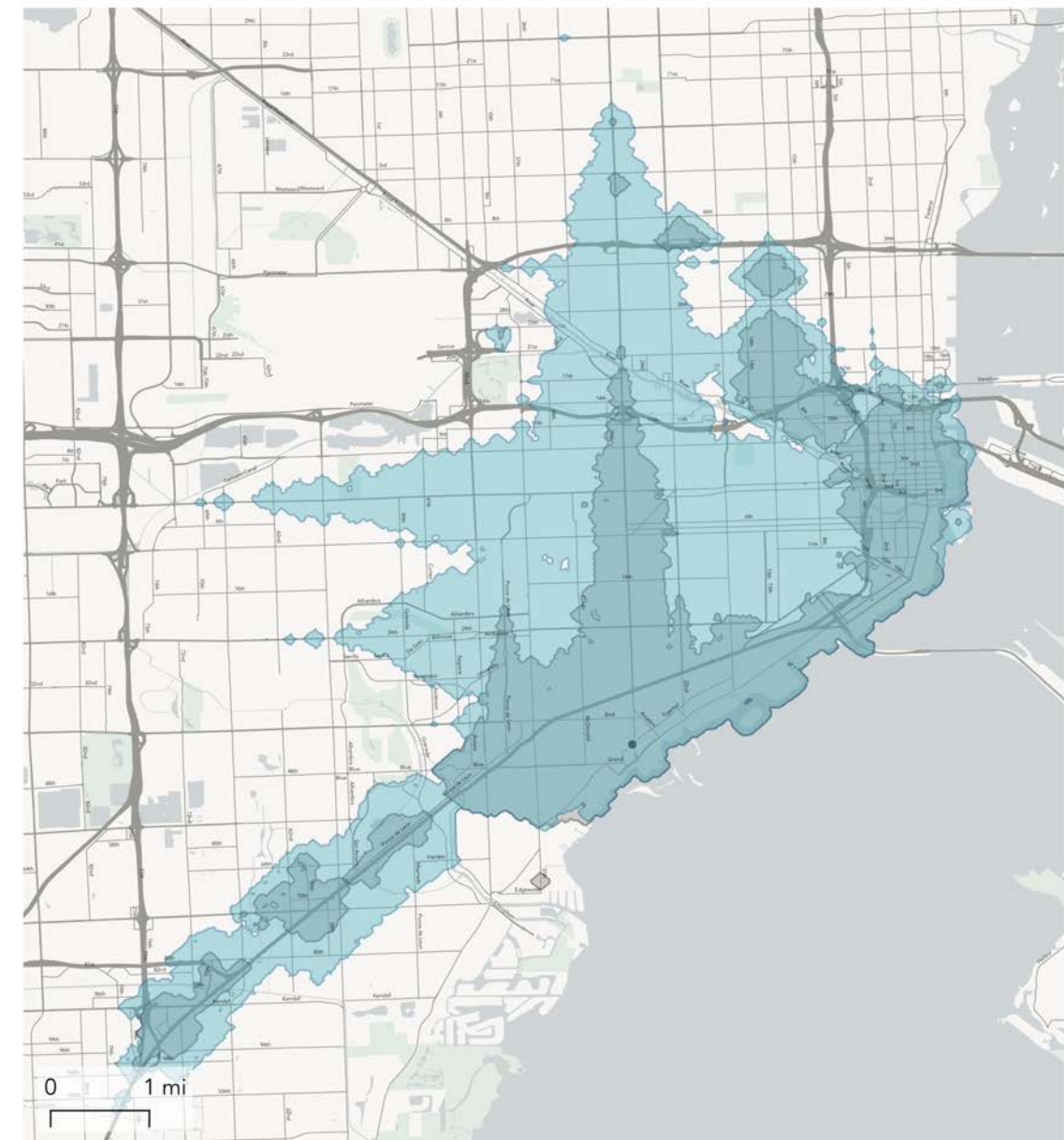


Change in opportunities (jobs and services) reachable	+46,580	+20%
Change in residents reachable	+113,975	+40%

How far can I travel in 45 minutes from
Coconut Grove
at noon?



Better Bus Network

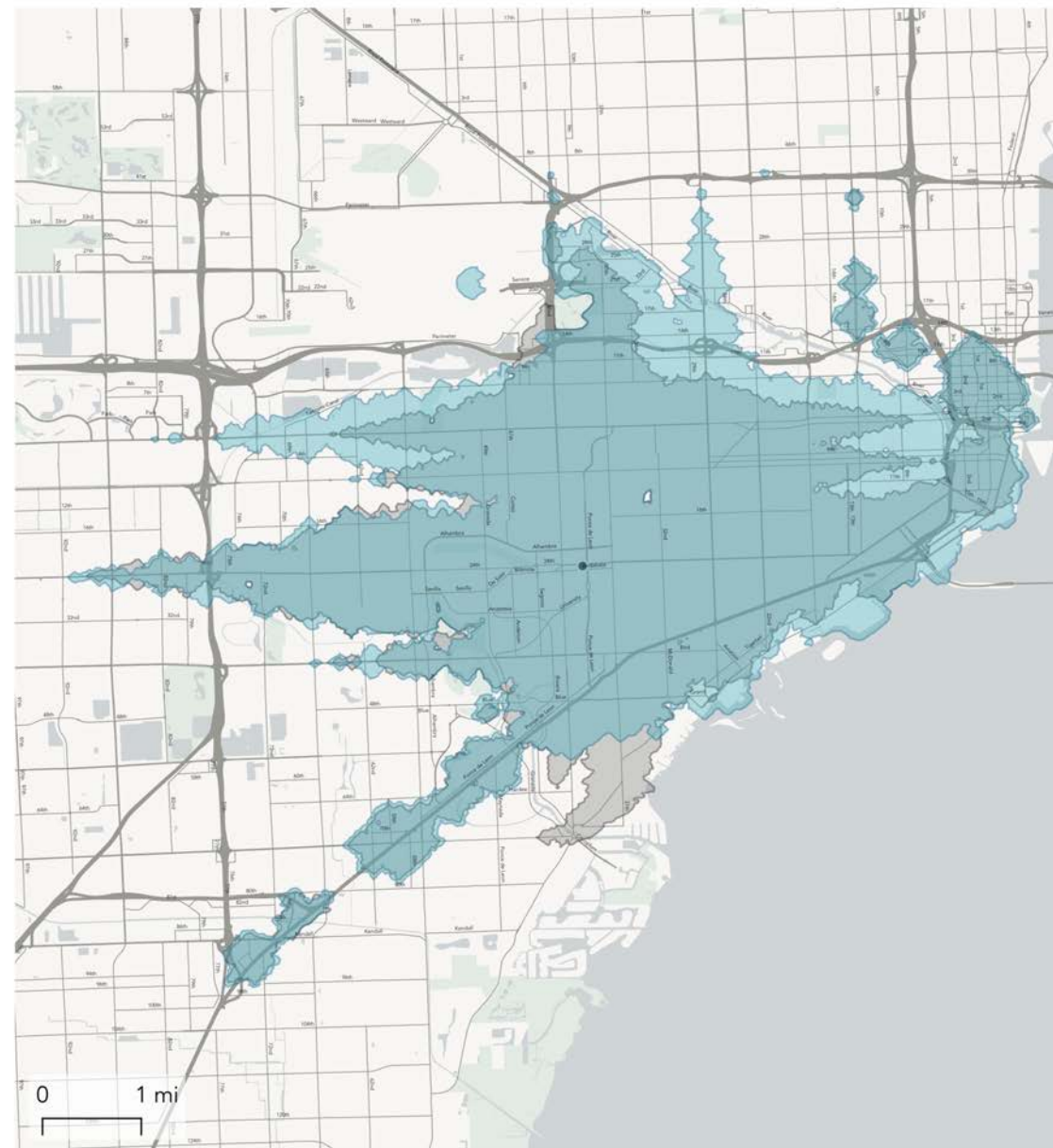


Change in opportunities (jobs and services) reachable	+105,550	+60%
Change in residents reachable	+216,405	+165%

How far can I travel in 45 minutes from
Coral Gables Downtown
at noon?



Better Bus Network

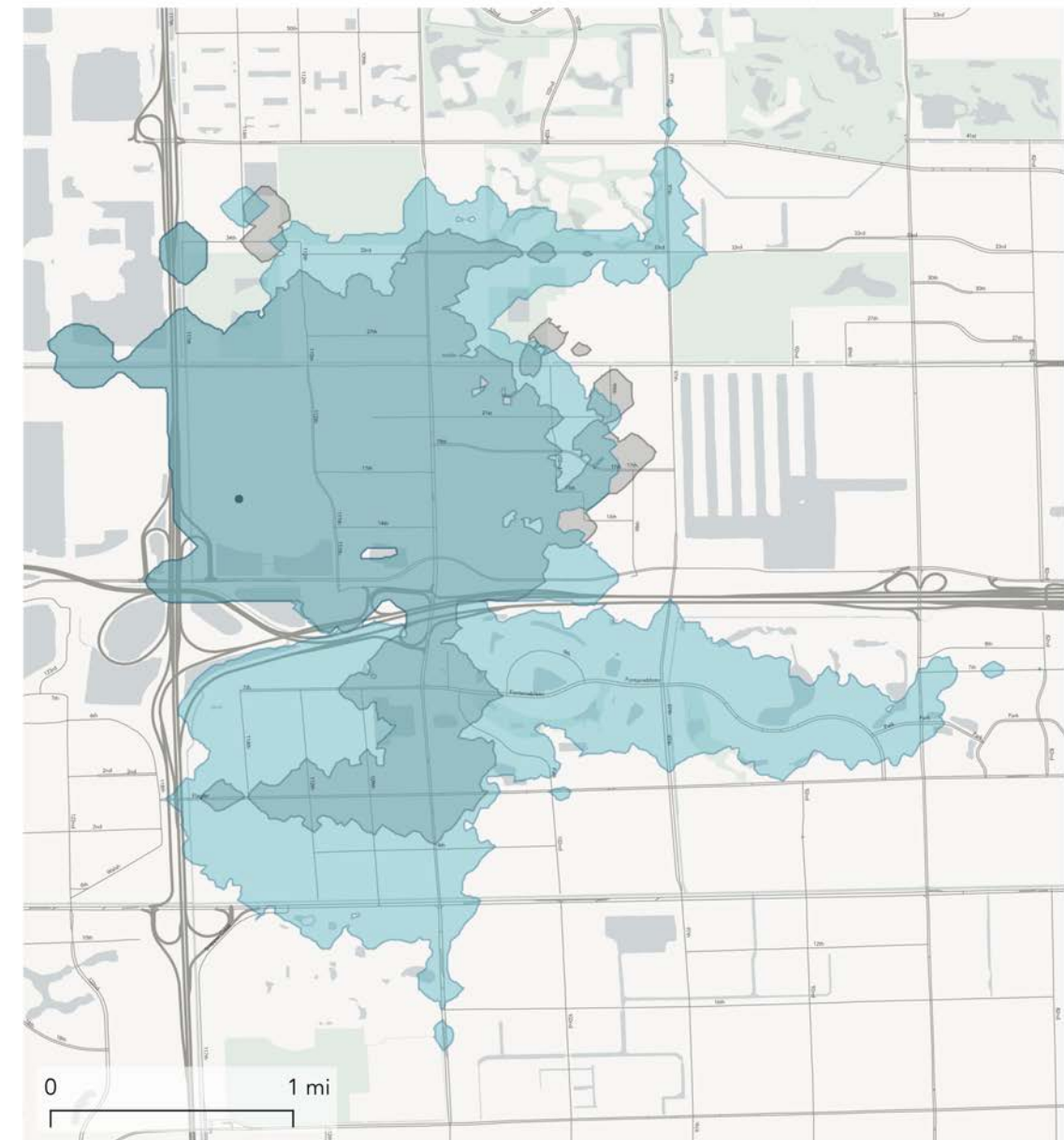


Change in opportunities (jobs and services) reachable	+51,370	+30%
Change in residents reachable	+74,785	+30%

How far can I travel in 45 minutes from
Dolphin Mall
at noon?



Better Bus Network

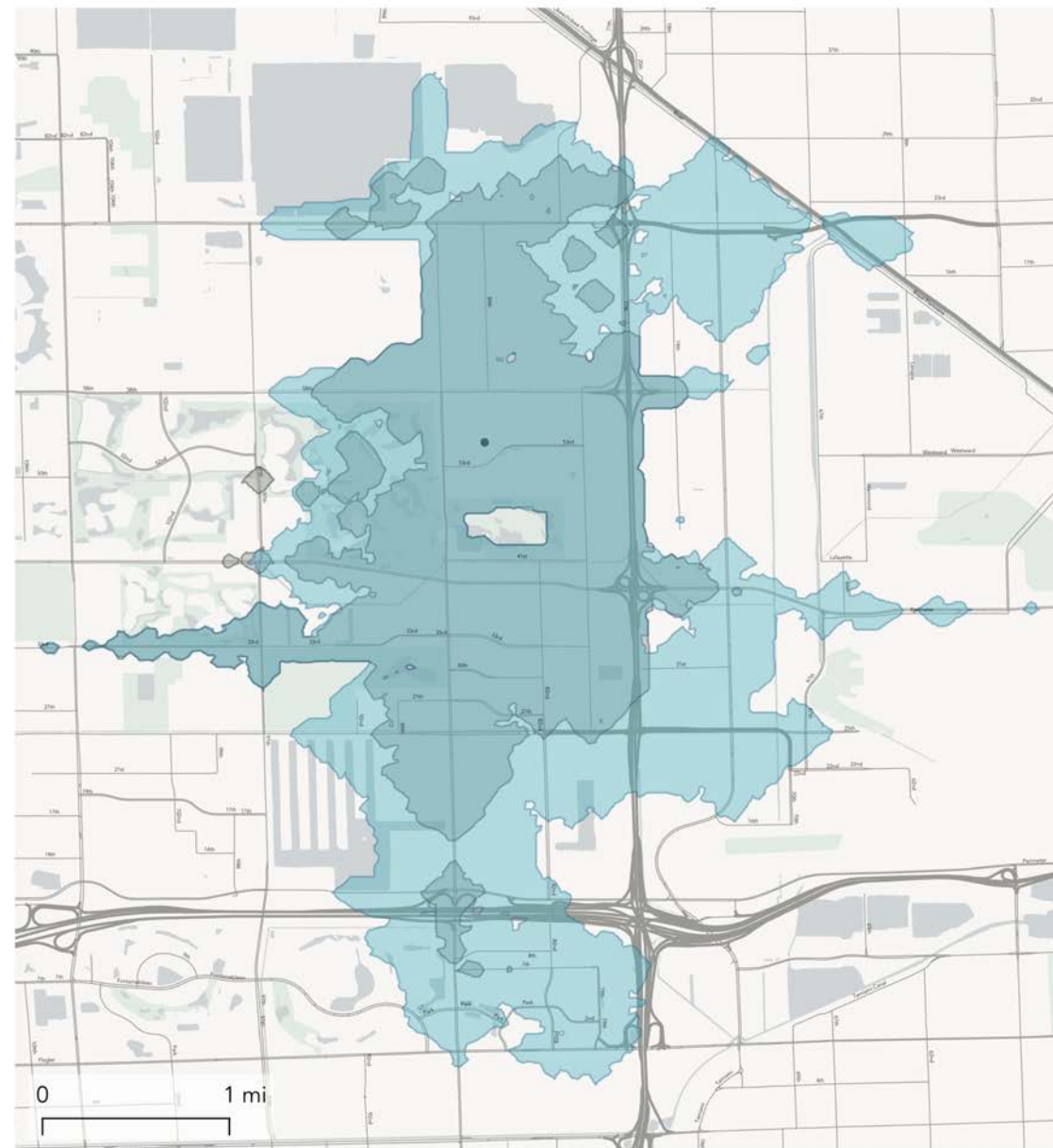


Change in opportunities (jobs and services) reachable	+9,390	+35%
Change in residents reachable	+36,190	+360%

How far can I travel in 45 minutes from
Doral City Hall
at noon?



Better Bus Network

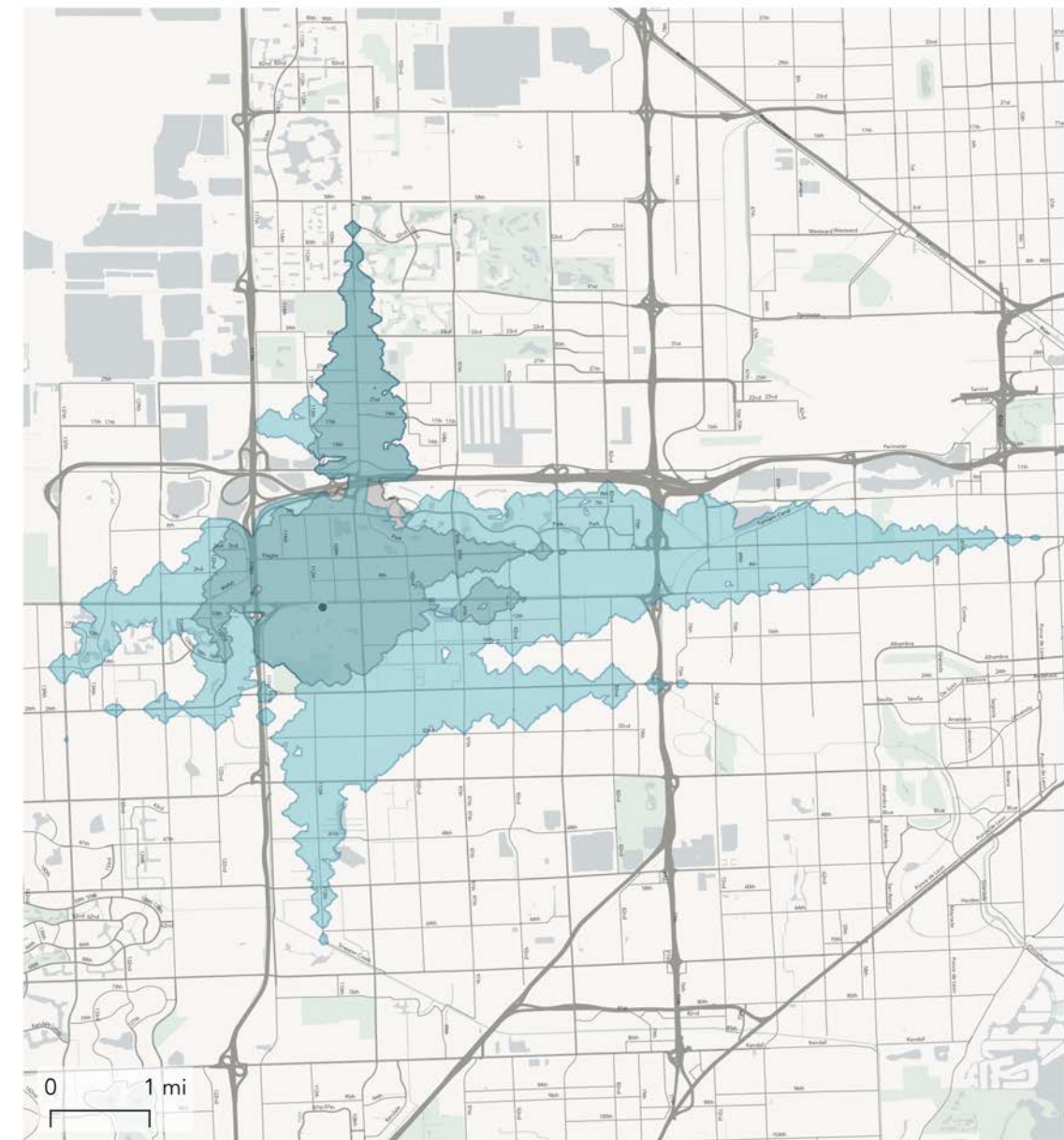


Change in opportunities (jobs and services) reachable	+37,535	+95%
Change in residents reachable	+21,895	+325%

How far can I travel in 45 minutes from
Florida International University
at noon?



Better Bus Network

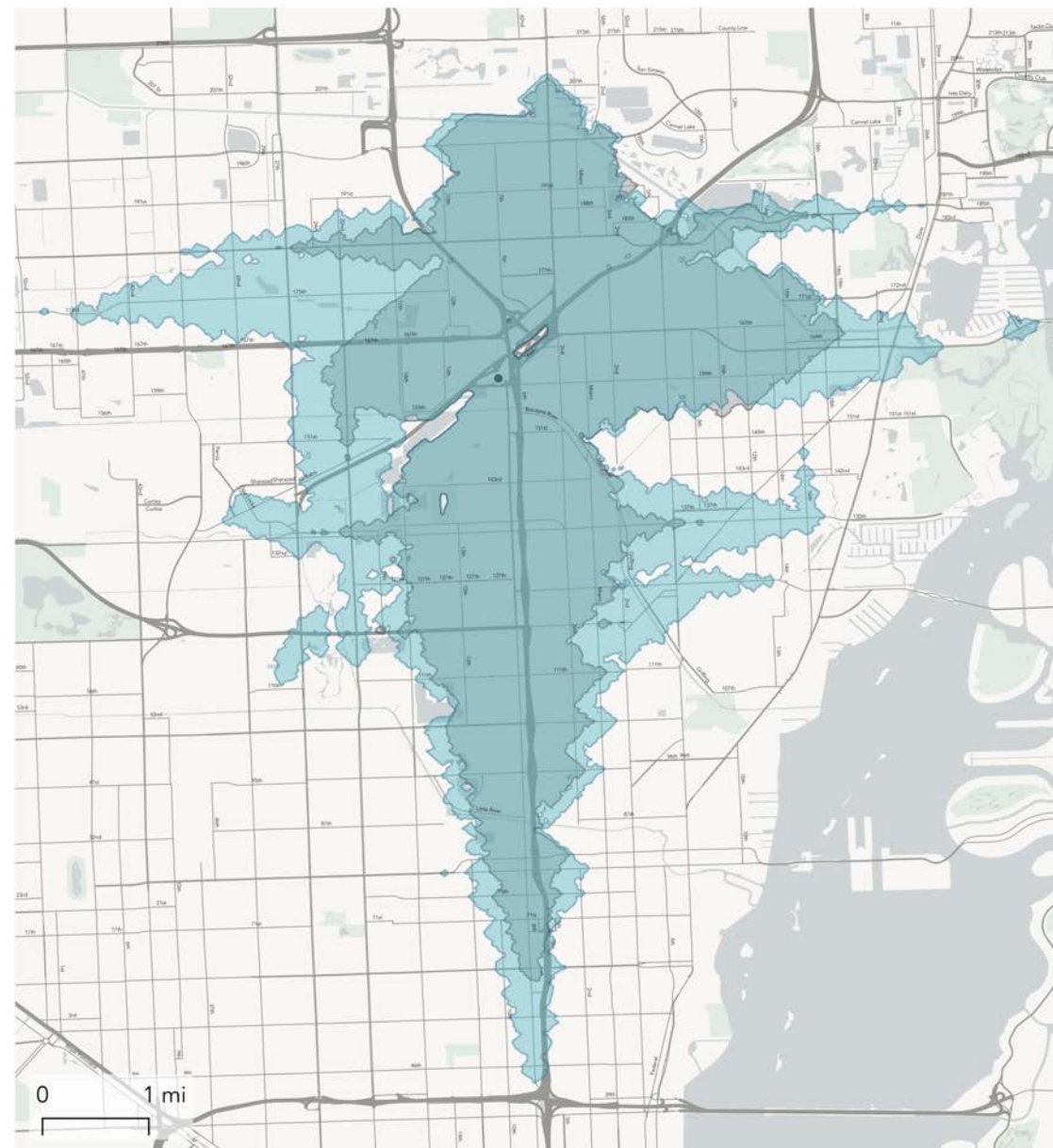


Change in opportunities (jobs and services) reachable	+24,975	+95%
Change in residents reachable	+106,780	+220%

How far can I travel in 45 minutes from Golden Glades at noon?



Better Bus Network

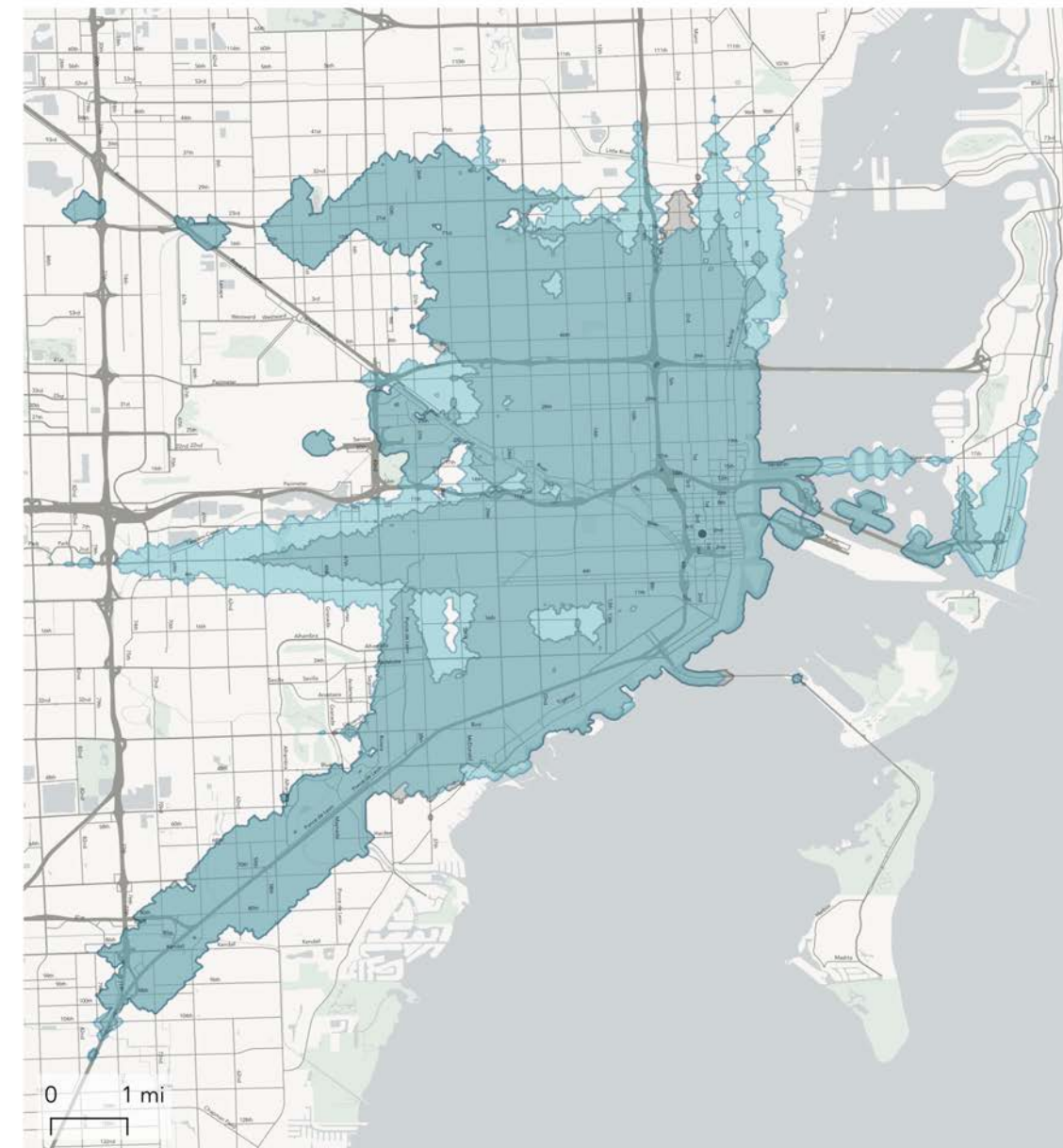


Change in opportunities (jobs and services) reachable	+13,985	+45%
Change in residents reachable	+73,950	+60%

How far can I travel in 45 minutes from Government Center at noon?



Better Bus Network

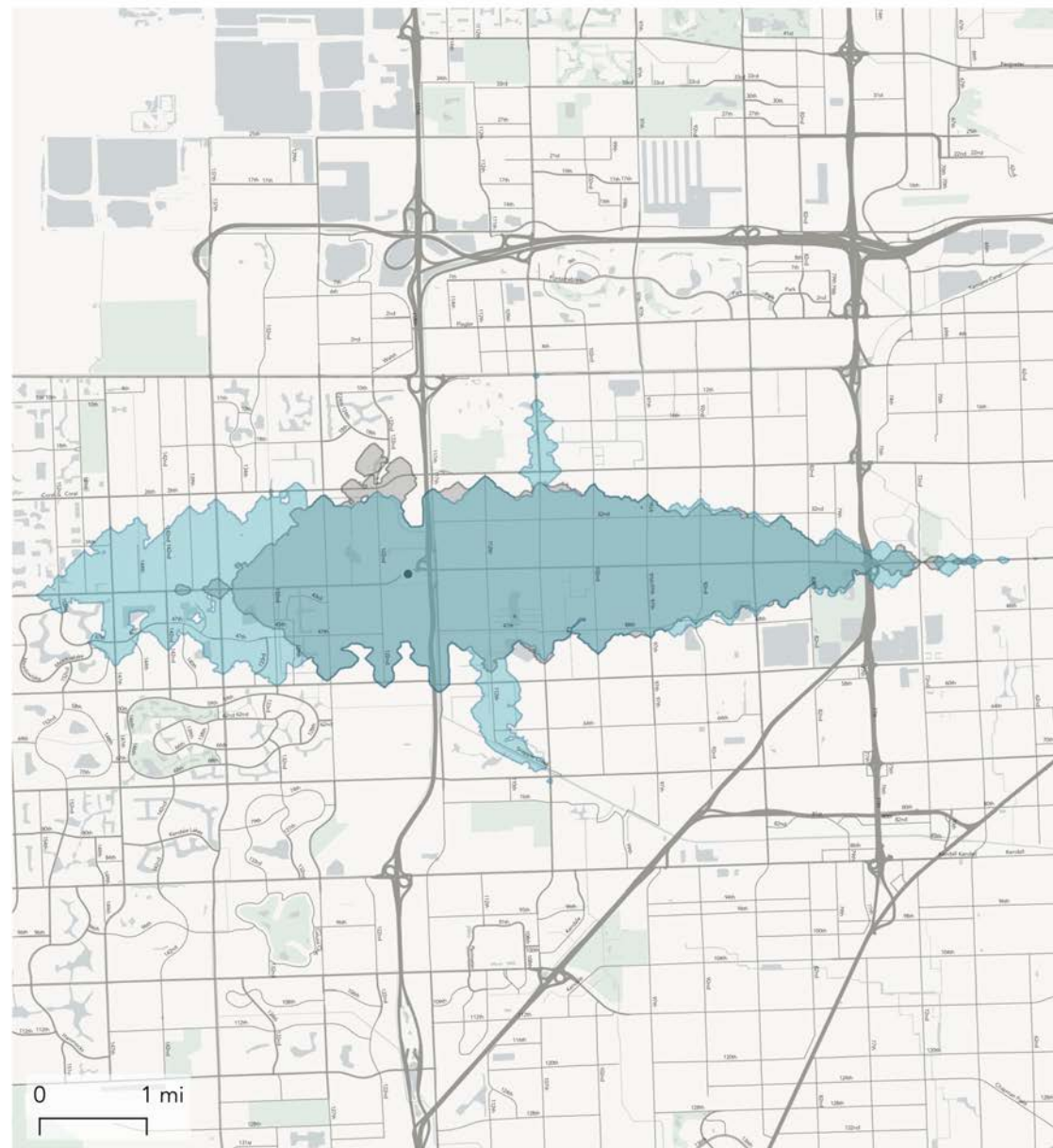


Change in opportunities (jobs and services) reachable	+35,705	+10%
Change in residents reachable	+97,020	+20%

How far can I travel in 45 minutes from Kendall Regional Medical Center at noon?



Better Bus Network

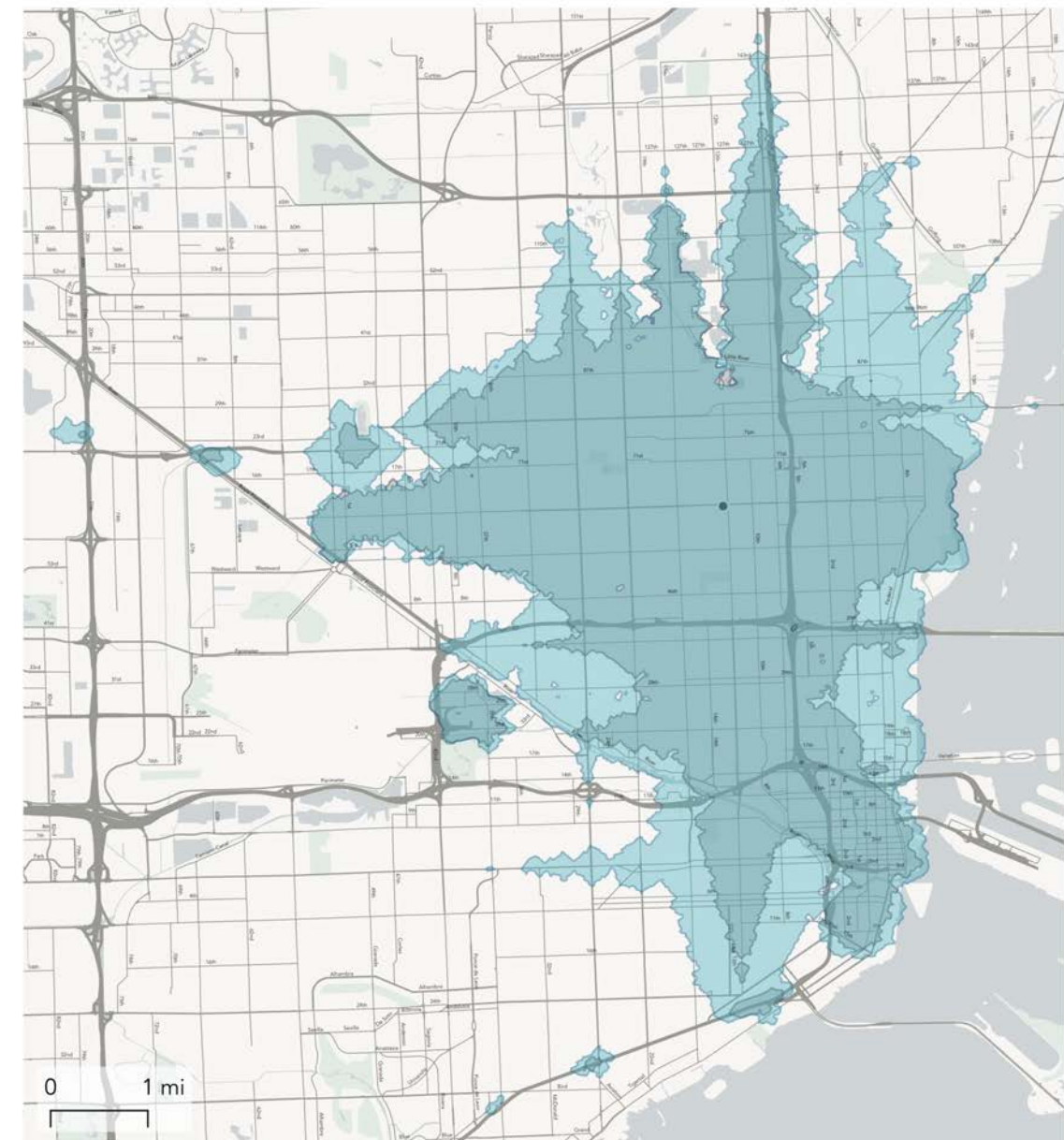


Change in opportunities (jobs and services) reachable	+3,015	+25%
Change in residents reachable	+18,780	+35%

How far can I travel in 45 minutes from Liberty Square - 12th and 62nd at noon?



Better Bus Network

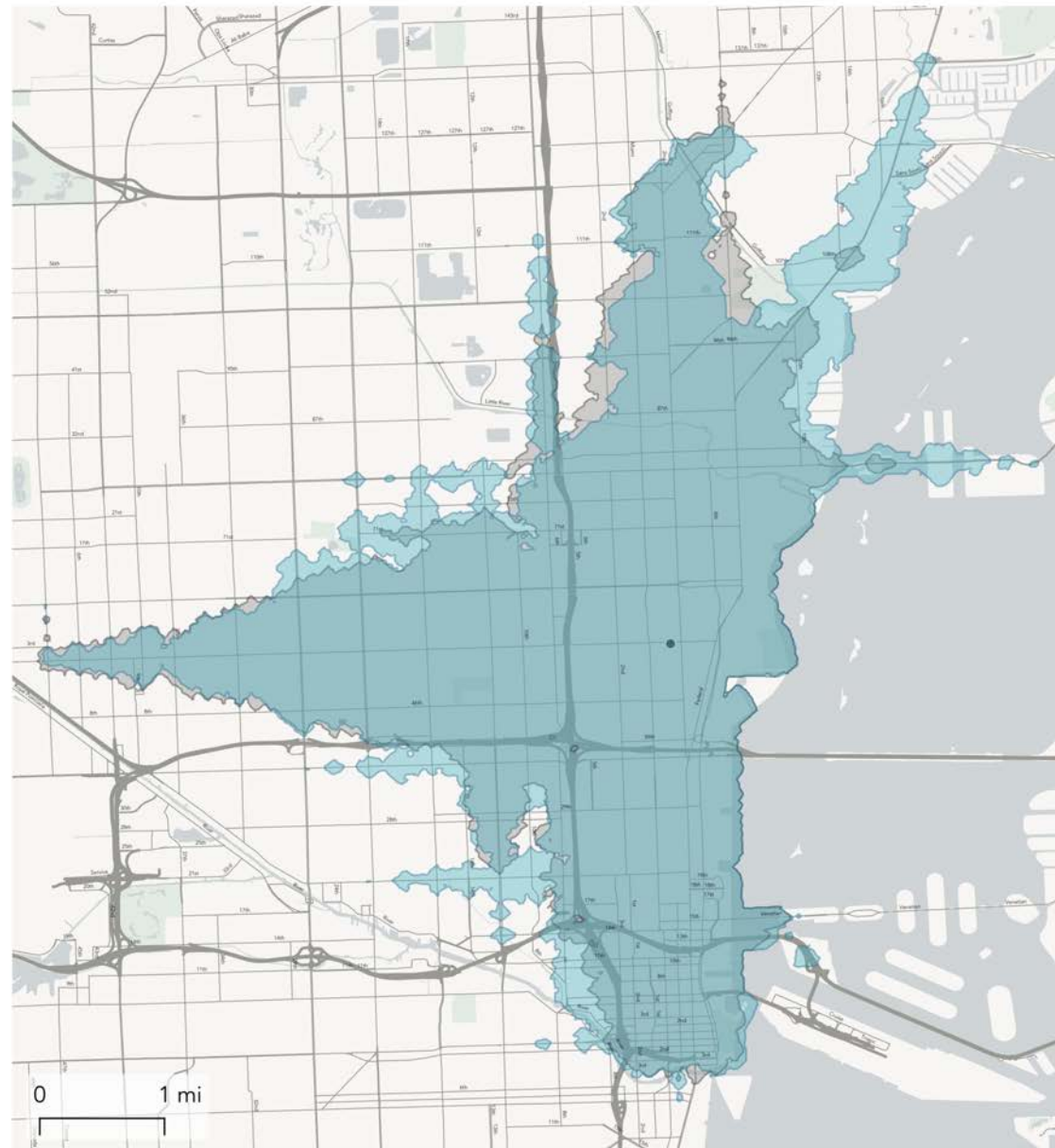


Change in opportunities (jobs and services) reachable	+96,985	+60%
Change in residents reachable	+123,110	+50%

How far can I travel in 45 minutes from
Little Haiti 2nd and 54th NE
at noon?



Better Bus Network

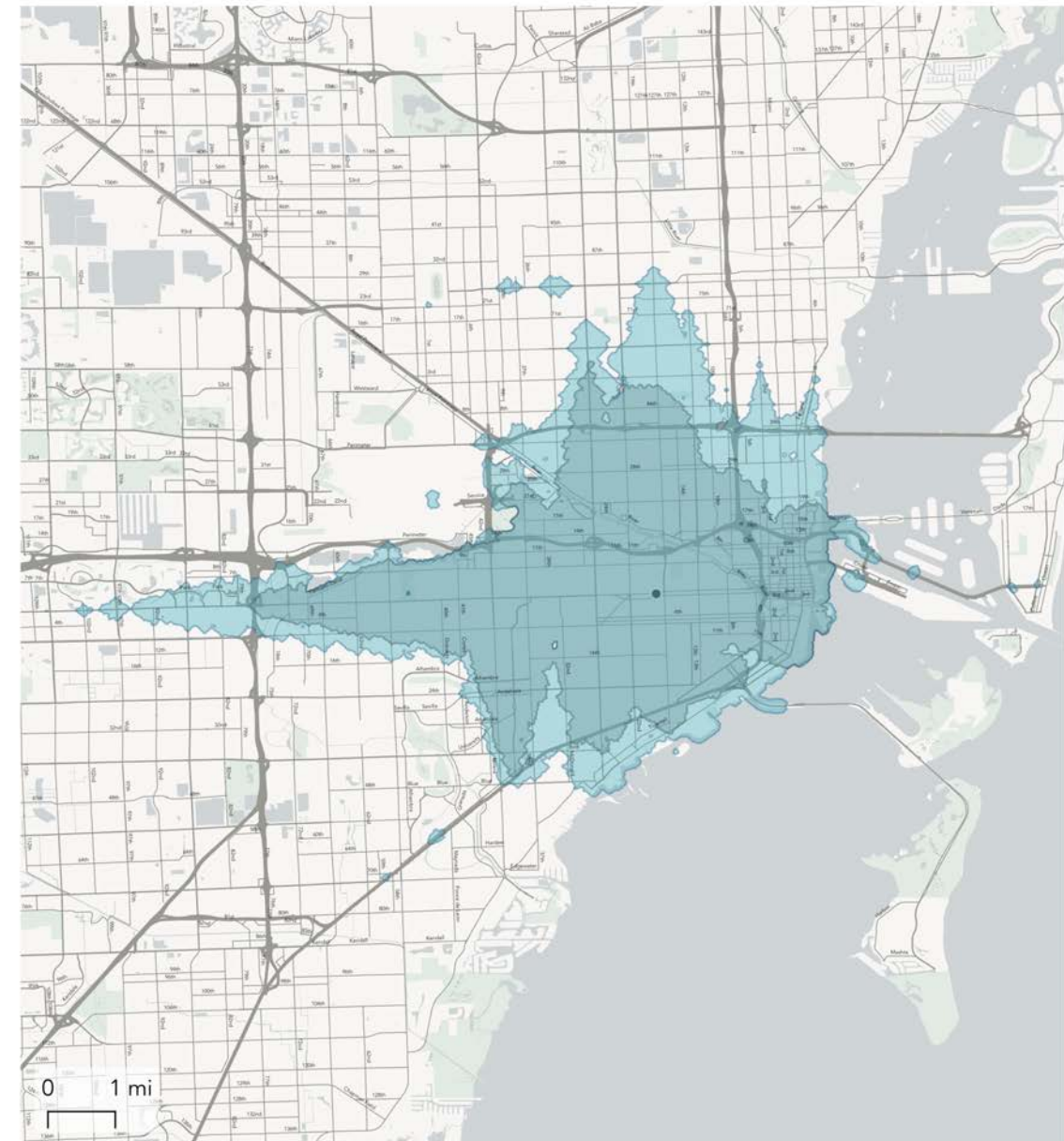


Change in opportunities (jobs and services) reachable	+19,195	+10%
Change in residents reachable	+23,900	+15%

How far can I travel in 45 minutes from
Little Havana - Flagler & 17th Ave
at noon?



Better Bus Network

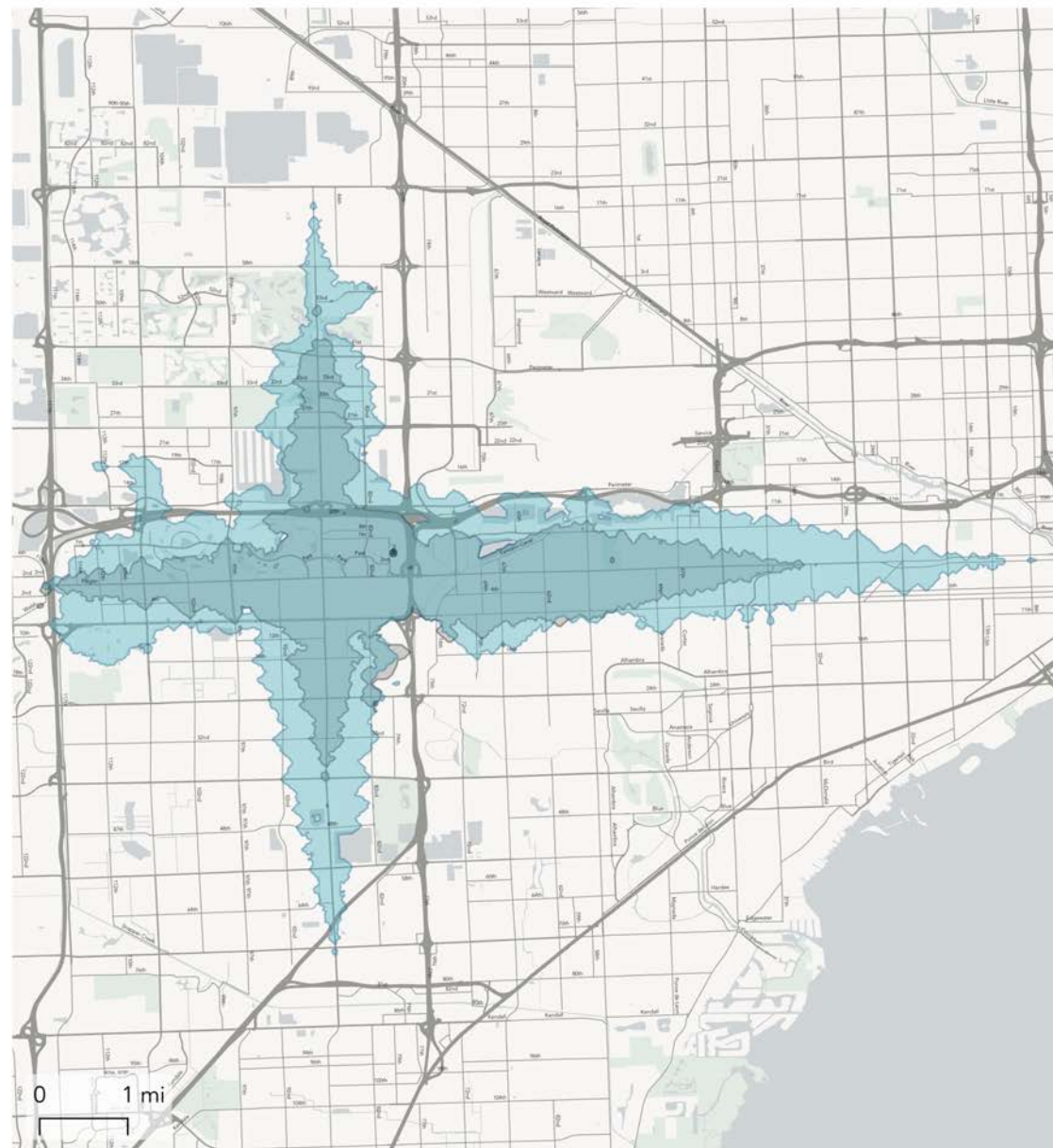


Change in opportunities (jobs and services) reachable	+72,255	+30%
Change in residents reachable	+101,665	+30%

How far can I travel in 45 minutes from
Mall of the Americas
at noon?



Better Bus Network

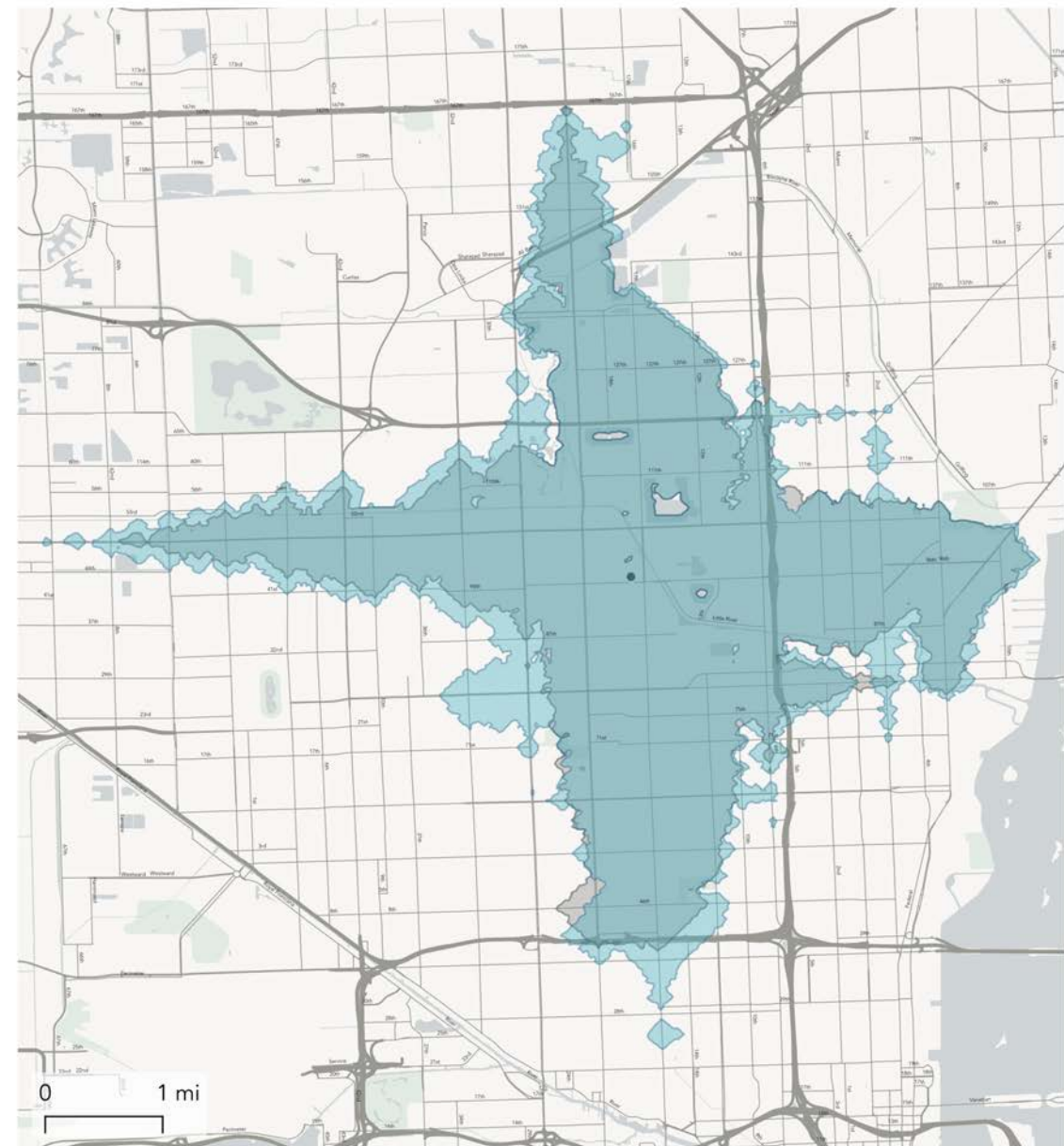


Change in opportunities (jobs and services) reachable	+47,875	+135%
Change in residents reachable	+95,390	+90%

How far can I travel in 45 minutes from
Miami Central High School
at noon?



Better Bus Network

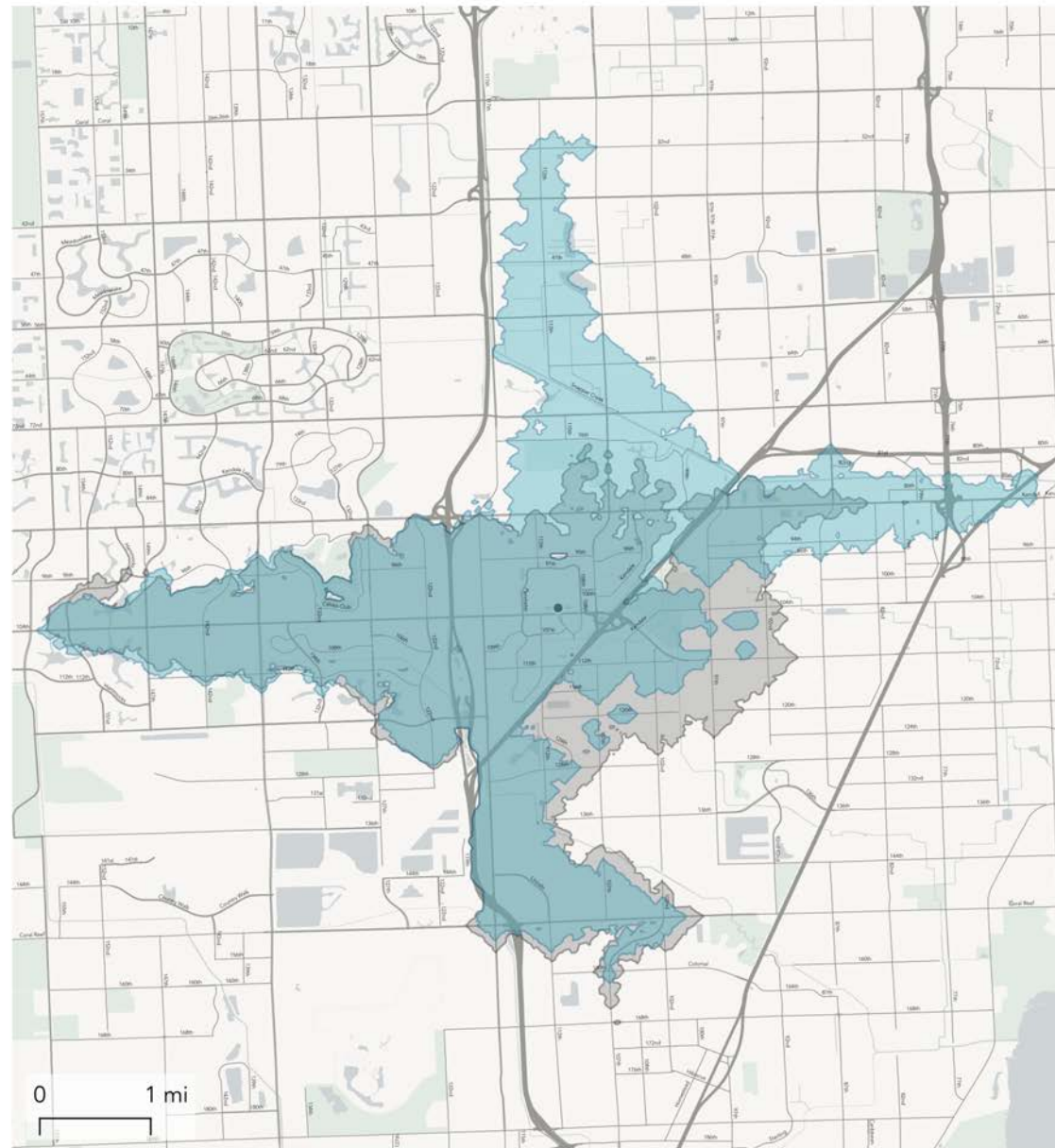


Change in opportunities (jobs and services) reachable	+6,040	+35%
Change in residents reachable	+24,890	+20%

How far can I travel in 45 minutes from
Miami-Dade CC Kendall
at noon?



Better Bus Network

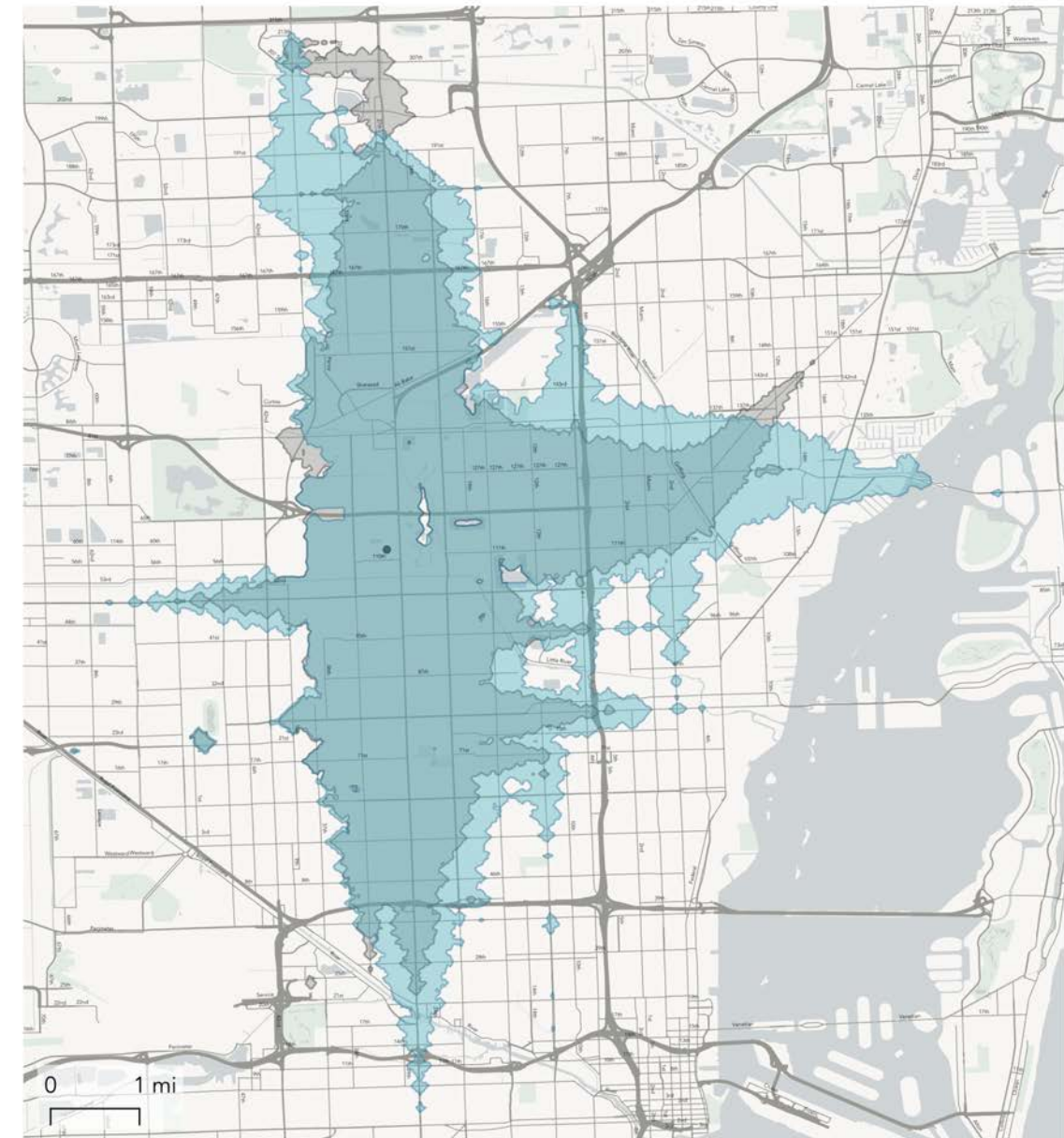


Change in opportunities (jobs and services) reachable	+20,545	+115%
Change in residents reachable	+24,810	+30%

How far can I travel in 45 minutes from
Miami-Dade CC North
at noon?



Better Bus Network

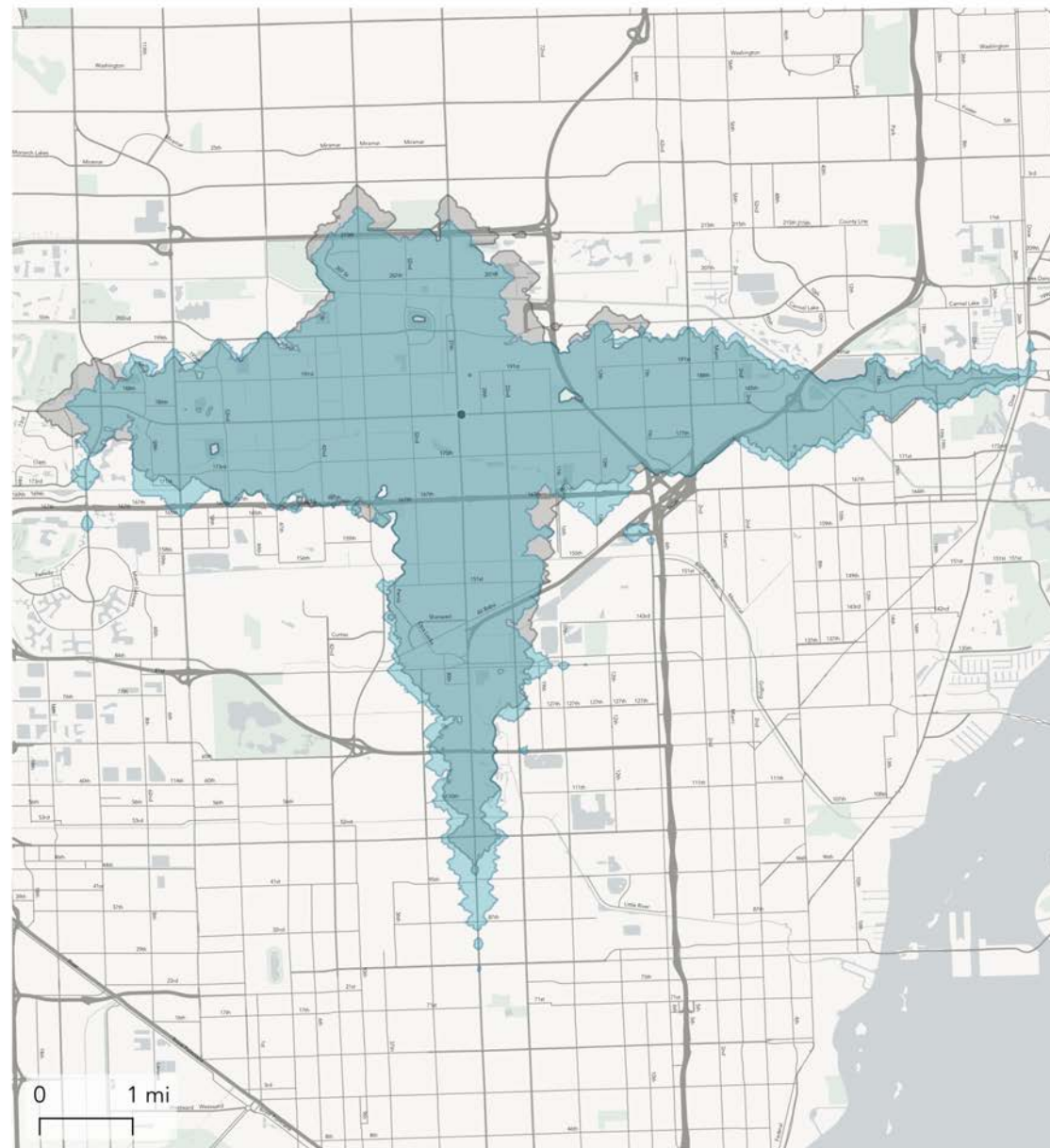


Change in opportunities (jobs and services) reachable	+14,285	+45%
Change in residents reachable	+73,785	+50%

How far can I travel in 45 minutes from
Miami Gardens Dr and NW 27th Ave
at noon?



Better Bus Network

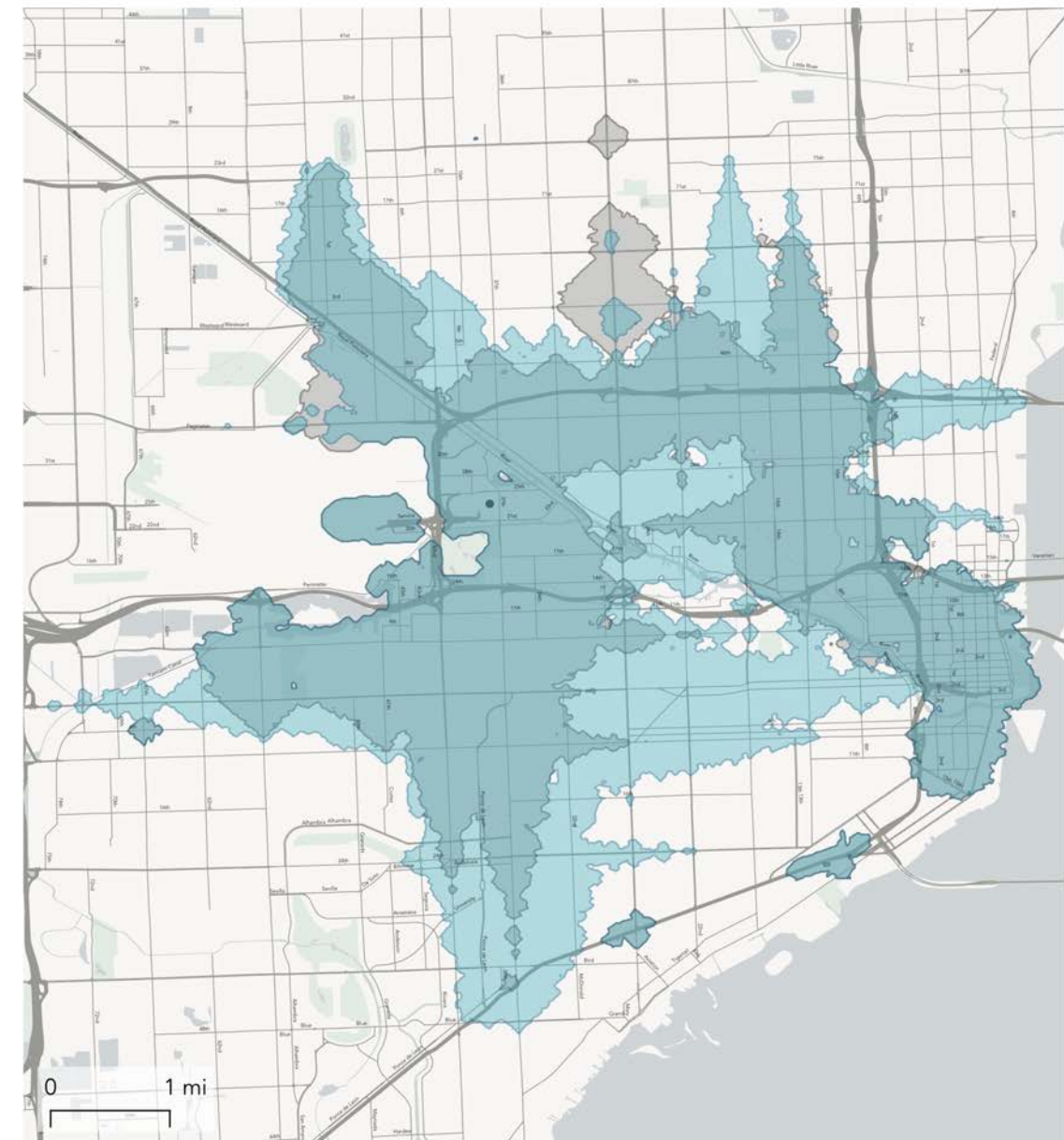


Change in opportunities (jobs and services) reachable	+3,480	+15%
Change in residents reachable	+4,155	+5%

How far can I travel in 45 minutes from
Miami Intermodal Center
at noon?



Better Bus Network

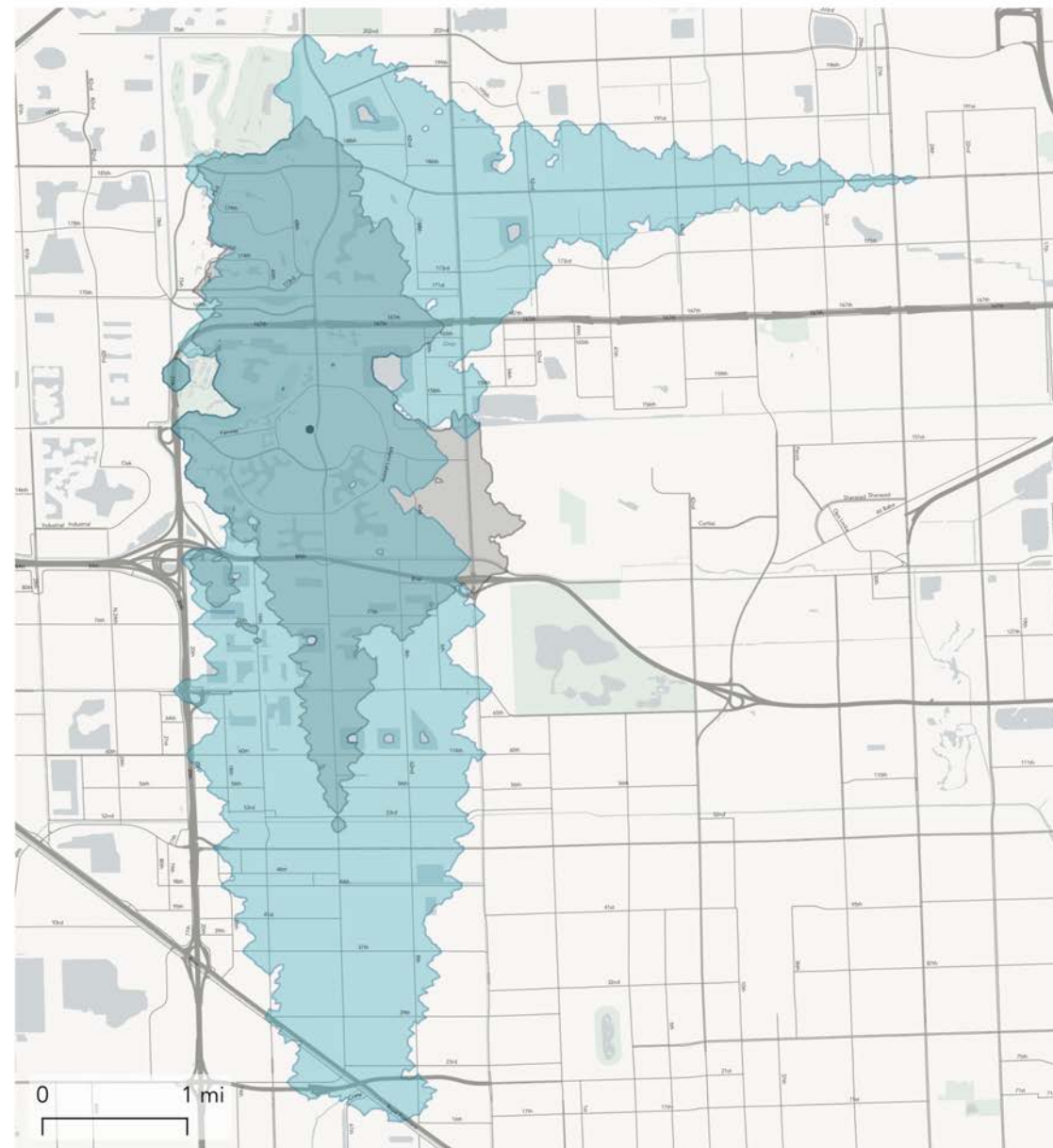


Change in opportunities (jobs and services) reachable	+48,515	+25%
Change in residents reachable	+120,920	+60%

How far can I travel in 45 minutes from
Miami Lakes Downtown
at noon?



Better Bus Network

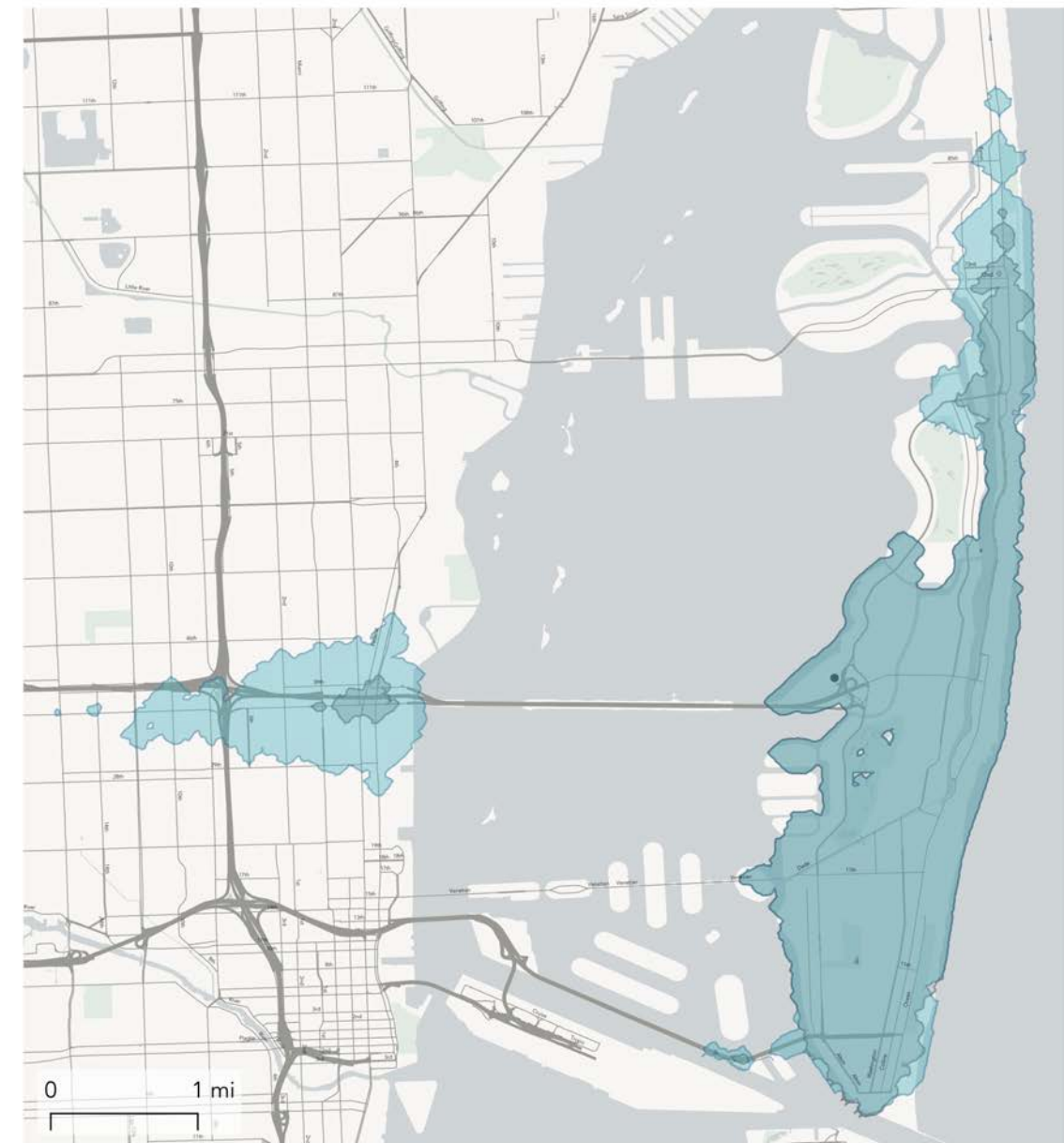


Change in opportunities (jobs and services) reachable	+20,520	+120%
Change in residents reachable	+94,050	+185%

How far can I travel in 45 minutes from
Mt Sinai Hospital
at noon?



Better Bus Network

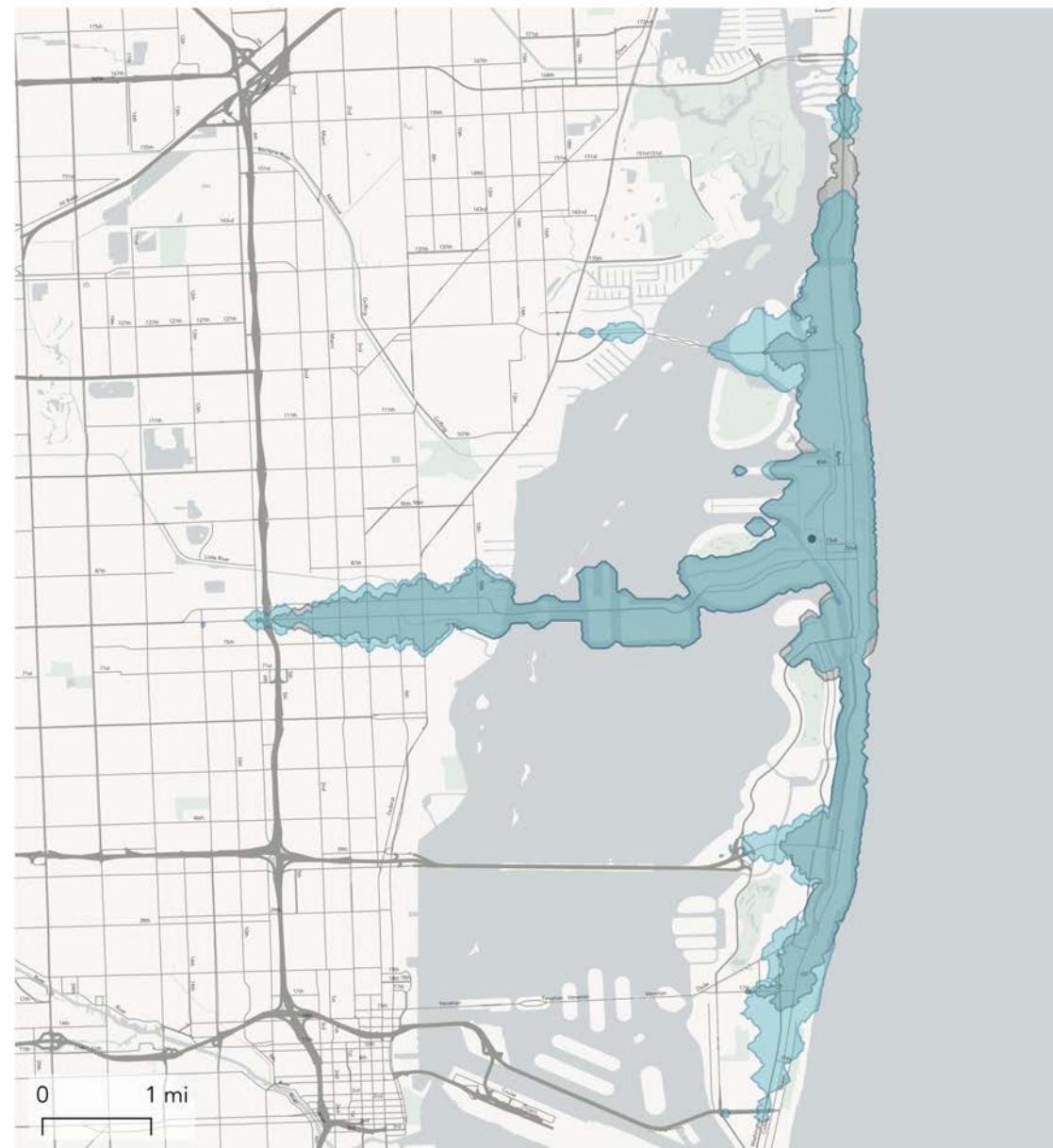


Change in opportunities (jobs and services) reachable	+7,885	+20%
Change in residents reachable	+19,110	+35%

How far can I travel in 45 minutes from
North Beach Bandshell
at noon?



Better Bus Network

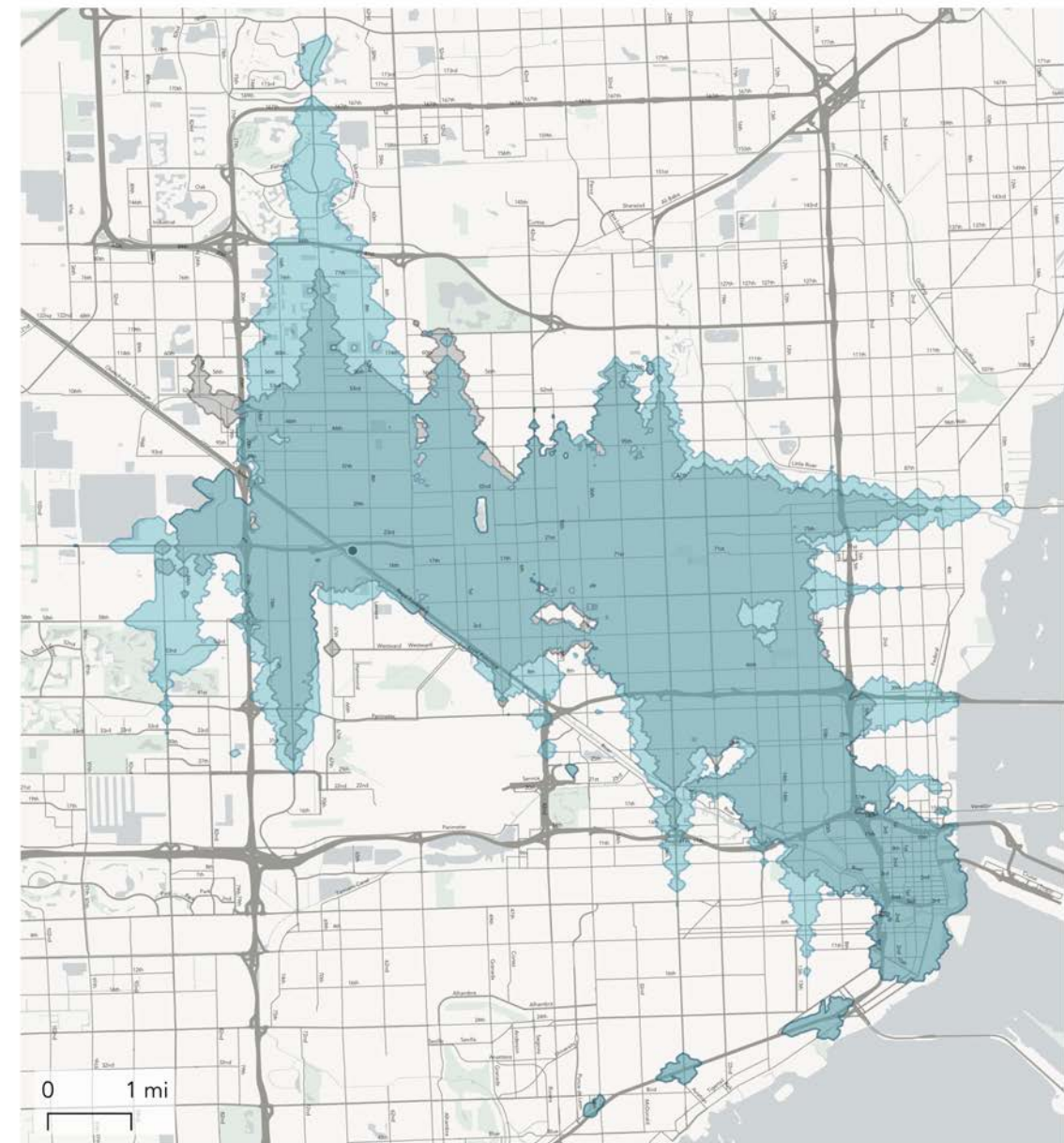


Change in opportunities (jobs and services) reachable	+9,530	+45%
Change in residents reachable	+14,040	+20%

How far can I travel in 45 minutes from
Okeechobee Metrorail Station
at noon?



Better Bus Network

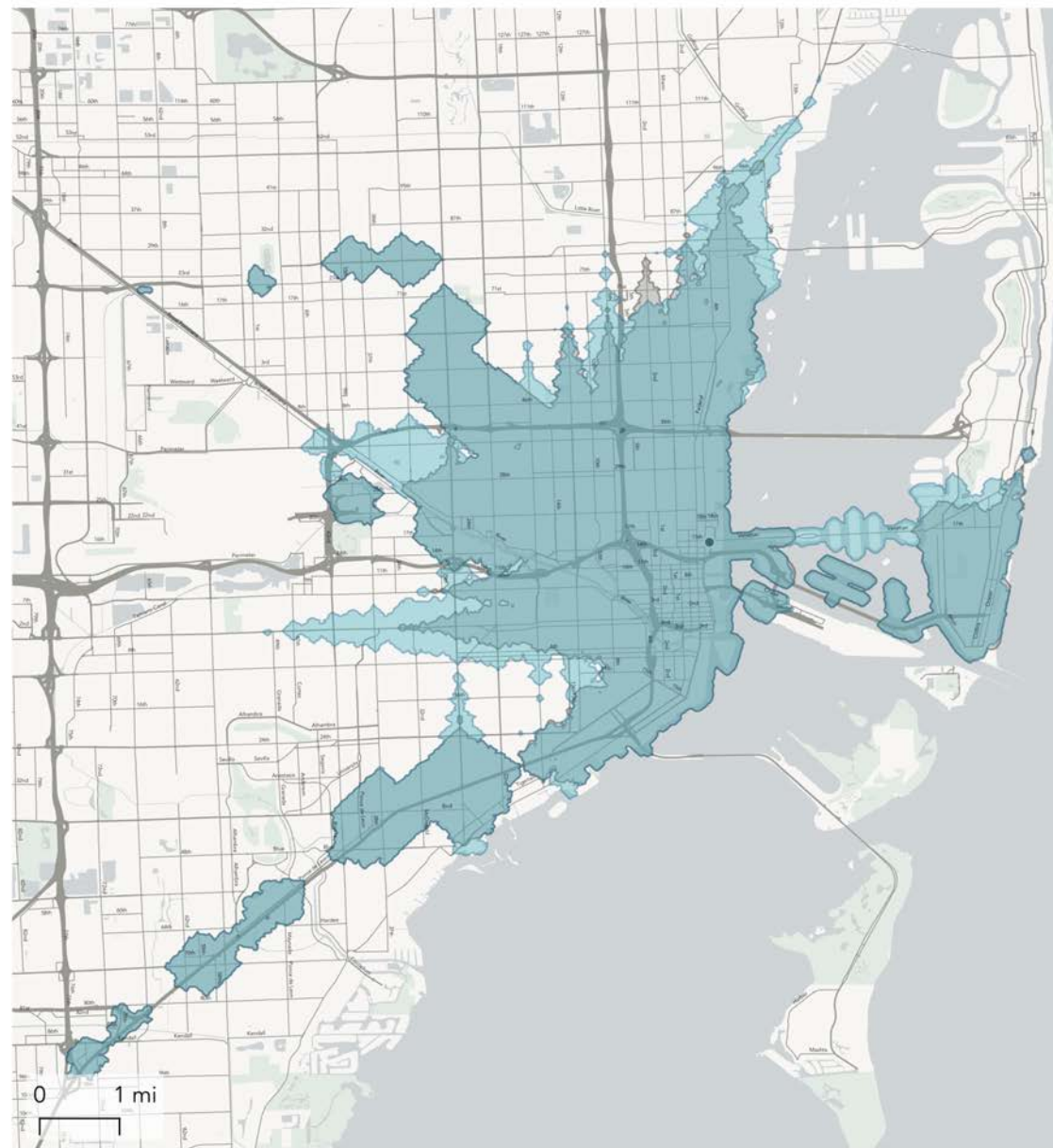


Change in opportunities (jobs and services) reachable	+42,740	+20%
Change in residents reachable	+70,620	+25%

How far can I travel in 45 minutes from
Omni Bus Terminal
at noon?



Better Bus Network

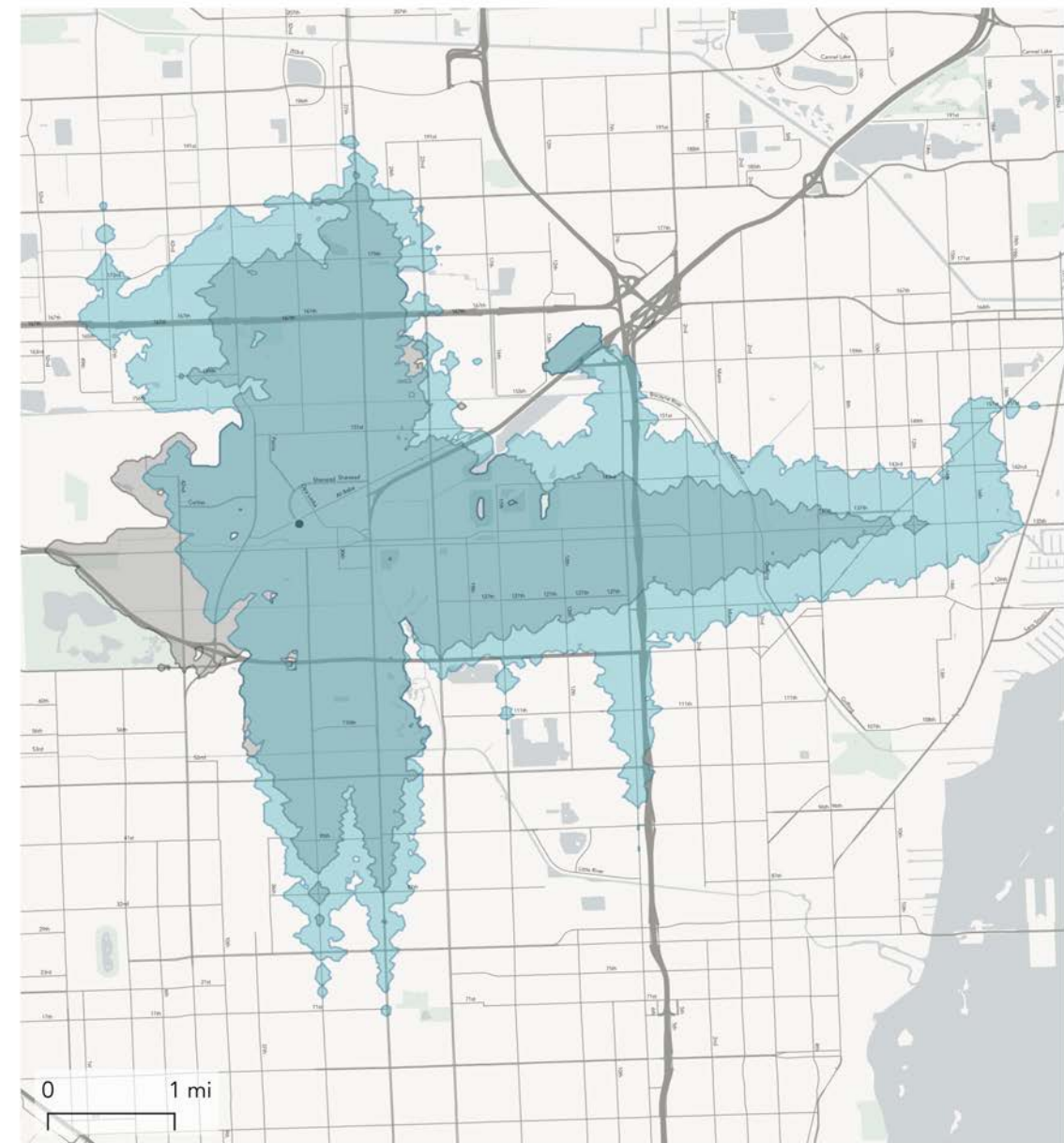


Change in opportunities (jobs and services) reachable	+14,760	+5%
Change in residents reachable	+44,775	+15%

How far can I travel in 45 minutes from
Opa Locka Tri Rail Station
at noon?



Better Bus Network

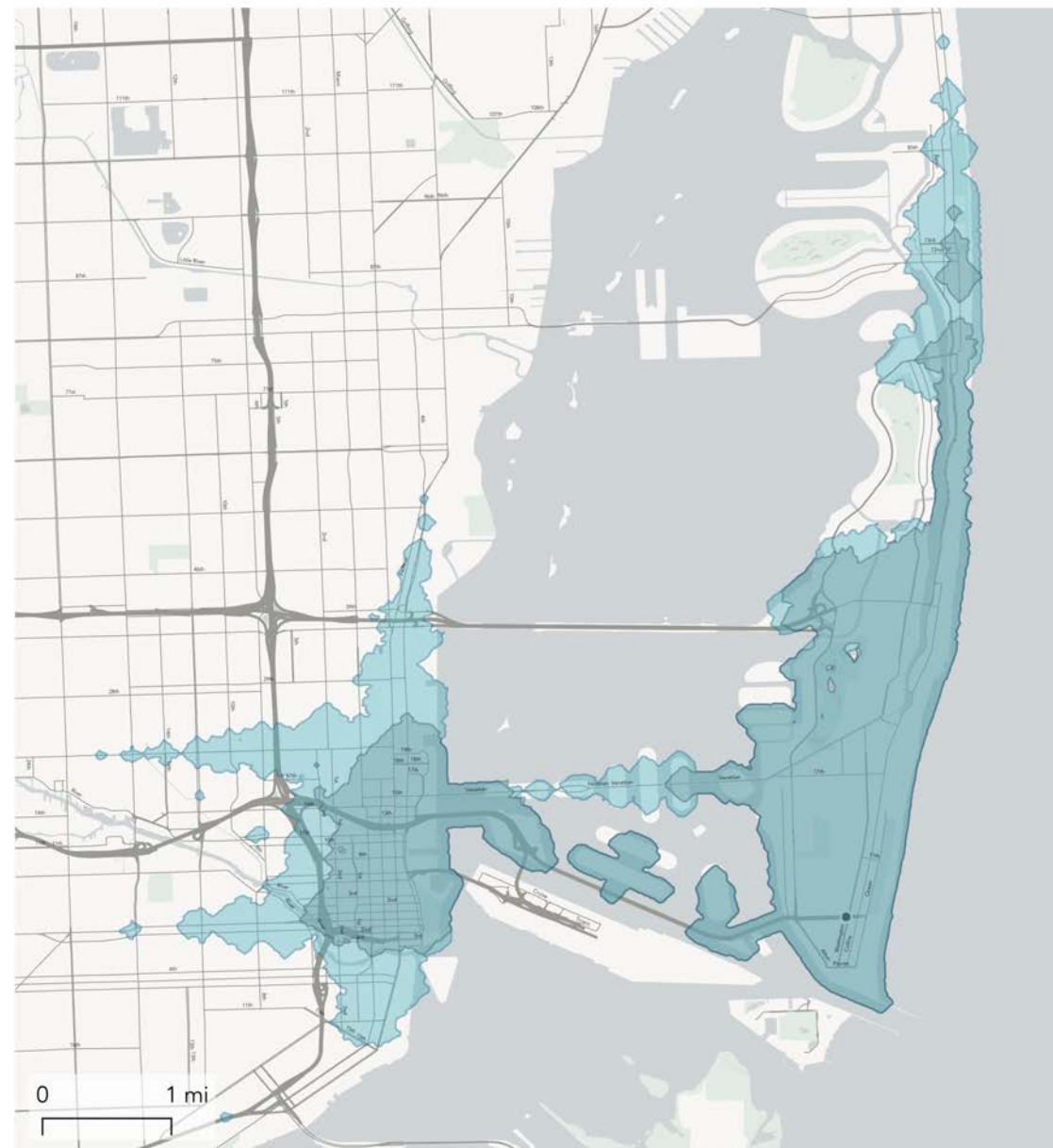


Change in opportunities (jobs and services) reachable	+8,205	+50%
Change in residents reachable	+53,165	+80%

How far can I travel in 45 minutes from
 South Beach - Washington and 5th St
 at noon?



Better Bus Network

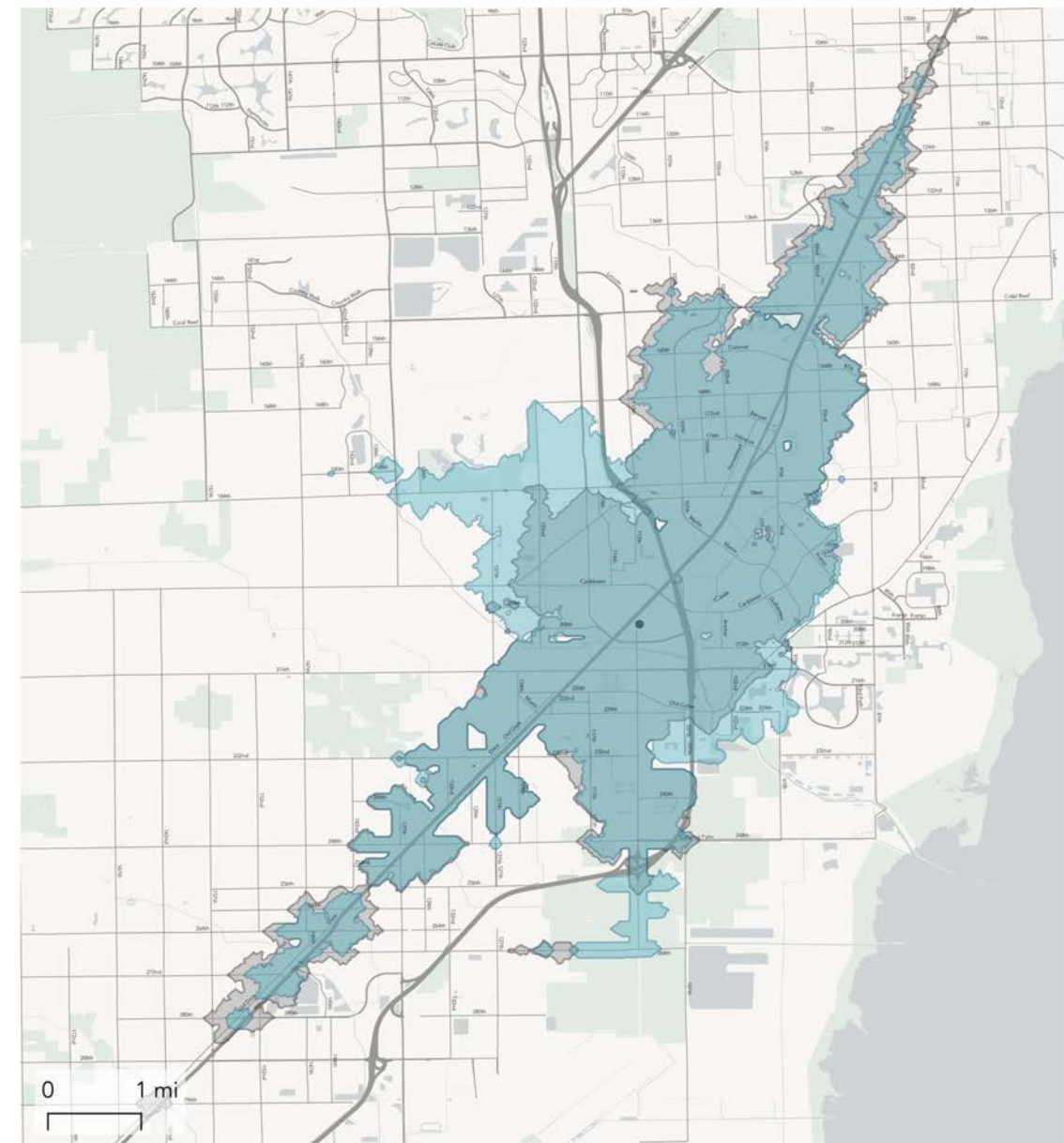


Change in opportunities (jobs and services) reachable	+56,440	+35%
Change in residents reachable	+49,990	+70%

How far can I travel in 45 minutes from
 Southland Mall
 at noon?



Better Bus Network

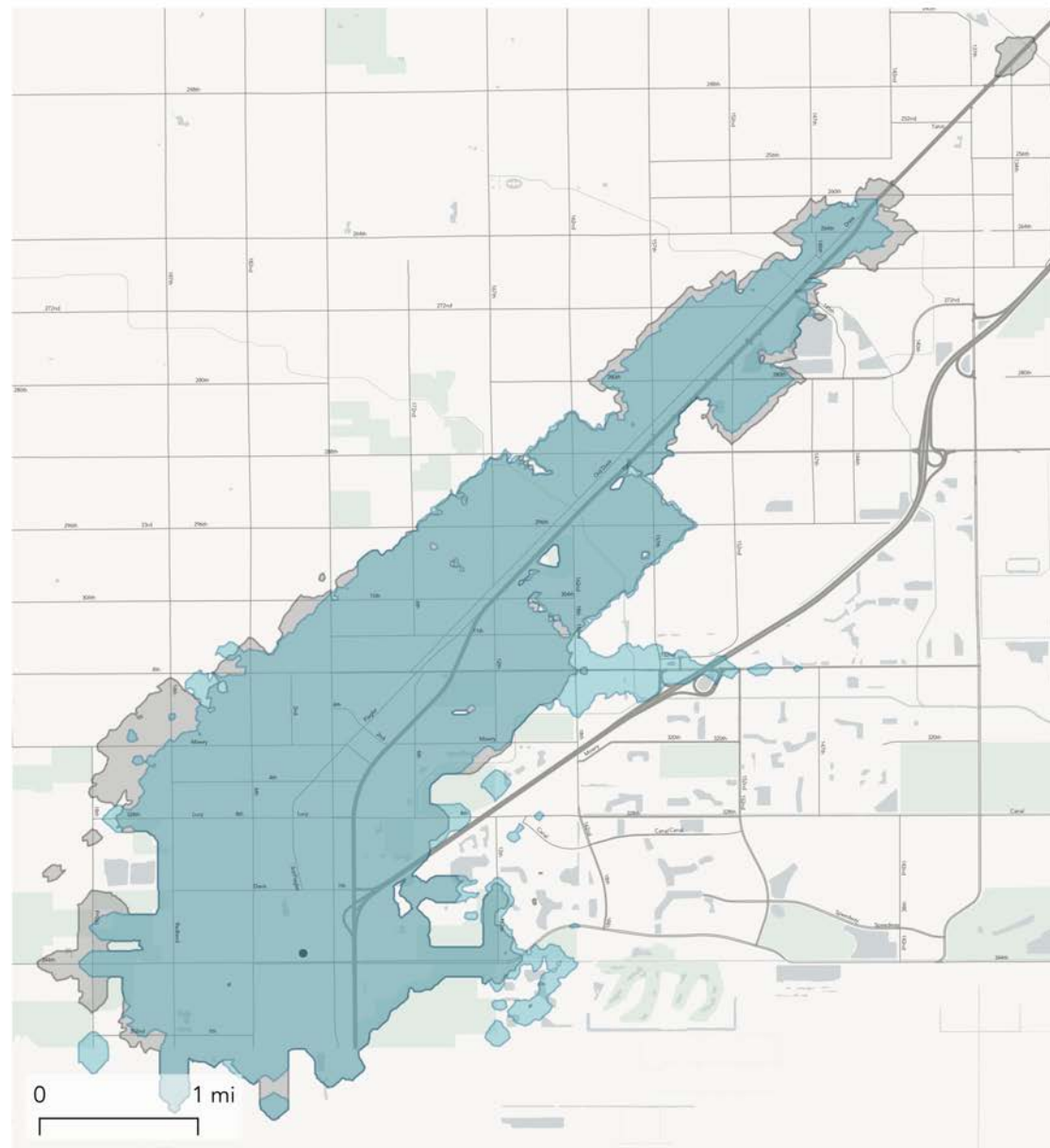


Change in opportunities (jobs and services) reachable	-595	0%
Change in residents reachable	+10,865	+10%

How far can I travel in 45 minutes from
SW 344 Park and Ride Lot
at noon?



Better Bus Network

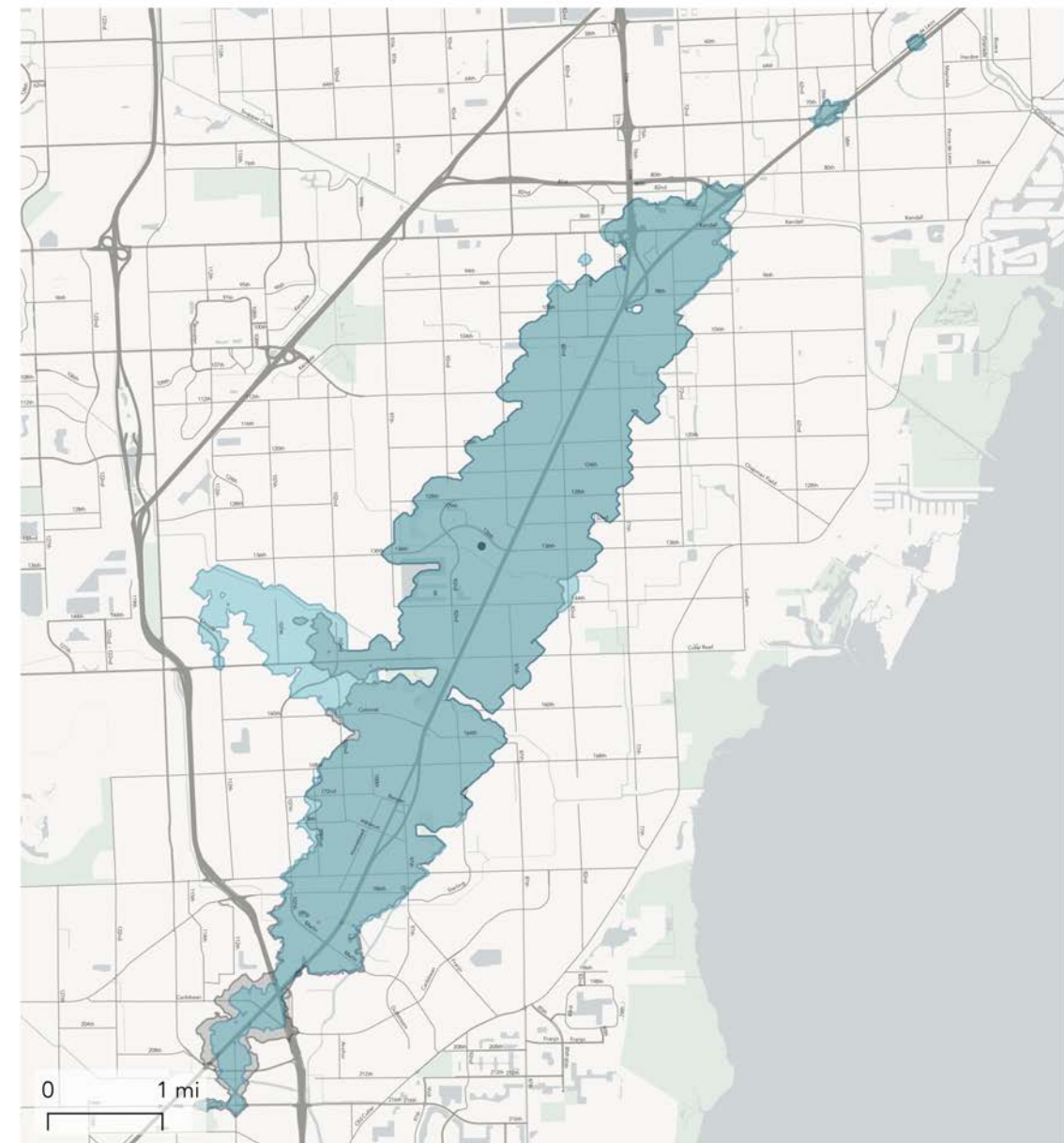


Change in opportunities (jobs and services) reachable	+295	+5%
Change in residents reachable	-745	0%

How far can I travel in 45 minutes from
The Falls Shopping Center
at noon?



Better Bus Network

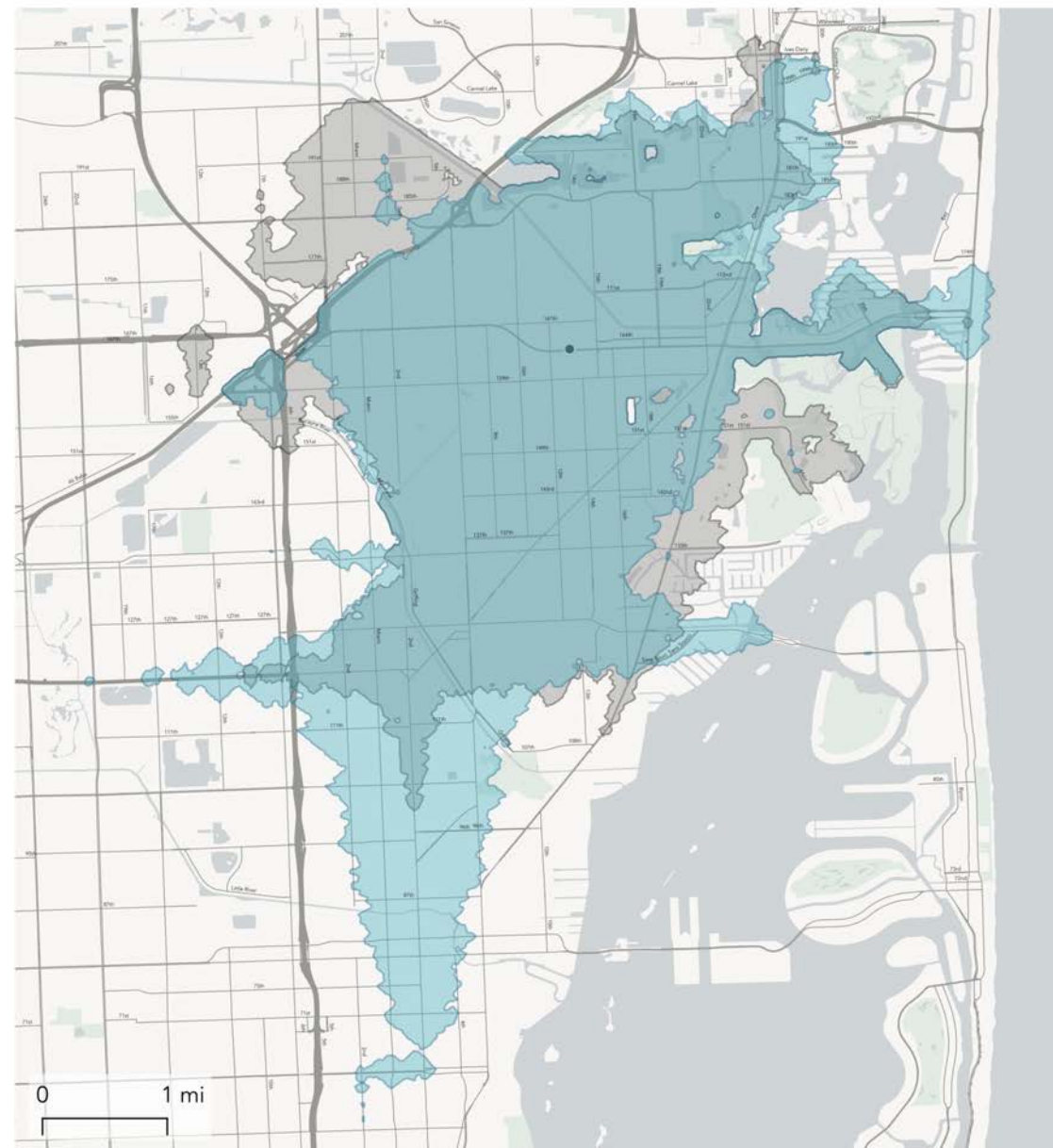


Change in opportunities (jobs and services) reachable	+435	+0%
Change in residents reachable	+5,250	+10%

How far can I travel in 45 minutes from
The Mall at 163rd St
at noon?



Better Bus Network

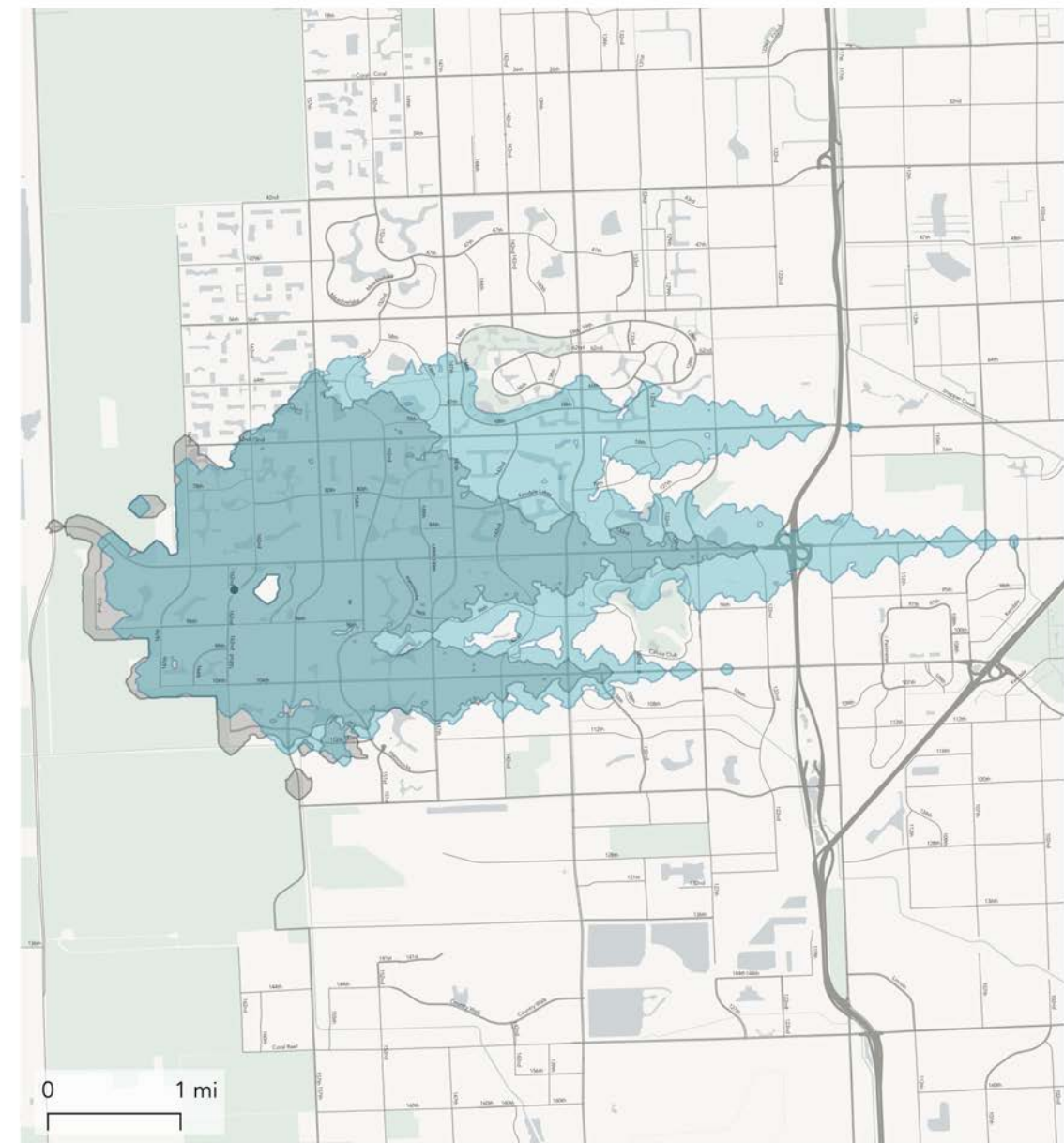


Change in opportunities (jobs and services) reachable	+5,495	+15%
Change in residents reachable	+21,895	+15%

How far can I travel in 45 minutes from
West Kendall Transit Terminal
at noon?



Better Bus Network

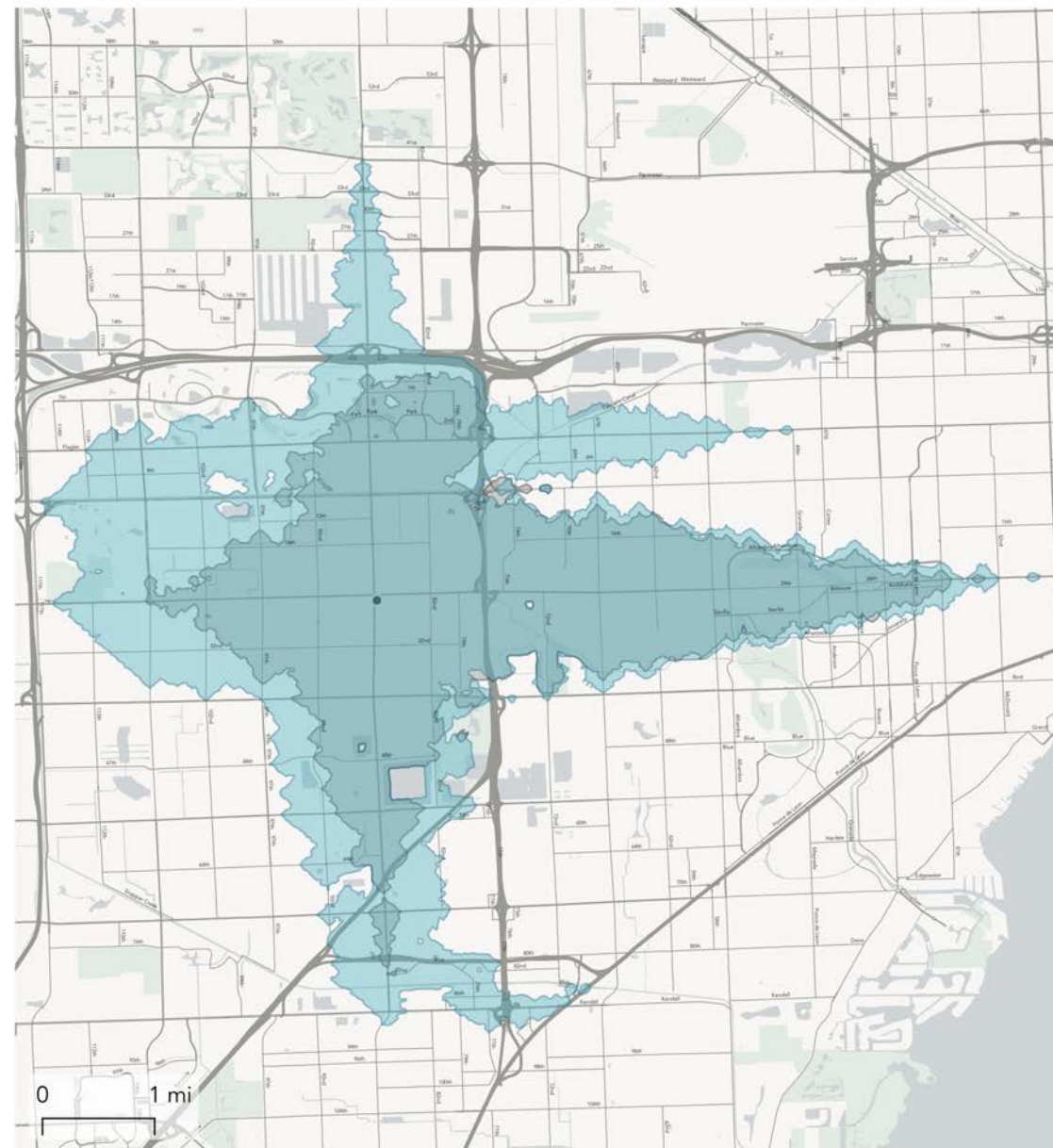


Change in opportunities (jobs and services) reachable	+5,130	+60%
Change in residents reachable	+32,490	+45%

How far can I travel in 45 minutes from Westchester Shopping Center at noon?



Better Bus Network

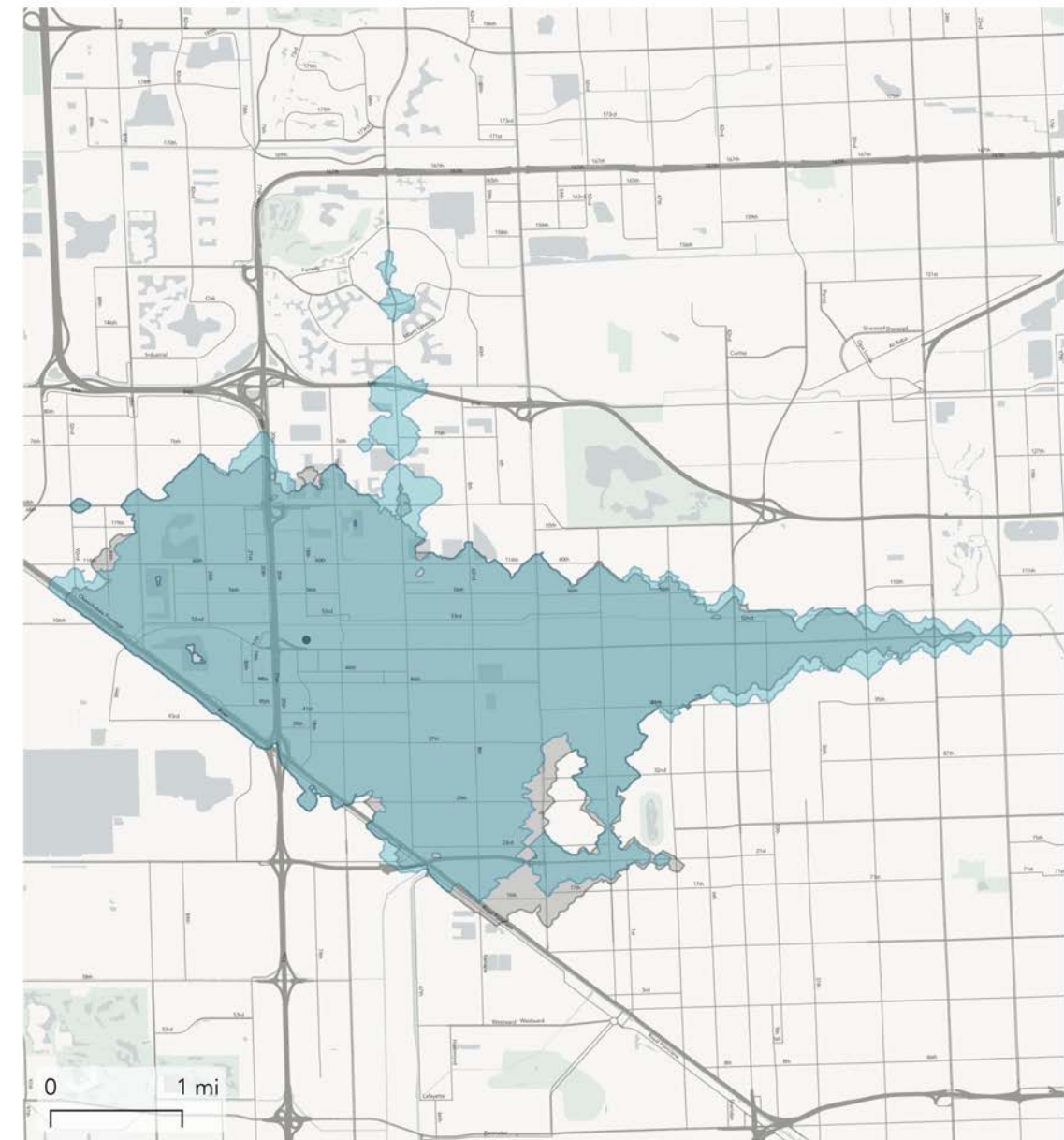


Change in opportunities (jobs and services) reachable	+40,585	+110%
Change in residents reachable	+78,710	+90%

How far can I travel in 45 minutes from Westland Mall at noon?



Better Bus Network



Change in opportunities (jobs and services) reachable	+830	+0%
Change in residents reachable	+3,295	+0%

Appendix B: Service Equity Analysis of Draft Network
