

Better
Bus
Project

Transit Concepts Report

For Miami-Dade County and Transit Alliance

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TransitAlliance

September 2019

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1 Introduction

What is the Better Bus Project?

What is the Better Bus Project?

The Better Bus Project is an advocacy-led and community-driven bus system redesign, led by Transit Alliance in partnership with Miami-Dade County. The county's fleet of over 750 buses serves two out of every three transit trips in Miami. Buses are the most flexible component of a transit system and have the highest potential for immediate improvement.

A bus system redesign is a collaborative planning effort to decide where today's bus service should go, when it should run, and how frequently it should operate, starting from a clean slate. The Better Bus Project is focused on the Miami-Dade Transit (MDT) bus network, which carries most bus riders in the county, but is also looking at improvements to trolley services in the cities of Miami, Miami Beach, and Coral Gables, which account for 70% of trolley ridership in the county.

Redesigning Miami-Dade's bus network is an opportunity to review existing and potential transit demand and to design a network that meets those demands most efficiently. Redesign does not mean changing every bus route and stop; rather, it means that thinking is not constrained by the existing network. Where the analysis suggests that existing service patterns make sense, those elements would be retained. Ultimately, the goal is a network designed for the city and region of today and tomorrow, not one based on the past.

How do you redesign a bus network?

Redesigning a bus system requires a number of decisions—and the most important decisions are about the community's goals and priorities for transit. These decisions are about how the community spends its resources, and thus, these decisions should be left to the community and its elected representatives. The Better Bus Project has been engaging with and surveying the community and decision-makers about the values and goals that transit should prioritize.

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.

Based on those key choices, we asked the public and riders about their values, such as:

- Would you walk farther to wait less?
- Should we run more buses where we have the most bus riders?
- Should we remove buses on the least popular routes to increase service on the most crowded routes?

Responses to these questions are described on the next page (and Appendix A), and they have guided the direction of the concepts phase of the project. Future phases of the project will include more engagement with the public, stakeholders, and decision-makers to get direction on how we ought to design the network to meet the goals and priorities of the community.

The Better Bus Project will seek public and stakeholder input on key choices and trade-offs to guide the development of the new Miami-Dade bus network.



Figure 1: This Concepts Report is part of Phase 2 of the Better Bus Project

What are the big questions?

Transit planning is not just a technical process. Transit plans reflect values. Difficult choices need to be made in the course of a transit plan, and we need guidance from the community about what values should guide those choices. The table to the right shows the four big questions at the center of this phase of the Better Bus Project.

Goals of Transit

Transit can serve many different goals. But different people and communities value these goals differently. And it's not usually possible to serve all of them well all the time.

Possible goals for transit include:

- **Economic:** transit can give businesses access to more workers, and give workers access to more jobs. Transit can also help attract industries, new residents, or tourists.
- **Environmental:** increased transit use can reduce air pollution and greenhouse gas emissions. Transit can also support more compact development and conserve land.
- **Social:** transit can help meet the needs of people who are in various situations of disadvantage, providing lifeline access to services and jobs.
- **Health:** transit can be a tool to support physical activity by walking. This is partly because most riders walk to their bus stop, but also because transit riders tend to walk more in between their transit trips.
- **Personal Liberty:** By providing people the ability to reach more places than they otherwise would, a transit system can be a tool for personal liberty, empowering people to make choices and fulfill their individual goals.

Some of these purposes are served only when transit has high ridership. The environmental benefits of transit only arise from many people riding the bus rather than driving, taking a taxi, or otherwise getting a ride in a private vehicle. And subsidy per rider is lower when ridership is maximized. We call these **ridership goals**.

Other goals are served by the fact that transit is available in a given area. A bus stop in a neighborhood gives residents insurance against isolation, even if the service is infrequent, not very useful, and few people ride it each day. Or that same service helps fulfill political equality; the desire to provide some service to all political wards within a city or town. We call these **coverage goals**.

The Big Questions	The issues	Possible solutions	Downsides	The questions	How this report addresses the questions	For more info, see pages
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?	This report studies ways we could change the network, but the existing system is always an option.	5, 6, 12
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)?	This report presents two concepts, one focused on ridership goals, the other on coverage goals.	4–6, 8, 40
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?	Both concepts illustrate the benefits of redesigning the City of Miami trolleys (and to a lesser degree the Miami Beach trolleys) so that they and County buses work together.	6–8, 38
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?	Both concepts show the benefits of 1,000 foot stop spacing.	6, 12, 39

If both concepts show the same answer to a question, doesn't that mean you've already decided? No, it means that these are separate questions from Question 2, which is what the two concepts illustrate. On other questions, you can compare both concepts to the existing system to see the range of possibilities and their impacts.

Ridership and Coverage Goals are in Conflict

Ridership and coverage goals conflict. **Within a fixed budget, if a transit agency wants to do more of one, it must do less of the other.**

Consider the fictional city in Figure 2. The little dots indicate dwellings, commercial buildings and other land uses. The lines indicate roads. As in many neighborhoods, most activity is concentrated around a few roads.

A transit agency pursuing only ridership would run all its service on the main streets, since many people are nearby, and buses can run direct routes. A high ridership network allocates frequent service to areas with favorable urban development patterns, forming a connected network. This would result in a network like the one at bottom-left.

If the transit agency were pursuing only coverage, it would spread out so that every street had some service, as in the network at bottom-right. All routes would then be infrequent, even on the main roads.

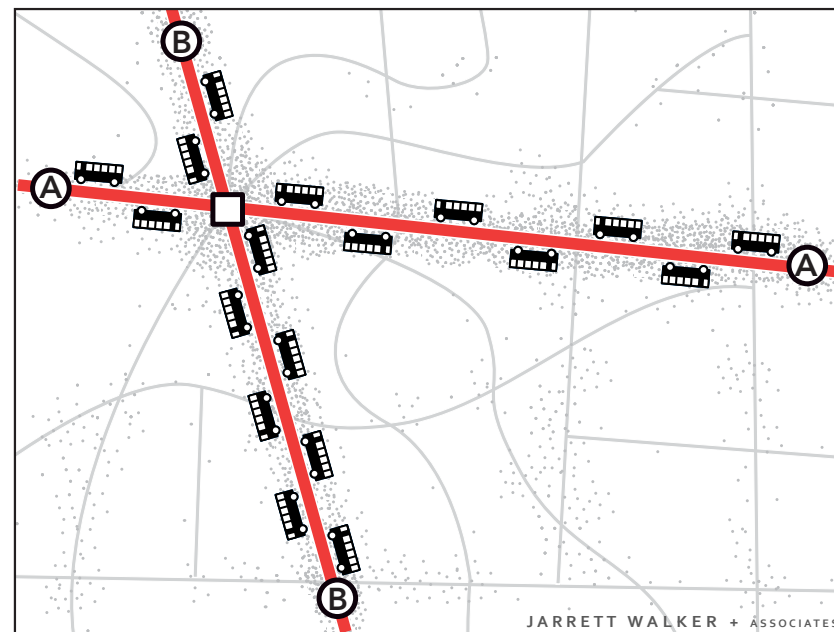
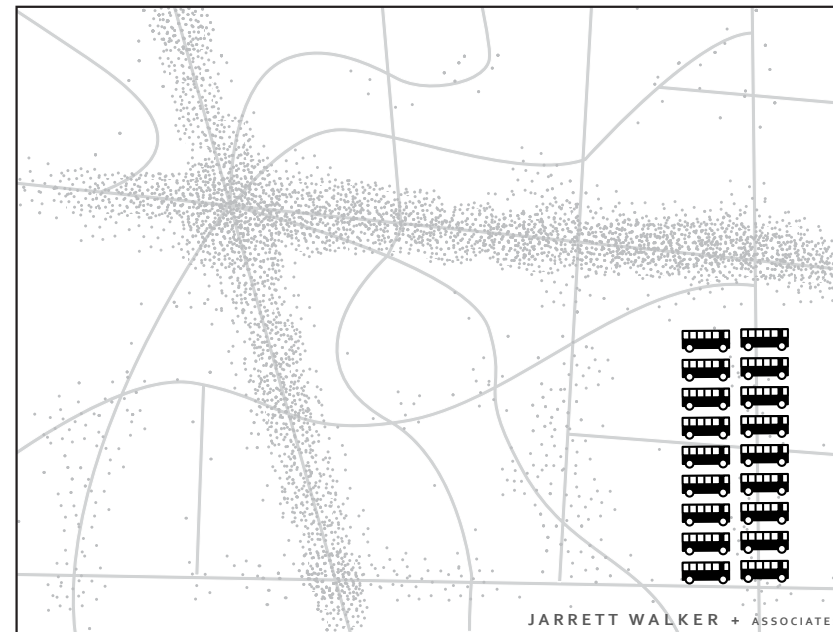
These two scenarios require the same number of buses and cost the same amount to operate, but deliver very different outcomes. To run buses at higher frequency on the main roads, neighborhood streets will receive less coverage, and vice versa.

The choice between maximizing ridership and maximizing coverage is not binary. All transit agencies spend some portion of their budget pursuing each type of goal. Transit agencies are often accused of failing to maximize ridership, as if that were their only goal. In fact, agencies are often intentionally operating “coverage services” that are not expected to generate high ridership. Agencies must balance the competing goals of high ridership and coverage. The balance they choose depends on the values of the agency and the region.

A particularly clear way for regions and transit agencies to set a policy balancing ridership and coverage goals is to **decide what percentage of their service budget should be spent in pursuit of each.**

The concepts in this report help to highlight the difference in a more coverage-oriented network for Miami-Dade and more ridership-oriented network. Public, stakeholder, and decision-makers will have a chance to respond to these concepts. And the answers they provide will guide the project team in developing the final plan around the desired balance between these opposing goals.

Figure 2: The Ridership / Coverage Trade-off



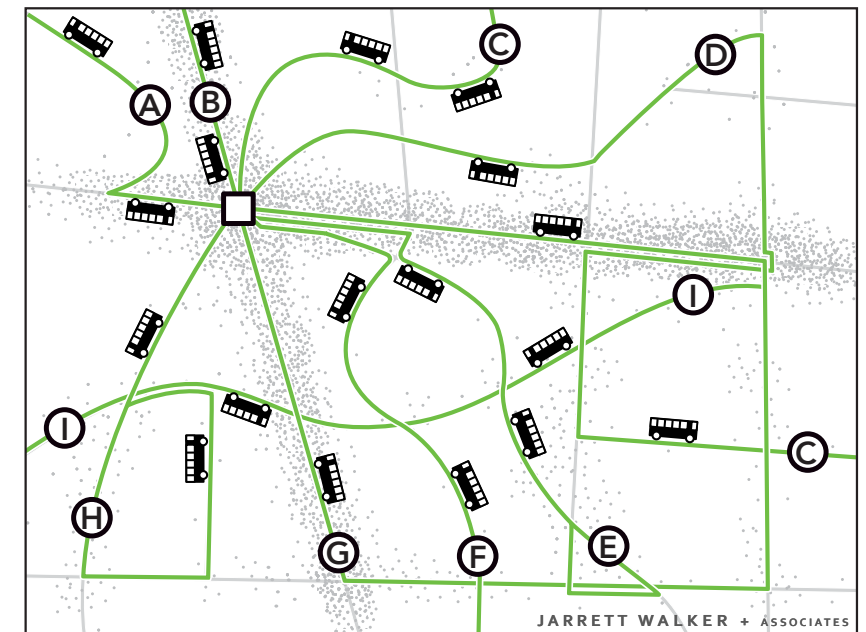
All 18 buses are focused on the busiest area. Waits for service are short but walks to service are longer for people in less populated areas. Frequency and ridership are high, but some places have no service.

Imagine you are the transit planner for this fictional town.

The dots scattered around the map are people and jobs.

The 18 buses are the resources the town has to run transit.

Before you can plan transit routes, you must first decide: What is the purpose of your transit system?



The 18 buses are spread around so that there is a route on every street. Everyone lives near a stop, but every route is infrequent, so waits for service are long. Only a few people can bear to wait so long, so ridership is low.

Public Input in Phase 1

Public Engagement

In the first round of engagement for the Better Bus Project, the Evaluation Phase, we asked the public and community stakeholders about their values and priorities for transit, and how they might balance certain trade-offs in Miami-Dade. These trade-offs are consistent with the findings presented in the [Choices Report](#) in July 2019.

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.

Survey Responses

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 3) favored shifting service to focus transit on denser areas, which is a method to achieving Ridership goals.

Priorities Workshop

On June 26, 2019, the Better Bus Project hosted about 50 municipal representatives, business leaders, and community organization representatives to participate in a day-long Transit Priorities Workshop. Staff from Jarrett Walker + Associates facilitated the workshop to engage community leaders in a conversation around the key choices outlined in the [Choices Report](#). The workshop featured a variety of interactive exercises to help stakeholders learn and understand transit geometry and trade-offs alongside other community leaders. Stakeholders were then asked to share their views on the transit trade-offs and needs in Miami-Dade using silent polling devices.

Stakeholders were first asked whether they prefer walking or waiting, similar to the walking vs. waiting question in the public survey. Most stakeholders said they preferred a shorter wait, even if it meant a longer walk, suggesting they would prefer a high frequency network oriented toward Ridership goals.

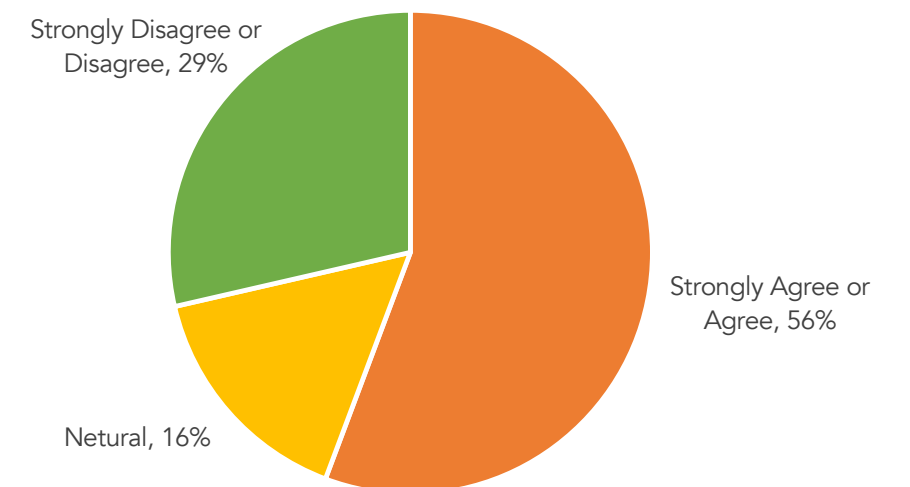
Stakeholders were then asked what Ridership vs. Coverage balance they would like to see for transit in Miami-Dade. More than 80% of stakeholders said they wanted to shift a little or a lot towards higher frequencies and higher ridership.

More details on the public survey responses and Priorities Workshop responses is available in Appendix A on page 42.

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

Figure 3: Responses to Shifting Resources to Highest Density Areas

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



What are the Concepts?

The Coverage and Ridership Concepts and the Existing Network illustrate a spectrum of possibilities for how to design the bus network in Miami-Dade. Figure 4 shows that range of possibility as a triangle, with more or less change on the vertical axis and the ridership-coverage trade-off on the horizontal axis.

Both concepts show the same contrast with the Existing Network on three key questions that represent the vertical axis of this diagram:

- **How Much Change?** Both the Coverage and Ridership Concepts would change the network significantly to increase the freedom and access people have by transit. If you don't think those changes are worth the benefits, tell us.
- **Whether and how to change trolley services?** Both the Coverage and Ridership Concepts assume that the City of Miami and Miami Beach would change their trolley network as described on the next page. If that's not possible, then the benefits shown in Chapter 3 won't be possible.
- **How far apart should bus stops be?** Both the Coverage and Ridership Concepts assume that bus stops should be about every 1,000 to 1,300 feet apart on most high ridership routes. This allows riders to get where they are going faster. If you don't think those changes are worth the benefits, tell us.

Thus both concepts show significant job access benefits, but only because they assume these three changes are possible and desirable. If you think those changes aren't worth the benefits shown in this report, then tell us.

The concepts are different from each other in how they emphasize Ridership and Coverage goals, which is represented as the horizontal axis on the triangle. **These concepts represent a spectrum of possibilities, and they are not intended to be an either/or proposition.** By showing the public, stakeholders, and decision-makers the range of possibilities, the County is asking: "Now that you see the outcomes of emphasizing on 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?"

The community's answers to these questions and the questions on page 3 will provide guidance to the study team and decision-makers to help develop the final plan with the right balance between these different goals.

Figure 4: Triangle showing range of possibilities for the Miami-Dade Bus Network.

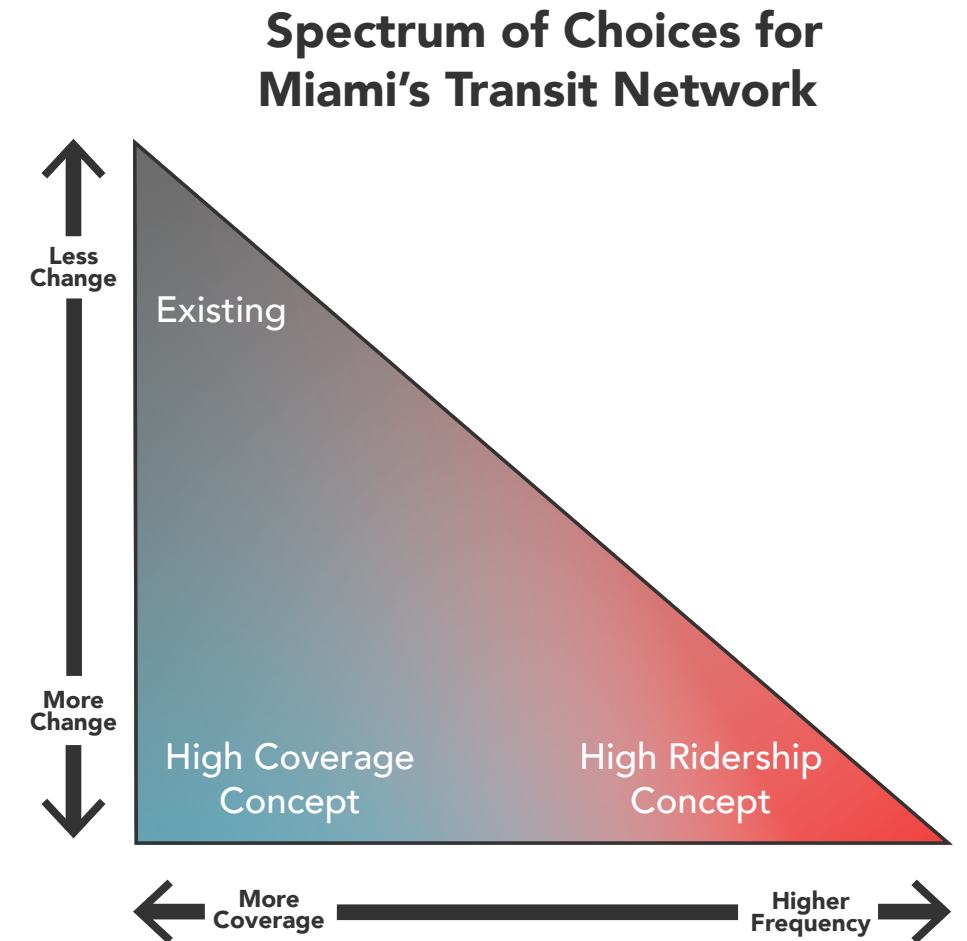
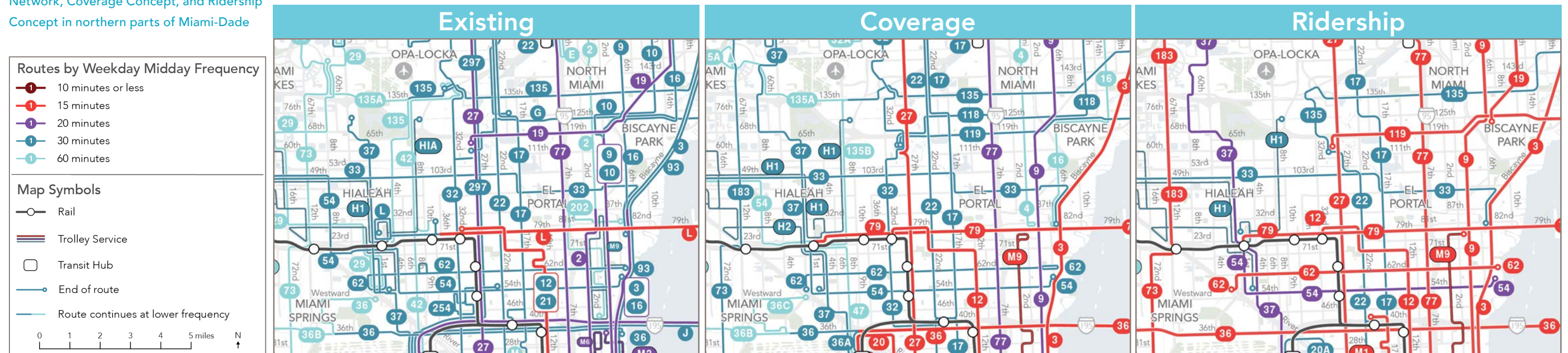


Figure 5: Comparison of the Existing Network, Coverage Concept, and Ridership Concept in northern parts of Miami-Dade



Municipal Trolleys: Redesign for More Useful Service?

One of the biggest opportunities for improved transit is to take a new approach to municipal trolley services. Historically, cities have designed trolleys around their own internal needs and community input, often without extensive collaboration with the County. As a result, there are many cases where two different bus services, one trolley and one County, run long distances down the same street.

In each of these cases, a single bus service could provide much higher frequency, reducing waiting and helping people reach more destinations sooner. To illustrate the benefits of a different approach, both concepts show possible redesigns of the trolley services together with the County services, so that they do different things instead of duplicating.

Redesigning trolley services turns out to be a no-cost way to dramatically expand where people can get to on transit.

Planning trolleys and County routes together would require new kinds of cooperation between the County and interested cities, because both would have to approve the network plan. City trolleys have arisen out of municipal consultation processes, so significant work would be needed to build community support for revising them.

Other barriers to integrating the trolleys and County services include the difference in fare—trolleys are free—and the limitations of the trolley vehicles, which are smaller and require more time to board people in wheelchairs. All these issues would need to be considered, yet the benefits are so great that we must illustrate what is possible.

The potential to unlock more access for more people across a large area is greatest in the City of Miami. Modest changes to the Miami Beach trolleys are also explored in the concepts. Both cities were represented in the staff workshop that designed the service concepts. Other major cities in the county are encouraged to think about their trolley systems in a similar way.

City of Miami Trolleys

In the City of Miami, both concepts achieve major expansions of frequency, and thus in access to opportunity. This is almost entirely the result of redesigning trolleys and County services so that they work together instead of competing with each other.

For example, Figure 6 shows the existing trolley and County buses duplicating each other along both SW 7th/8th and Coral Way east of SW 37th Avenue, but the concepts offer more frequent service on these streets, as a result of only serving Coral Way with trolleys and SW 8th Street with county buses. A similar specialization is suggested in other corridors, as shown in Chapter 2.

The poorest-performing trolleys tend to be those that go in one-way loops, because most actual travel demand is for straight lines. For example, the Flagami, Overtown, Health District, and Wynwood trolleys all get fewer than 12 boardings per service hour. These trolley routes are either very short, have large one-way loop patterns, or have indirect paths relative to a nearby County route.

The concepts would reduce most one-way loops to create straight lines that run more frequently. Some trips that can now be completed directly would require a transfer, but the transfer would be fast and the path more direct, compared to one-way loops that often carry riders far out of direction in one way or another.

The dramatic benefits of this approach are illustrated in Chapter 3. The number of jobs a Miami resident can reach in 45 minutes goes up substantially across most in the city, even in the Coverage Concept. That means residents have more choices in their lives: not just jobs, but shopping, social, and education opportunities as well. It is by expanding opportunity that transit both maximizes its ridership and maximizes its value to the city.

The City of Miami controls its trolley system, so would need to approve any changes to it. City staff were actively involved in developing these concepts, starting the conversation about how trolleys and County buses might work together.

Obviously, this approach would imply a different City of Miami policy for the trolleys. **A new policy would need to define the trolleys as the City's contribution to a single transit network designed to maximize opportunity for everyone in the city.** Such a change in policy will certainly be controversial, but as we illustrate in both concepts here, the benefits are vast.

Miami Beach and Other Trolleys

Both concepts suggest less dramatic changes to the Miami Beach trolley system, developed in close discussion with Miami Beach staff. Unlike the City of Miami ideas, the Miami Beach trolley revisions are slightly different in the two concepts.

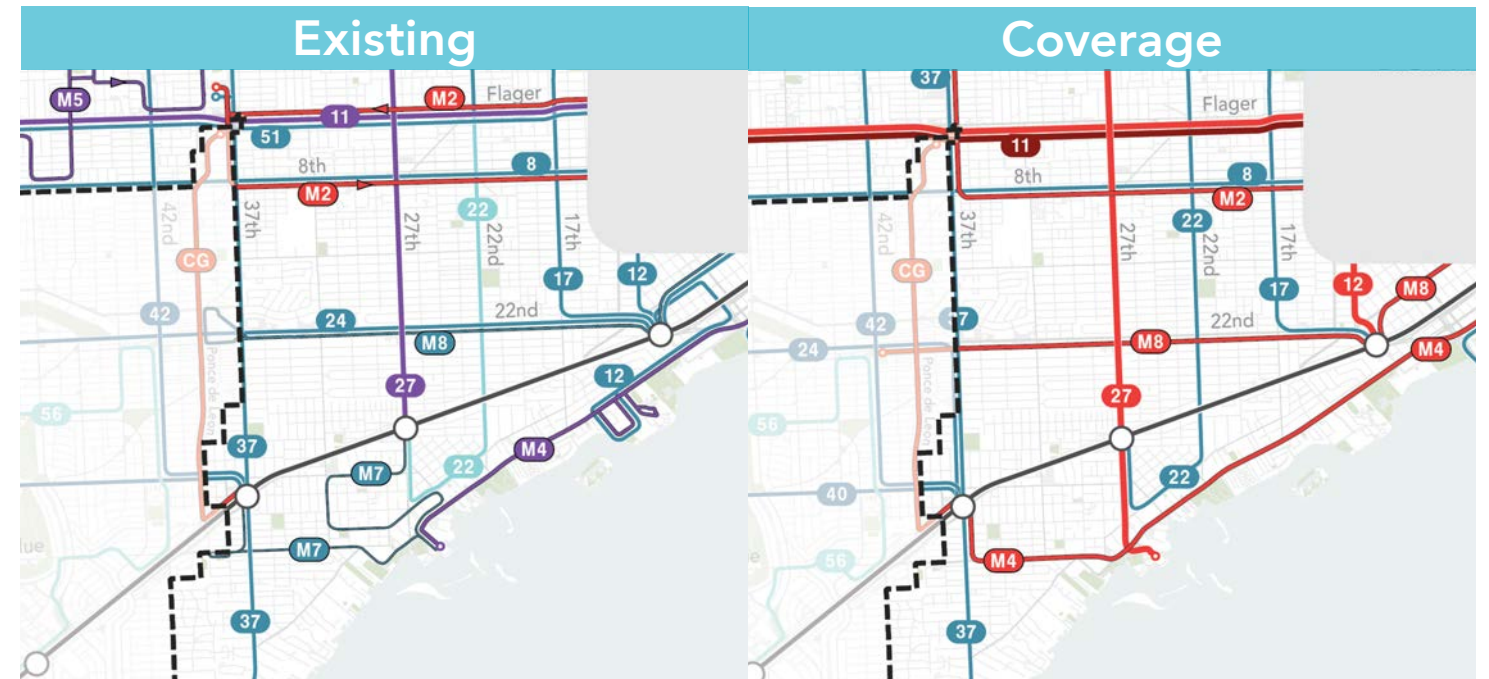


Figure 6: Comparison of the Existing Network and Coverage Concept in southern parts of the City of Miami

The project scope and timing did not allow us to work closely with every city about the relationship between trolleys and County buses during development of the concepts. So we focused on the two cities where duplication is most extensive and the opportunities for improvement are the greatest.

In the case of Hialeah and Doral, we did not consider possible revisions to the trolley networks, but we did ensure that the County services were designed to minimize duplication with them, and to provide the most effective possible connections with them. To make that clear, we have shown those two networks on our maps.

A future refinement of the plan would work closely with every city that runs extensive trolleys, finding ways that the trolleys and County buses can complement each other to help everyone get where they're going. Obviously, cities remain sovereign over their trolley networks, so any resulting plans with recommendations for changes to city trolley networks would need to be approved by the relevant city government.

What are the outcomes of each concept?

The major outcomes of each concept are described in Chapters 2 and 3, but in general the concepts change proximity to service and the access provided by transit in the following ways:

Compared to the Existing Network, the Coverage Concept

- Increases by 26% the number of jobs the average resident can reach by transit in 60 minutes. That means the average resident can reach 25,000 more jobs in an hour.
- Increases the percent of people near frequent transit service from 10% to 20%, and increases the percent of jobs near frequent transit service from 23% to 32%.
- Keeps the number of people and jobs near any transit service about the same.

Compared to the Existing Network, the Ridership Concept

- Increases by 43% the number of jobs the average resident can reach by transit in 60 minutes. That means the average resident can reach 40,000 more jobs in an hour.
- Increases the percent of people near frequent transit service from 10% to 28%, and increases the percent of jobs near frequent transit service from 23% to 43%.
- Reduces the percent of people who are within a 1/4 mile of transit, from 61% to 48%. Reduces the percent of jobs that are within a 1/4 mile of transit from 68% to 58%.

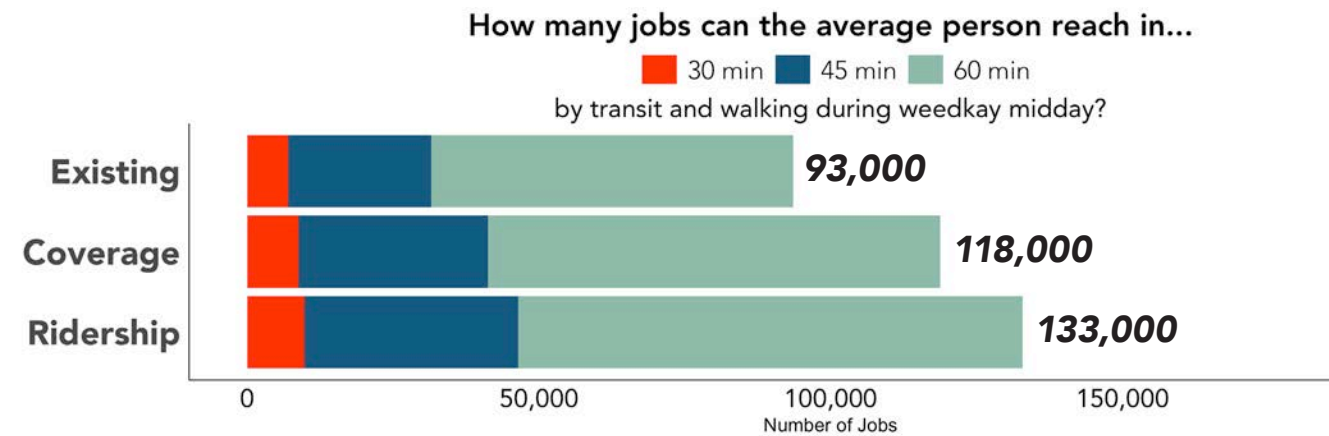


Figure 7: Jobs accessible in 30, 45 and 60 minutes by walking and transit for the average resident in Miami-Dade

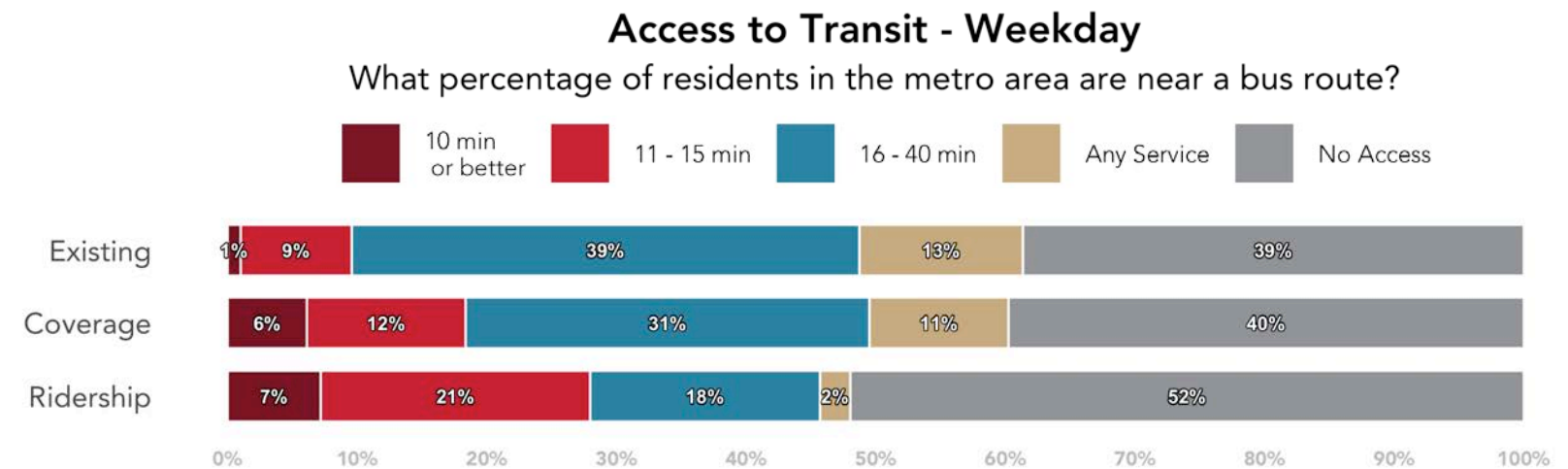


Figure 8: The total number of people or jobs near any service is higher in the Coverage Concept, but the number of people and jobs near frequent service is much higher in the Ridership Concept.

Both the Coverage and Ridership Concepts dramatically increase access to jobs by transit—due in large part to redesign of trolley networks.

The Coverage Concept puts frequent service near 18% of residents. The Ridership Concept puts frequent service near 28% of residents.

What can you do?

How to use this report?

This Concepts Report shows two different ways that transit could be designed for Miami-Dade in the future. To assess these concepts and how they fit your goals for transit, we suggest you:

- Consider the Ridership-Coverage trade-off described on page 4 and consider the other trade-offs described in the Choices Report.
- When looking at the concept maps starting on page 13, find the places you care about and note the nearby routes and their frequencies (as indicated by the color). Route numbers in the concept 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 concepts can be found in the tables starting on page 16. 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 28, which show how many people and jobs are near any transit service and near frequent service.
- For travel times in each concept, look at the maps of travel time change starting on page 30.
- For more information about how the two concepts would affect access to jobs, look at the job access maps starting on page 34.

What is in the rest of this report?

In Chapter 2, we describe the two concepts compared to the Existing Network.

In Chapter 3, we review the outcomes of the two concepts, 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 next steps and engagement opportunities.

Appendix A provides more detail on input from the public and stakeholders. Appendix B provides more detailed maps of the concepts. Appendix C provides additional maps that show travel time change for multiple locations around the county.

What's next?

This Concepts Report is meant to help you, the general public, existing transit riders, stakeholder, and elected officials understand the important questions for Miami-Dade as part of the Better Bus Project. Transit Alliance will be conducting surveys and other outreach efforts during the Fall of 2019. That outreach process will ask you how you would answer the key questions on page 3 and where, along the spectrum of Ridership-Coverage, Miami-Dade should design its bus network.

Responses from the public and stakeholders will guide elected officials, particularly the Miami-Dade Board of Commissioners and municipal commissioners, in determining the goals of the final network.

With direction from the elected officials, the study team will design a recommended network in late 2019. The recommended network, maps, and outcome measures will be summarized in a report for public and stakeholder review in early 2020. The draft recommended network will then be the center of another public conversation to finalize the details.

The outreach process around these concepts will run from September through early November, and a survey will be available for public input.

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

- take the Phase 2 Concepts survey;
- sign up for the project newsletter;
- watch videos that summarize key choices and the redesign process;
- request a community presentation, or communicate with the project team;
- sign up to volunteer or work with Transit Alliance to spread the word and support outreach efforts for the Better Bus Project; and
- generally stay up-to-date on the latest happenings with the network redesign process!



Better Bus Project

Your voice matters! Contact the project team and take the Better Bus Project Concepts Survey at www.betterbus.miami

2 Network Concepts

A Range of Possibility

Introduction to the Network Concepts

This chapter presents two network design concepts for Miami-Dade County and compares them to the existing network. Both concepts have the same amount of service, but they show different ways to allocate these same resources.

The two concepts include some similar features, such as how they redesign the trolley networks in Miami and Miami Beach. In this way, both concepts show the answer to the first key policy question: “What happens if you accept a lot of change, and redesign the entire network, including major trolley systems, to maximize access?”

The concepts differ in the degree to which they emphasize Ridership and Coverage goals, described on page 4. As discussed in the Choices Report, the existing system devotes about 70% of its resources toward Ridership goals and about 30% to Coverage goals and duplication. The Coverage Concept in this report puts 80% of its resources toward Ridership goals and 20% toward Coverage goals. The Ridership Concept puts about 90% of its resources toward Ridership goals and 10% toward Coverage goals.

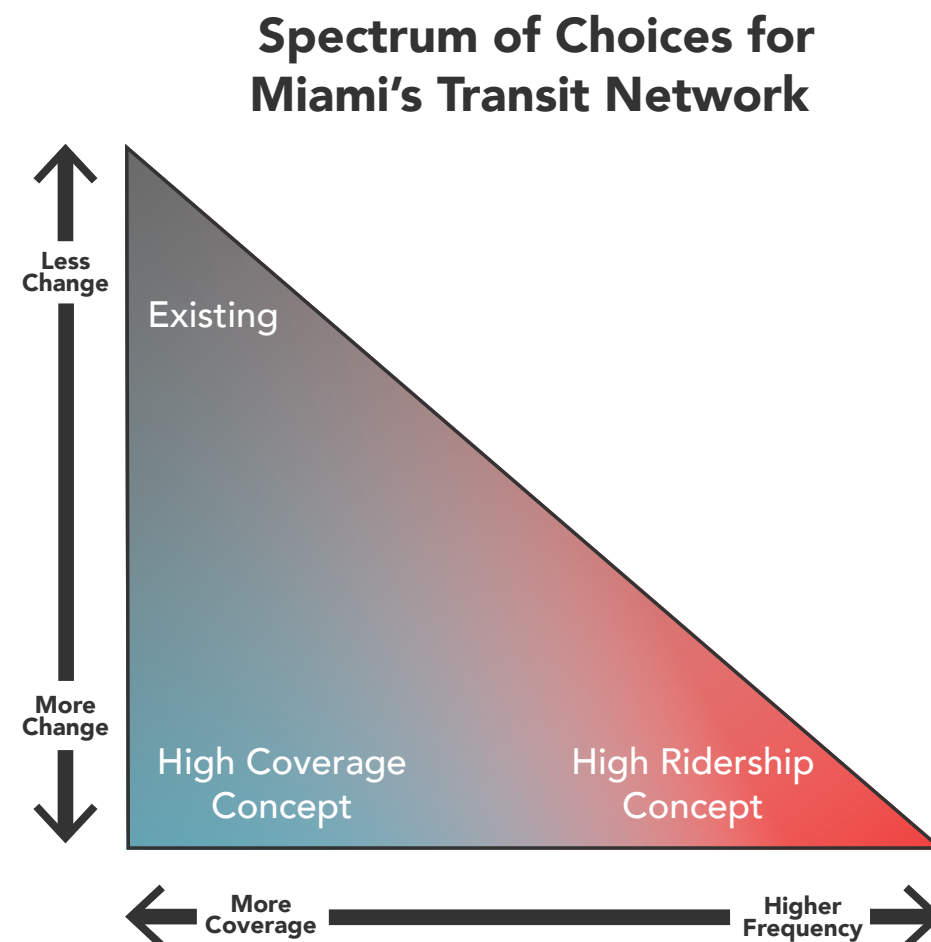
The concepts shown in this chapter represent a spectrum of possibilities, and they are not intended to be an either/or proposition. By showing the public, stakeholders, and decision-makers the range of possibilities, the County is asking: “Now that you see the outcomes of emphasizing one goal over another, how do you balance the Ridership and Coverage goals? In other words, if you want better service, what is your definition of better?” When comparing these concepts and their outcomes, the choice is not “Pick one of these three”; rather, it is “Where in the spectrum of possibilities (illustrated in Figure 9) should the Miami-Dade network be?”

Concepts Not Proposals

At this stage, the study team is not proposing anything. The public conversation about the concepts will help guide the development of an actual network proposal.

Some features are common to all conceptual networks, as outlined under the Key Assumptions section, but even these are not proposals yet. In designing the Concepts, we are highlighting the Ridership-Coverage trade-off, and to do this, we made a single choice about matters that were unrelated to that trade-off, and kept that choice constant across both concepts. Different choices could have been made, and we welcome public comment about these features of the plan.

Figure 9: Triangle showing range of possibilities for the Miami-Dade Bus Network.



No Preferred Concept

None of the staff from Transit Alliance, Miami-Dade Transit, the municipalities involved, nor the consultant staff have a preference among the concepts shown in this report.

The most important word in this report is “if”. The Coverage Concept shows what might happen **if** Miami-Dade dramatically redesigned trolley services and county services to be complementary and chose to maintain the same level of overall network coverage, but with consistent service design guidelines. The Ridership Concept shows what might happen **if** Miami-Dade dramatically redesigned trolley services and county service and also chose to shift toward Ridership goals as the primary goal. No decision has been made yet.

Because the Ridership Concept differs the most from the existing system, this report devotes more space to explaining it. This may create the illusion that we are promoting this concept, but that is not the intent.

The Big Picture Matters More than Details

These concepts have not been refined to the point that they would be ready to implement, because their purpose is to illustrate choices at a high altitude. Based on public feedback to the concepts, a final plan will be developed, and details will be filled in.

In general, these concepts are intended to be complete descriptions of the regularly recurring midday pattern of services, seven days a week. The concepts also show frequencies changing throughout the day and week, but this is not meant to detail:

- Morning and evening peak services
- School peak services
- Specialized commute services consisting of only a few trips
- Local routing details such as turnarounds
- Scheduling—the concepts identify frequencies for each period of the day, but an actual schedule will include a transition from one frequency to another.
- Minor deviations affecting small numbers of trips

These details will be added later in a final plan, but doing so now, at this conceptual stage, would be premature.

Assumptions and Choices

Concept Assumptions

The Existing Network devotes about 70% of resources to Ridership goals and about 30% of resources to Coverage goals and duplicative service. The Coverage Concept shifts the balance to 80% Ridership and 20% Coverage goals, mostly through a reduction in duplicative service. The Ridership Concept puts 90% of resources toward Ridership goals and 10% of resources toward Coverage goals.

In designing these concepts, a few key assumptions have been made regarding the future of transit in Miami-Dade. First, these concepts assume that Metrorail and Metromover continue to run as they do today, with their current frequency and hours of operation. Both of these services are critical parts of the transit network, particularly Metrorail, which provides a fast and frequent service from north to south across a large part of the county.

No Additional Budget

This is a budget-neutral bus network redesign, meaning that both concepts assume the same amount of bus service as today. Specifically, this is quantified in the total service hours. Today, Miami-Dade Transit operates about 2.1 million service hours annually, with about 1.95 million operated directly by the County, and about 95,000 operated by contractors. In both concepts, 2% of the budget is reserved as contingency, such as for minor deviations, extra layover needs, or other unexpected costs in the revised route designs.

County-operated service and contractor service are tracked separately in the concepts because contracted operations cost the county about 50% less. Thus, cost adjustments are made for contracted service.

Concept Design Choices

Directness

Routes in each concept are designed to be as direct as possible. This avoids deviations that delay passengers on board, improves legibility, and creates a clearer grid network that enables transfers so as to provide greater access.

Consistent Frequencies

To make the system easier for users to understand and remember, routes are assigned consistent frequencies throughout the system. Routes have “clockface” frequencies that divide evenly into an hour: every 7.5, 10, 12, 15, 20, 30, or 60 minutes. A bus that comes every half hour will arrive predictably, at 7:02 am, 7:32 am, 8:02 am, 8:32 am, and so on. In

the Existing Network, there are many routes with frequencies that are difficult to remember. For example, in the midday, Route 56 arrives every 42 minutes, and Route 71 arrives every 65 minutes.

Concept Policy Questions

As introduced on page 3, there are key policy questions where the concepts show the same answer. This does NOT mean that these questions are settled. The Existing Network is a contrast that shows outcomes if the answer to these questions is “No”. The Coverage and Ridership Concept both assume the following:

- Miami-Dade is willing to accept significant changes in the transit network to achieve increases in job access.
- The Cities of Miami and Miami Beach can be redesigned to be complementary to a county-wide network, which unlocks substantial resources for improving job access for large parts of the county.
- Stop spacing for all routes is assumed to be 1/4 mile instead of the current average of 1/8 mile. Thus, with wider stop spacing, buses can travel about 10% faster. This gets riders where they are going faster. For more details on stop spacing, see page 49 of the [Choices Report](#).

Other Trolley Services

All other municipal trolley networks are assumed to remain the same as today. Hialeah and Doral networks are shown on the concept maps as they exist today because they are large enough and frequent enough to substantially impact access across large parts of the county. Other municipal trolley networks may be redesigned if the municipal operator wishes to change in response to the Better Bus Project redesign choices. Of note, the City of Doral is currently studying a redesign of their trolley system and will soon have draft recommendations.

MAX Routes

As described on page 48 of the [Choices Report](#), a MAX bus is rarely worth waiting for because the frequency of service is too low and the bus is not much faster than a local route.

For example, both Route 3 (Biscayne Local) and Route 93 (Biscayne MAX) start at Government Center and end at Aventura Mall in North Dade. Route 3 stops about twice as often as route 93, and therefore is slower. For a relatively long trip from NE 123rd Street to Government Center, Route 93 will get there about 8-9 minutes faster.

However, both routes run every 30 minutes at midday, so a rider waiting at a shared stop will probably take a Route 3 bus if it arrives first. The wait for the next Route 93 bus will likely outweigh the time saved by Route 93’s faster speed.

This pattern holds true for most MAX routes in the Existing Network. Thus, in designing the concepts, we have consolidated most local and MAX routes into higher frequency local services.

A few corridors benefit from service with wider stop spacing for longer distance travel; we have called such service Rapids. In both concepts, there is an all-day Rapid 11R that operates on Flagler. Other Rapids operate at peak times only.

Peak Routes

In the Existing Network, nearly 5% of service hours are devoted to peak-only routes. As described in the [Choices Report](#), many of these peak-only routes have low productivity and high deadhead costs and are serving more Coverage goals than Ridership goals. Thus, the Ridership Concept removes some peak-only routes with low productivity and reduces the number of trips on others. Details on peak-only services can be found in the Frequency and Span Charts starting on page 16.

Existing Network

To help the reader compare the Existing Network, the Coverage Concept, and the Ridership Concept, maps of each are shown on the following pages. A map of the Existing Network is shown in Figure 10.

In each network map, routes are color-coded by midday frequency (9am to 3pm on weekdays). The choice of noon (midday), rather than morning or evening rush hour, is intentional. While travel often peaks at rush hour, many people need to travel at midday. Retail and restaurant industries change shifts throughout the day, particularly in midday and later evening. Office workers may need to travel for meetings or personal appointments. College students often attend midday classes. Parents may need to pick up a sick kid from school. The maps only show what service is like at midday, but during morning and evening rush hours, frequency increases on some routes additional routes appear, notable express routes to park-and-ride lots. The frequency charts show this, starting on page 16.

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.

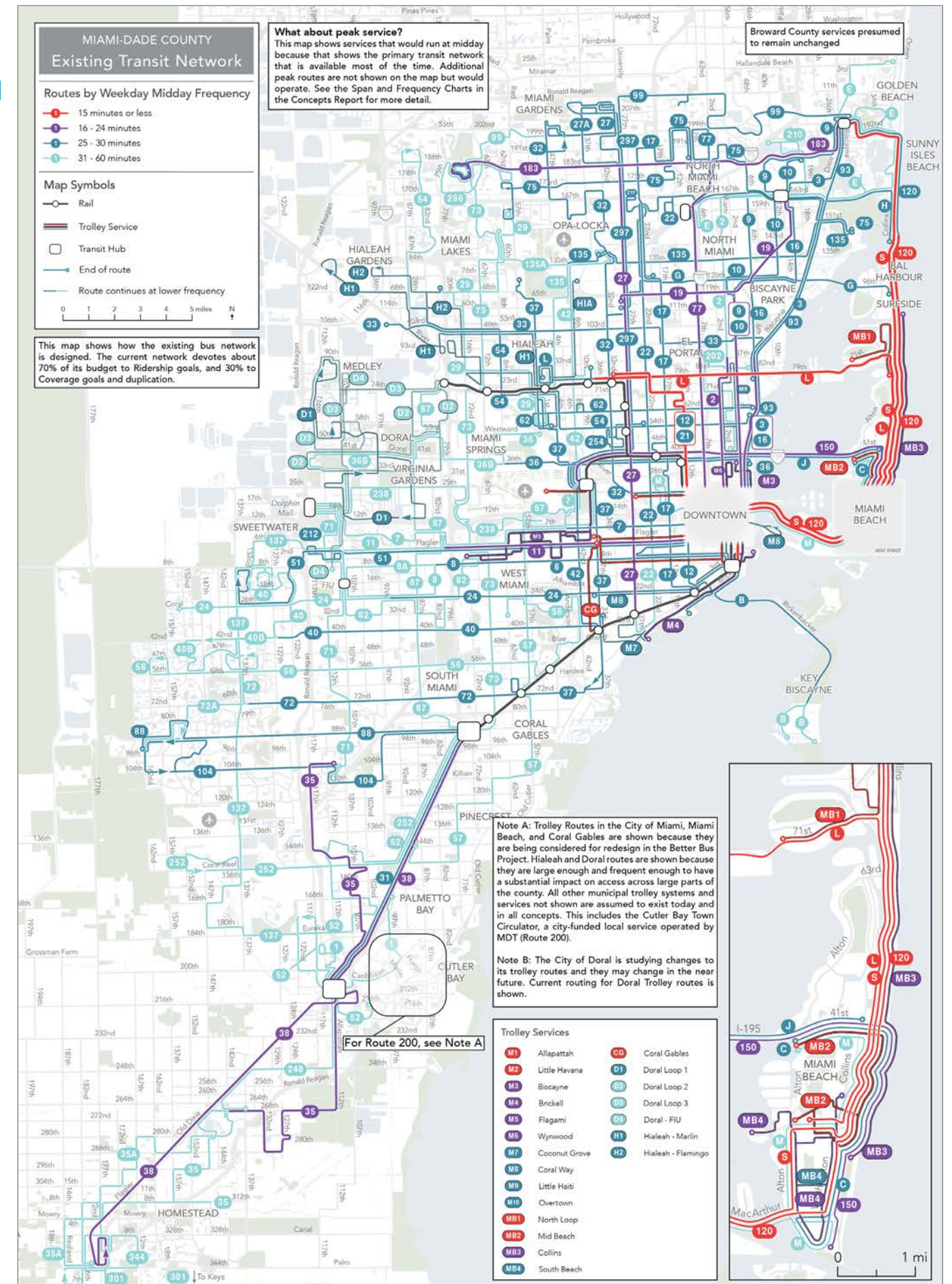
Metrorail lines and stations are shown in black. The Metrorail Green and Orange lines operate every 15 minutes at midday, and where they overlap, their combined frequency is every 7.5 minutes. The Metromover is shown on the Downtown maps (next page for the Existing Network). All Metrorail and Metromover services are expected to operate at their current frequencies and times.

Municipality-operated trolley routes are shown as lines and labels with a dark outline.

The existing network is unusual in the near total lack of frequent service, outside of the beaches and downtown Miami. There are only a few high frequency bus routes during midday, mostly serving Miami and Miami Beach. Only five Miami-Dade routes or corridors are frequent (15-minutes or better) at midday, and only five trolley routes are frequent at midday. This means that waiting times are long and transfers are difficult, limiting where people can get to in the time they have available.

Figure 10: Existing Transit Network in Miami-Dade

The existing network is unusual in the near total lack of frequent service, outside of the beaches and downtown Miami.



The Coverage Concept

In the Coverage Concept, most areas served today are still served, so the service is spread thinly. The concept is designed to provide similar overall coverage to the Existing Network—stops showing consistent ridership today continue to have transit service within 1/4 mile—but the service is more efficient because it reduces duplication amongst county routes and between county routes and trolleys. Routes are spaced consistently along section line roads to minimize duplication of service.

The Coverage Concept has a far larger network of frequent, all-day bus routes. Main corridors, like 12th and 27th Avenues, would have high frequency service (15 minutes or better). Some important corridors, like Flagler, have even higher frequency (10 minutes or better), shown as dark red lines on the map. To provide higher frequency on so many corridors, the concept consolidates duplicative service and reduces frequency on corridors with low ridership.

The map to the right is meant to provide a high-level view of frequent and infrequent service available across the county and overall design of the network, rather than minor routing details.

To explore this network and its relevance to your life, you can:

1. Find a place you care about on the map using the labeled streets.
2. Note which routes are nearby, by number and by color.
3. Look at the legend to learn the weekday frequencies of these routes.
4. See where else the routes go. They may go farther than your routes do today.

Other information about this concept that you may want to review:

- The table on page 22 shows each route's frequencies, how they change throughout the day, during what hours each route operates, and whether a route runs on the weekend.
- The charts on page 28 show the number of residents and jobs served by frequent service and by any service in this concept.
- Maps illustrating how people's travel time would change from various locations around the county compared to the Existing Network, starting on page 30.

In the Coverage Concept, places with a route today would still have a route in the future.

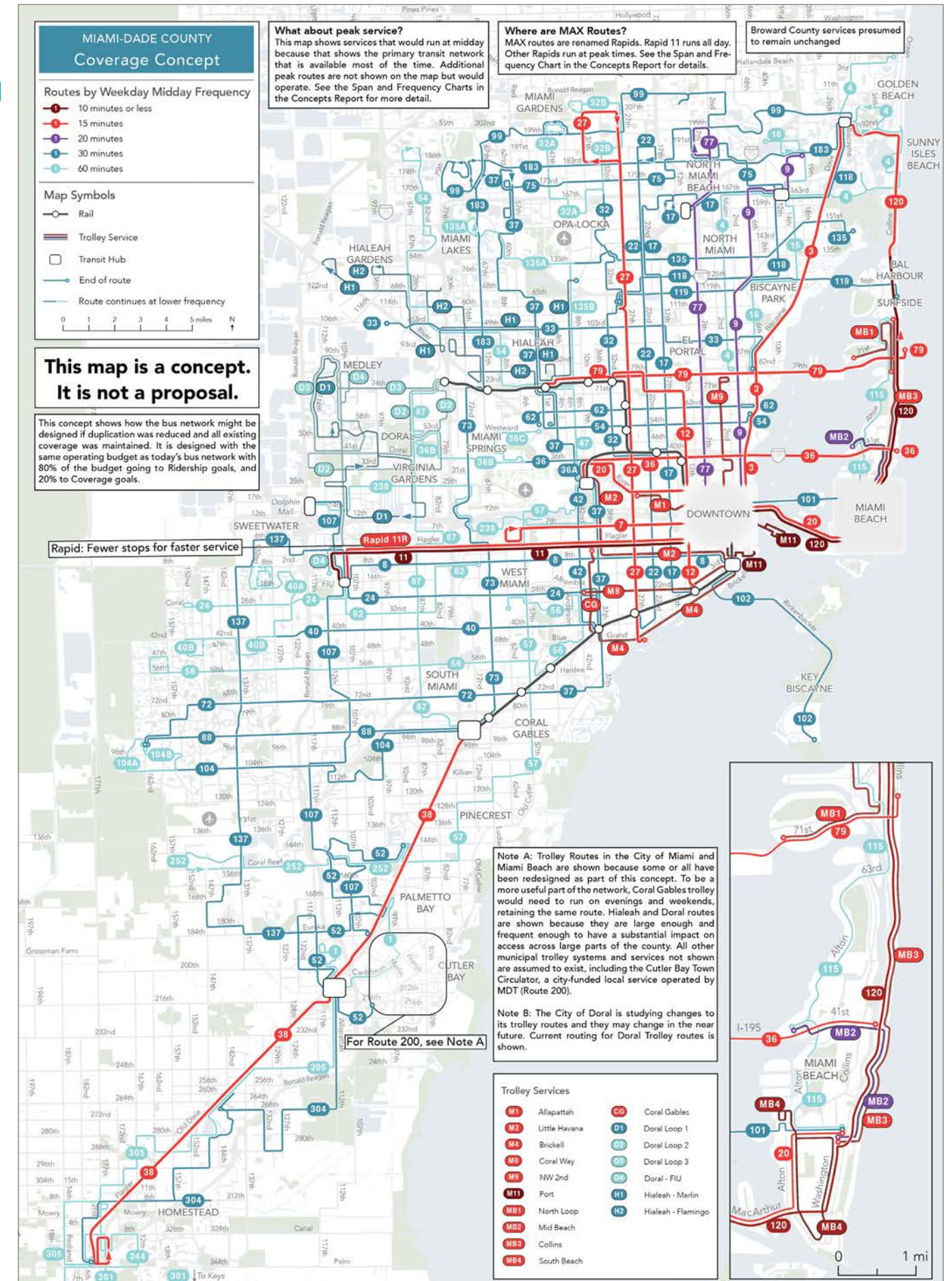


Figure 11: Coverage Concept Network in Miami-Dade

The Ridership Concept

The ridership concept concentrates better service where there are more people, jobs and opportunities. This dramatically increases how many useful destinations an average resident can reach in a given amount of time, which is the key to increasing ridership.

Concentrating service into fewer, but higher frequency, routes means some lower-demand areas are now a longer walk to transit service, or even too far to walk at all, in this concept.

Most of the network is designed as a high frequency grid that allows for easy transfers between lines, where the street grid and geography allow such a design. Wherever two red lines cross on this map, an easy transfer is possible. In the Ridership Concept, the frequent network is much larger, and extends much farther in this concept. In the northern parts of Miami-Dade, Routes 9, 77, 62, 119, and 183 are now frequent, making connections between places like North Miami and Surfside much faster. In the southern part of the county, Routes 73, 88, and 107 are more frequent, meaning connections between places like Horizons West in Kendall Lakes and Miami-Dade College Florida International University are faster.

The map to the right is not meant to be specific about the details. Instead, it is meant to provide a high level view of the overall network within the county. The goal is to help the reader see the overall picture of frequent and infrequent service available across the county and the overall design of the network.

The project team is certain that, were this concept to be implemented, it would get higher ridership than the Coverage Concept. Why are we so certain? Repeated, wide-scale research has shown that higher frequencies and longer spans of service are correlated with major increases in ridership. In other words, people choose transit if it is workable given their destination and their time constraints, so making more destinations accessible within less time for a large number of people is a straightforward way to attract more riders.

Other information about this concept that you may want to review:

- The table on page 22 shows each route's frequencies, how they change throughout the day, during what hours each route operates, and whether a route runs on the weekend.
- The charts on page 28 show the number of residents and jobs served by frequent service and by any service in this concept.
- Maps illustrating people's travel times from various locations compared to the Existing Network, starting on page 30, .

In the Ridership Concept, there are fewer but more frequent routes and a bus is more likely to be coming when someone needs it.

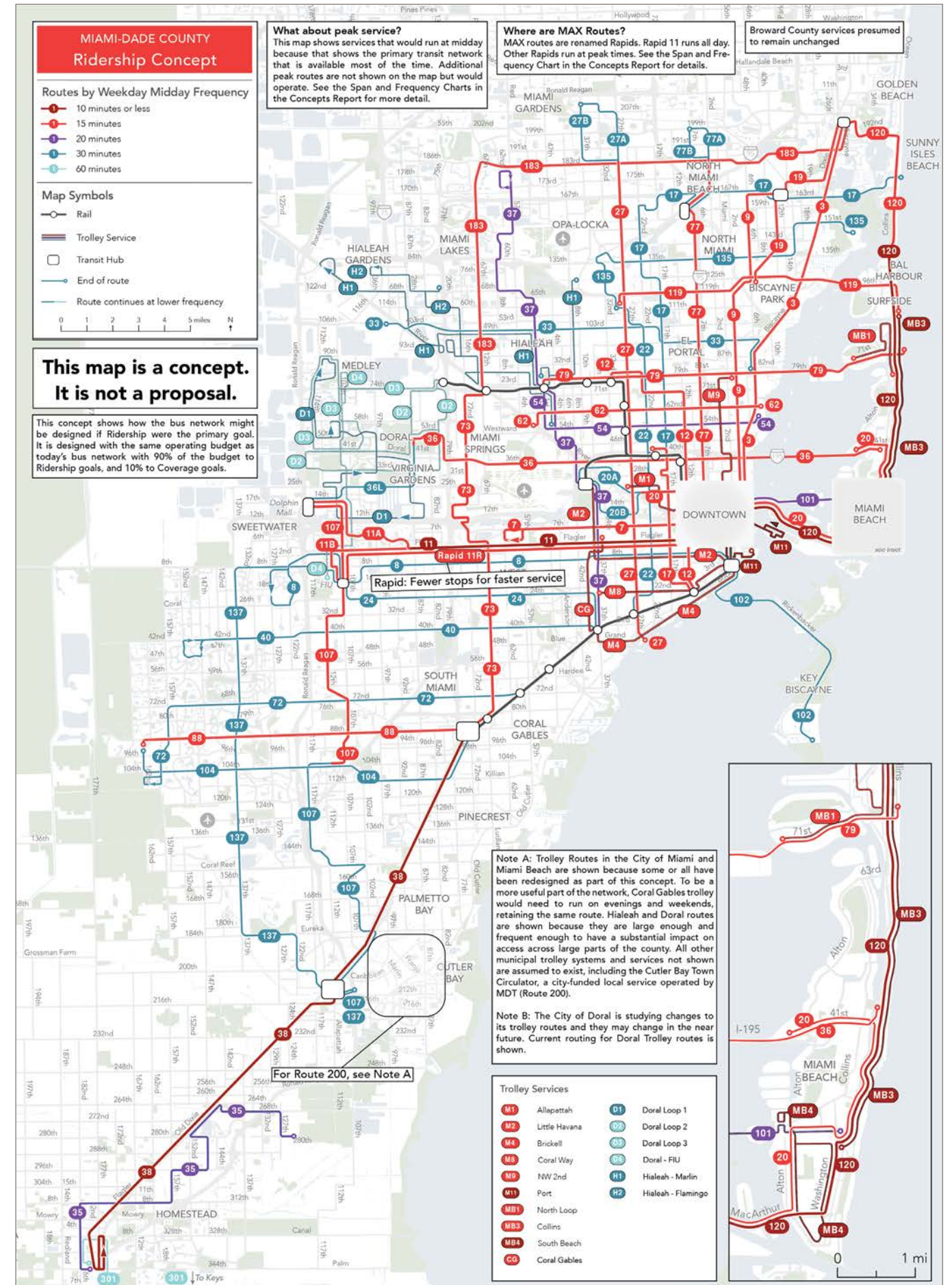
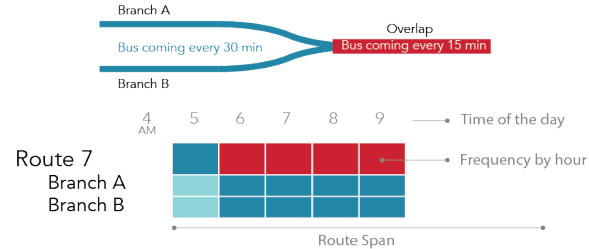


Figure 12: Ridership Concept Network in Miami-Dade

Existing Network Spans of Service

Figure 13 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 or 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 13: Existing Network. Frequency and Span of Routes with 20 Minute or Better Frequency at Midday

Existing Network Spans of Service

Figure 14 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.

Many existing routes have much lower frequency in the evening or weekends, or disappear entirely. Evening and weekend service is crucial to many potential transit riders, like hotel and restaurant workers.

Existing Network Route Frequencies and Spans

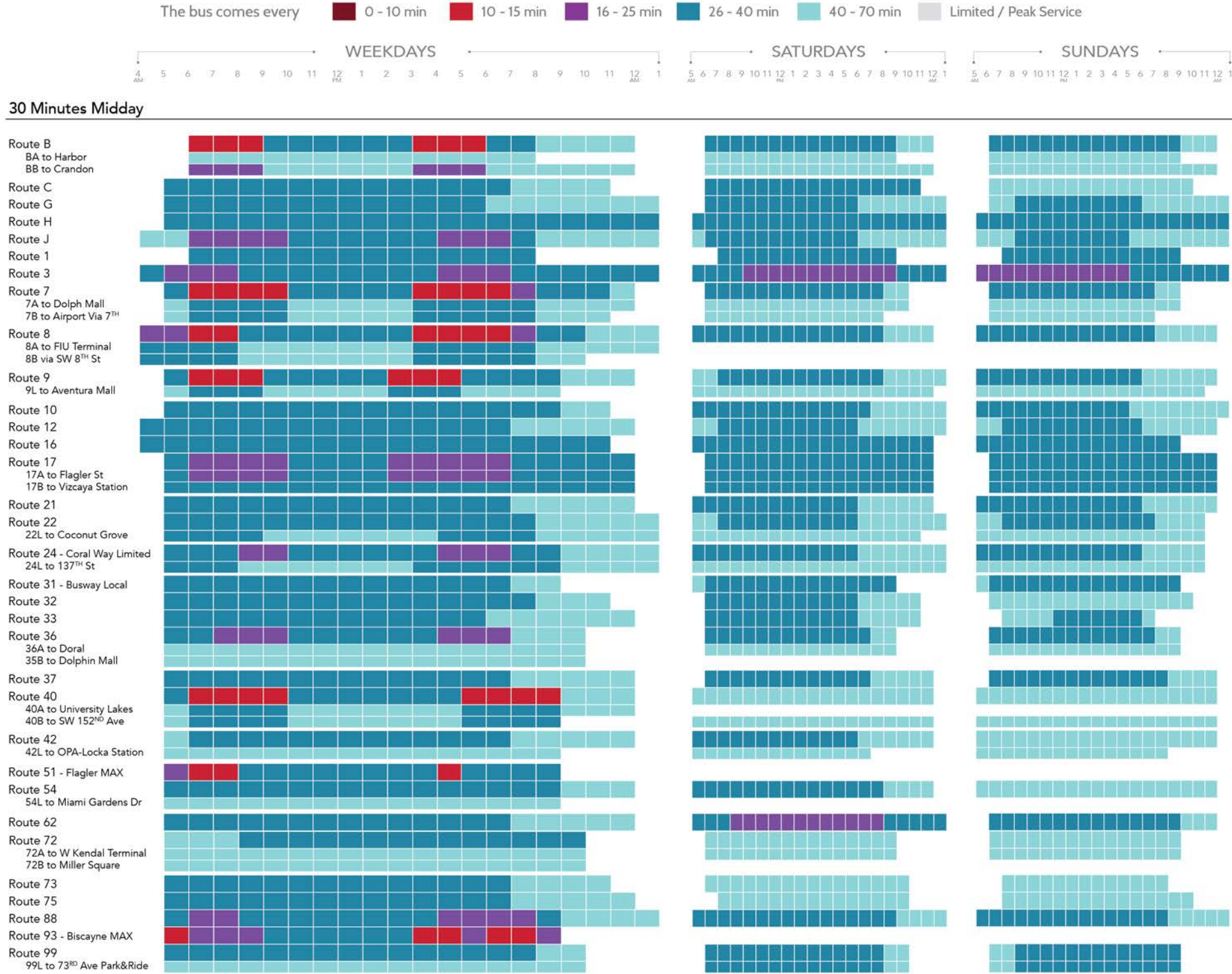


Figure 14: Existing Network. Frequency and Span of Routes with 30 Minute at Midday

Existing Network Spans of Service

Figure 15 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.

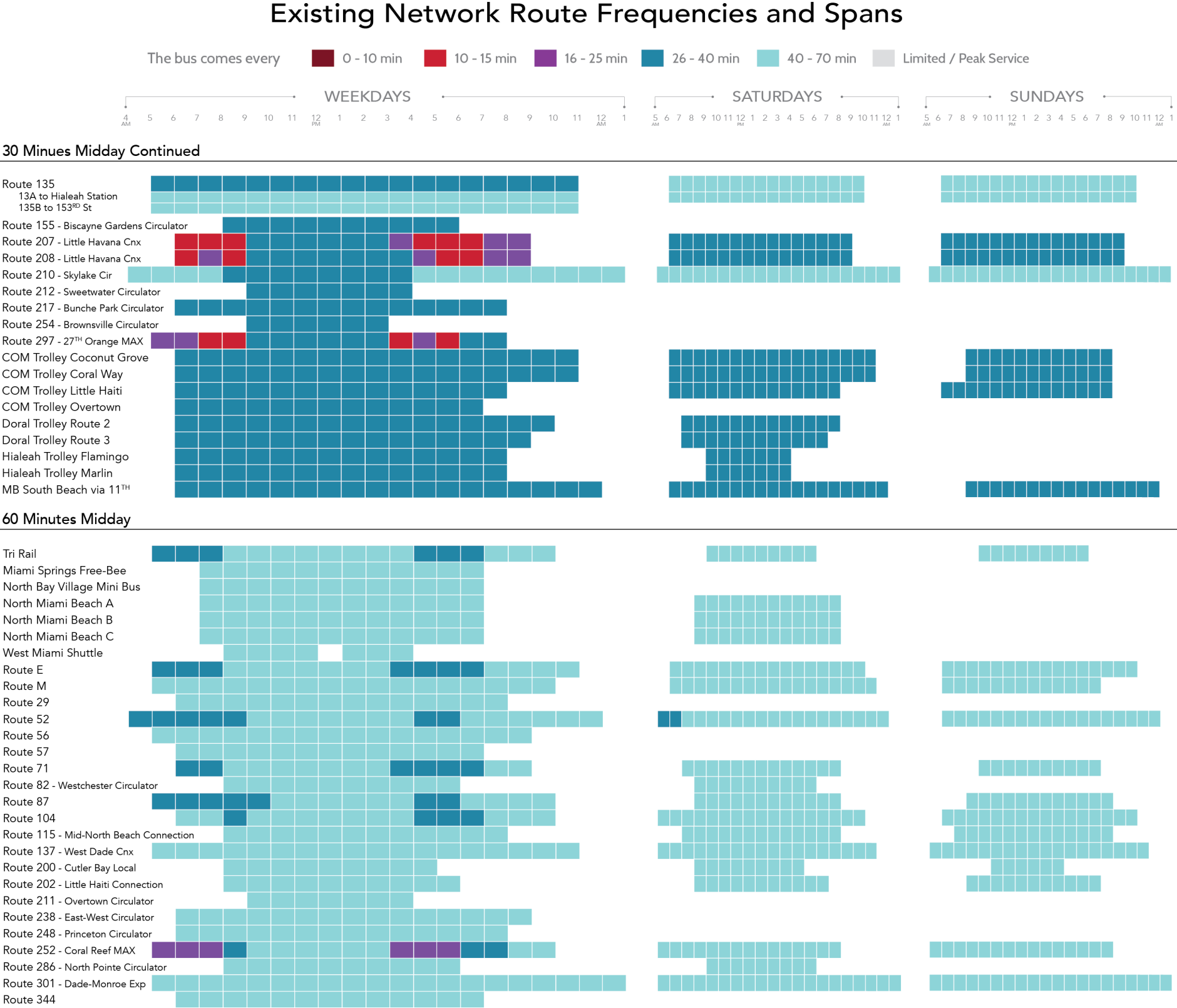


Figure 15: Existing Network. Frequency and Span of Routes with 30 and 60 Minute Frequency at Midday

Existing Network Spans of Service

Figure 16 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](#).

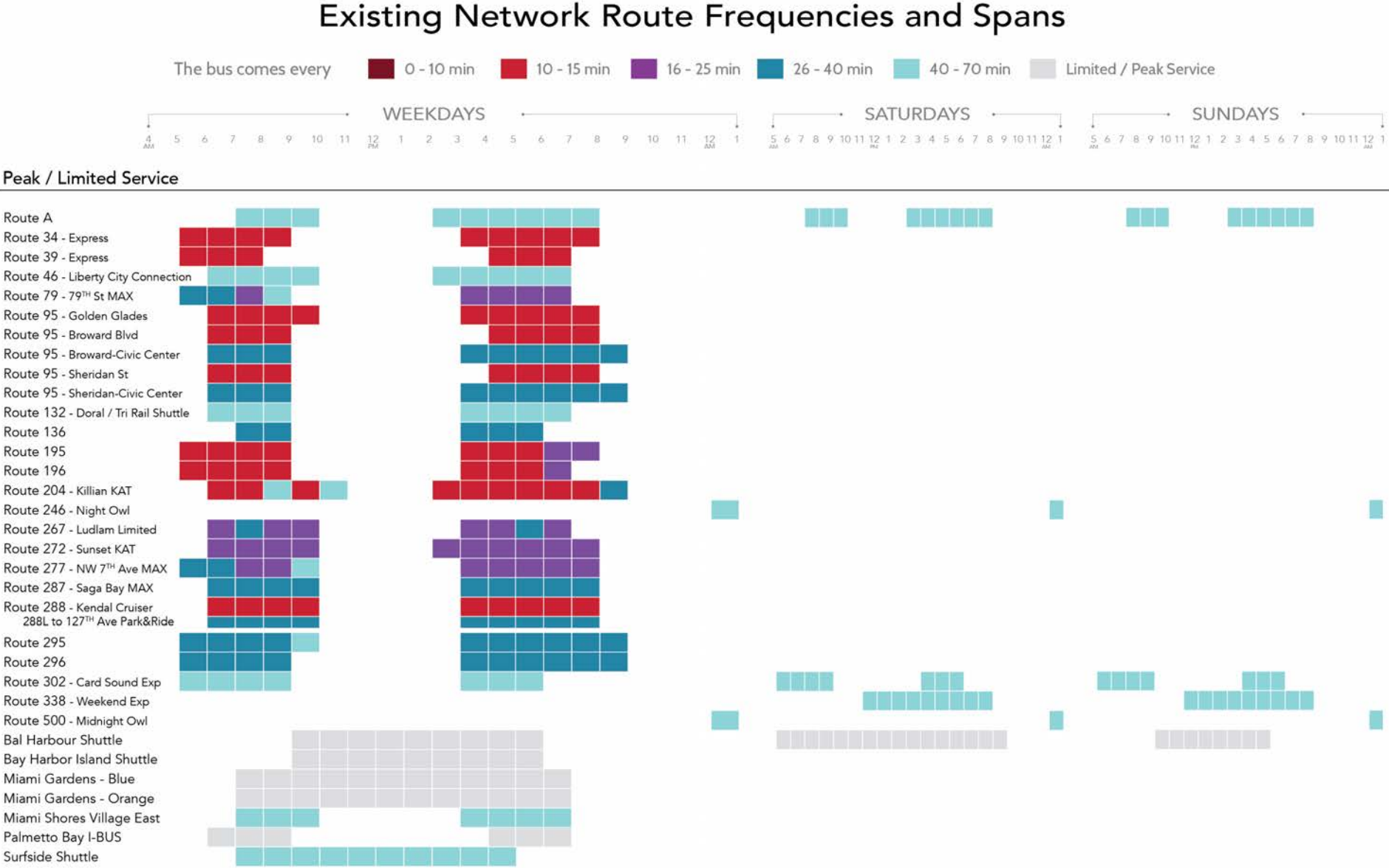


Figure 16: Existing Network. Frequency and Span of Peak-Only and Limited Trip Routes.

Coverage Concept Spans of Service

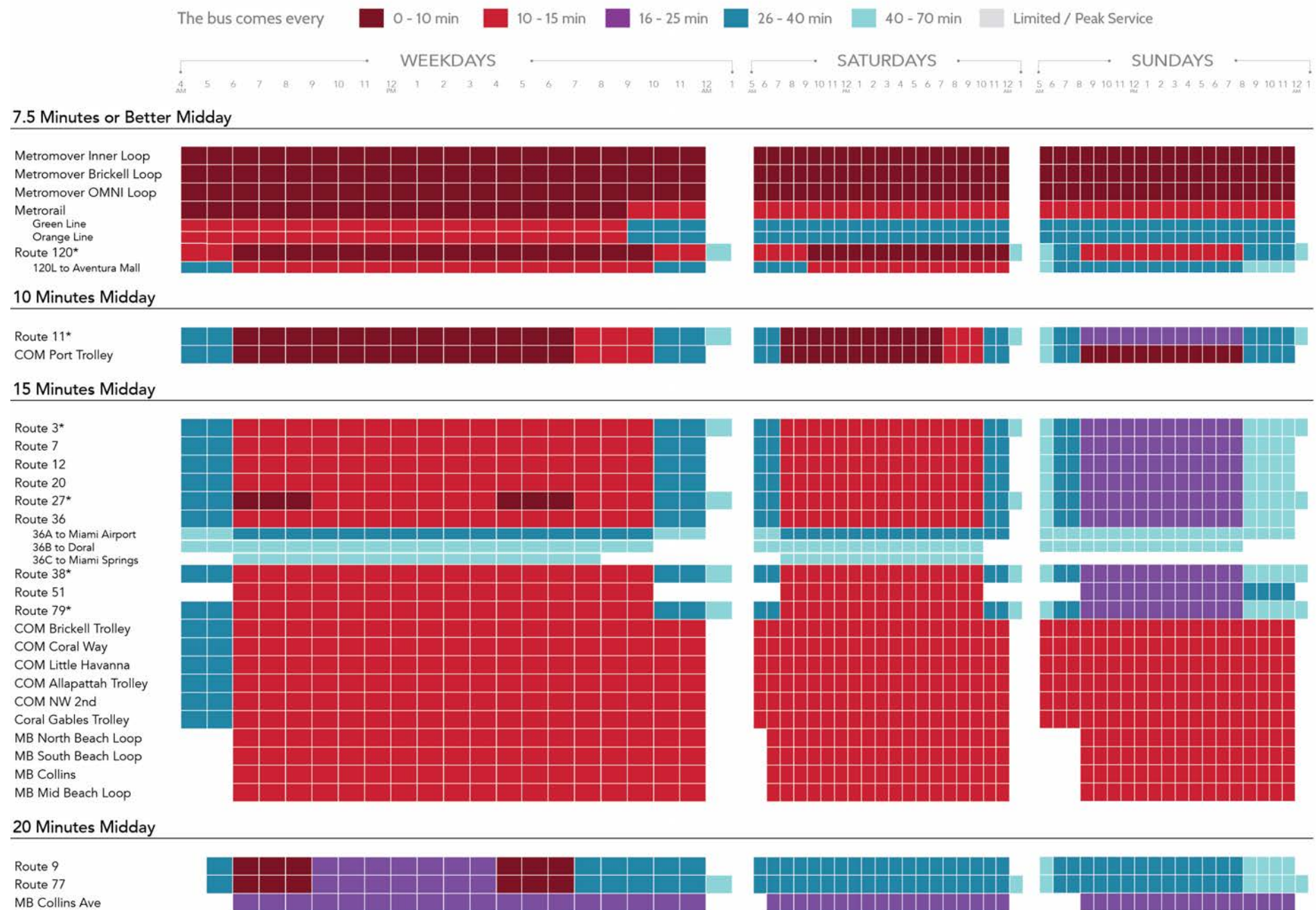
Public transit has traditionally been planned on the assumption that most travel happens on weekdays and during peak time. The everyday experience of traffic seems to confirm this. Nevertheless, there are good reasons to question whether transit should still be planned primarily around weekday daytimes:

- 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 then.

In the existing network, most routes only operate once or twice an hour in the evening on weekdays and have reduced frequency on weekends. Besides the rail and trolleys, no routes run 15 minutes or better during the weekends—the best available service comes every 20 minutes.

Both concepts have been designed with more consistent and more frequent service in the evening and on weekends across the entire system. The Coverage Concept has fewer routes than the existing network; however, most of the routes would run consistently from 5 AM until 10 PM, with more consistent frequency during the weekend. Figure 17 shows the routes with a midday frequency of at least every 20 minutes on weekday.

Coverage Concept - Network Route Frequencies and Spans



*Owl Service from 12 am to 4 am, hourly.

Figure 17: Coverage Network. Frequency and Span of Routes with 20 Minute or Better Frequency at Midday

Coverage Concept Spans of Service

Most of the routes in the Coverage Concept 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 18 shows the span and frequency of routes that operate every 30 minutes at midday on weekdays.

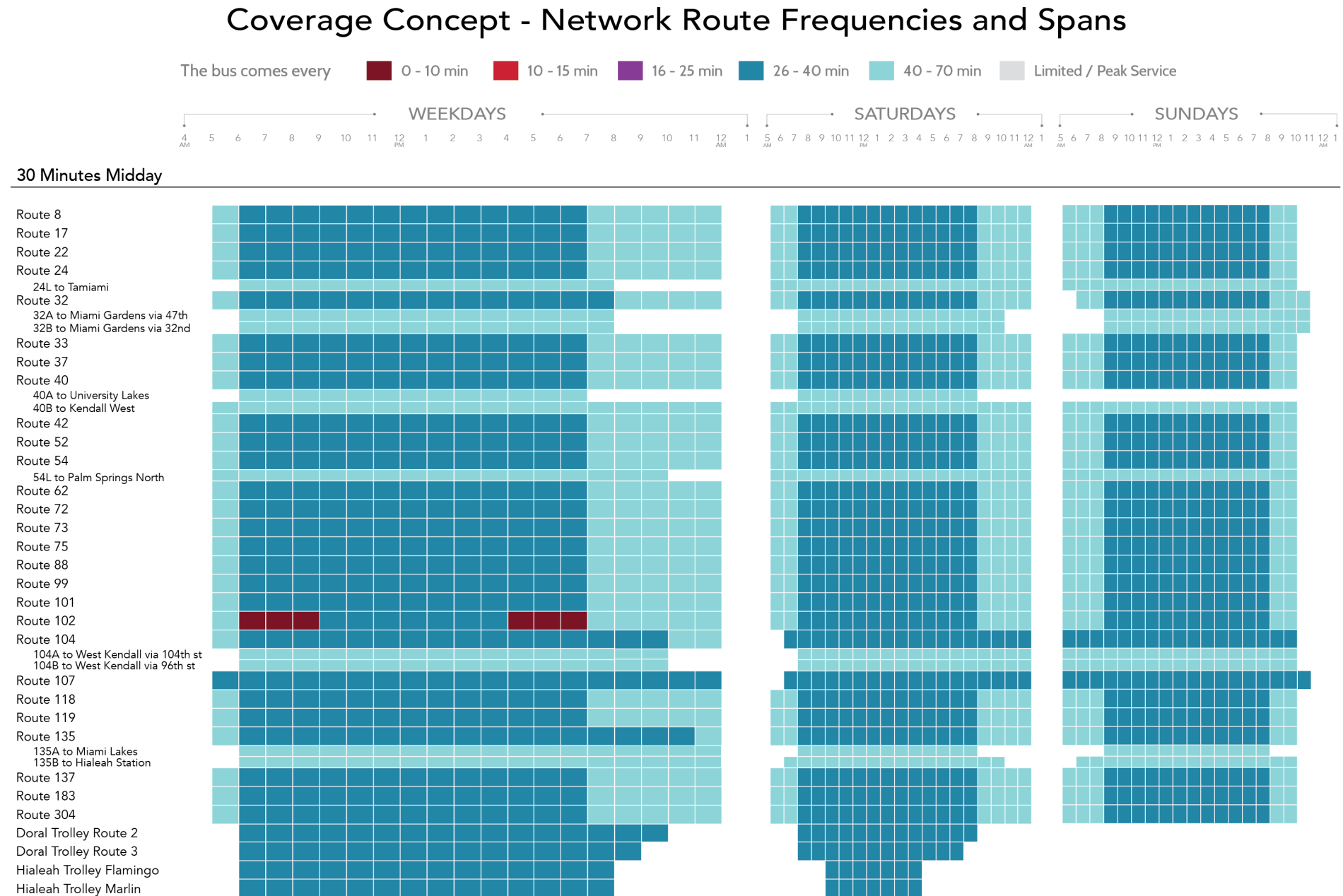


Figure 18: Coverage Network. Frequency and Span of Routes with 30 Minute Frequency at Midday

Coverage Spans of Service

Figure 19 shows the span and frequency of routes in the Coverage Concept that operate every 60 minutes at midday, operate only at peaks, or have limited service on weekdays.

Coverage Concept - Network Route Frequencies and Spans



Figure 19: Coverage Network. Frequency and Span of Routes with 60 Minute Frequency at Midday and Peak-Only and Limited Trip Routes.

Ridership Concept Spans of Service

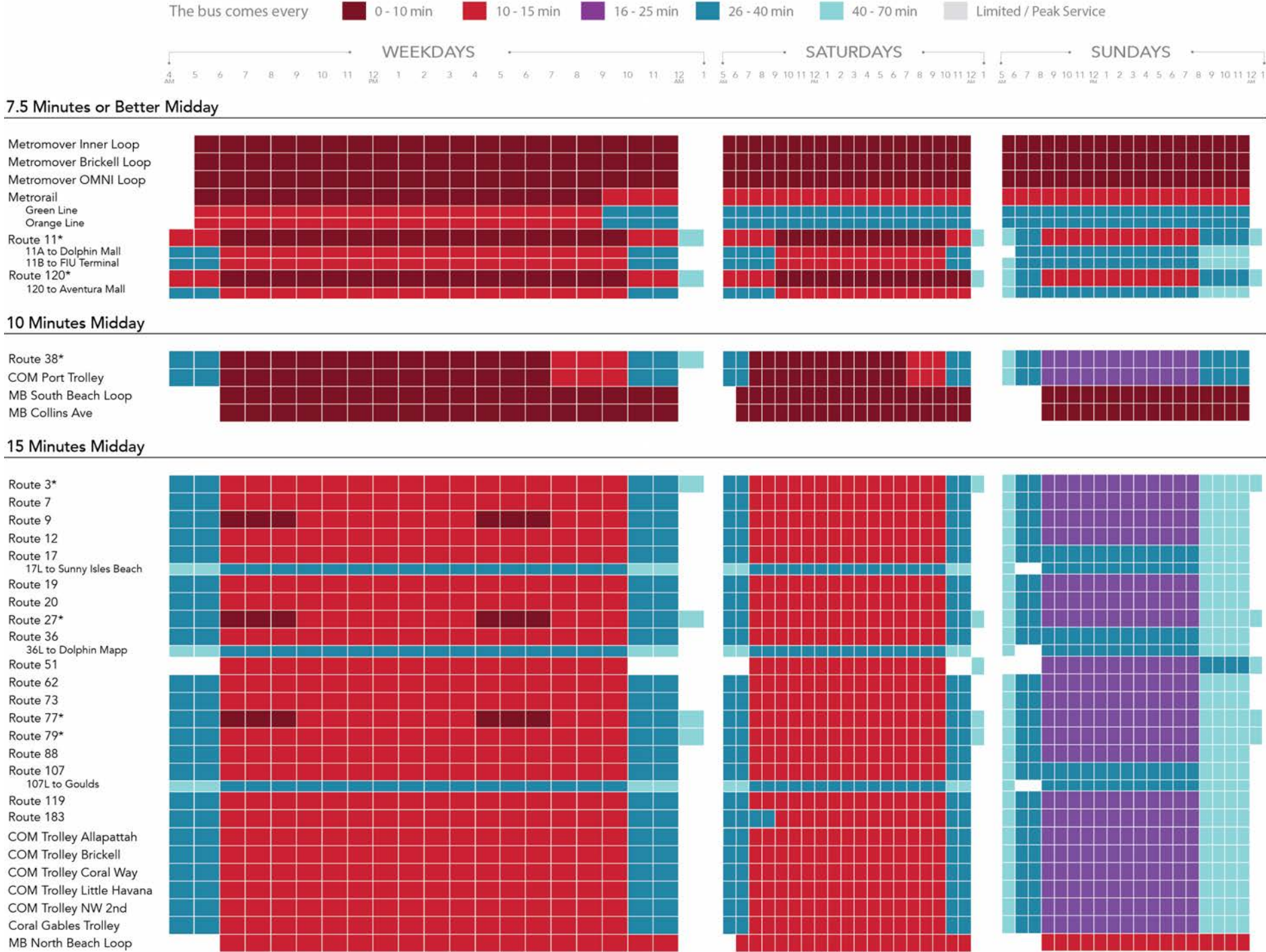
In the Ridership Concept most of the service would consist almost entirely of routes that operate every 15 minutes or better from 5 AM to 10 PM, with service continuing to midnight, or later, on most routes. This means the bus is always coming soon, and you don't need to know the schedule to plan your trip. Because of the high frequencies, many trips on transit would take less time than they do now even when they require longer walks. Figure 20 shows the span and frequency of service for routes that operate every 15 minutes or better at midday on weekdays.

Service in the evening would be frequent for most of the night (at 10 PM most routes would transition from every 15 minutes to every 30 minutes), which will result in less waiting at most times of the day, faster trips, and more useful service. For most of the routes, this is as twice as frequent as existing service. More frequent evening service is useful not just for socializing and shopping, but also for service and entertainment industry, hospital, and other workers whose shifts may end far later than 6 PM.

Service would also remain frequent during the weekends. A 15 minute route would still run every 15 minutes on Saturdays from 7 AM to 10 PM, and 20 minutes on Sundays from 7 AM to 8 PM. Although the frequency is not consistent between Saturday and Sunday, this would be much more frequent than most existing routes. Most existing routes operate a mix of service every 30 minutes and hourly service during the weekends.

Both the Coverage and Ridership Concepts would have more consistent route types with more consistent frequencies across the day and week.

Ridership Concept - Network Route Frequencies and Spans



*Owl Service from 12 am to 4 am, hourly.

Figure 20: Ridership Concept. Frequency and Span of Routes with 15 Minute or Better Frequency at Midday

Ridership Concept Spans of Service

With most routes operating every 15 minutes or better, there are relatively few routes operating less frequently. Figure 21 shows the span and frequency of routes that operate every 20, 30, or 60 minutes at midday on weekdays. Compared to the Existing Network or the Coverage Concept, there are far fewer routes that operate at these lower frequencies. All routes that have been redesigned in the Ridership Concept operate at least every 30 minutes; only municipal trolley routes or Tri Rail runs less than every 30 minutes at midday.

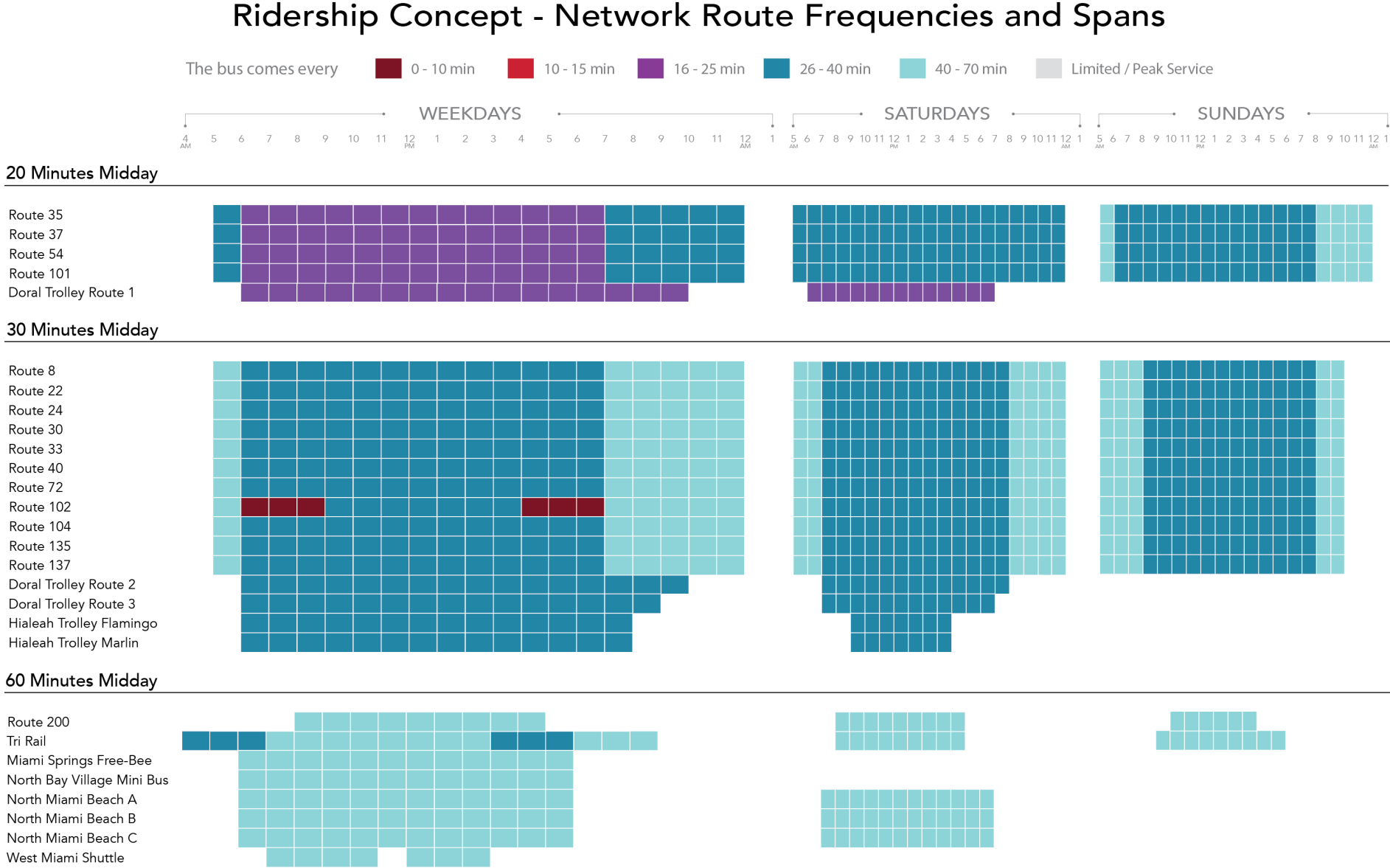


Figure 21: Ridership Concept. Frequency and Span of Routes with 20, 30 and 60 Minute Frequency at Midday

Ridership Concept Spans of Service

Figure 22 shows the span and frequency of peak only and limited trip routes. Most peak only routes remain, except that Routes 204 (Killian KAT), 272 (Sunst KAT), and 288 (Kendall Cruiser) would no longer run in the Ridership Concept because they are relatively low productivity routes. Also, the frequency of the 95 Golden Glades service would be reduced, specifically by removing service that starts or ends north of Golden Glades and consolidating all trips to end in Downtown Miami.

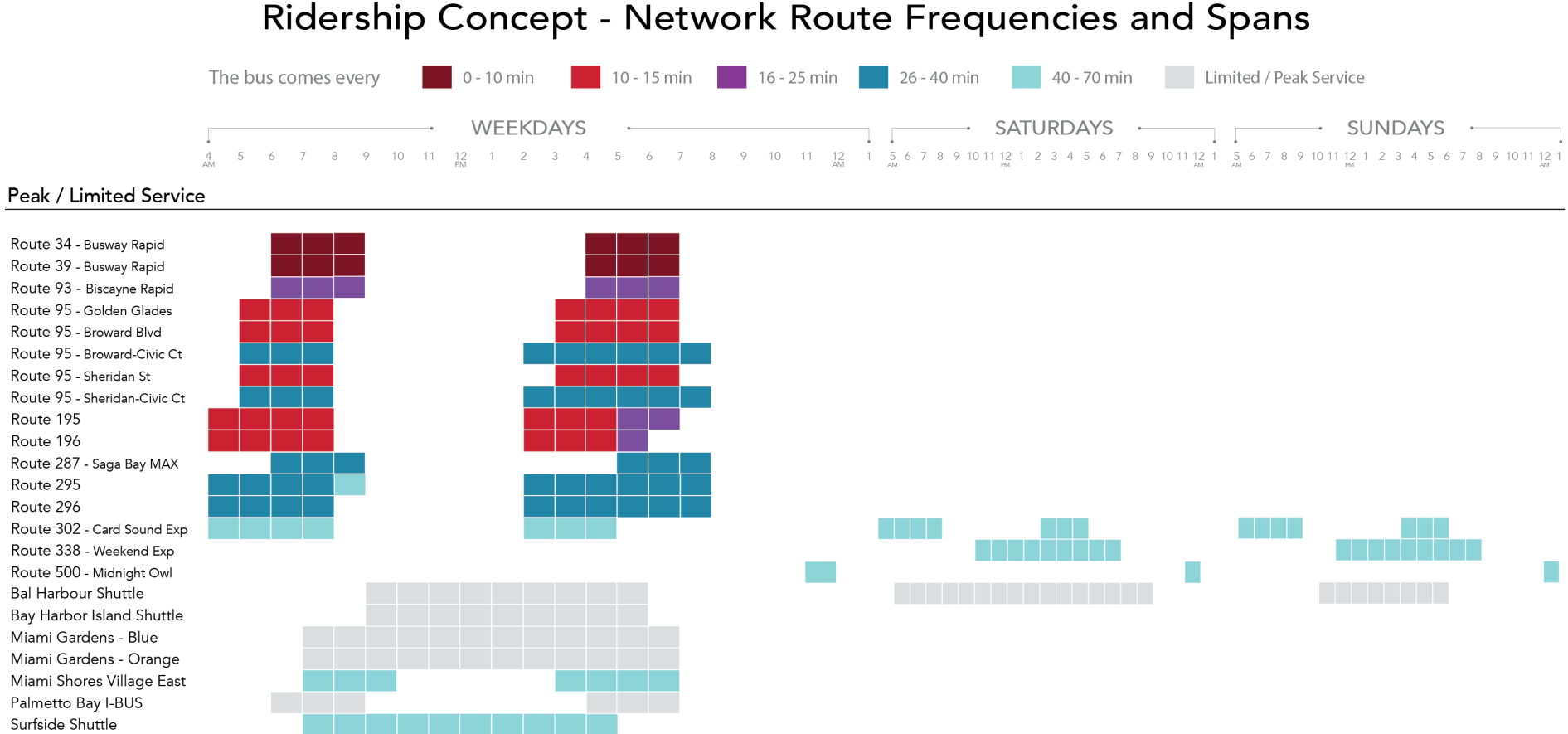


Figure 22: Ridership Concept. Frequency and Span of Peak-Only and Limited Trip Routes.

3 Comparing Outcomes

Comparing Outcomes

This chapter provides two different ways of measuring the outcomes of the two concepts compared to the existing network. These measurements are not forecasts, and they do not rely on any assumptions about how culture, technology, process or other factors will change in the next few years. As the world changes more rapidly, those assumptions become more and more questionable.

Instead, these are simple arithmetic measures that combine proximity, travel time, population, and employment information to show the potential of each concept and how each differs from the existing network. We calculate all of these outcomes during a weekday noon. This time represents the level of service experienced by the majority of existing transit trips. This is because people take most of their trips during the daytime and because midday service is indicative of the typical experience of most transit riders.

Proximity to Service

The first measure reported on the next page is very simple: **how many residents and jobs are near transit?** This is sometimes called “coverage”. Proximity does not tell us whether people will find transit useful, only that is available nearby. If a concept does better at getting a higher percentage of people near transit that concept does well at meeting a Coverage goal—it puts transit closer to more people.

Specifically, we measure how many people and jobs would be located within ¼ mile of a bus stop in each concept. Figure 23 shows the method used to determine how many people are within ¼ mile of each stop. The method uses air distance, not distance along streets, so it may overestimate how many people are near service in less walkable area. Since the same method is used for each concept, this limitation affects all the results, and therefore doesn’t bias any result for any concept.

To provide some idea of usefulness, we distinguish between how many people and jobs are near very frequent service (every 10 minutes or better), service every 10 to 15 minutes, service every 16 to 60 minutes, or any service at all. A ¼ mile is a distance often used to determine whether someone is “close enough” to transit: however, many people are willing to walk farther to reach more frequent service.

Access (and Freedom) Outcomes

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 24 shows an example of this type

of visualization of transit access for Florida International University, comparing the Coverage Concept to 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 a basic part of what determines ridership, but 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.

From Access to Ridership

Ridership arises from the combination of access and human behavior. Our behavior is heavily affected by pricing and other features that social scientists study. So while access is not, by itself, a prediction of ridership, it is a foundation of it. It is also the aspect of ridership that transportation planning influences most, and it can be described geometrically in a way that gives us a high degree of confidence. The geometric explanation is described in detail on page 12 of the [Choices Report](#).

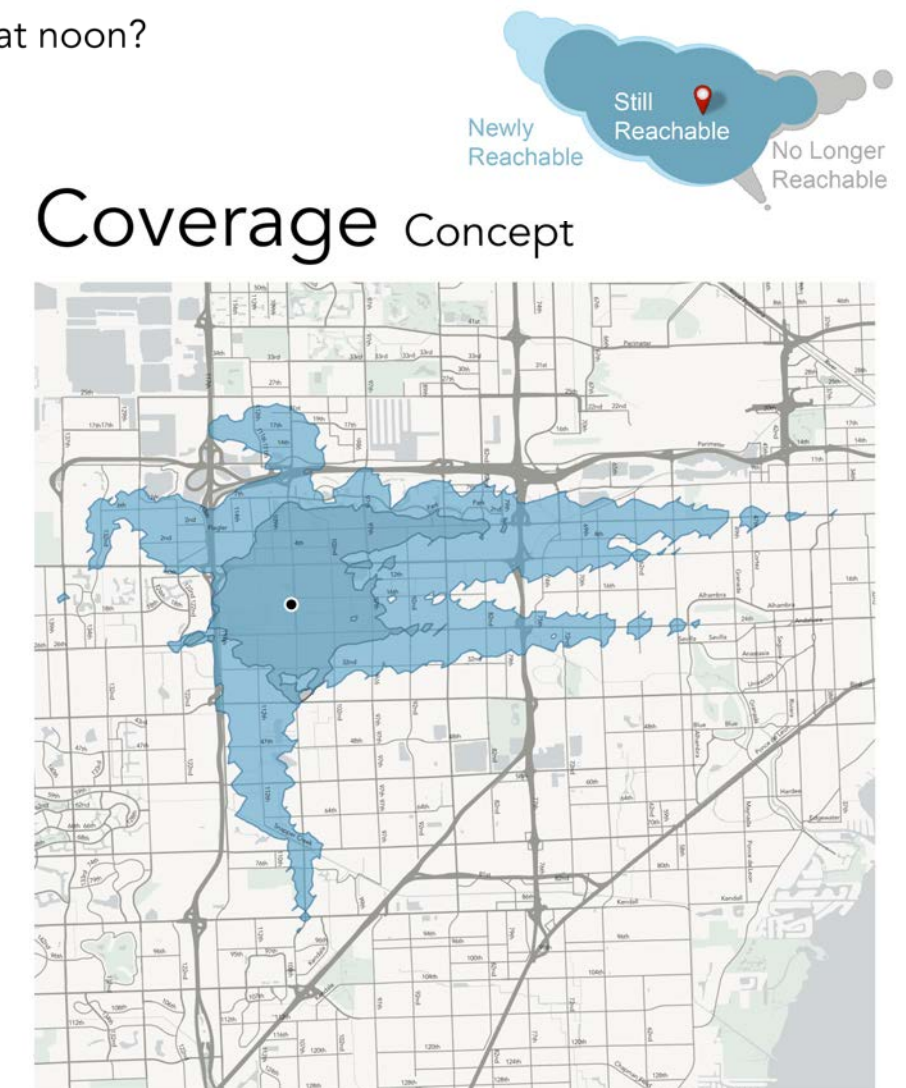
Measuring Access and Freedom

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 30, 45, or 60 minutes on transit (door-to-door, including walking, waiting, and riding) from anywhere in the region, and calculate how many jobs are located the area that is reachable.

Figure 24: Example of change in places reachable in 45 minutes from Little Havana in the Coverage Concept, compared to the Existing Network.

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



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 23 show how many residents (at top) and jobs (at bottom) would be “close enough” to any service for the Existing Network and the Coverage and Ridership Concepts. 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 61% of people and 68% 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 23% of jobs near a frequent bus or train.

Both the Coverage and Ridership Concepts would significantly increase the number of people and jobs near frequent service, as more routes would be running every 15 minutes or better.

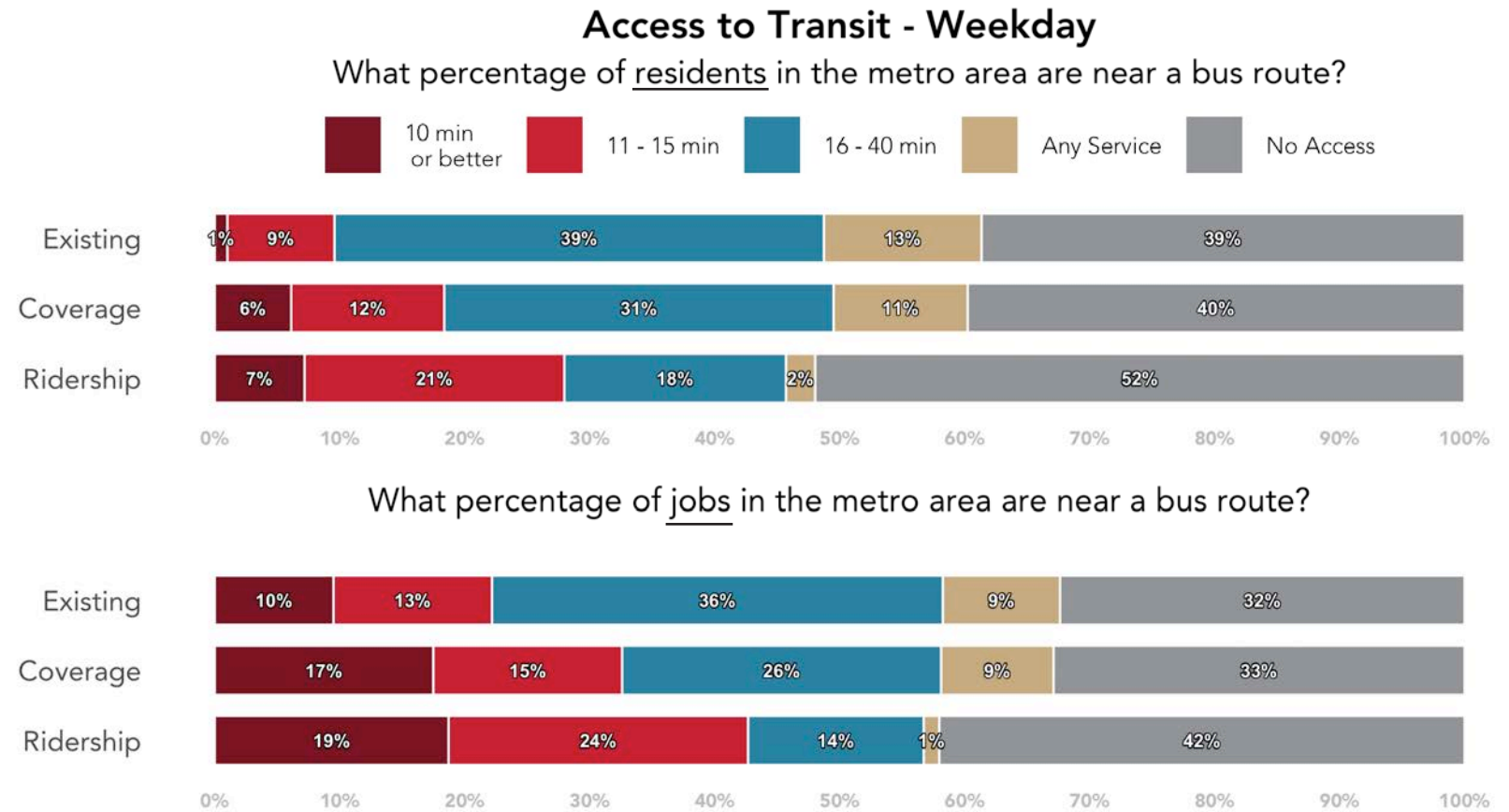
Compared to Existing, the Coverage Concept would

- increase the number of residents near frequent service from 10% to 18%;
- increase the number of jobs near frequent service from 23% to 32%;
- increases the number of residents and jobs that are more than ¼ mile from service (~1%), represented by the grey bars in Figure 23.

Compared to Existing, the Ridership Concept would

- increase the number of residents near frequent service from 10% to 28%;
- increase the number of jobs near frequent service from 23% to 43%;
- reduces the percent of people who are within a ¼ mile of transit, from 61% to 48%;
- reduces the percent of jobs that are within a 1/4 mile of transit from 68% to 58%.

In the Ridership Concept more people and jobs are near frequent service, but fewer total people and jobs are within ¼ mile of any service. This difference reflects the basic geometric trade-off: if Miami-Dade was seeking only to deploy frequent and useful transit service to the best markets for transit, it wouldn’t reach as many people and places. They



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

Figure 25: The total number of people or jobs near any service is higher in the Coverage Concept, but the number of people and jobs near frequent service is much higher in the Ridership Concept.

key would then be to ensure the bus network reaches the people and places most likely to generate strong ridership.

Proximity does not tell us how useful the service is to people—only that it is nearby. In pursuit of a coverage goal, an agency will spread service thinly, to cover as many people as possible. Spreading transit thinly means routes have low frequencies, short spans, and circuitous routing. A route that is not very useful, but is proximate to many people, is helping an agency meet a coverage goal.

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.

The Coverage Concept puts frequent service near 18% of residents. The Ridership Concept puts frequent service near 28% of residents.

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 26 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 and to frequent service from the existing network to the concepts appears to have a similar effect on people of color, people in poverty and seniors as on the general population. More people in disadvantage are within a quarter mile of any transit service compared to the general population.

More people of color are within ¼ mile of frequent service compared to the existing network, 10% more in Coverage and 20% more in Ridership. In the Coverage Concept, the number of people of color with no access is very similar to the existing network. On the other hand, since the Ridership Concept reduces overall proximity to service to prioritize frequent service, 12% fewer people of color are within quarter mile of transit. This is similar to the reduction in the percent of all people near any service shown in Figure 25.

The number people in poverty who are near a frequent bus route increases by 11% in the Coverage Concept and by 23% in the Ridership Concept. The percent of people in poverty who are more than a quarter mile from service increases slightly in the Coverage Concept (~1%) and increases by about 13% in the Ridership Concept. This is similar to the increase in the percent of all people more than a quarter mile from any service shown in Figure 25.

The Coverage Concept increases the percent of seniors near frequent service by 9%, while the Ridership Concept increases it by 18%. In the Coverage Concept, about 2% more seniors would be more than a quarter mile from service. In the Ridership Concept about 14% more seniors would be more than a quarter mile from any transit service.

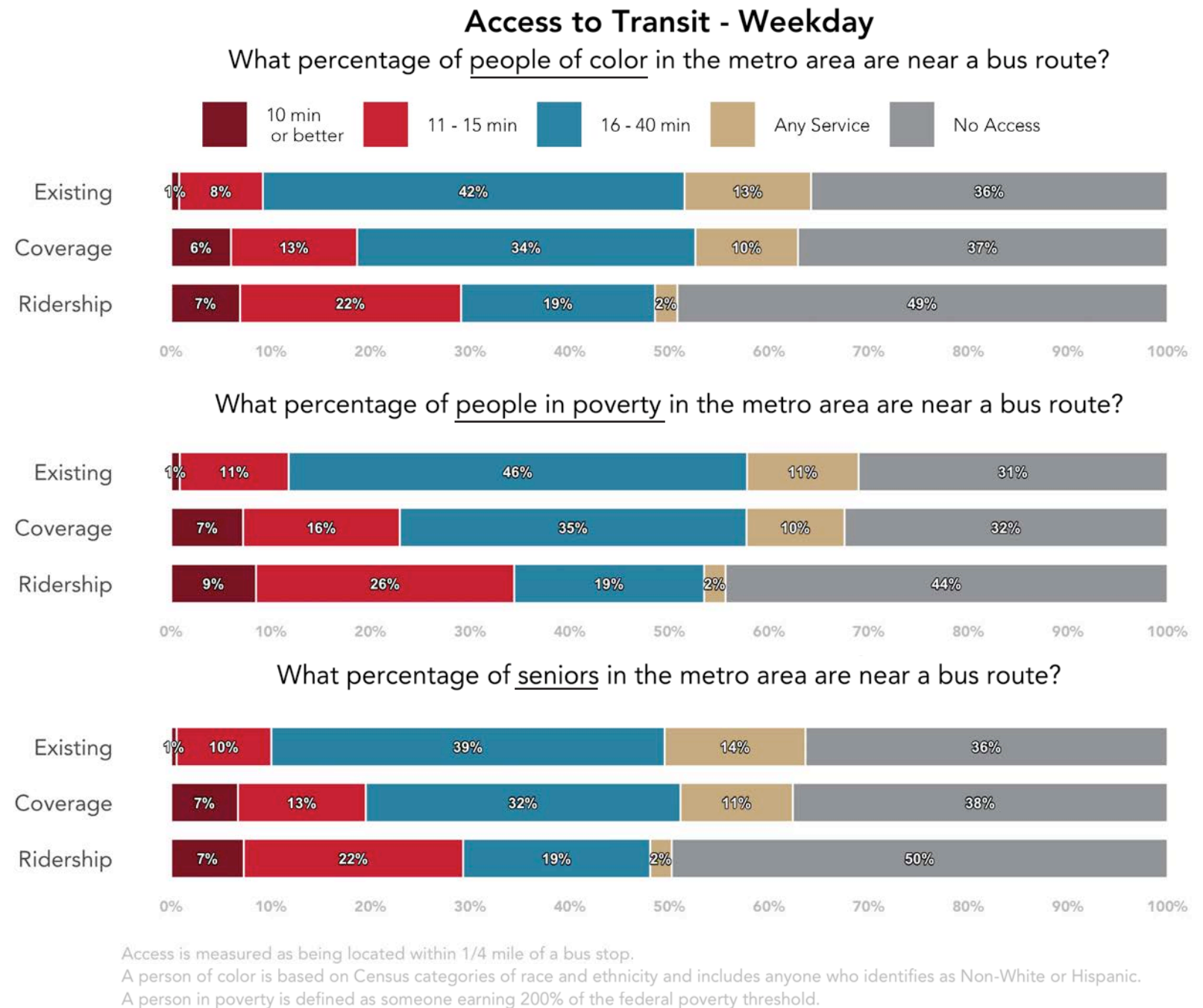


Figure 26: As with all residents, more people of color and people in poverty have access to any service in the Coverage Concept, but far more have access to frequent service with the Ridership Concept.

Freedom, Access, Usefulness

People ride transit if they find it useful. *High* transit ridership results when transit is useful to *large* numbers of people. A helpful way to illustrate the usefulness of a network is to visualize where a person could go using public transit and walking, from a certain location, in a certain amount of time.

The maps Figure 27 shows someone's access to and from near Government Center Metrorail station in 45 minutes, at noon on a weekday in the Ridership and Coverage Concepts. Each concept is compared to the Existing Network. The technical term for this illustration is **isochrone**. A more useful transit network is one in which these isochrones are larger, so that each person is likely to find the network useful for more trips. It also represent an expansion of freedom, as described on page 27.

The dark blue represents areas that are reachable today and will be reachable in the corresponding concept. Areas that are newly reachable are shown in light blue, and areas that are no longer reachable are shown in gray. The maps show that both concepts have an increase in access to residents and jobs over the existing network.

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.

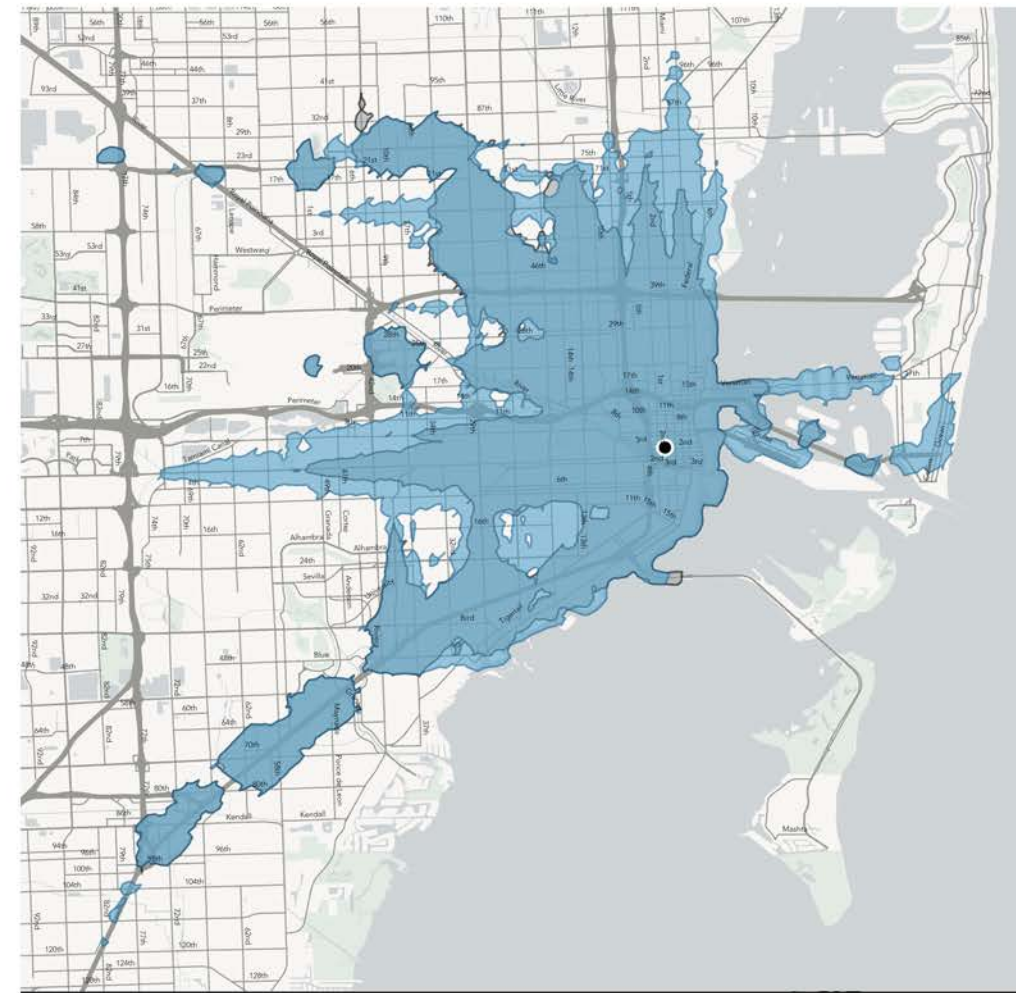
Ridership arises from service being useful, for more people, to get to more busy places. That's why predictive models of ridership do this very same analysis behind-the-scenes.

The isochrones on the next few pages (32-34) report the change in the numbers of jobs and residents within each isochrone, relative to the existing network for 3 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. Especially in the Ridership Concept, some places are reachable quickly even when the trip involves a transfer.

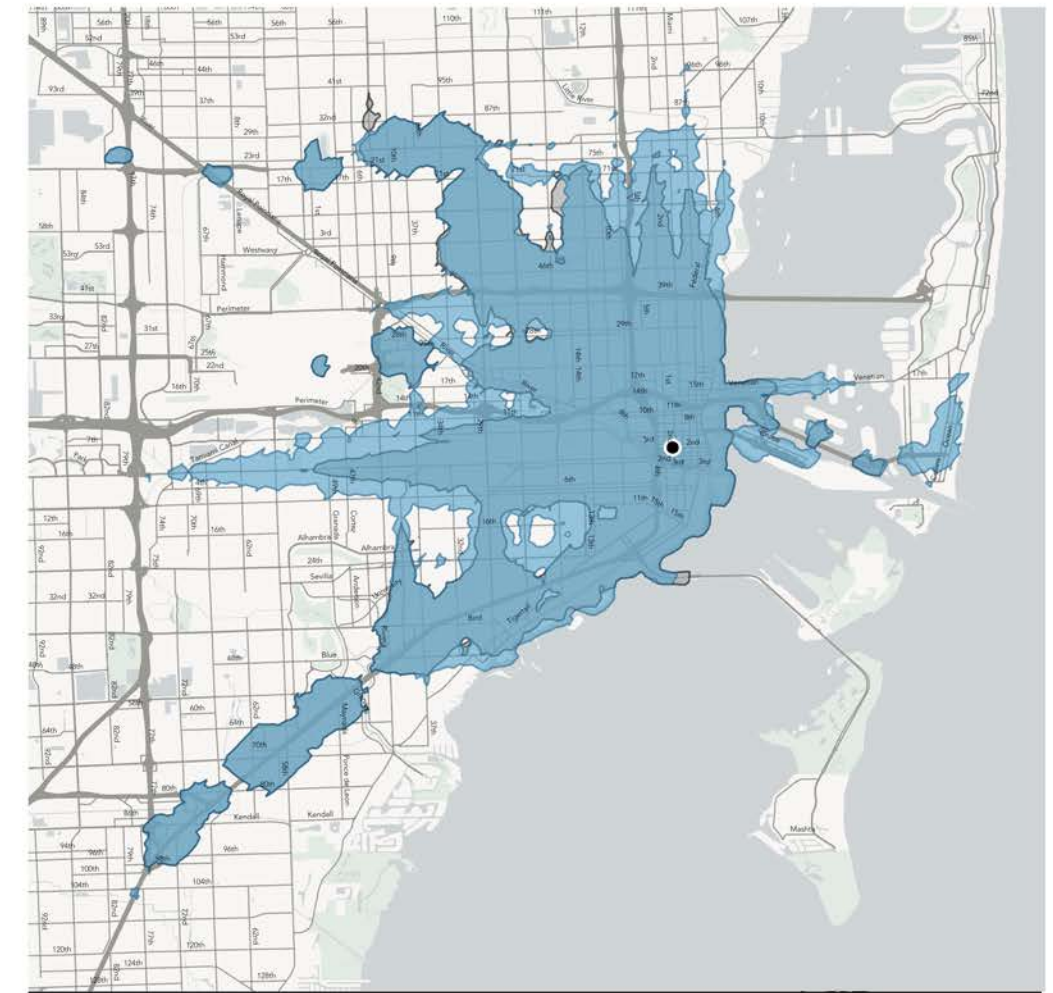
How far can I travel in 45 minutes from Government Center at noon?

Ridership Concept



Change in jobs reachable	+42,335	+15%
Change in residents reachable	+119,410	+35%

Coverage Concept



Change in jobs reachable	+36,070	+10%
Change in residents reachable	+100,620	+30%



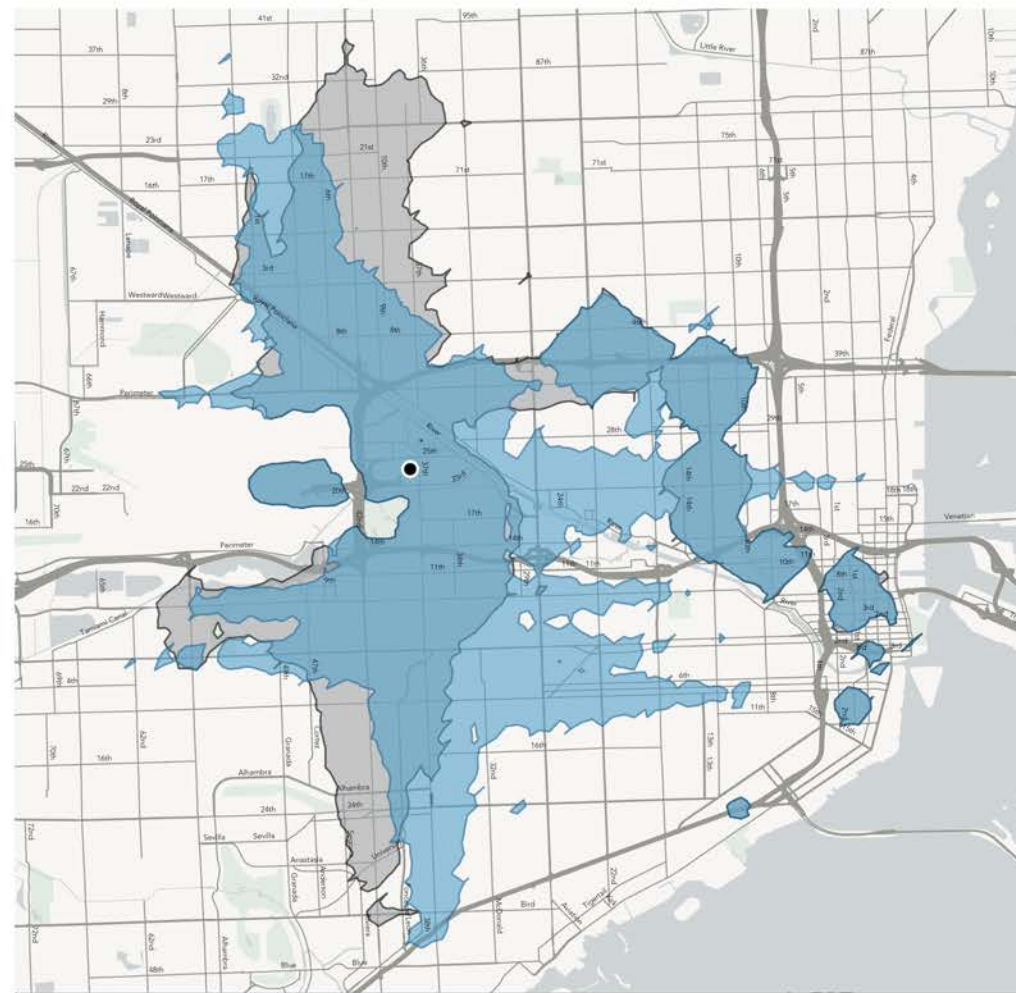
Figure 27: An isochrone shows how far someone can go, in a given amount of time, by walking and transit. This isochrone Map from Government Center shows change in access in 45 minutes for the Coverage and Ridership Concepts.

Access from Miami Intermodal Center

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

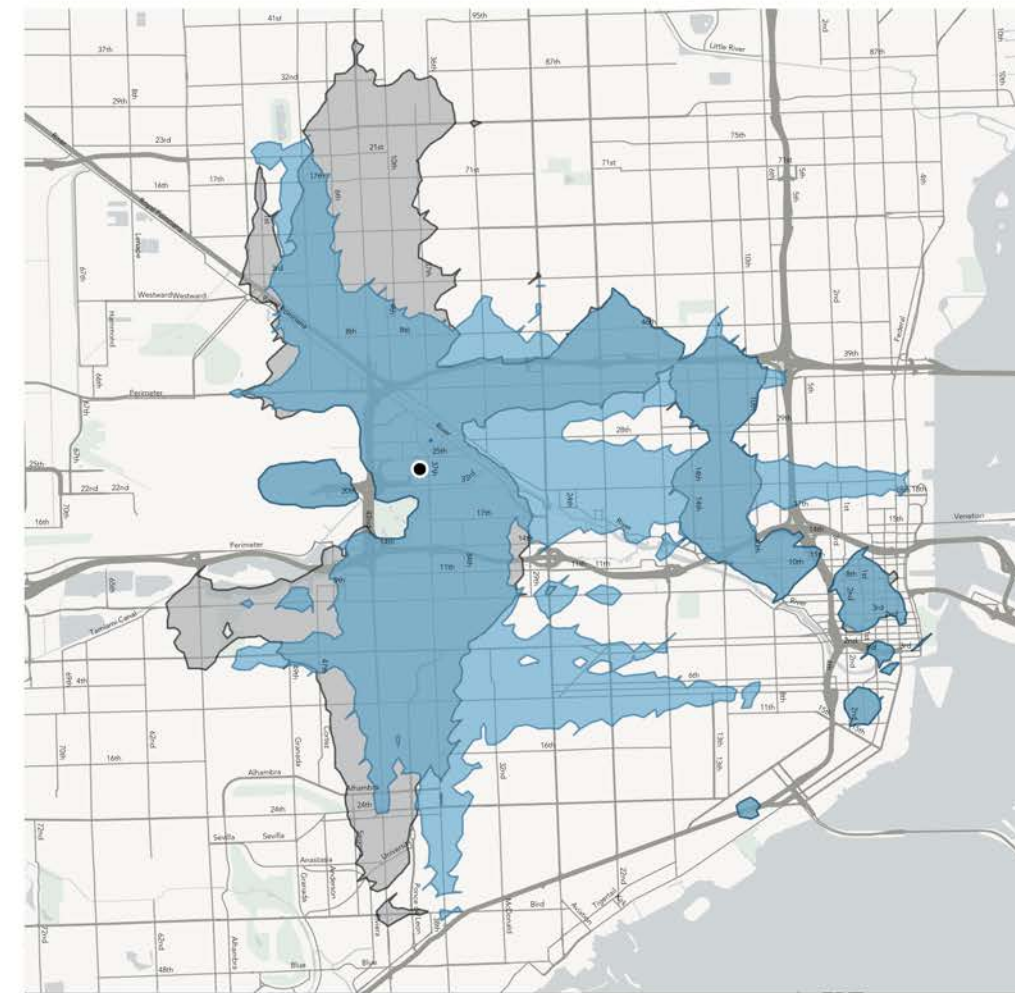


Ridership Concept



Change in jobs reachable	+5,785	+5%
Change in residents reachable	+45,055	+30%

Coverage Concept



Change in jobs reachable	+8,620	+10%
Change in residents reachable	+20,520	+15%

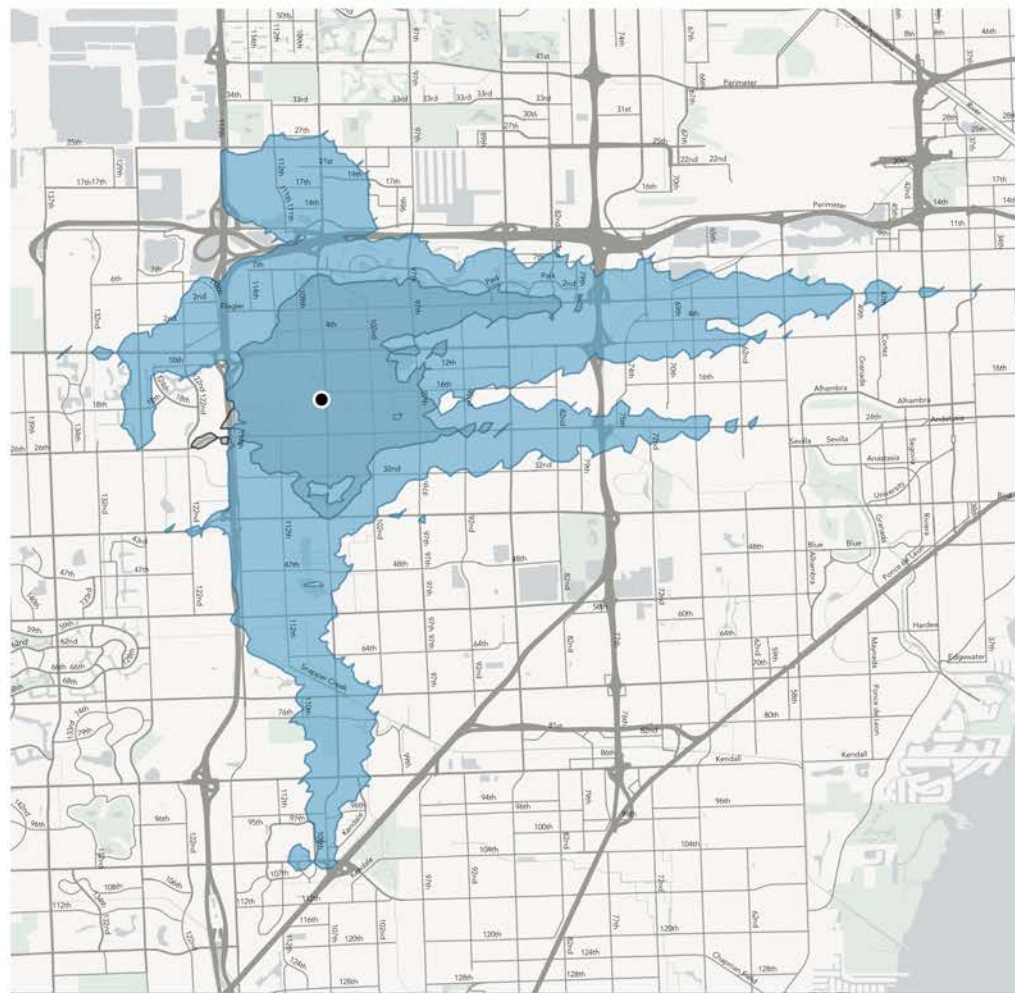
Figure 28: This isochrone Map from the Miami Intermodal Center shows change in access in 45 minutes for the Coverage and Ridership Concepts.

Access from Florida International University

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

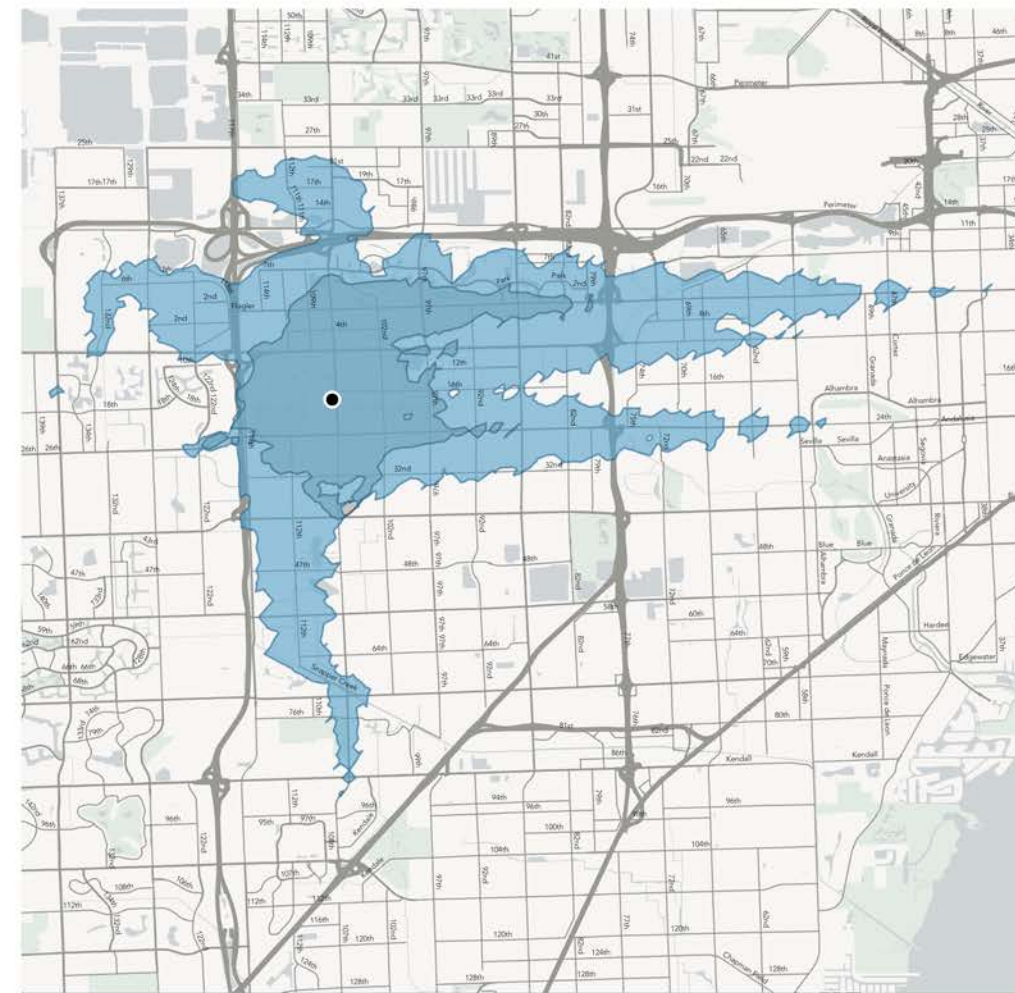


Ridership Concept



Change in jobs reachable	+43,030	+295%
Change in residents reachable	+125,795	+285%

Coverage Concept



Change in jobs reachable	+32,885	+225%
Change in residents reachable	+110,655	+250%

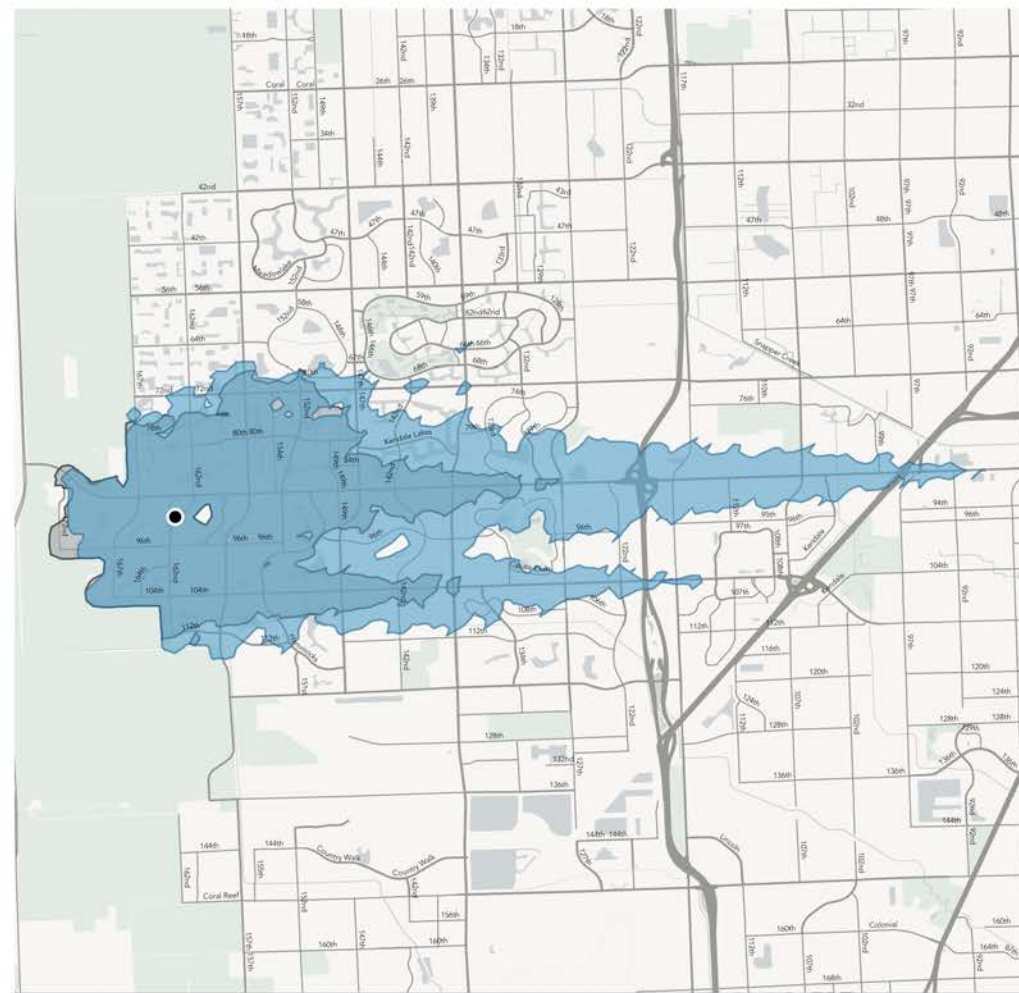
Figure 29: This isochrone Map from Florida International University shows change in access in 45 minutes for the Coverage and Ridership Concepts.

Access from West Kendall Transit Terminal

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

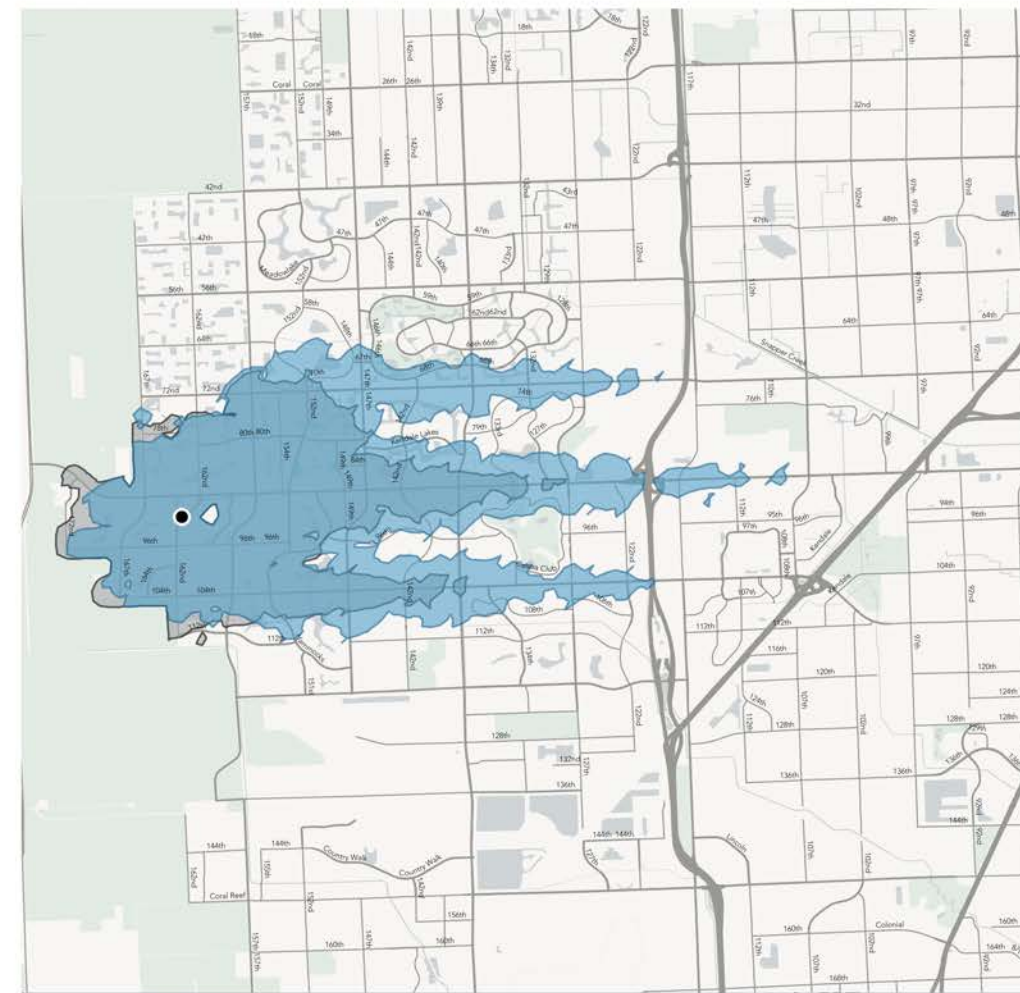


Ridership Concept



Change in jobs reachable	+10,390	+165%
Change in residents reachable	+44,795	+70%

Coverage Concept



Change in jobs reachable	+4,275	+70%
Change in residents reachable	+32,520	+50%

Figure 30: This isochrone Map from West Kendall Transit Terminal shows change in access in 45 minutes for the Coverage and Ridership Concepts.

Change in Access: Coverage

The previous maps show how the concepts expand where people could go in a given time, from certain places. (Again, access to other opportunities, like education on shopping would likely change in a similar way.)

The map on this page and the next summarize 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 Concept shown. Where red dots predominate, more people are bearing the cost (in this case a decline in access to jobs) of the Concept shown. The darker the shade, the greater the increase or decrease in access.

Coverage Concept

The Coverage Concept 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 (Miami, Miami Beach, and surrounding areas) 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 even the Coverage Concept does some shift of service toward busier corridors. Because it's planned for coverage, frequencies are reduced in low-demand areas, turning them orange, so that they can be increased in higher demand parts in the same suburban city or area. Most places that would experience a decrease in access in this concept have low residential densities.

For example, there is a decrease in access along NE 183rd Street near NE 6th Avenue and extending west along NE 183rd, but the density of residents in this area is relatively low, as indicated by the wide spacing in dots. This decrease in access occurs because the frequency of Route 183 would be reduced from every 20 to every 30 minutes.

Another example of a decrease in access is in Hialeah. Access has decreased for the areas along East 8th Avenue north of East 25th Street because the frequency of Route 54 would be reduced from every 30 to every 60 minutes in this area. This stretch of East 8th Avenue has very low ridership today, each stop gets about 1 or 2 boardings per day. It is also relatively low density, compared to other parts of Hialeah. In the Coverage Concept, Routes 33 and Hialeah bus routes maintain higher frequency service on the denser and higher ridership corridors in this area, like West 49th Street.

Overall coverage has not be reduced significantly, but, the Coverage Concept is a slight increase in the focus on ridership goals compared to the Existing Network.

The Coverage Concept would increase the number of jobs reachable by the average resident in 45 minutes by 33%.

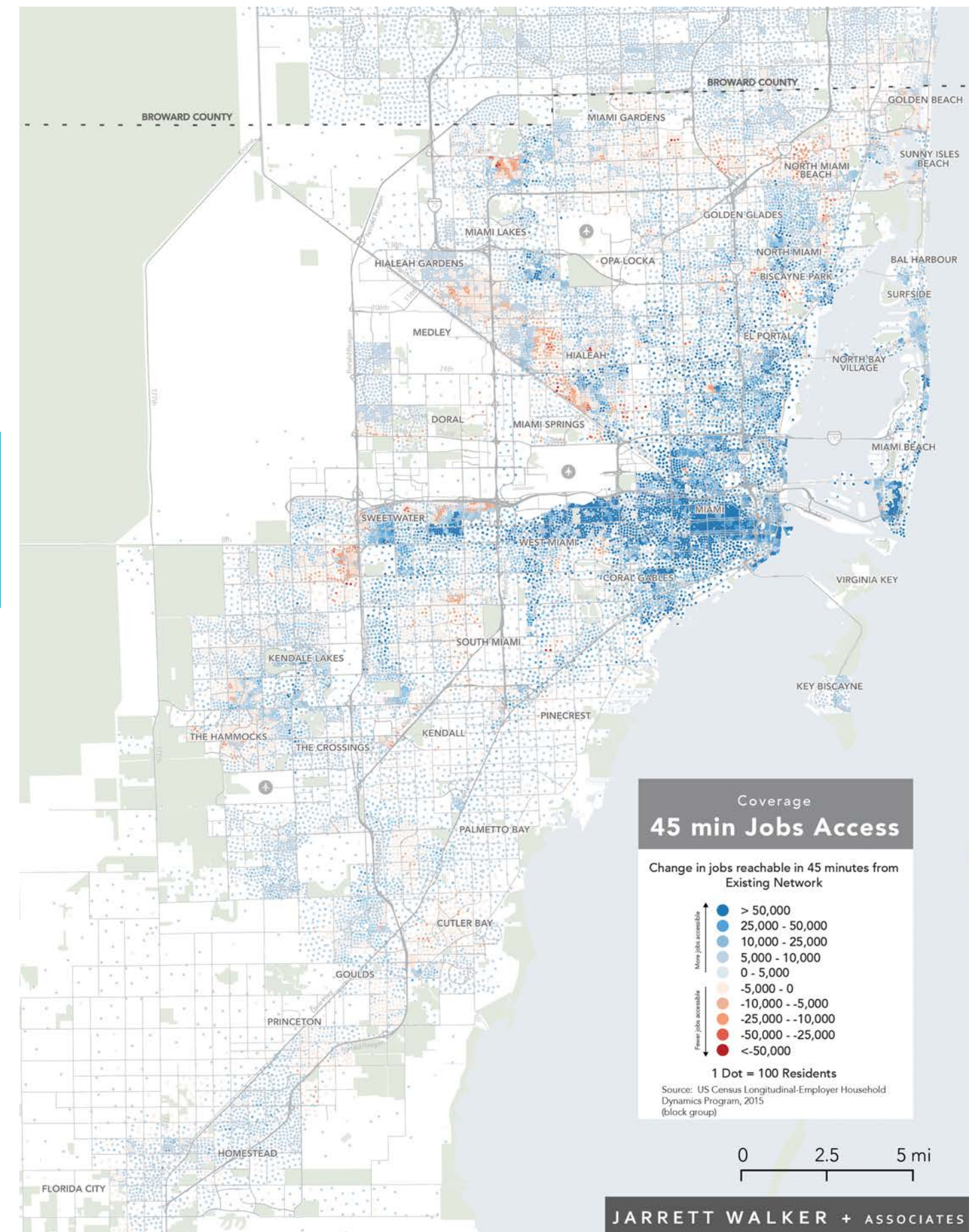


Figure 31: Change in Jobs Reachable in 45 minutes for the Coverage Concept Compared to Existing Network.

Change in Access: Ridership

Ridership Concept

Because this concept is based on a high ridership design, weekday service at noon consists mostly of routes that operate every 15 minutes or better. This leads to a large increase in access to jobs in many parts of the county. Traveling across large parts of the county, particularly in the most dense areas, would be much faster, because waiting times would be much shorter, both for the initial wait for a bus and for a connection. The Ridership Concept would require people to walk longer distances, but it will get most people farther and faster to their destinations, primarily due to shorter waits.

The Ridership Concept would increase the number of jobs reachable by the average resident in 45 minutes by 51%.

Increases in access to jobs are larger in the core of the region. Cities like Miami, Miami Beach, and North Miami would see large access benefits due to increases in frequency and consolidation of the trolleys. Outside the core, increased frequency on corridors such as Ludlum Road (Route 73), SW 88th Street (Route 88), and SW 107th Avenue (Route 107) would drastically improve access for West Miami, South Miami, and Sweetwater.

Even residents in farther out places see benefits from the Ridership Concept. While there are parts of Hialeah that see some decreases in job access, the average resident in Hialeah can reach 45% more jobs in 60 minutes in the Ridership Concept. In Homestead, the average resident can reach 31% more jobs in 60 minutes by transit in the Ridership Concept.

The most substantial decrease in access would be experienced in areas south of US 1 between Douglas Road and 57th Avenue, where overall density is low. This includes the far southwestern corner of the City of Miami, and the southern areas of the City of Coral Gables. These areas would not be served by Routes 37 (30 min) and 57 (60 minutes) in this concept, since these resources would be reallocated to higher density corridors. This reflects another geometric trade-off, the Ridership Concept focuses on making service more frequent and useful to most residents, but it wouldn't reach as many places, and in particular it wouldn't reach the less dense parts of the county.

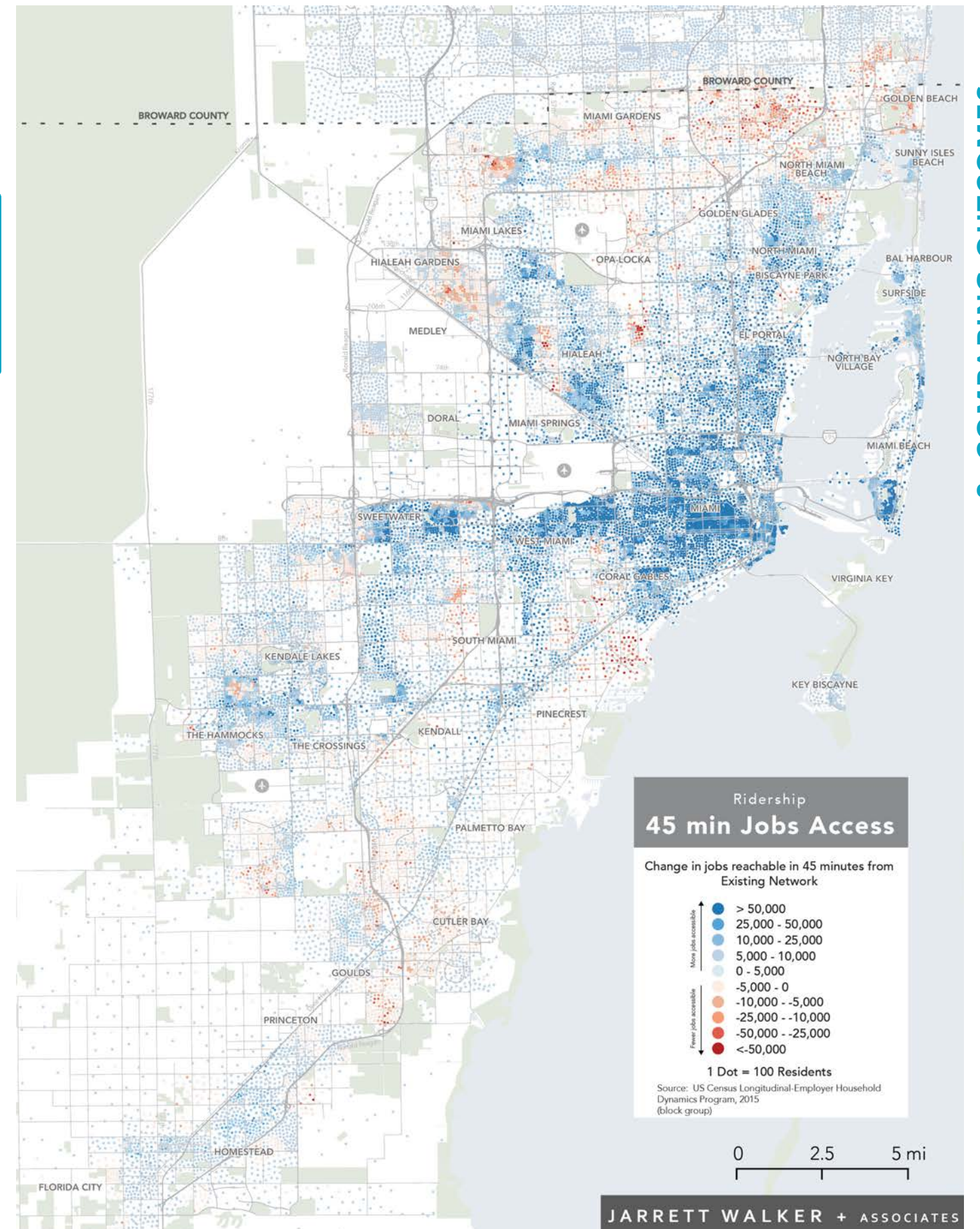


Figure 32: Change in Jobs Reachable in 45 minutes for the Ridership Concept Compared to Existing Network.

Change in Access to Jobs

Both Coverage and Ridership concepts have a large increase in the number of jobs accessible to the average person in Miami-Dade. Figure 33 shows the average number of jobs reached on transit at midday on weekday weekdays, for the average person in the county and for different subgroups. The average resident can reach 31% more jobs in the Coverage Concept and 48% more in the Ridership Concept within 45 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 slightly better increase in access than the general public.

These benefits come from the fact that areas with a high concentration of poverty are clustered around areas where there is a high residential density, a great market for transit services. These areas would experience better frequency, and thus better access, in the Ridership and Coverage Concepts.

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.

In one hour, the average resident could reach 27% more jobs in the Coverage Concept and 43% more jobs in the Ridership Concept.

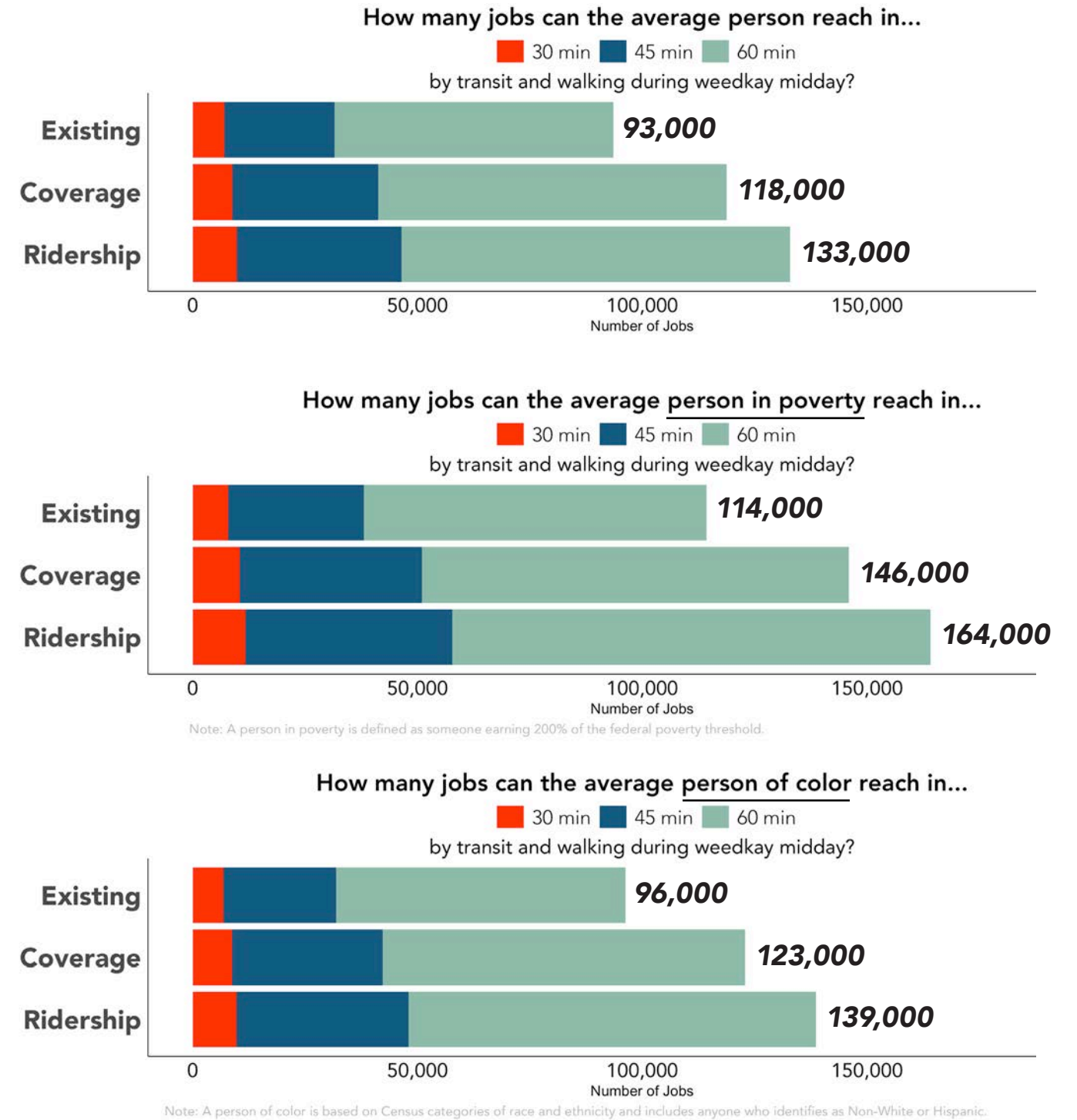


Figure 33: Jobs accessible in 30, 45 and 60 minutes by walking and transit for different groups in Miami-Dade

4 Key Choices and Next Steps

Key Choice: Role of County and Municipal Operators

Redesigning Municipal Trolleys

A key assumption in both the Ridership and Coverage Concepts is that a significant change in the design of the county and municipal transit networks is acceptable and desirable, if it improves access and opportunity for most people.

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. **Should trolleys—specifically Miami and Miami Beach Trolleys—be redesigned to be more complementary to a county-wide network?**

Both the Ridership and Coverage Concepts achieve significant access improvements by redesigning the trolley networks in the Cities of Miami and Miami Beach. Redesigning the City of Miami network is particularly fruitful, because it allows the City and County to create complementary services across multiple major corridors. Thus, the combined network takes most people farther, faster, independent of the question of who operates the service. As a result, both Concepts increase job access for most people, particularly in Miami and Miami Beach, where reduced duplication can unlock substantial service improvements.

Redesigning trolley service in the City of Miami unlocks enormous resources to increase job access within Miami and large parts of the county.

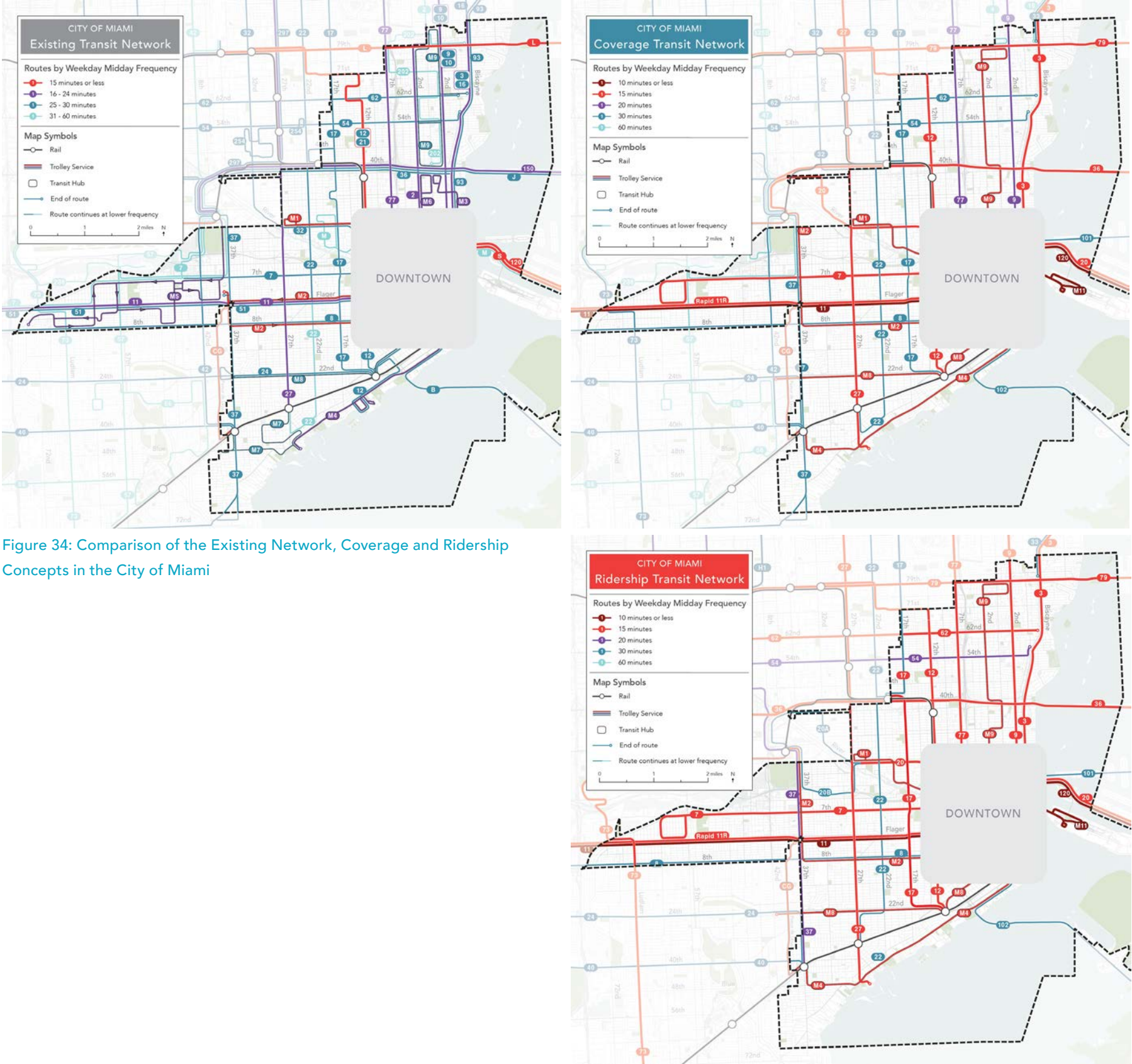


Figure 34: Comparison of the Existing Network, Coverage and Ridership Concepts in the City of Miami

Key Choice: Stop Spacing

On most local routes in Miami-Dade, stops are about every 850 feet apart, which is about every 1.5 blocks. 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 35 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.

Miami blocks are typically about 660 feet long. Widening stop spacing to every 2 blocks would result in stops about every 1,320 feet (1/4 mile). Every 4 blocks would result in spacing of about every 2,660 feet (1/2 mile).

Both the Coverage and Ridership Concepts assume that stop spacing is widened to every 1/4 mile on most routes, meaning that most services can operate about 10% faster, getting riders to their destinations sooner, and allowing the county to run more service for the same dollars.

There are two major downsides to widening stop spacing. First, some people have difficulty walking and will be inconvenienced by a longer walk. Seniors and people with disabilities are more likely to feel inconvenienced by this change. Second, as stops are spaced farther apart, transit becomes less useful for very short trips. This is because walking distances at each end of the trip increase to the point that very short trips would be faster by walking or biking. Some cities and agencies view this as a good thing, arguing that the point of transit is to provide an alternative to driving, not an alternative to walking.

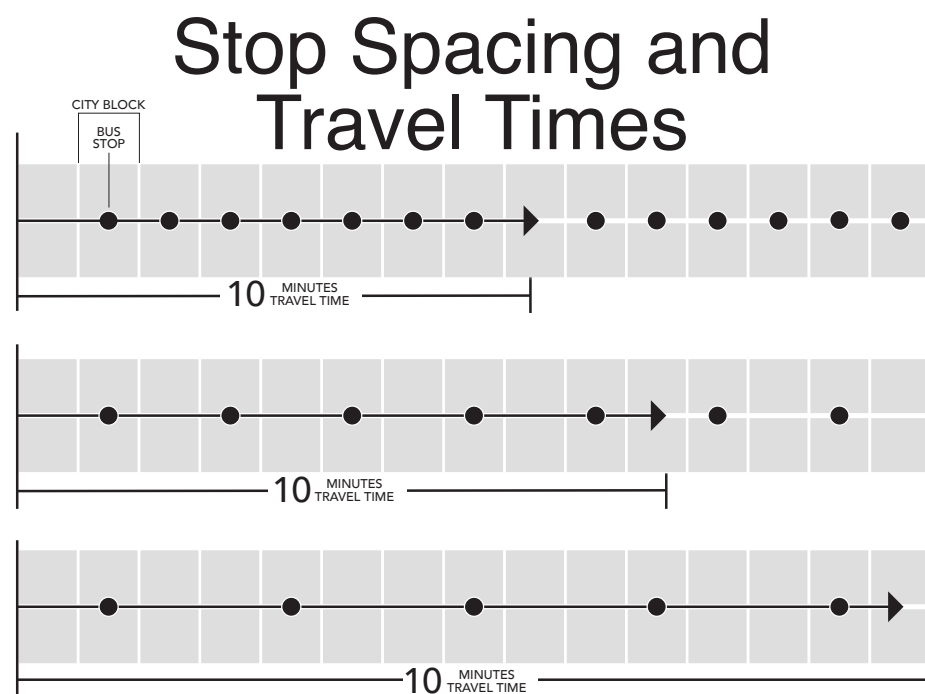
One key to a successful revision of stop spacing is for it to be a consistent policy applied in all comparable circumstances across the city, and tied to a clear citywide benefit in travel times. Many transit agencies have successfully widened stop spacing where these benefits were clear.

Most transit agencies, including Miami-Dade Transit, have networks that draw some compromise between maximizing the number of people who have short walks to a bus stop and maximizing the speed of service by having stops farther apart. It is worth asking the question:

What is more important: Having very short walks to a stop, even if it means slower service and longer trips? Or having longer walks to a stop and having faster bus trips and, potentially, more bus service?

Wider stop spacing would result in an increase in average bus speeds of about 10%, getting riders to their destinations faster.

Figure 35: Trade-off between stop spacing and travel time



Key Choice: Ridership or Coverage

The most important question governing the design of any transit network: should the service be designed to generate the most ridership (and in doing so, serve a range of other associated goals), or to reach more people?

Ridership-oriented networks serve several popular goals for transit, including:

- Reducing environmental impact through fewer Vehicle Miles Travelled.
- Achieving low public subsidy per rider, by serving more riders with the same resources, and by fares collected from more passengers.
- Allowing continued urban development, even at higher densities, without being constrained by traffic congestion.

On the other hand, coverage-oriented networks serve a different set of goals, including:

- Ensuring that everyone has access to some transit service, no matter where they live.
- Providing lifeline access for those who cannot drive.
- Providing access for people with severe needs.
- Providing a sense of political equity, by providing service to every municipality or electoral district.

Success is defined differently depending upon the goal. A network focused on coverage is not seeking to generate high ridership, so its success should not be evaluated based on its productivity; what matters is the degree to which service is available to the population. On the other hand, when ridership is the explicit goal, the key measure of success is return on investment (in terms of ridership) of every unit of service deployed.

Ridership and coverage goals are both laudable, but they lead us in opposite directions. Within a fixed budget, if a transit agency wants to do more of one, it must do less of the other. Many agencies act as though these goals were not in conflict, promising that they will “increase ridership while ensuring that all residents have access,” or “run efficiently” and “provide access for all.” This generally leads to a feeling among the public, elected officials and even transit staff themselves that no matter what they do, they are failing to achieve their goals.

This is the natural result when major goals are in conflict. If a high-ridership bus line is crowded, a transit agency is criticized for not offering enough

frequency; yet if they remove buses from a low-ridership line to reallocate them to the high-ridership line, they are criticized for cutting someone’s lifeline transit access. Only by acknowledging the conflict between these goals, and explicitly deciding how much effort to use pursuing each, can a transit agency succeed at both.

It is often said about public and private organizations alike that if you want to know what really matters, look at their budgets. High-level policies are valuable, but when they are vague or in conflict, the real evidence of a community’s values is in its budget. Thus we suggest that Miami-Dade think about this choice not as black-and-white, but as turnable dial that the community can help to set:

What percentage of the available budget for transit should be dedicated to generating as much ridership as possible, and what percentage should be spent providing transit where ridership is predictably low, but needs are high?

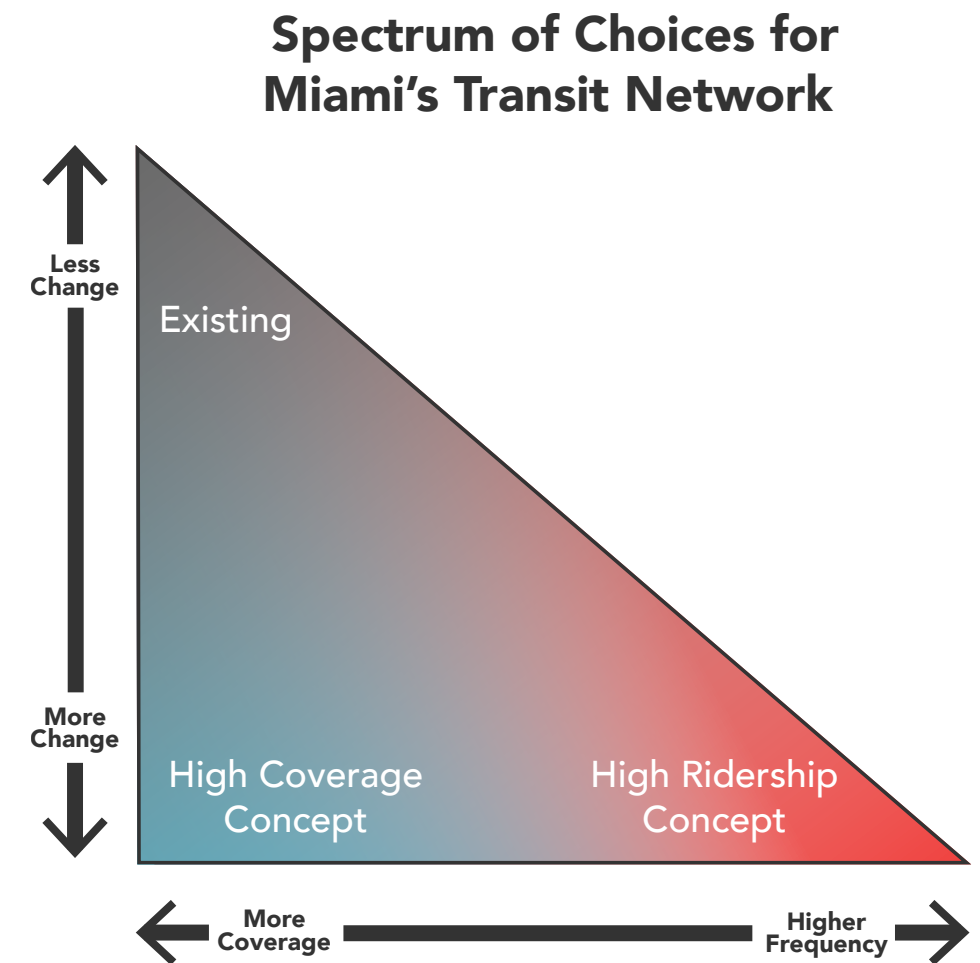
The Coverage and Ridership Concepts, along with the Existing Network, represent a spectrum of possibility on the key policy questions including the ridership-coverage trade-off:

- The Existing Network devotes about 70% of its resources to maximizing ridership and while the other 30% has predictably low-ridership, because of where or when it runs, or other factors that make it useful to predictably-small numbers of people.
- The Coverage Concept devotes about 80% of its resources to maximizing ridership while the other 20% is pursuing coverage goals.
- The Ridership Concept devotes about 90% of its resources to maximizing ridership while the other 10% is pursuing coverage goals.

A existing 70/30 balance between maximizing ridership and providing coverage may be the right balance for Miami-Dade in the future, or the community may wish for a shift in purpose. The initial input from the community and stakeholders during the workshops and surveying completed in Phase 1 suggests that people would like to shift in the direction of ridership goals.

The Coverage and Ridership Concepts give people clearer pictures of what turning that dial toward ridership would look like and the outcomes it would achieve. With a clearer picture of the effects of shifting toward ridership goals, whether to make a shift, in what direction—either towards higher or wider coverage—and how fast Miami-Dade should make such a shift are key questions that will be put to the public, stakeholders and elected officials in the second phase of outreach for the Better Bus Project.

Figure 36: Triangle showing range of possibilities for the Miami-Dade Bus Network



Next Steps

What happens next?

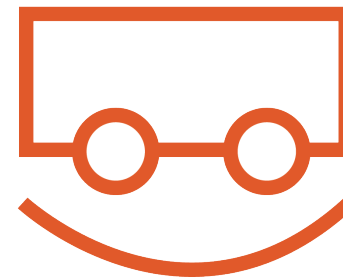
This Concepts Report will inform public and stakeholder outreach as part of the second phase of the Better Bus Project. Transit Alliance will be conducting surveys and other outreach efforts during the fall of 2019. That outreach process will include the key questions that the Concepts raise and responses from the public and stakeholders will guide the policy direction on how to design the new network for Miami-Dade.

With direction from the public and stakeholders, the project team will design a Draft Recommended Network that would be a proposal to change transit service in the county. The proposal will include maps of the new routes, and measures like job access change, proximity to service, and speed of service will be summarized in a report for the public and stakeholder to review in early 2020. The concepts will then be the center of another public conversation to finalize the New Miami-Dade Bus Network.

The outreach process around conceptual networks will start in September and a new survey will be available at that time to provide the public an opportunity for input on these Concepts to help guide the eventual proposal.

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

- take the Phase 2 survey;
- sign up for the project newsletter;
- watch videos that summarize key choices and the network redesign process;
- request a community presentation, or just email and check in with the project team;
- sign up to volunteer or work with Transit Alliance to spread the word and support outreach efforts for the Better Bus Project; and
- generally stay up to date on the latest happenings with the network redesign process!



Better Bus Project

This Concepts Report is part of Phase 2 of the Better Bus Project. Future Phases will have more opportunities for transit riders, residents, and stakeholders to participate in the process.

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.

We are holding a series of workshops to determine how to shape the final network plan.

PHASE 3

Final

December – February

The final network plan will be voted on by the Board of County Commissioners.

If the plan is approved, we will hold information sessions ahead of the plan being implemented in 2020.

Your voice matters! Contact the project team and take the Better Bus Project survey at www.betterbus.miami

Appendix A: Phase 1 Public Input

Public Engagement

Public Engagement

In the first round of engagement for the Better Bus Project, the Evaluation Phase, we asked the public and community stakeholders about their values and priorities for transit, and how they might balance certain trade-offs in Miami-Dade. These trade-offs are consistent with the findings presented in the [Choices Report](#) in July 2019.

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;
- surveyed the public and existing riders (in English, Spanish, and Creole) online and in person on the bus.

Survey Respondent Demographics

In total, 2,295 people responded to the survey.

Figure 37 shows the racial and ethnic identity of respondents. About 50% of respondents identify as Spanish/Hispanic/Latino and about 25% identify as Black/African-American. Census data¹ indicates that about 70% of Miami-Dade residents identify as Hispanic or Latino and almost 20% identify as Black/African-American. Overall, the racial and ethnic mix of survey respondents is diverse but still underrepresents the Hispanic/Latino and Black/African-American population of Miami-Dade County.

¹ The Census allows people to identify race and ethnicity independently, so someone may identify as both Hispanic and Black. In this survey, a respondent could only choose one category, thus it is not possible to provide a direct correlation to Census demographics.

Figure 38 shows the age ranges of respondents. Most respondents are between 25 and 64 years of age, with about 40% of respondents between 25 and 44 years and about 30% between 45 and 64 years. The survey responses slightly underrepresent seniors (about 10% in the survey compared to 15% of the Miami-Dade population), while the number of young respondents (under 24 years of age) is disproportionately low (almost 20% in the survey compared to about 30% of the Miami-Dade population).

Figure 37: Race or Ethnicity of Phase 1 Survey Respondents

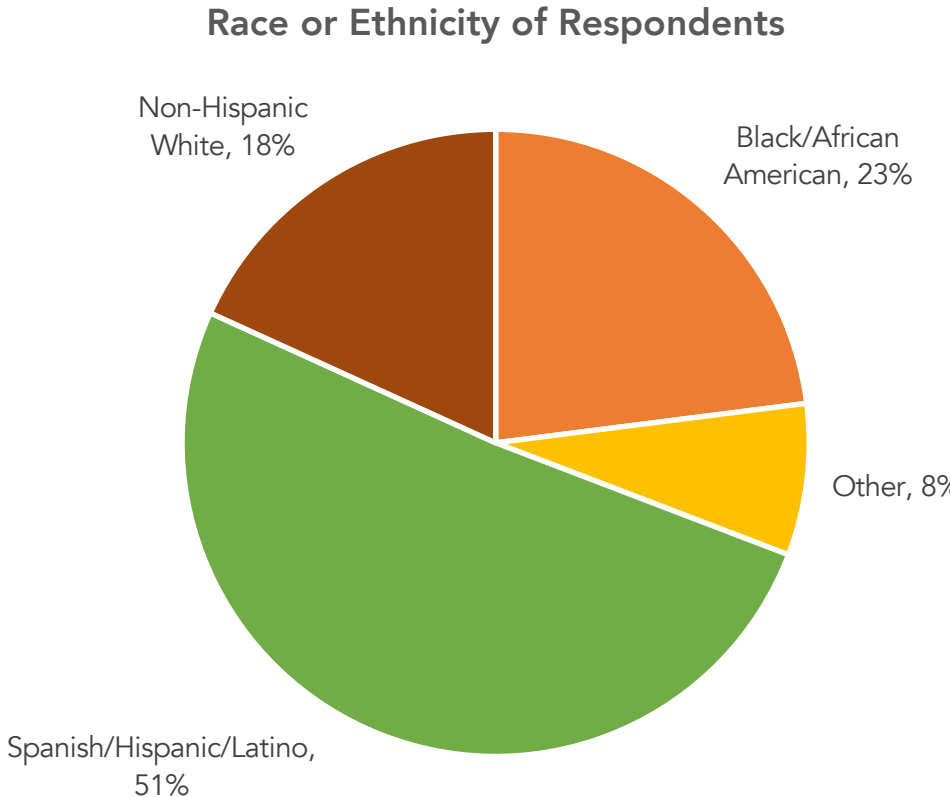
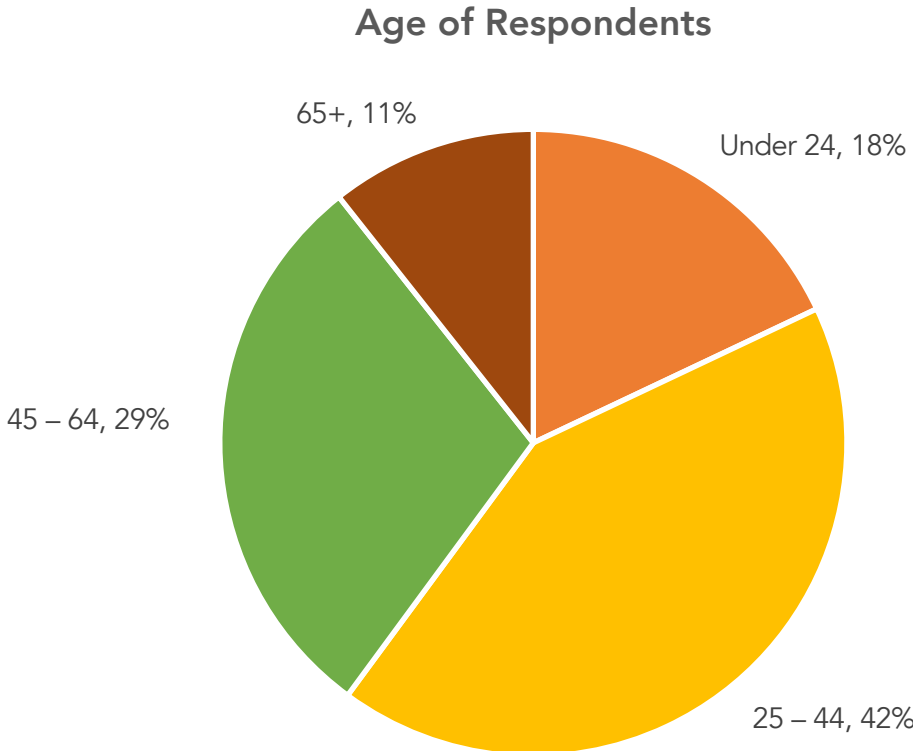


Figure 38: Age of Phase 1 Survey Respondents



Survey Respondents Favor Ridership Goals

Survey Responses

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?
- Should we remove buses on the least popular routes to increase service on the most crowded routes?
- Should we run more buses where we have the most bus riders in Miami-Dade County and less service everywhere else?

Within a fixed budget, shifting resources toward Ridership would put more buses on routes that are often full today and add more service in places where large numbers of potential and existing bus riders live, work, and shop, but it would remove buses from low-ridership routes and low density. Shifting toward Ridership usually results in shorter waits for the bus, but longer walks to stops.

Walking vs. Waiting

The first engagement question focuses on the trade-off between walking and waiting, which relates to Ridership vs. Coverage goals. If Miami-Dade chooses to shift towards Ridership, adding frequency is key. However, within a fixed budget, increasing frequency means consolidating service into fewer routes, thereby increasing walk distances to stops.

“Would you rather have a longer walk for a shorter wait, or a shorter walk with a longer wait?” Figure 39 shows that nearly 50% of respondents say they want whatever gets them to their destinations fastest, suggesting that they will walk farther to reach more frequent service (which results in a shorter wait for the bus, and usually a shorter trip time). Additionally, more than 30% of respondents say they prefer a longer walk to a bus stop for a shorter wait. Less than 20% say they prefer a shorter walk to the bus stop, even if it requires a longer wait for the bus. Basically, most respondents favor shorter waits, even if it means longer walks—and these are usually the results of Ridership goals.

Ridership vs. Coverage

The second and third engagement questions ask the public what type of network outcomes they prefer, related to Ridership vs. Coverage goals.

“Should we remove buses on the least popular routes to increase service on the most crowded routes?” In Figure 40, we see that respondents are split evenly, with 43% in favor of shifting buses from low-ridership routes to most crowded routes, and 43% opposed. 15% of respondents are neutral. Based on this question, respondents seem 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?” Figure 41 shows that most respondents agree, with over 55% in favor of shifting resources to the busiest transit areas. Less than 30% of respondents are opposed, while about 15% are neutral. Based on this question, a majority of the public is willing to the overall balance of the system towards Ridership goals that focus transit service on denser areas.

Figure 39: Responses to Walking vs. Waiting Trade-off

Would you rather have a longer walk for a shorter wait, or a shorter walk with a longer wait?

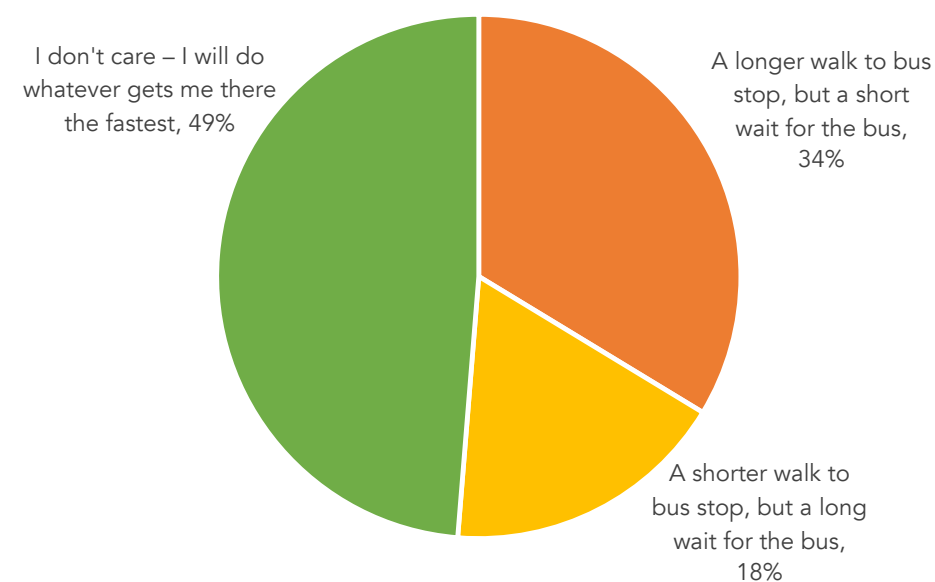


Figure 40: Responses to Shifting Resources to Most Popular Routes

Should we remove buses on the least popular routes to increase service on the most crowded routes?

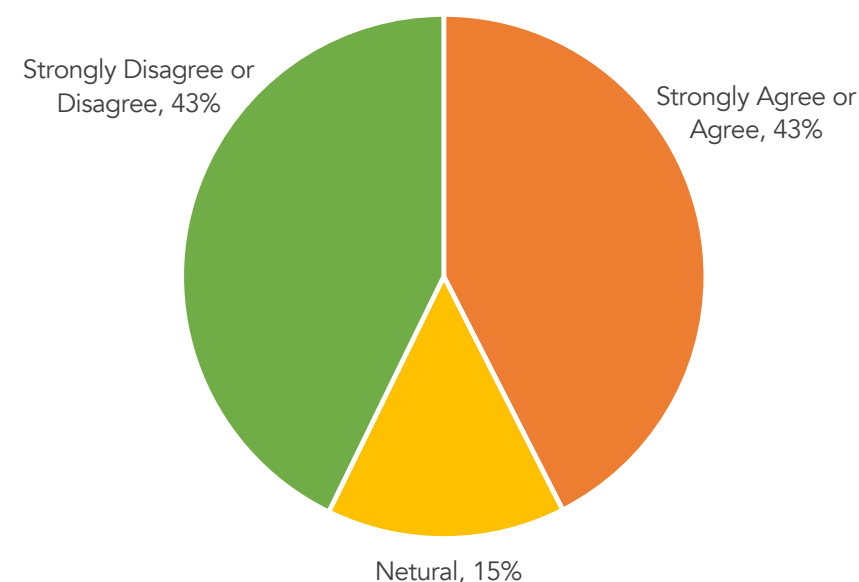
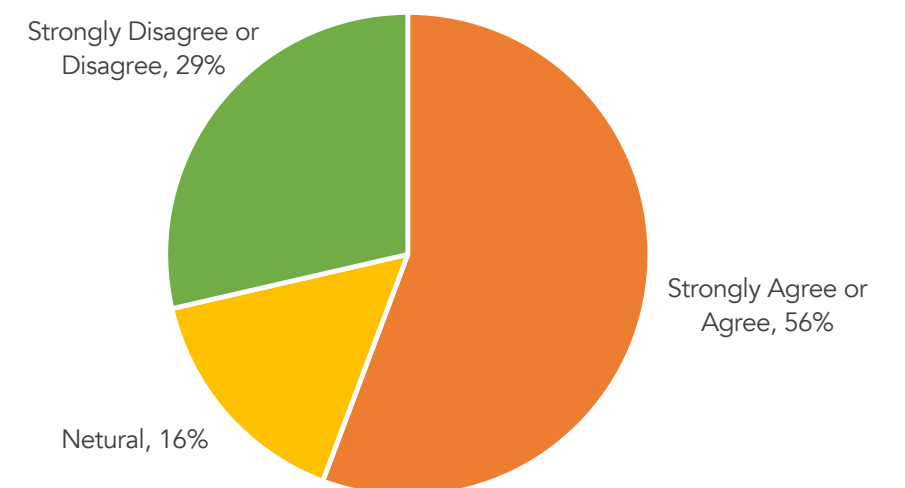


Figure 41: Responses to Shifting Resources to Highest Density Areas

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



Phase 1 Priorities Workshop

Priorities Workshop

On June 26, 2019, the Better Bus Project hosted about 50 municipal representatives, business leaders, and community organization representatives to participate in a day-long Transit Priorities Workshop. Staff from Jarrett Walker + Associates facilitated the workshop to engage community leaders in a conversation around the key choices outlined in the [Choices Report](#). The workshop featured a variety of interactive exercises to help stakeholders learn and understand transit geometry and trade-offs alongside other community leaders. Stakeholders were then asked to share their views on the transit trade-offs and needs in Miami-Dade.

Why do this workshop?

Planning for transit requires two parallel planning processes: one is technical and one is based on values.

In the technical process of transit planning, we deal with limits and possibilities dictated by geometry, geography, and technology. Technical analyses can tell us what is possible under certain levels of funding and certain conditions. But a technical analysis cannot tell us what is right or best for a community, unless it is guided by a discussion about values and priorities.

In the values-based part of transit planning, we deal with questions to which there is no universally correct answer—questions over which reasonable people can disagree. These questions are the key choices described in the Choices Report and in this Concepts Report.

People will answer these questions differently, depending on personal preferences and values, or on the values of the organization or group they represent. More fundamentally, people will also disagree about which benefits from transit are most important. This is why engaging stakeholders and the public are crucial, as only they can make a decision on what is right for their community.

The workshop involved three key activities:

- An educational transit planning game designed to teach the participants about the real trade-offs involved in transit and to give them a sense of how their own values can be expressed through network design in a fictional city.
- A review of the existing land use conditions, transit network, and transit performance in Miami-Dade.
- A series of anonymous polling questions posed at the end of the workshop. The workshop introduced stakeholders to the principles of transit planning so they could clarify their own views, and thus provide clear and actionable input to the Better Bus Project, Miami-Dade Transit, and municipal transit operators.

By engaging intensely in exercises and thinking about their own values in transit, the stakeholders involved in the Priorities Workshop can better understand and explain the key issues that the community needs to consider as it thinks about transit priorities and goals.



Figure 42: Groups of stakeholders engaged in a transit planning exercise during the Priorities Workshop



Stakeholders Favor Ridership Goals

Silent Polling Results

At the end of the workshop, stakeholders responded to several high-level questions with silent polling devices.

Stakeholders were first asked whether they prefer walking or waiting, similar to the walking vs. waiting question in the public survey. Figure 43 shows that over 30% of respondents prefer whatever gets them to their destination soonest, while nearly 50% prefer a longer walk to the bus stop for a shorter wait. Less than 25% prefer a shorter walk to the stop but longer wait for the bus. This suggests that most stakeholders would prefer a high frequency network oriented toward Ridership goals, even if it means longer walks to the bus.

Stakeholders were then asked what Ridership vs. Coverage balance they would like to see for Miami-Dade transit. Ridership and Coverage are described as two competing goals:

- Generating high ridership through investment in the most productive transit markets; vs.
- Providing coverage (any access to the transit system, often at low frequency) to the widest area, through serving the largest number of people and jobs, regardless of ridership potential.

The Existing Network in Miami-Dade dedicates 70% of the operating budget to Ridership goals, with 30% spent on Coverage goals and duplicative service.

Figure 44 shows that over 70% of responding stakeholders would like to “shift a lot toward higher frequencies and higher ridership.” About 20% want to “shift a little bit towards higher frequencies and higher ridership.” Only 7% of respondents want to maintain the current balance of Ridership and Coverage goals, and no respondents want to shift towards Coverage goals.

Finally, stakeholders were asked what balance they would like to see between peak (rush hour) service and all-day service (across the whole day, evening, and weekends). As described in the [Choices Report](#), peak service has high costs that are often hidden, and the service tends to be less productive. Additionally, evening and weekend service are often underserved in transit markets.

Figure 45 shows that 35% of stakeholders believe that peak times need more service than today, while no respondents prefer the current amount of peak service. 35% of respondents want to shift a little service from the peak to other times of day, over 10% would like to shift a lot of service from the peaks to other times, and close to 20% believe that service should be constant throughout every day. Taken together, these last three suggest that a large majority (65%) of stakeholders think at least some service should shift from the peak to other times of the day.

Stakeholder Guidance

This transit workshop was not intended to provide definitive guidance on how Miami-Dade should design its network. Alongside the technical analysis conducted by staff and extensive input from the public, feedback from stakeholders will help shape the final form of the future transit network in Miami-Dade.

We caution against drawing conclusions from the workshop, as feedback may be skewed due to self-selection bias. More than 70 stakeholders were invited, an invitation list that was designed to reflect a diverse set of interests and views. However, people less interested in transit were less likely to attend, and out of the 70 people invited, only 50 stakeholders participated. For that reason, the responses shown here should not be construed as definitive.

At the same time, attendees were motivated and invested, and most leaders found common ground in desired transit outcomes, despite representing diverse interests from the community. These leaders will work to build consensus amongst the public toward these transit outcomes they all view as important. Thus, feedback from the workshop is a good indicator of the direction Miami-Dade will likely shift in the future, though it is not definitive.

Figure 43: Stakeholder Responses to the Walking vs. Waiting Trade-off

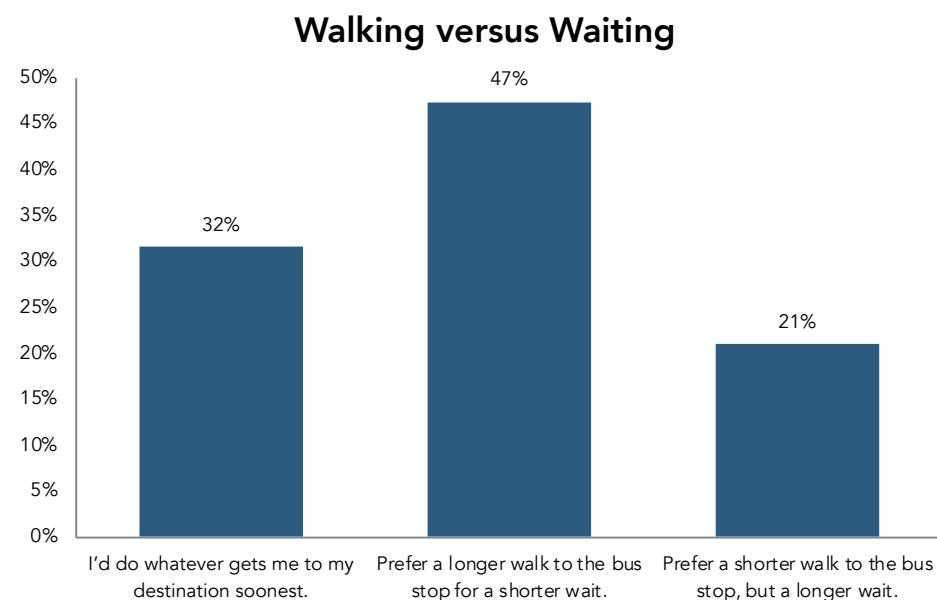


Figure 44: Stakeholder Responses to the Ridership vs. Coverage Balance

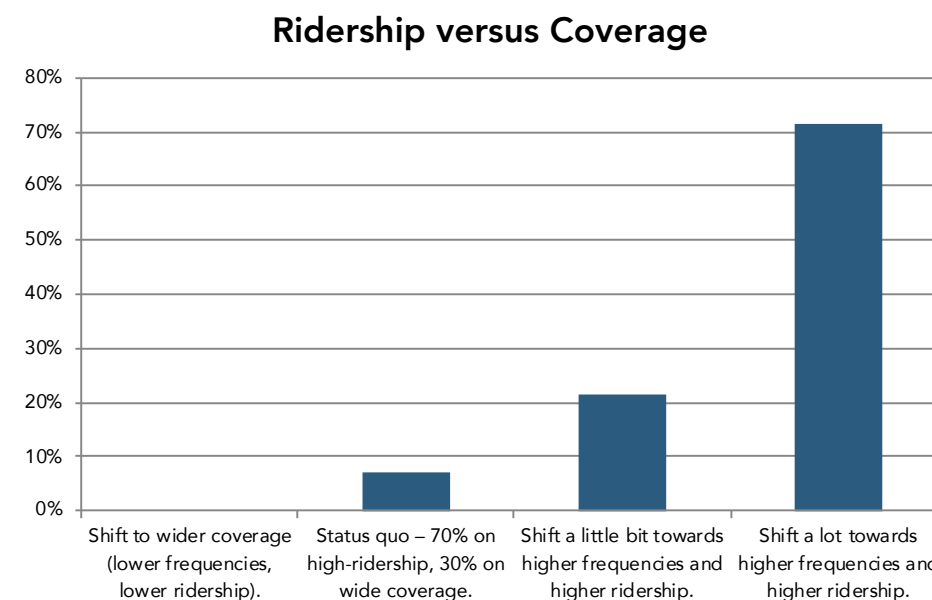
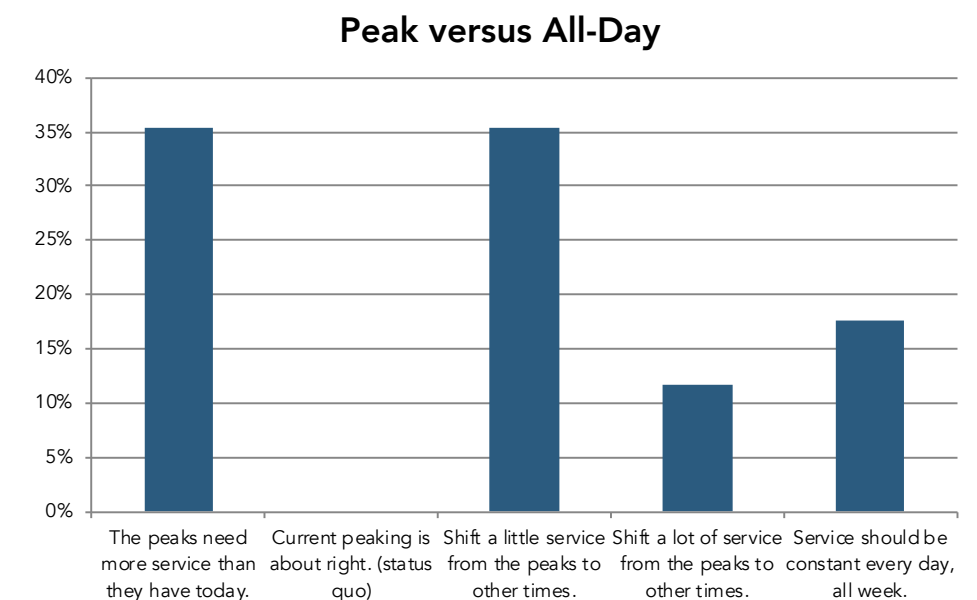
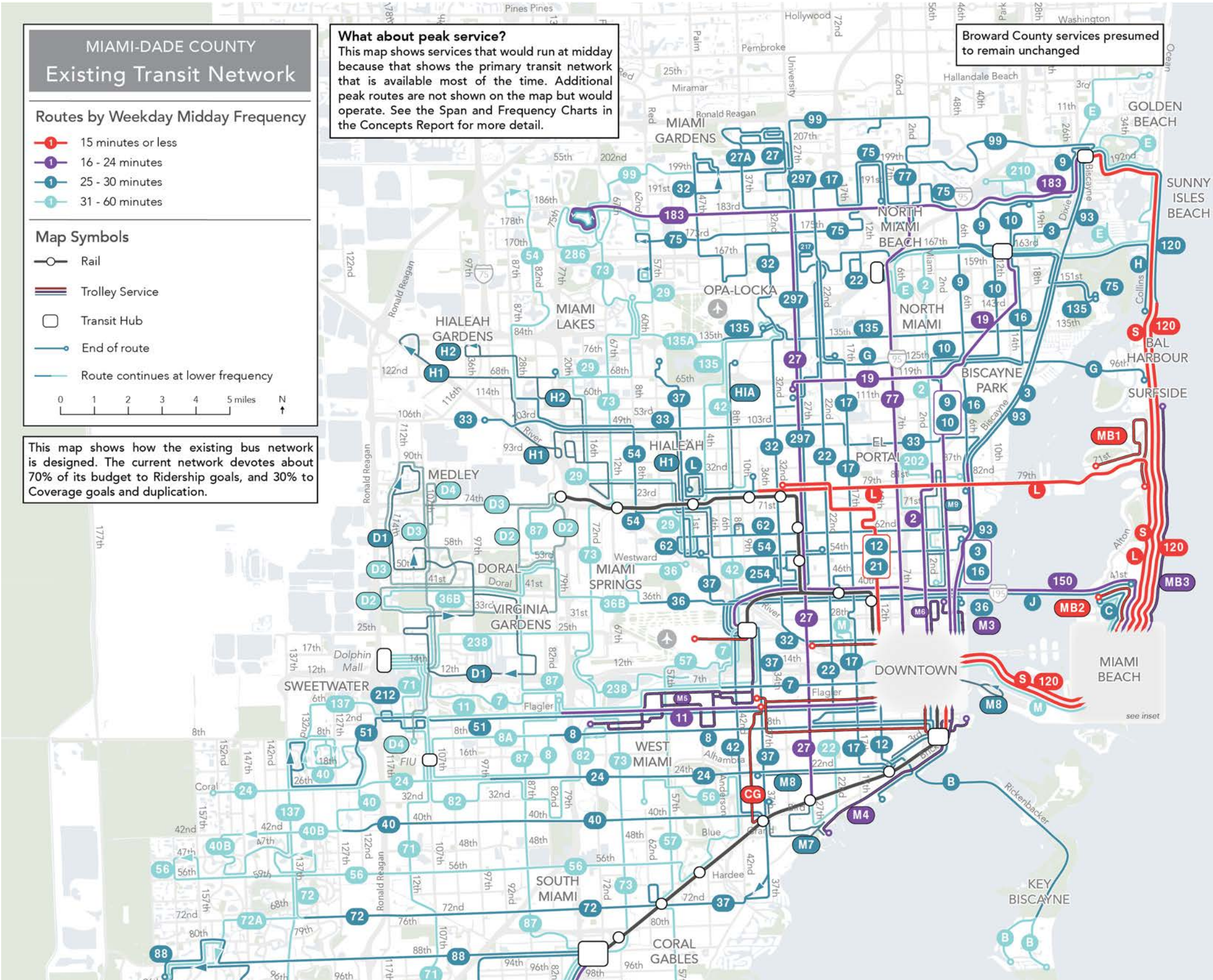


Figure 45: Stakeholder Responses to the Peak vs. All-Day Service Balance



Appendix B: Detailed Concept Maps

Existing Network: North County



Existing Network: South County

MIAMI-DADE COUNTY
Existing Transit Network

Routes by Weekday Midday Frequency

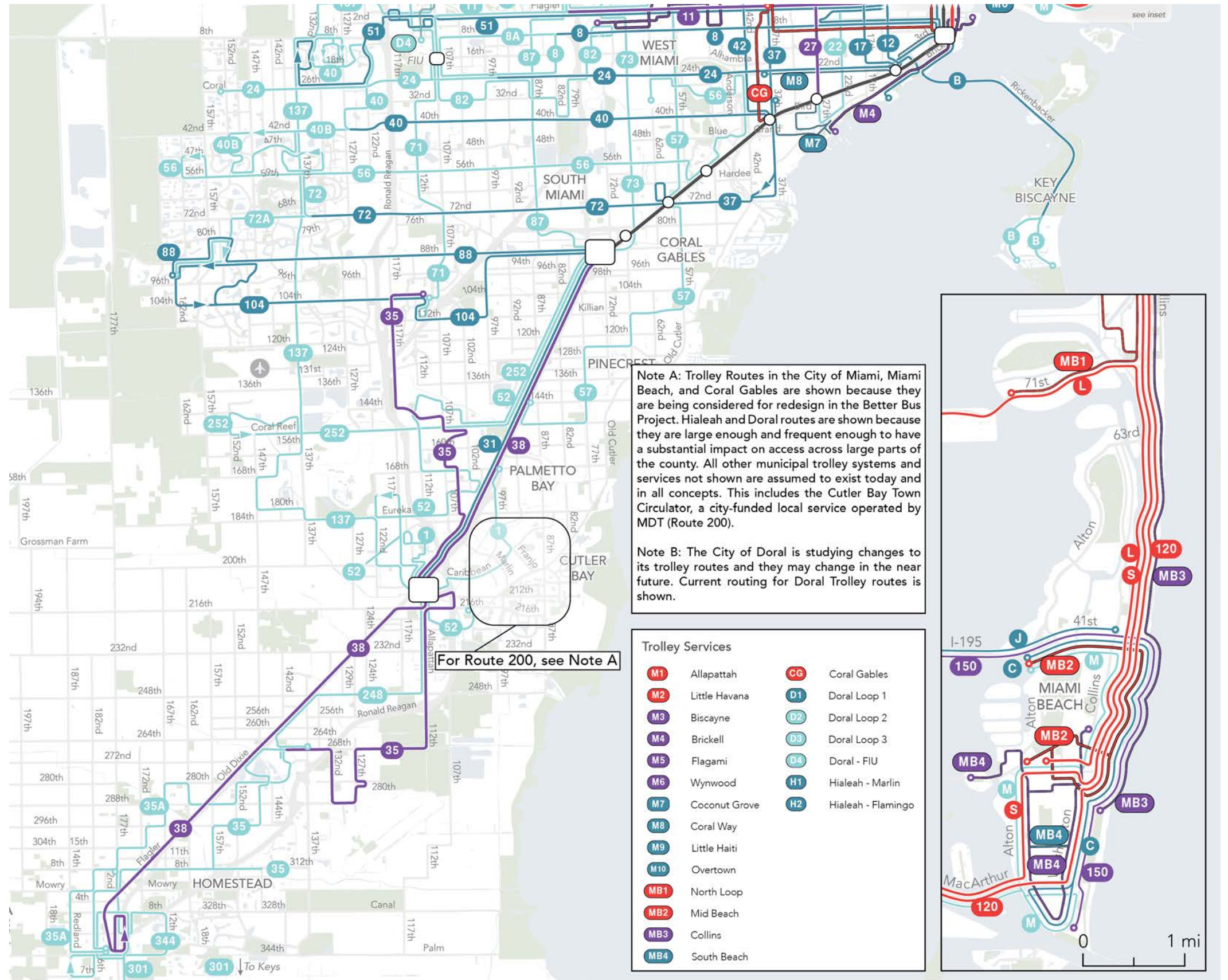
- 15 minutes or less
- 16 - 24 minutes
- 25 - 30 minutes
- 31 - 60 minutes

Map Symbols

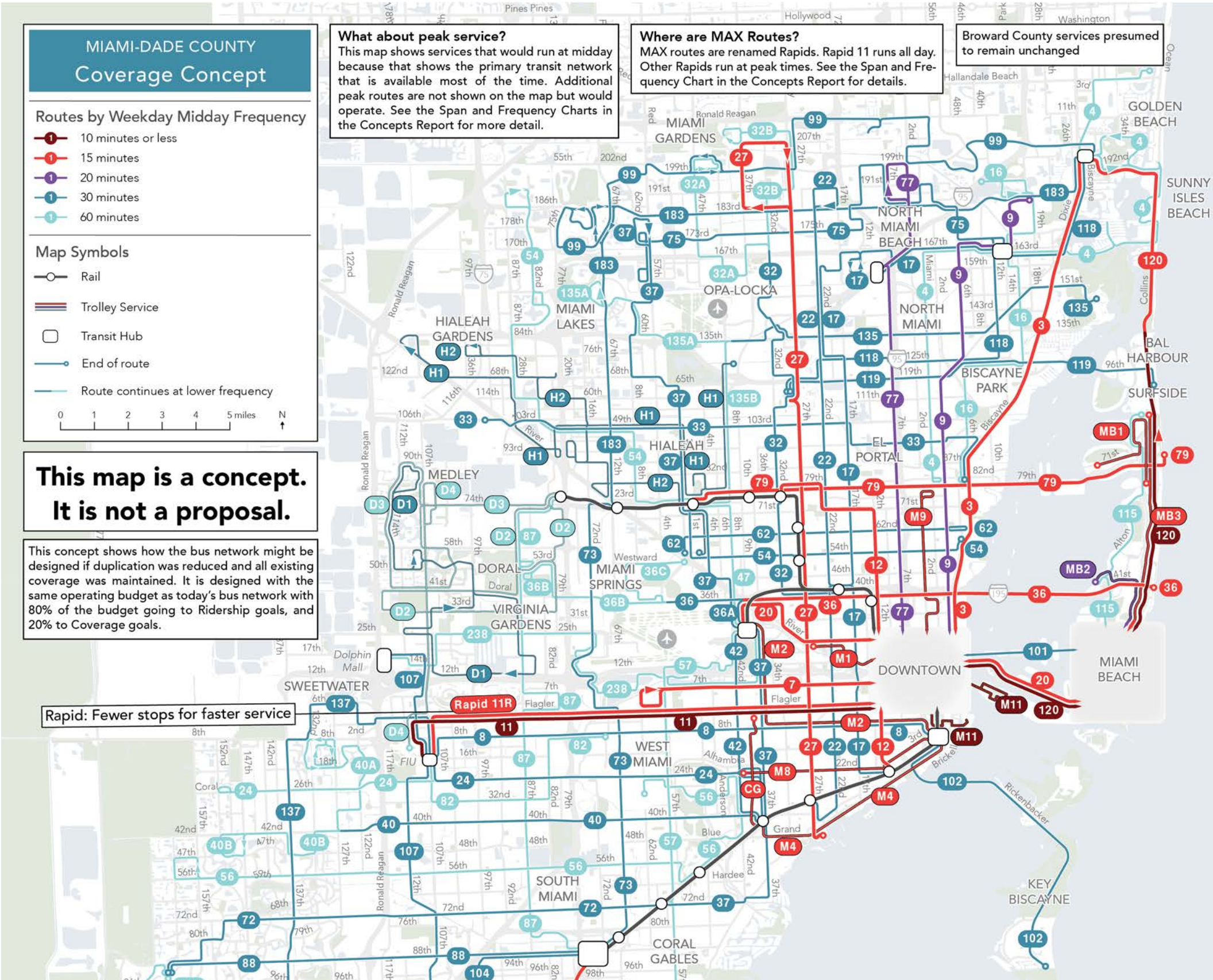
- Rail
- Trolley Service
- Transit Hub
- End of route
- Route continues at lower frequency

0 1 2 3 4 5 miles N ↑

What about peak service?
This map shows services that would run at midday because that shows the primary transit network that is available most of the time. Additional peak routes are not shown on the map but would operate. See the Span and Frequency Charts in the Concepts Report for more detail.



Coverage Network: North County



MIAMI-DADE COUNTY Coverage Concept

Routes by Weekday Midday Frequency

- 10 minutes or less
- 15 minutes
- 20 minutes
- 30 minutes
- 60 minutes

Map Symbols

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

0 1 2 3 4 5 miles N ↑

What about peak service?
This map shows services that would run at midday because that shows the primary transit network that is available most of the time. Additional peak routes are not shown on the map but would operate. See the Span and Frequency Charts in the Concepts Report for more detail.

Where are MAX Routes?
MAX routes are renamed Rapids. Rapid 11 runs all day. Other Rapids run at peak times. See the Span and Frequency Chart in the Concepts Report for details.

Broward County services presumed to remain unchanged

This map is a concept. It is not a proposal.

This concept shows how the bus network might be designed if duplication was reduced and all existing coverage was maintained. It is designed with the same operating budget as today's bus network with 80% of the budget going to Ridership goals, and 20% to Coverage goals.

Rapid: Fewer stops for faster service

Coverage Network: South County

MIAMI-DADE COUNTY Coverage Concept

Routes by Weekday Midday Frequency

- 10 minutes or less
- 15 minutes
- 20 minutes
- 30 minutes
- 60 minutes

Map Symbols

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

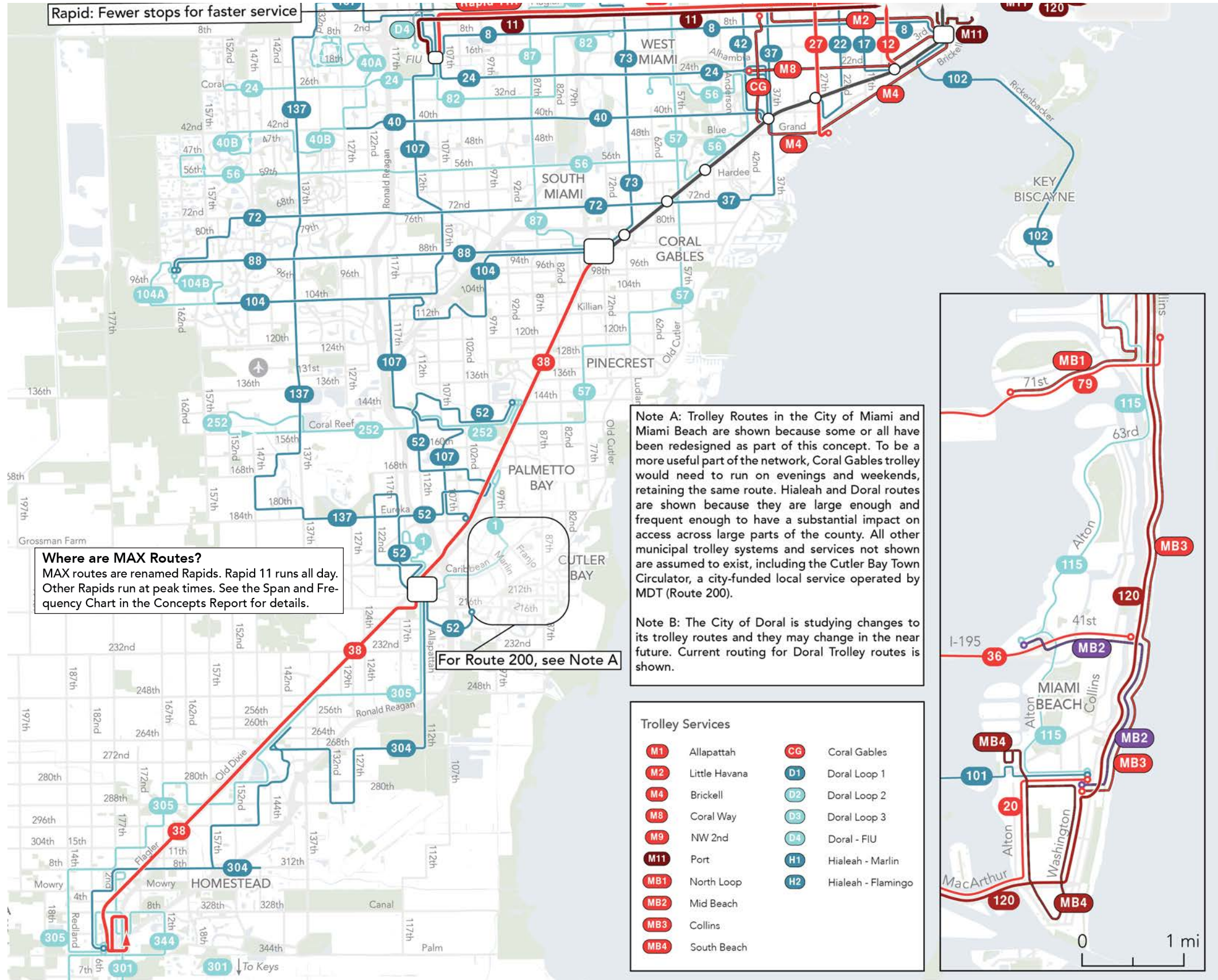
0 1 2 3 4 5 miles N ↑

**This map is a concept.
It is not a proposal.**

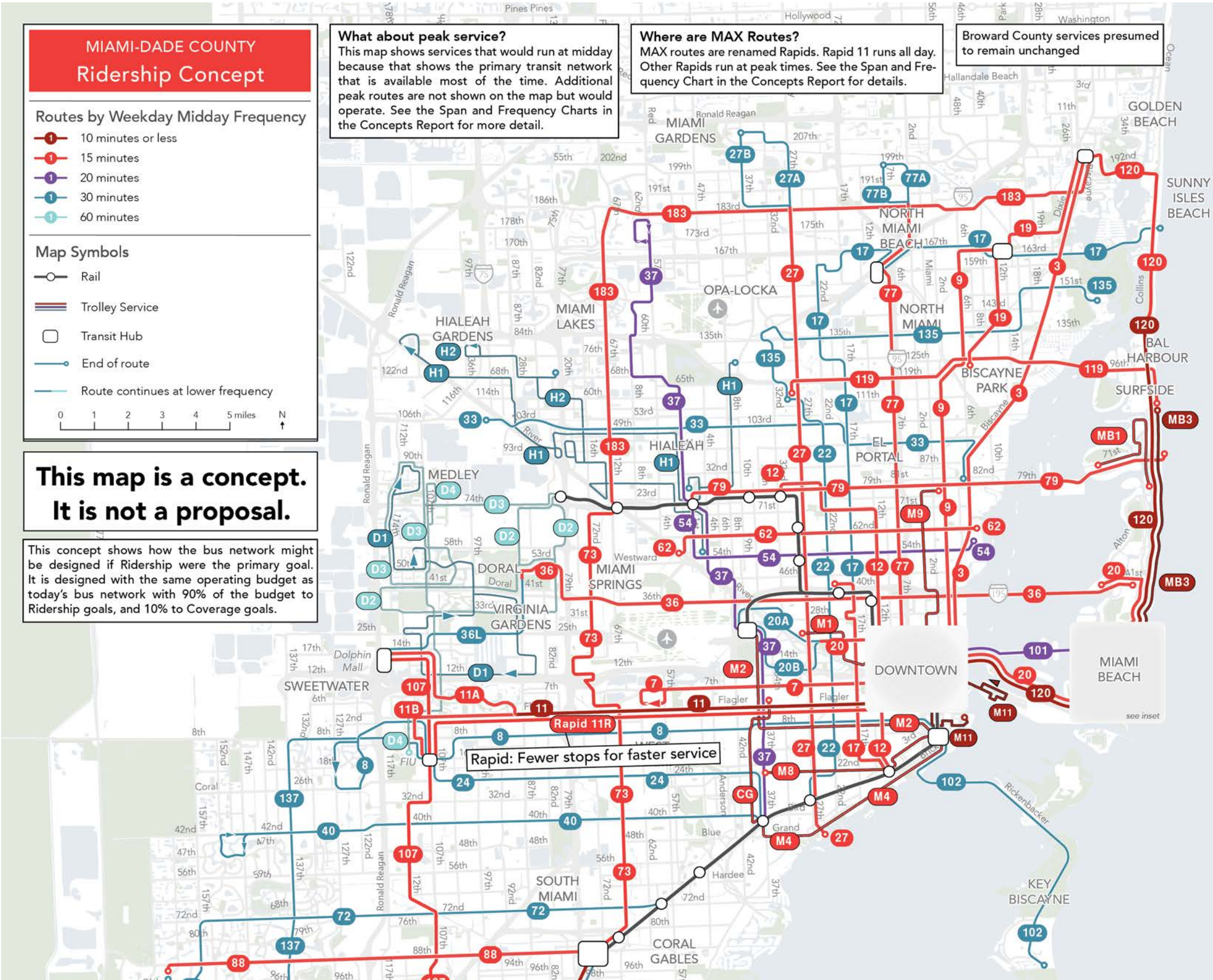
This concept shows how the bus network might be designed if duplication was reduced and all existing coverage was maintained. It is designed with the same operating budget as today's bus network with 80% of the budget going to Ridership goals, and

What about peak service?

This map shows services that would run at midday because that shows the primary transit network that is available most of the time. Additional peak routes are not shown on the map but would operate. See the Span and Frequency Charts in the Concepts Report for more detail.



Ridership Network: North County



Ridership Network: South County

**MIAMI-DADE COUNTY
Ridership Concept**

Routes by Weekday Midday Frequency

- 10 minutes or less
- 15 minutes
- 20 minutes
- 30 minutes
- 60 minutes

Map Symbols

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

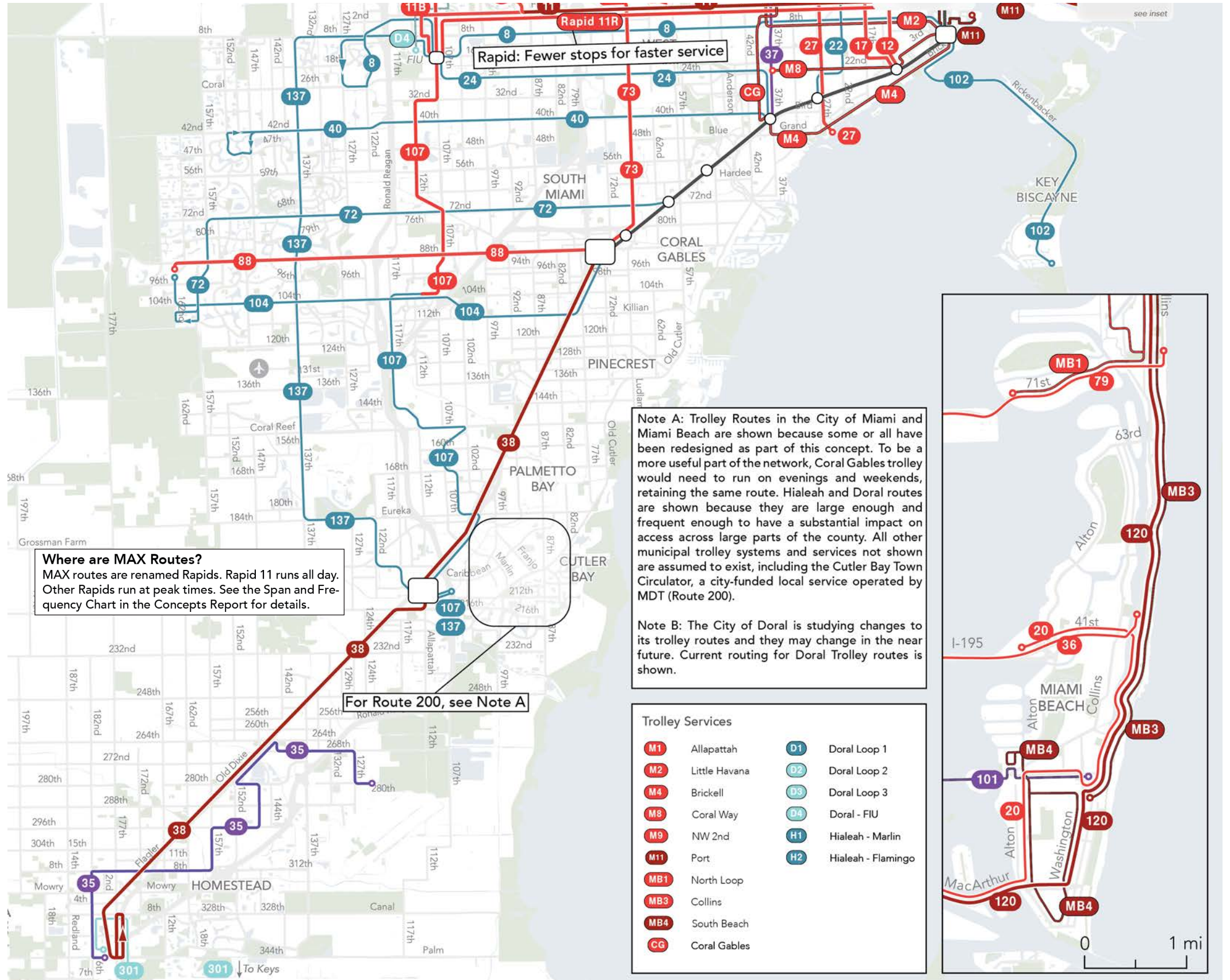
0 1 2 3 4 5 miles N ↑

**This map is a concept.
It is not a proposal.**

This concept shows how the bus network might be designed if Ridership were the primary goal. It is designed with the same operating budget as today's bus network with 90% of the budget to Ridership goals, and 10% to Coverage goals.

What about peak service?

This map shows services that would run at midday because that shows the primary transit network that is available most of the time. Additional peak routes are not shown on the map but would operate. See the Span and Frequency Charts in the Concepts Report for more detail.



Existing Downtown Network

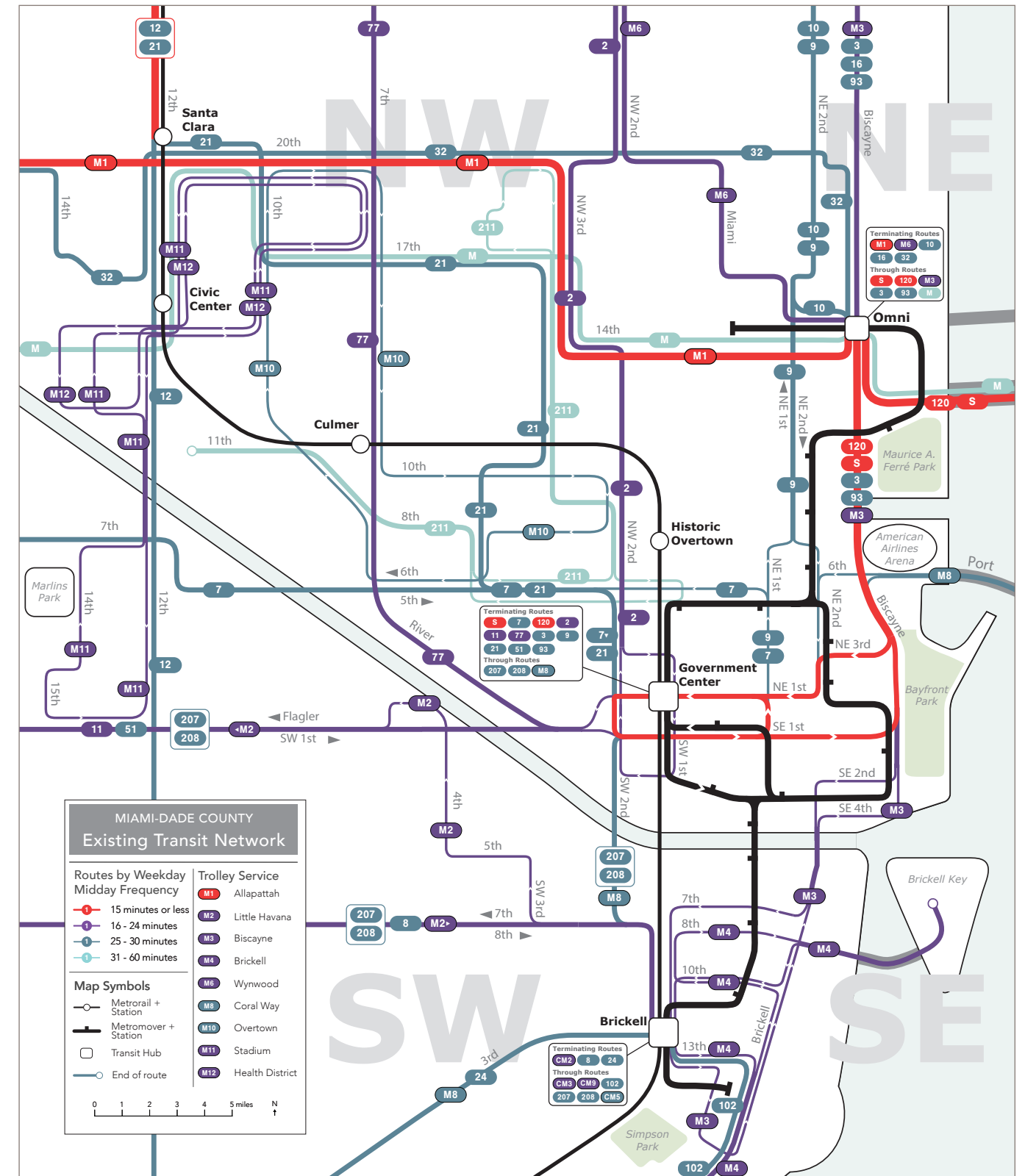
Figure 46 shows the map of the Existing Network within and near Downtown Miami.

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

The Existing Network creates a lot of complexity 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 specific trip needs.

This complexity can make it difficult for new riders and visitors to understand and use the system.

Figure 46: Existing Transit Network in and around downtown Miami.



The Coverage Concept in Downtown

The map to the right shows the detail of how routes in the Coverage Concept 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 connections still require using Metrorail or Metromover, particularly to get between Government Center and Brickell connections. This design is a choice to try and avoid the reliability problems of running buses over the drawbridges across the Miami River.

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 20 minutes, similar to today.
- Route 2 is removed and replaced by a more frequent Miami Trolley Route (M9).
- Routes 9 and 10 are consolidated into an every 20 minute Route 9 along NE 2nd Ave.
- Routes 3 and 93 are consolidated into the more frequent Route 3.
- Route 120 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.
- 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 101 provides service from Omni Terminal, across the Venetian Causeway to Lincoln Terminal in Miami Beach every 30 minutes all day.
- The M1 Miami Trolley Route takes over service on NW/NE 14th and 17th Streets with service every 15 minutes.
- Frequency of service on Routes 7 and 11 is higher, meaning shorter waits for service to reach NW 7th and Flagler corridors.
- Miami Trolley Route M2 (Little Havana) is now two-way along SW 7th and 8th Streets, providing 15 minute service from Brickell to Little Havana and on to the airport. Route 8 operates every 30 minutes, providing service from Brickell to the SW 8th Street corridor west of 37th Avenue.

In downtown, the Coverage Concept would reduce duplication and increase the frequency of service on most corridors.

- Miami Trolley Route M8 provides service every 15 minutes from Brickell to Coral Gables via SW 3rd Avenue and 22nd Street. Route 24 has been shortened to end at Douglas Road Metrorail Station.
- Miami Trolley Route M4 provides service every 15 minutes via Brickell Avenue to Coconut Grove.
- Miami Trolley Route M11 provides service every 10 minutes from Brickell Key to Brickell Station, then onto Government Center, and the Port.

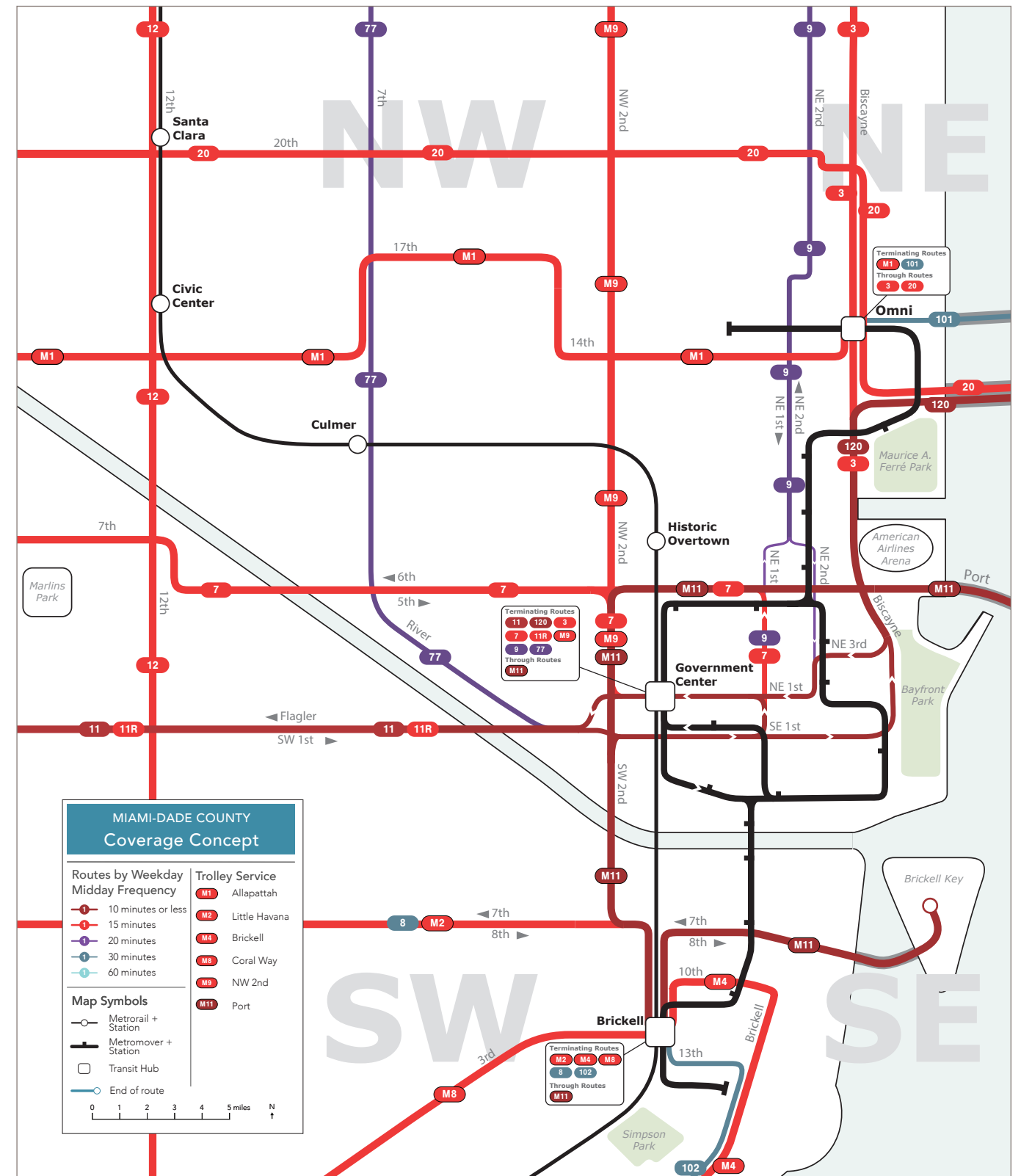


Figure 47: Coverage Concept in and around downtown Miami

The Ridership Concept in Downtown

The map to the right shows the detail of how routes in the Ridership Concept would serve Downtown Miami and surrounding areas. The network is very similar to the Coverage Concept, except for the following differences:

- Route 77 operates every 15 minutes, more frequently than the 20 minute frequency in the Coverage Concept.
- Routes 9 operates every 15 minutes along NE 2nd Avenue, more frequently than the 20 minute frequency in the Coverage Concept.
- Route 101 is every 20 minutes all day, more frequent than in the Coverage Concept.

In this Concept, routes 9 and 77 provide frequent service creating more easy connections with other frequent routes and thus expanding the network's high frequency grid, not only in Downtown, but also in the northern parts of the County.

Increased frequency on key routes, creates easier connections, and faster trips to and from downtown.

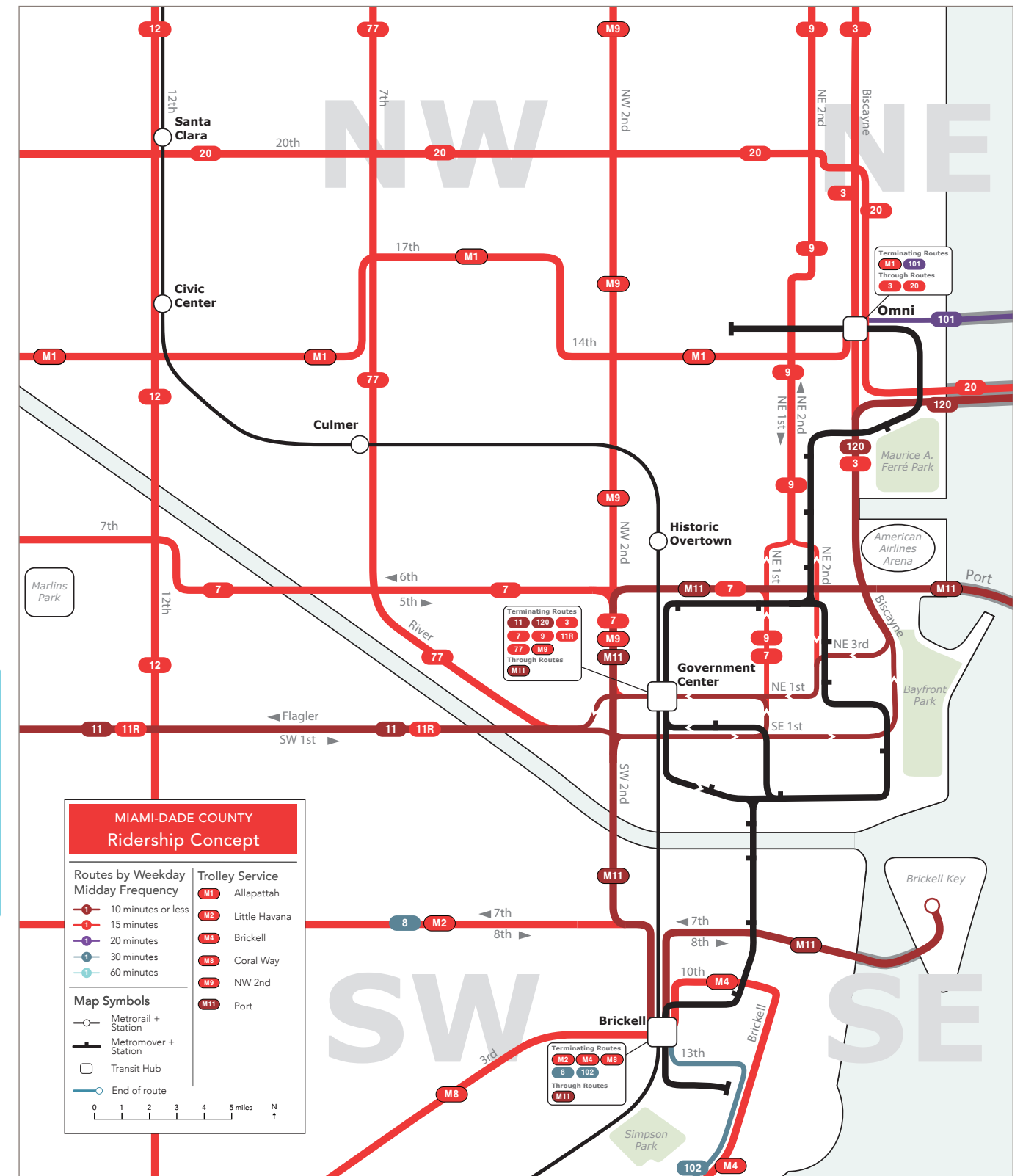


Figure 48: Ridership Concept in and around downtown Miami

City of Miami: Existing Network and Coverage Concept

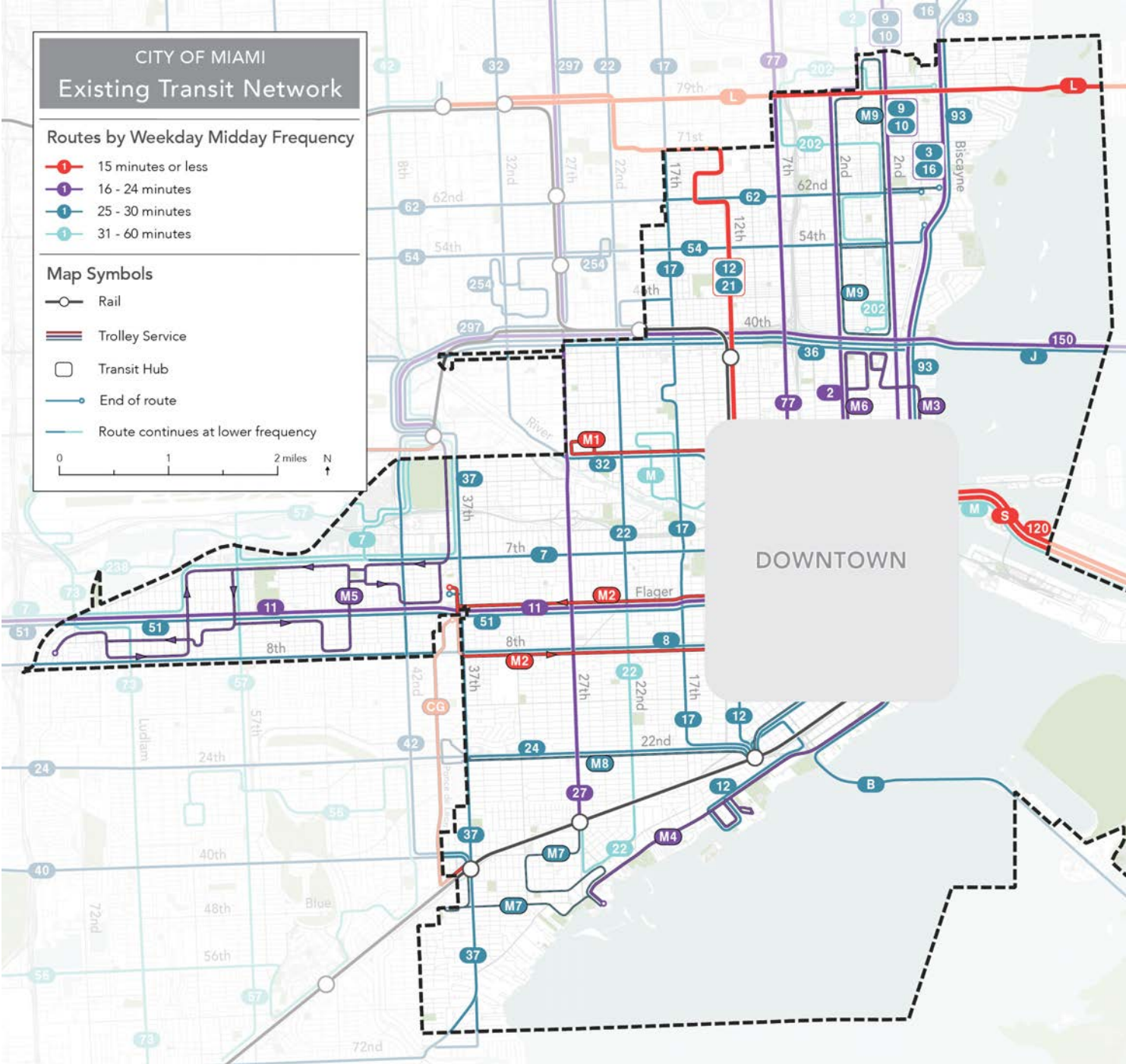


Figure 49: Existing Transit Network in the City of Miami

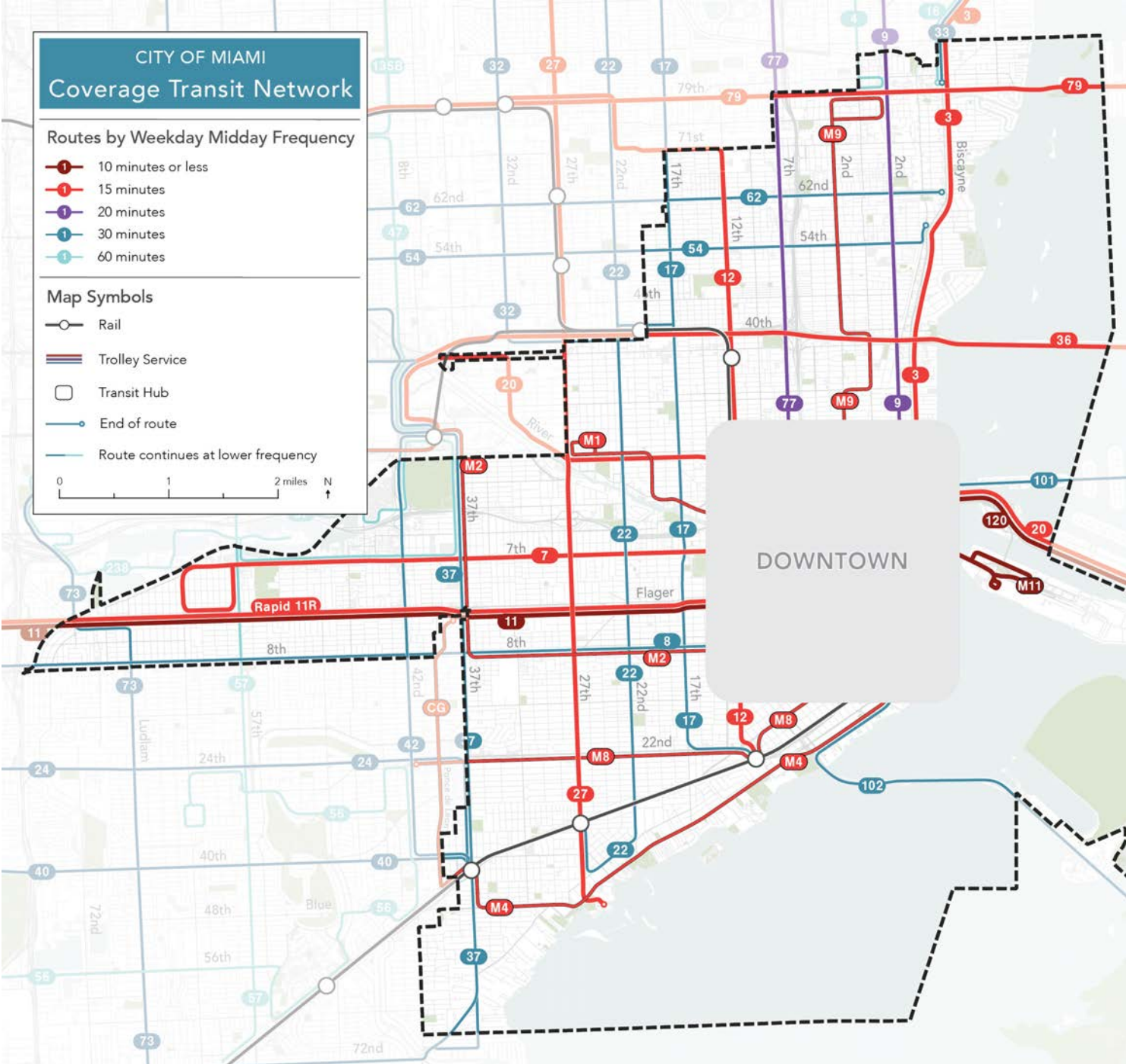


Figure 50: Coverage Concept in the City of Miami

City of Miami: Existing Network and Ridership Concept

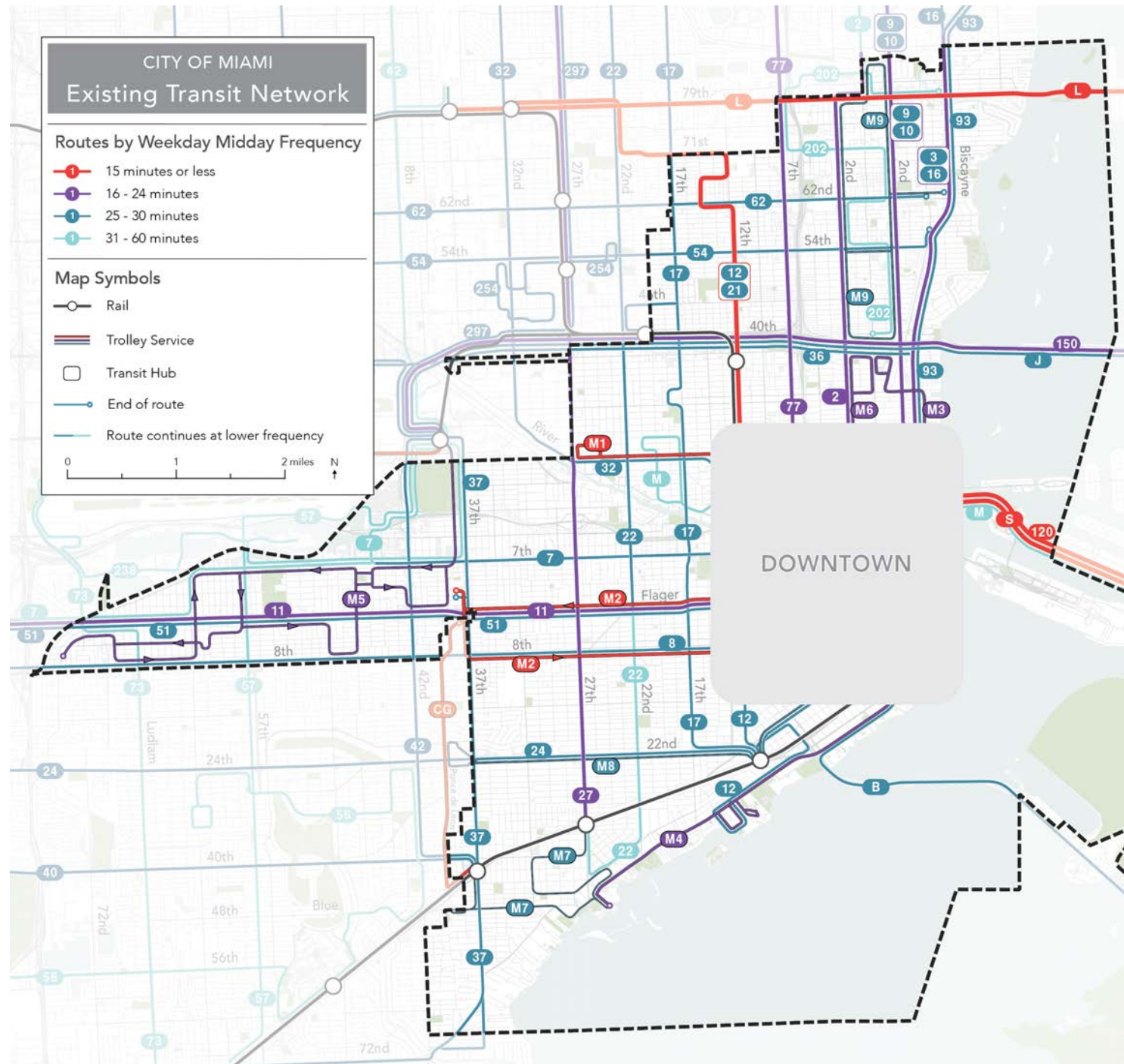


Figure 52: Existing Transit Network in the City of Miami

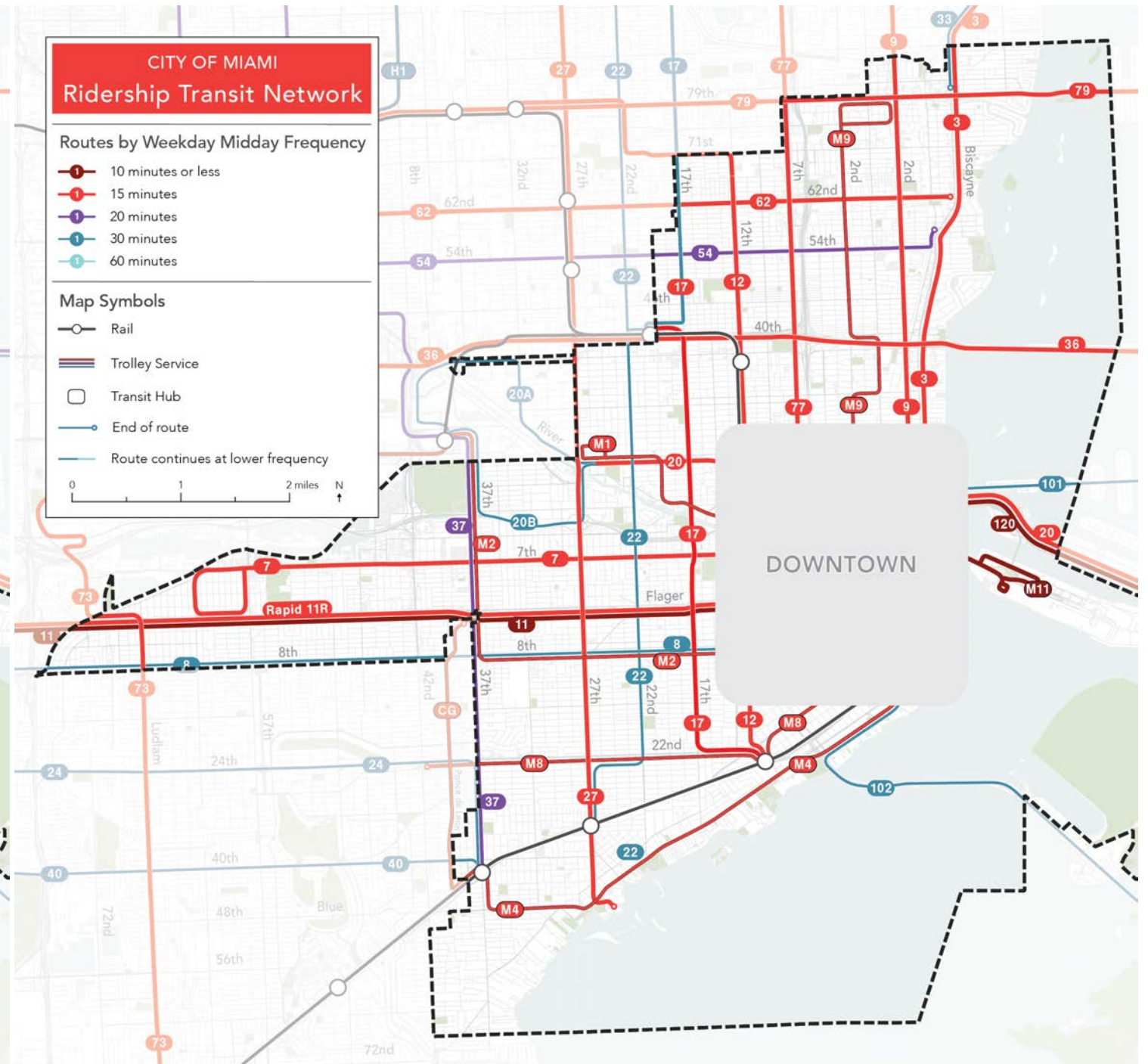


Figure 51: Ridership Concept in the City of Miami

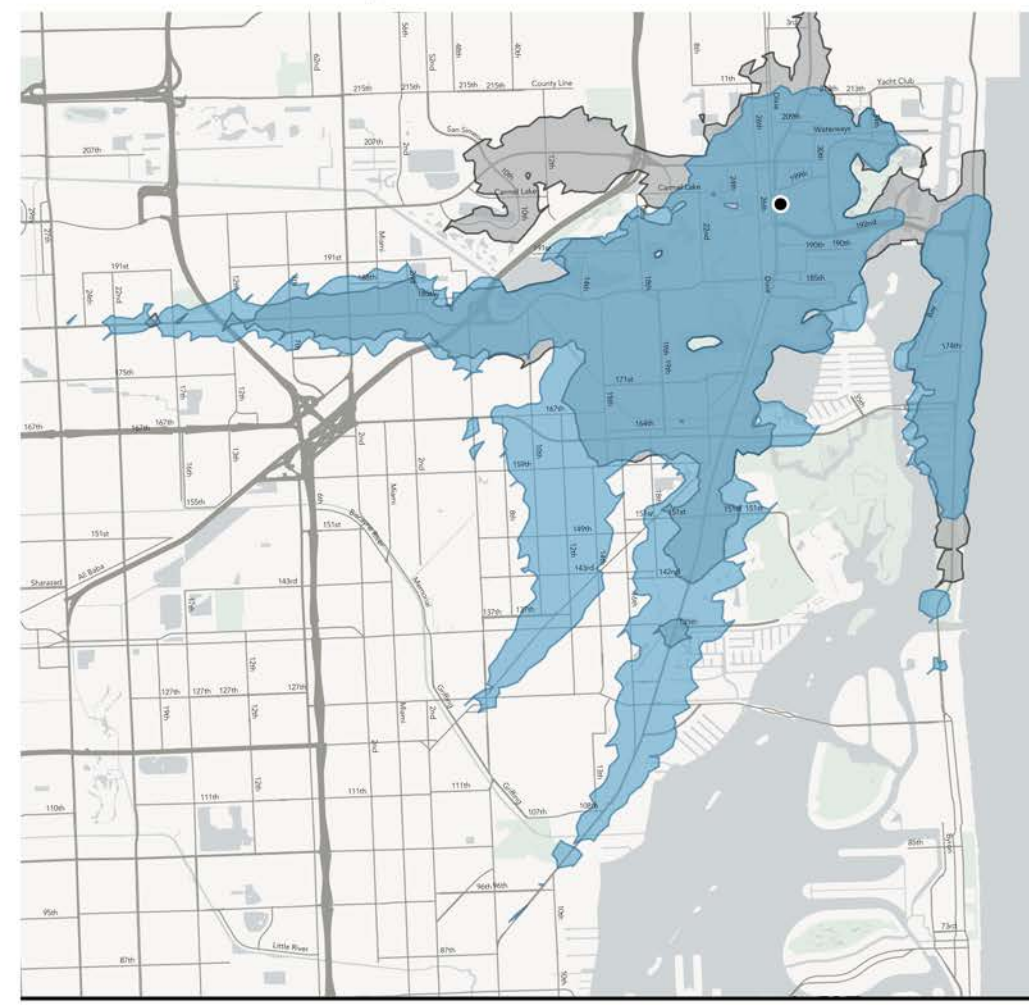
Appendix C: Isochrones

Index of Isochrone Locations for Ridership and Coverage Concepts

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

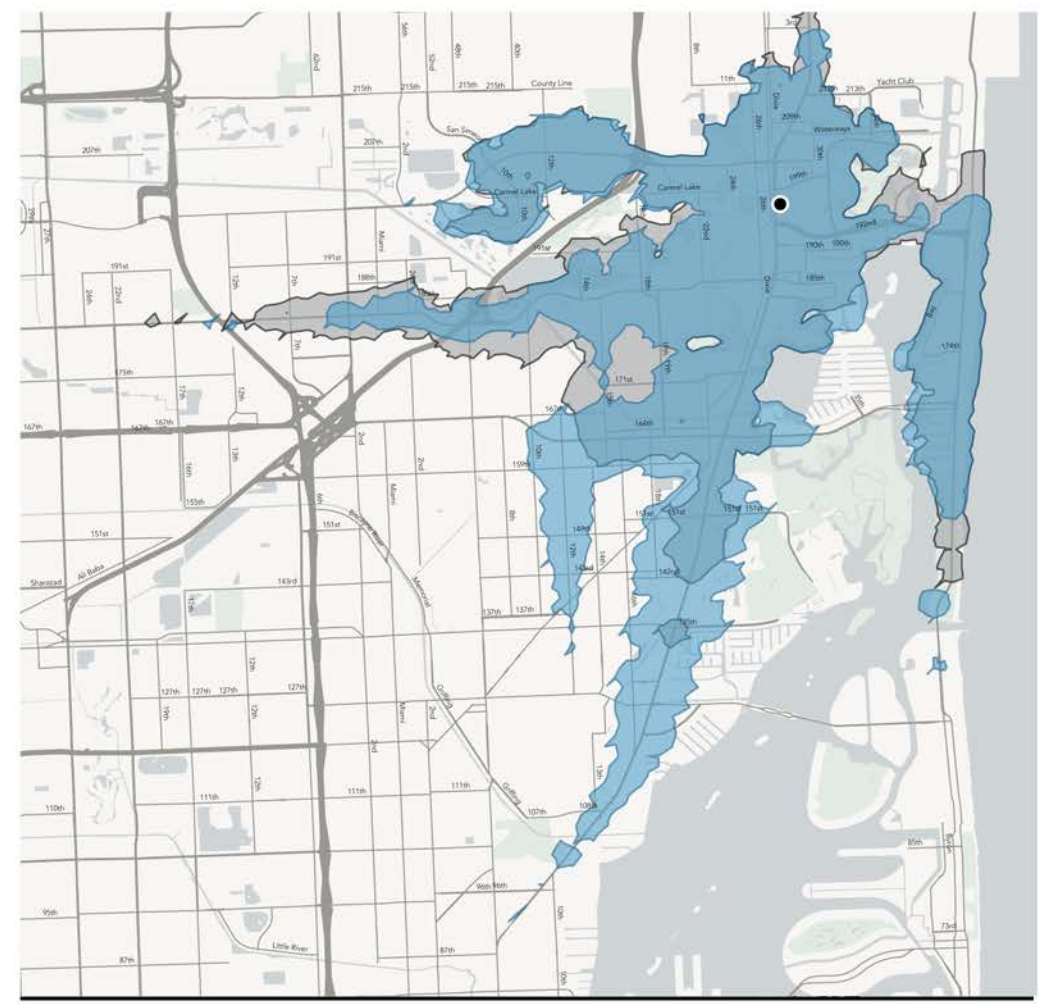


Ridership Concept



Change in jobs reachable	+6,310	+15%
Change in residents reachable	+25,585	+30%

Coverage Concept

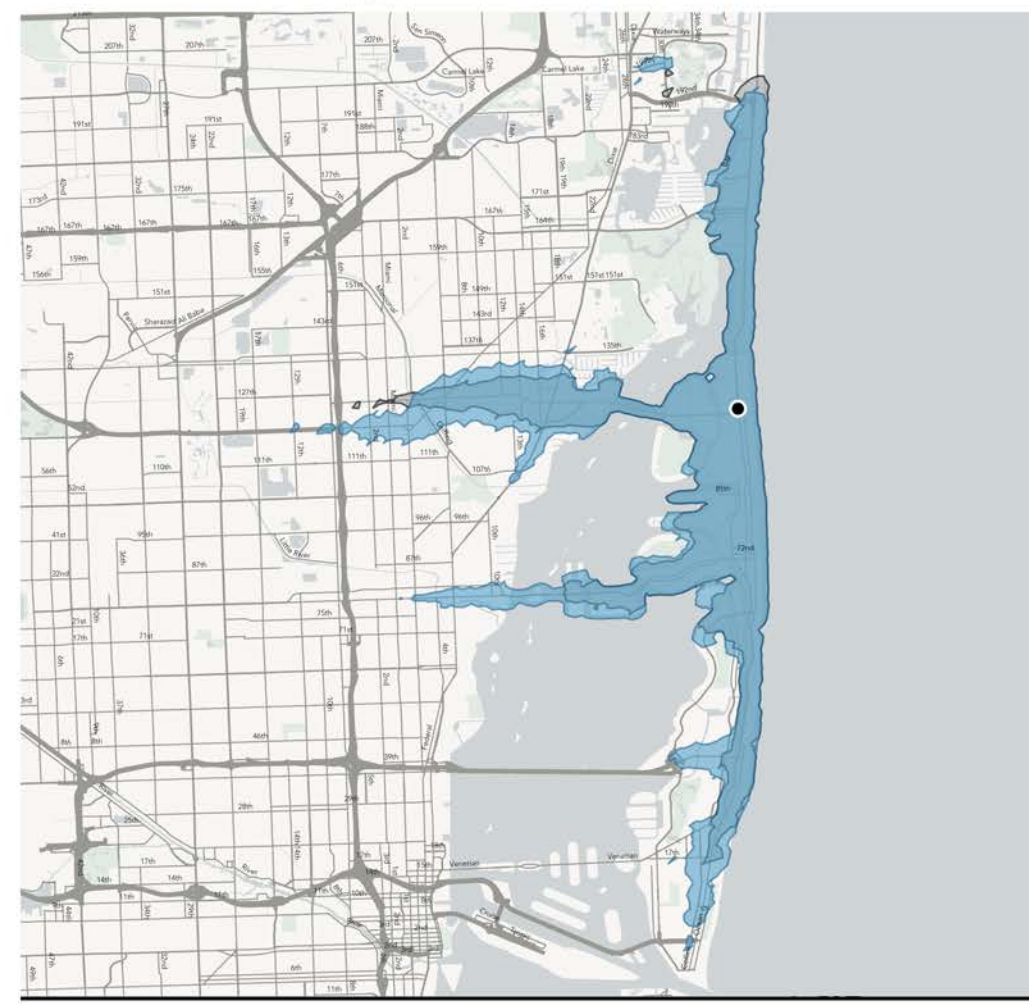


Change in jobs reachable	+4,785	+10%
Change in residents reachable	+12,380	+15%

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

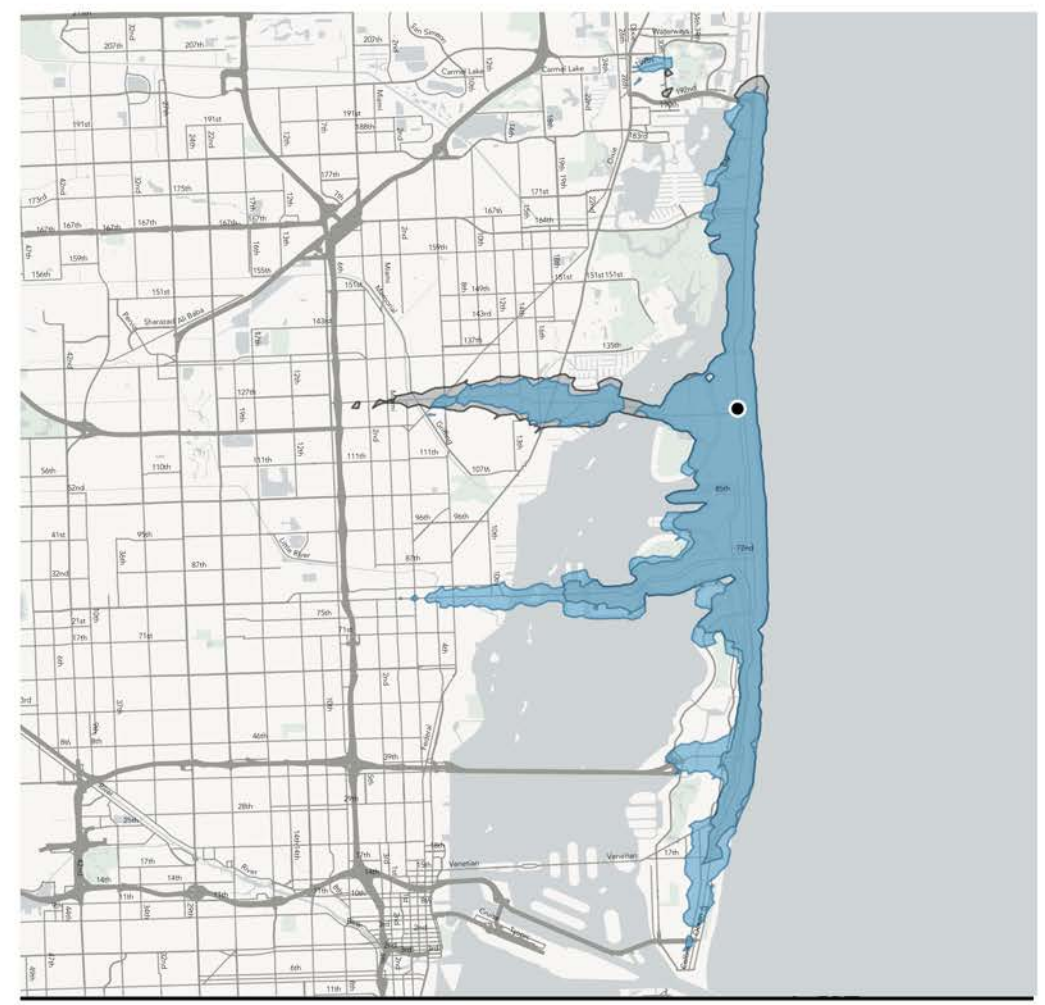


Ridership Concept



Change in jobs reachable	+15,985	+60%
Change in residents reachable	+26,115	+30%

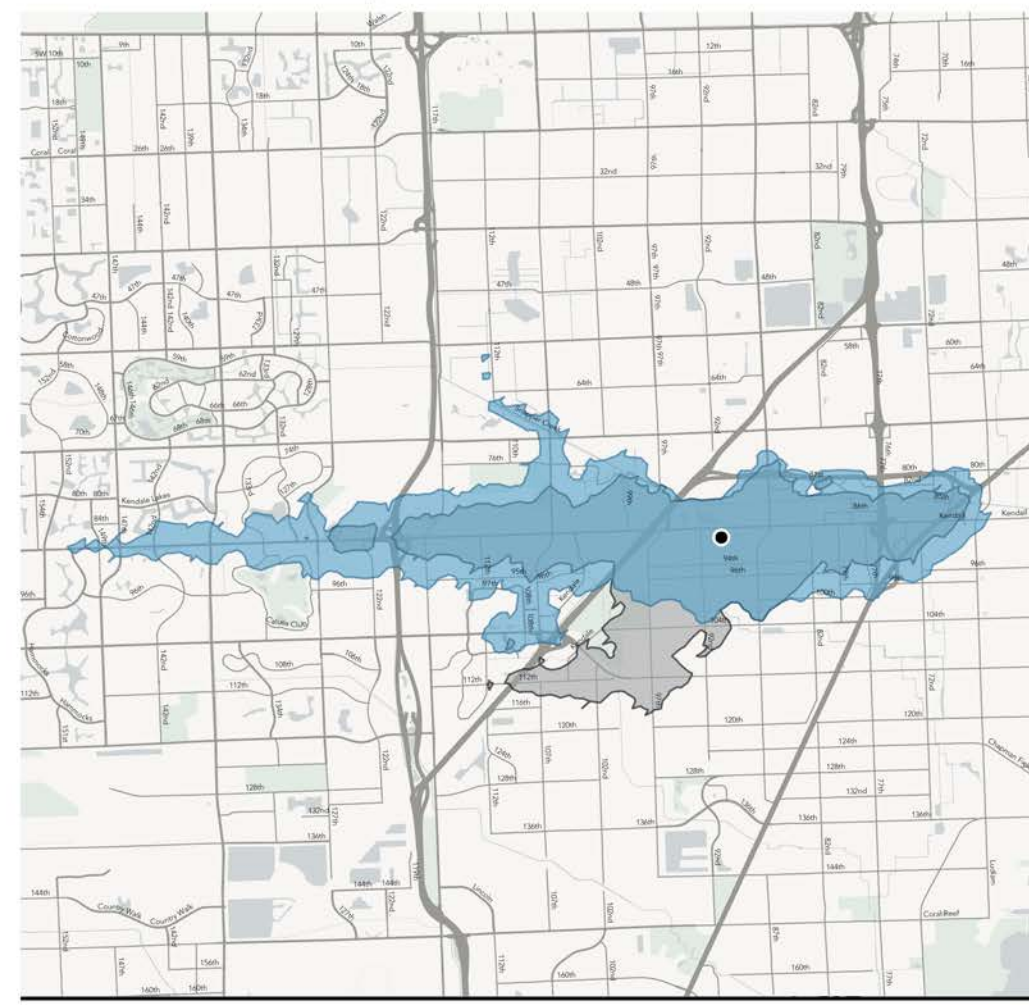
Coverage Concept



Change in jobs reachable	+10,865	+40%
Change in residents reachable	+9,705	+10%

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

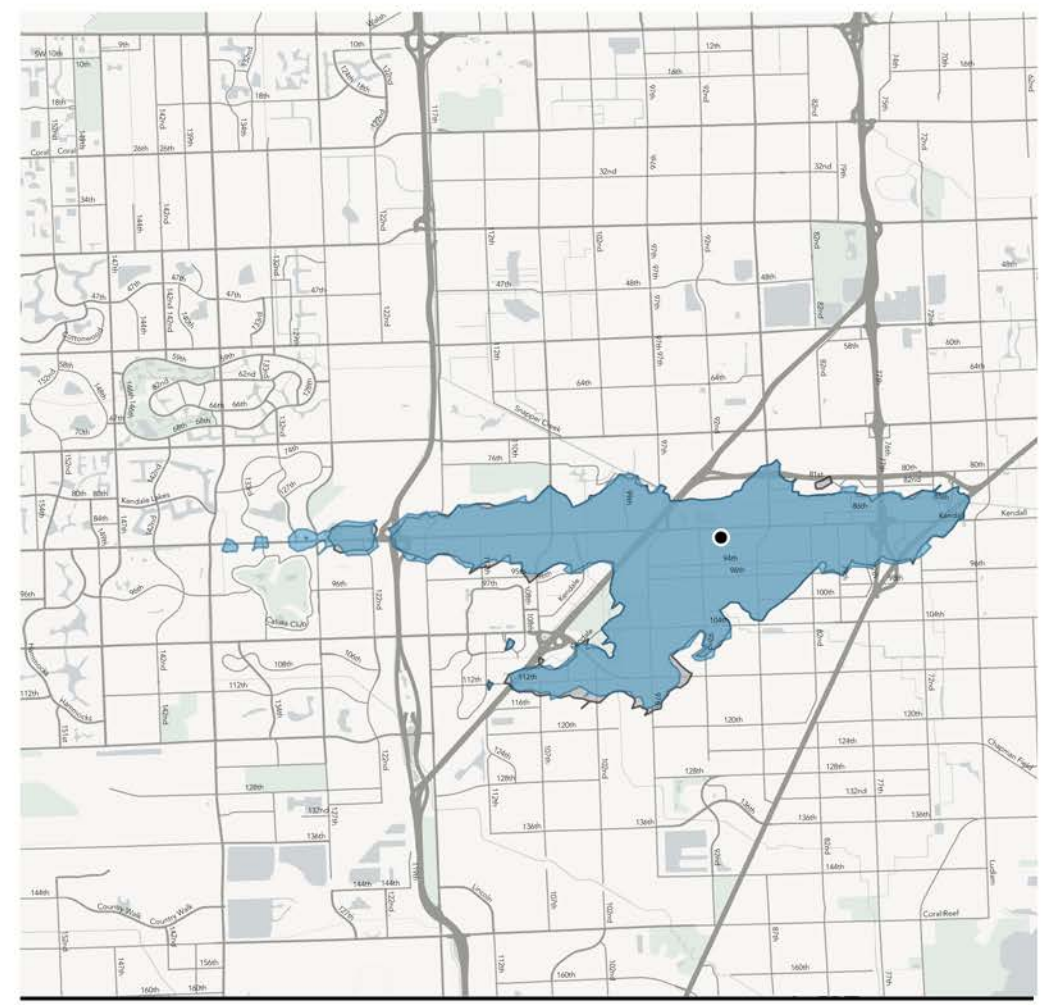
Ridership Concept



Change in jobs reachable	+8,780	+30%
Change in residents reachable	+23,875	+85%



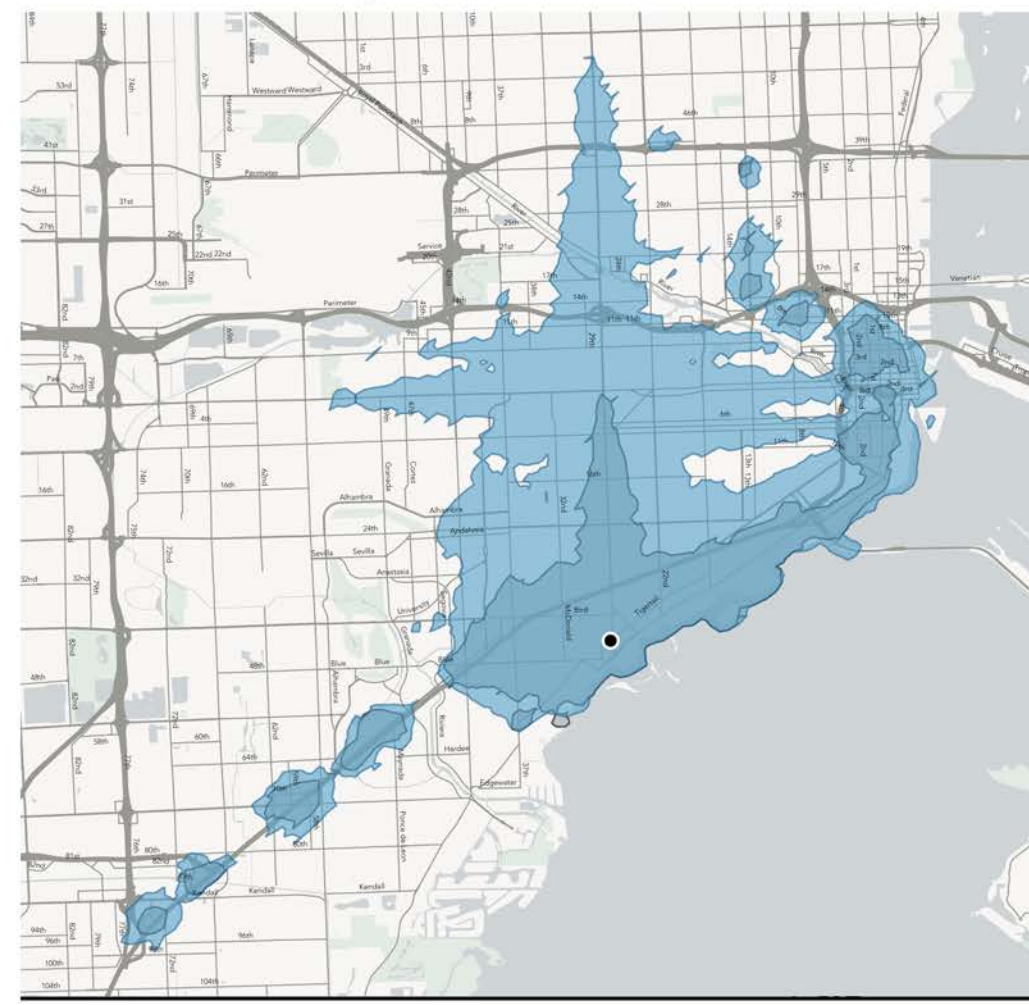
Coverage Concept



Change in jobs reachable	+705	+0%
Change in residents reachable	+1,570	+5%

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

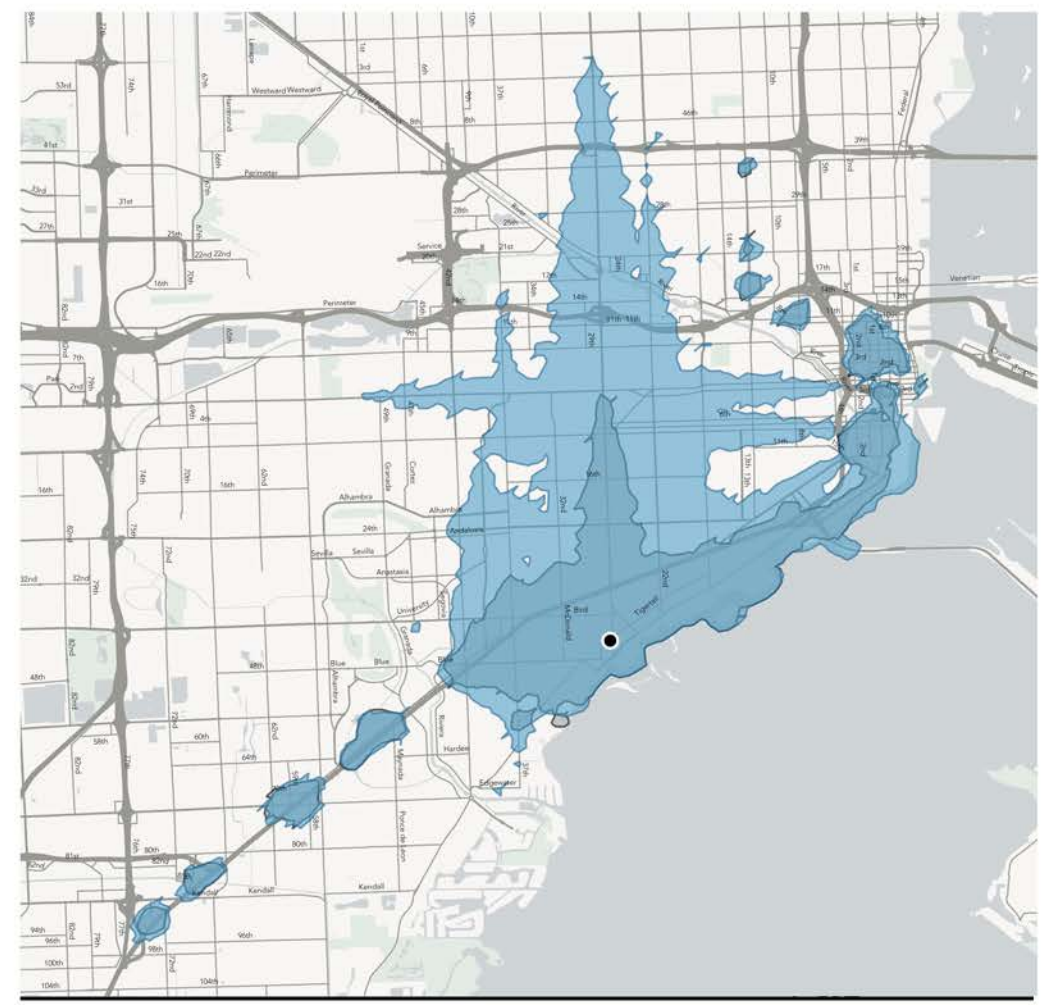
Ridership Concept



Change in jobs reachable	+139,770	+220%
Change in residents reachable	+184,760	+300%



Coverage Concept

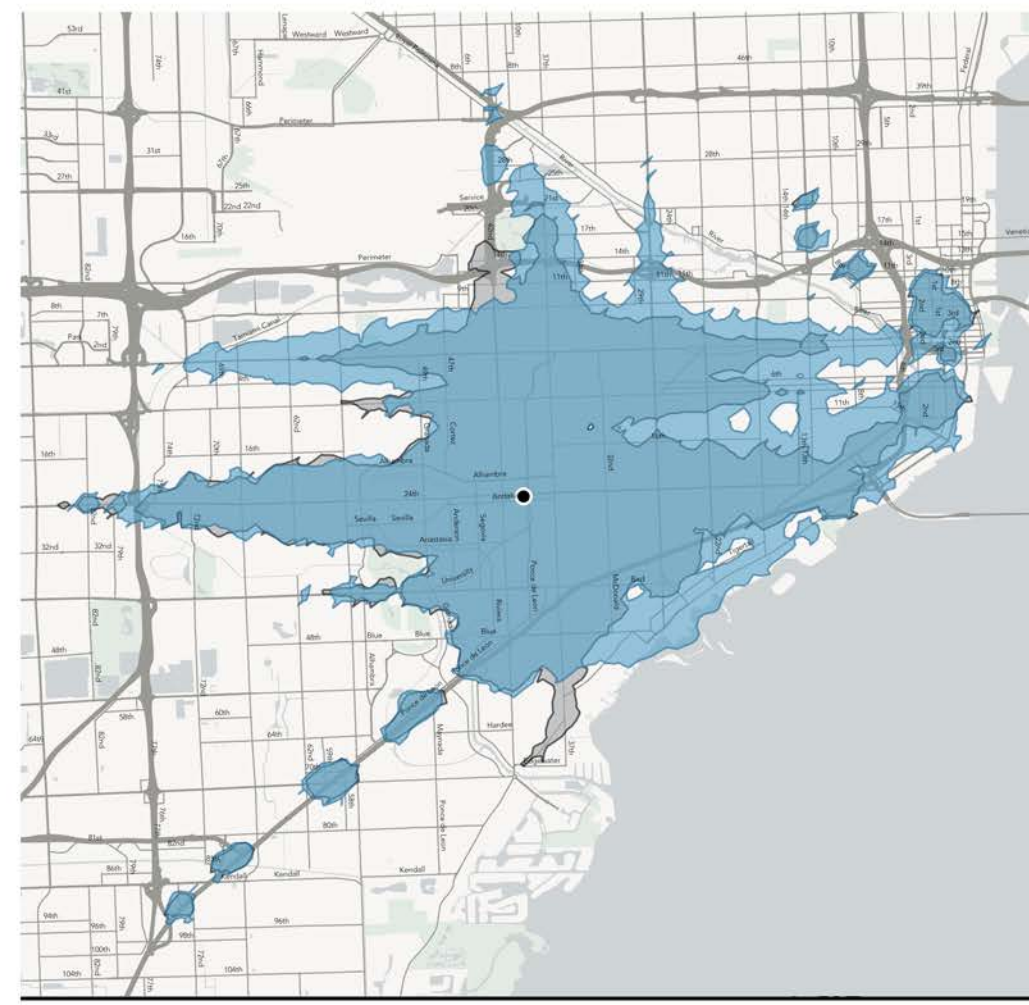


Change in jobs reachable	+77,340	+120%
Change in residents reachable	+150,515	+245%

How far can I travel in 45 minutes from
Coral Gables Downtown - Coral Way and Ponce
at noon?

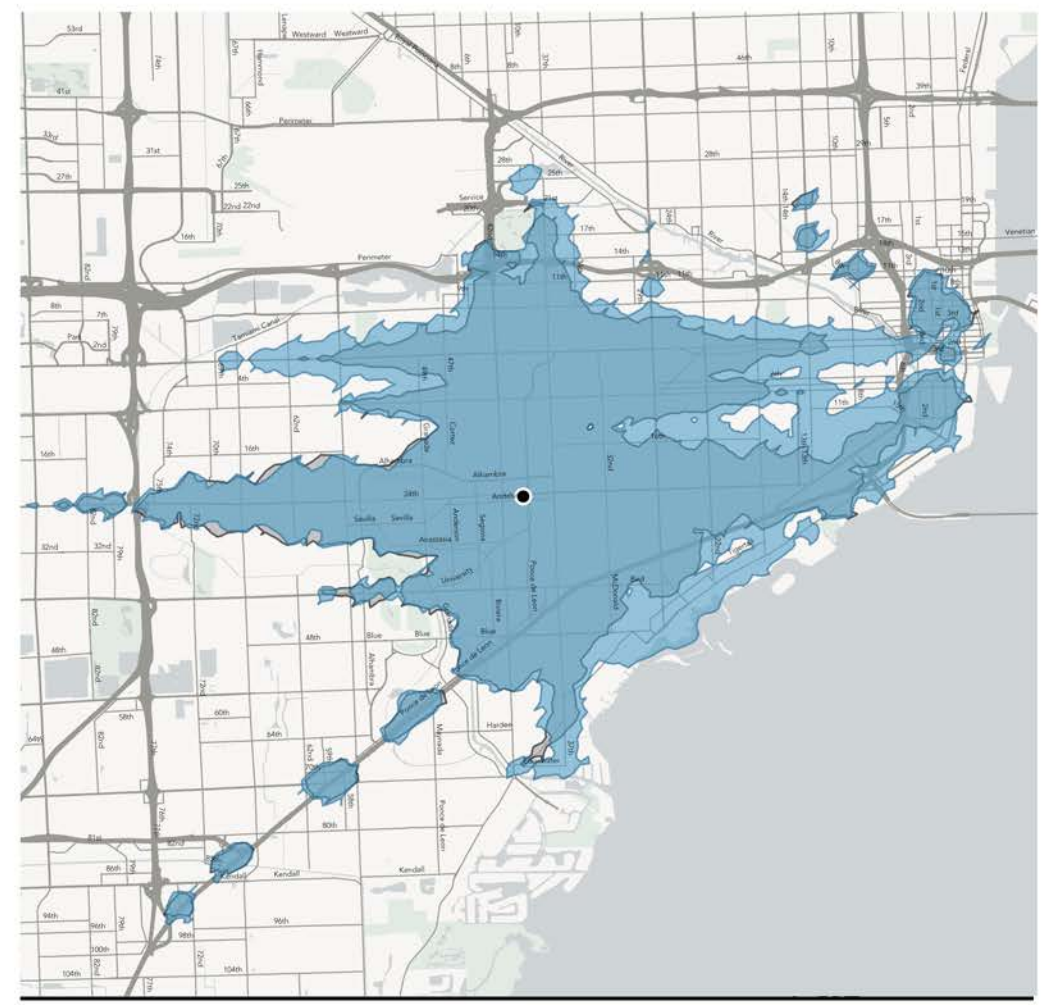


Ridership Concept



Change in jobs reachable	+42,885	+40%
Change in residents reachable	+77,190	+45%

Coverage Concept

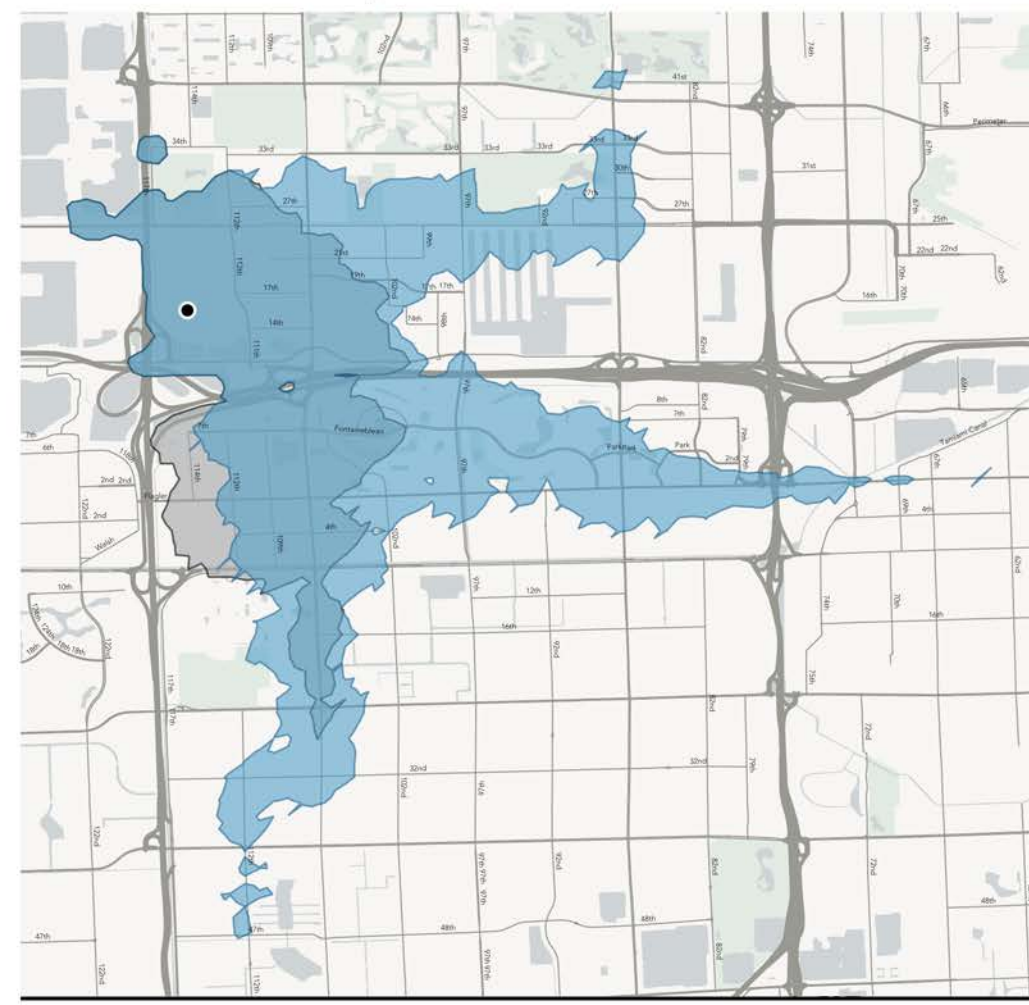


Change in jobs reachable	+45,815	+45%
Change in residents reachable	+70,975	+40%

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

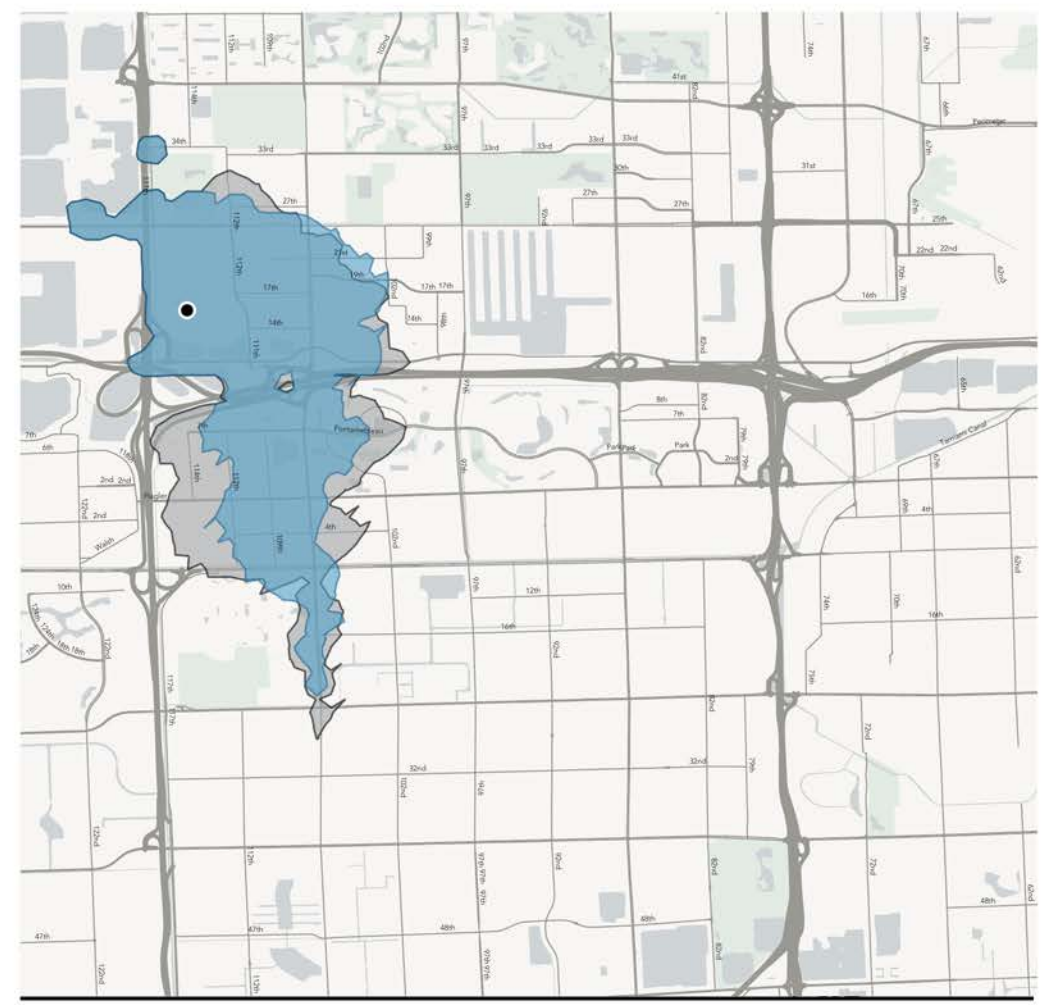


Ridership Concept



Change in jobs reachable	+20,545	+95%
Change in residents reachable	+28,485	+95%

Coverage Concept

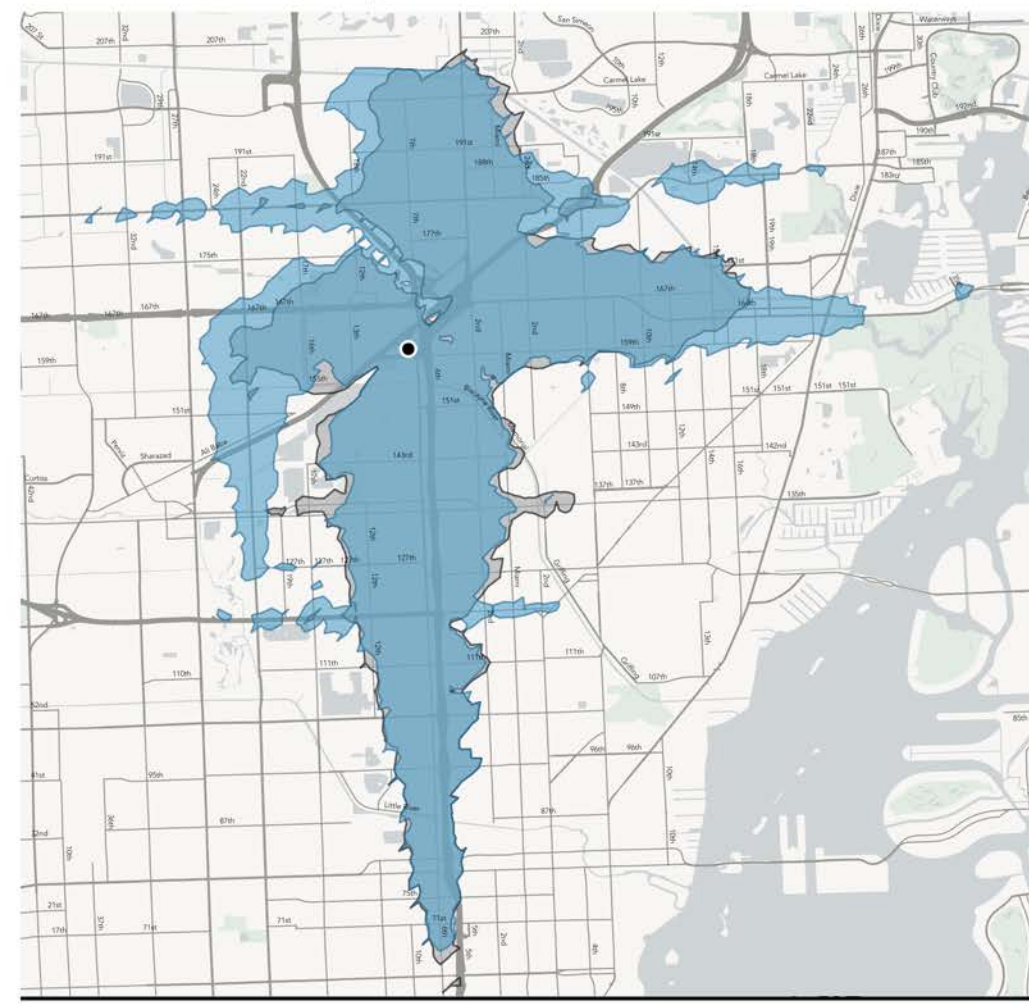


Change in jobs reachable	-1,640	-10%
Change in residents reachable	-10,400	-35%

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

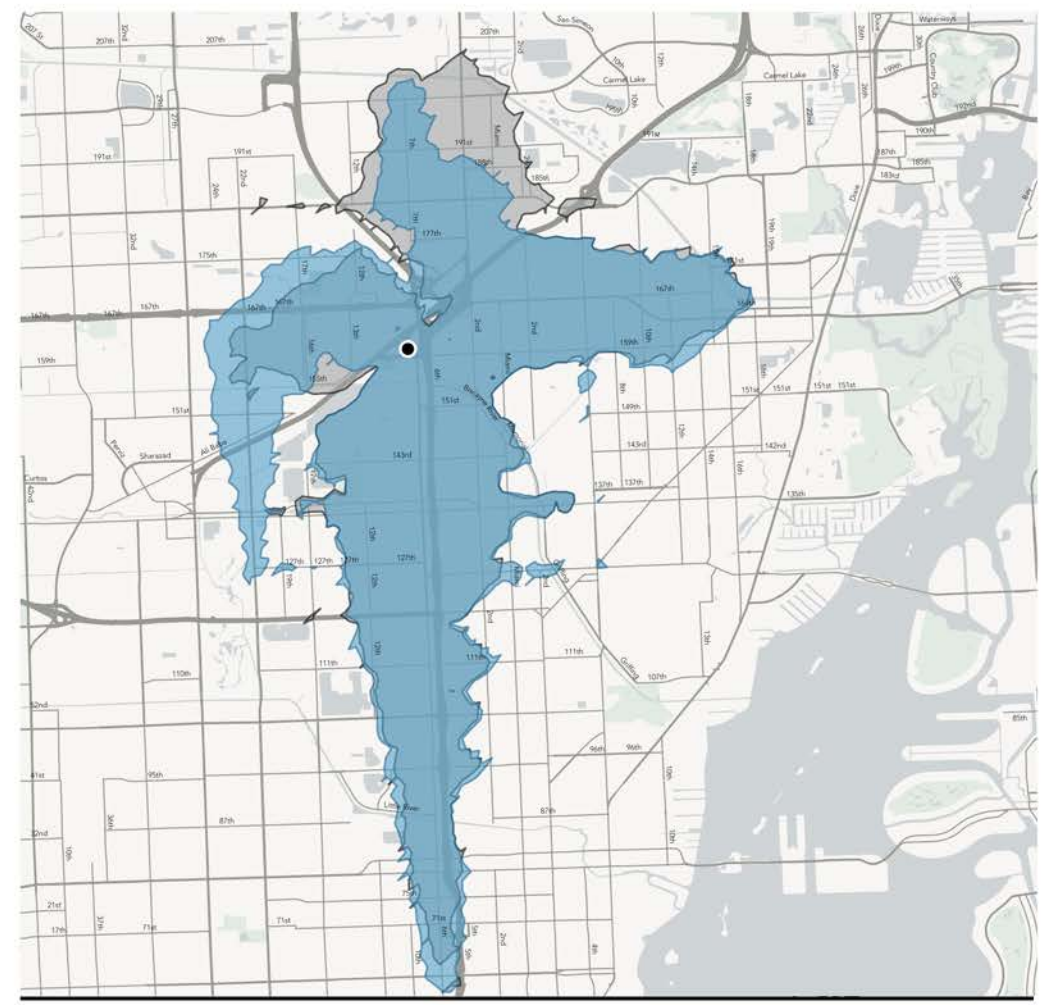


Ridership Concept



Change in jobs reachable	+4,880	+20%
Change in residents reachable	+19,570	+25%

Coverage Concept

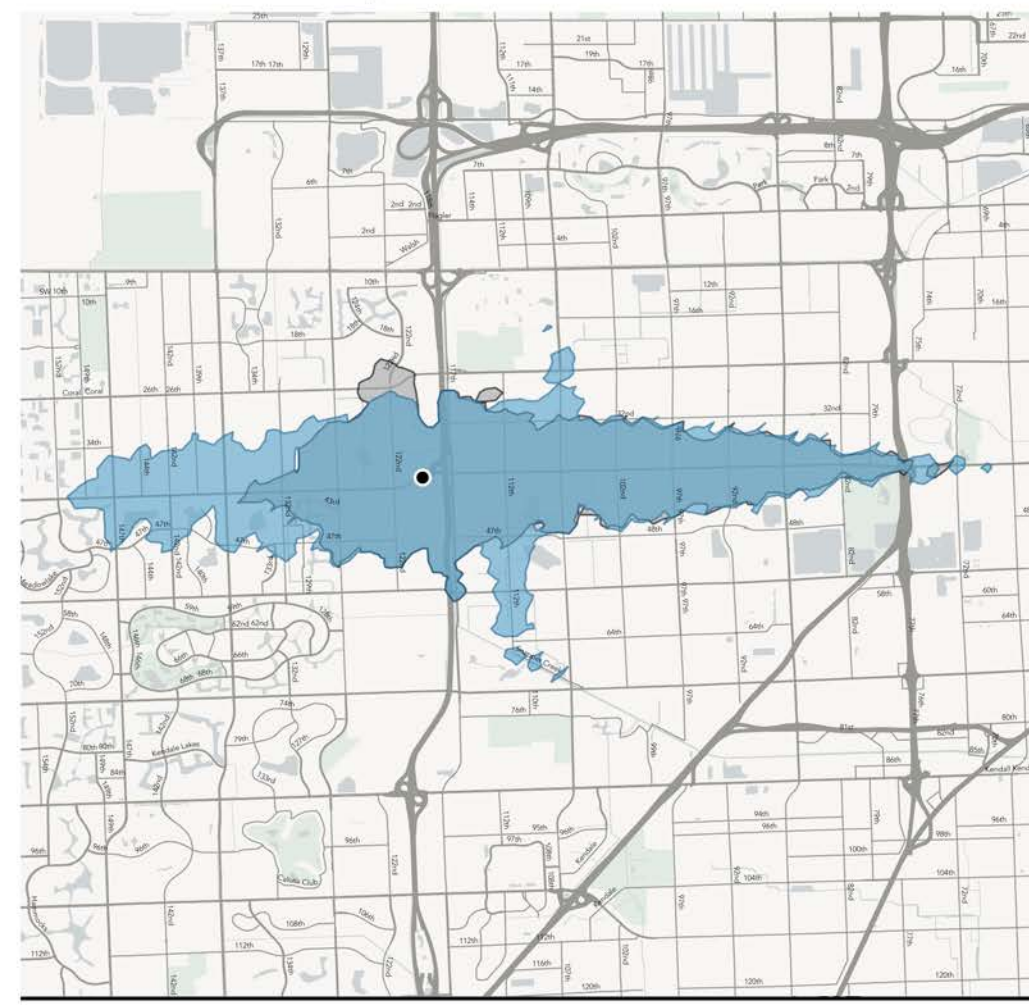


Change in jobs reachable	-455	0%
Change in residents reachable	+3,790	+5%

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

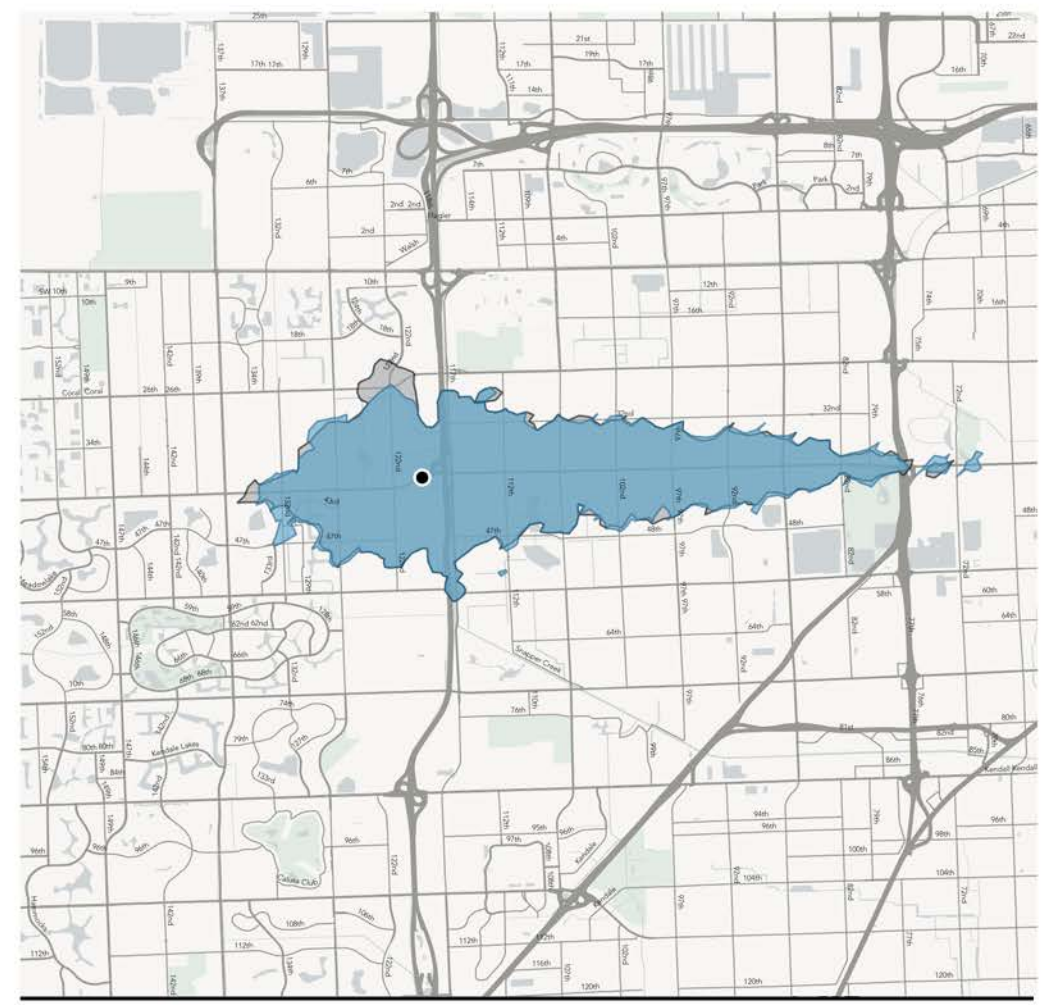


Ridership Concept



Change in jobs reachable	+1,945	+20%
Change in residents reachable	+15,200	+45%

Coverage Concept

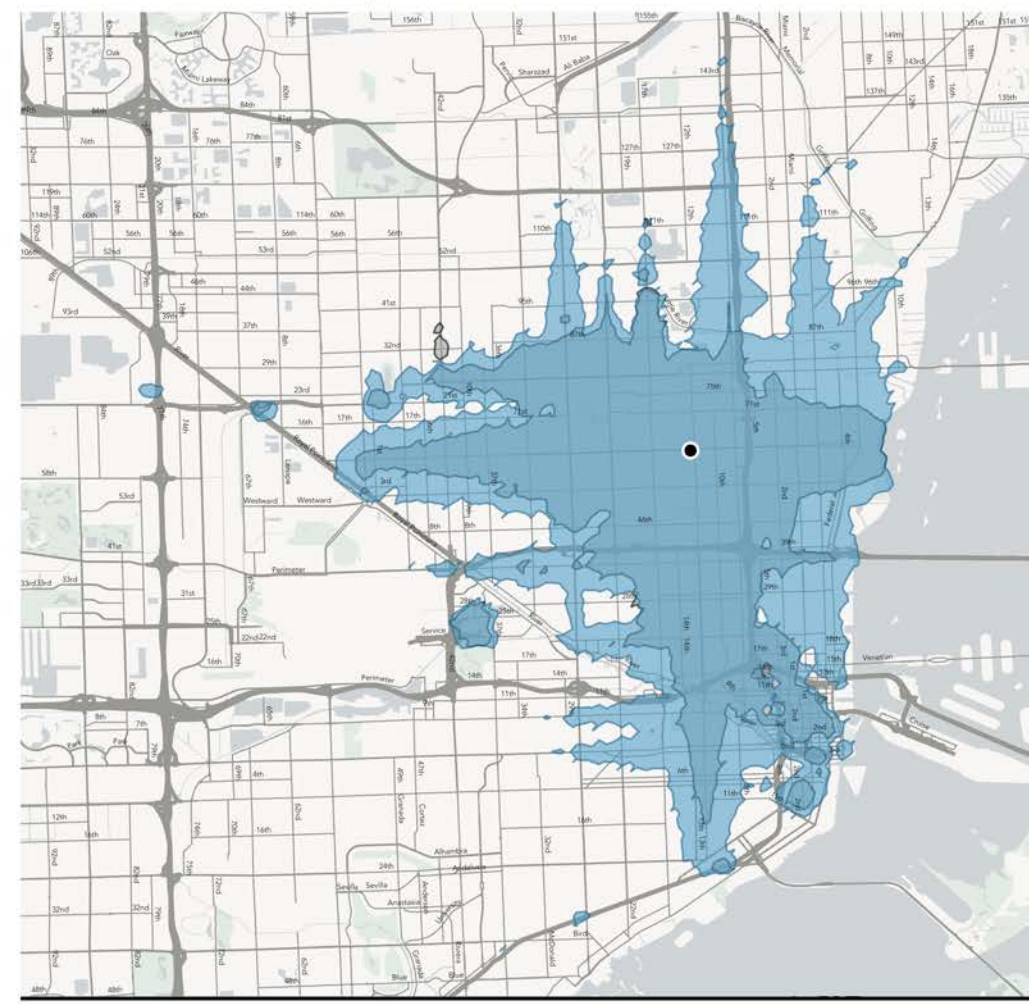


Change in jobs reachable	+85	+0%
Change in residents reachable	-340	0%

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

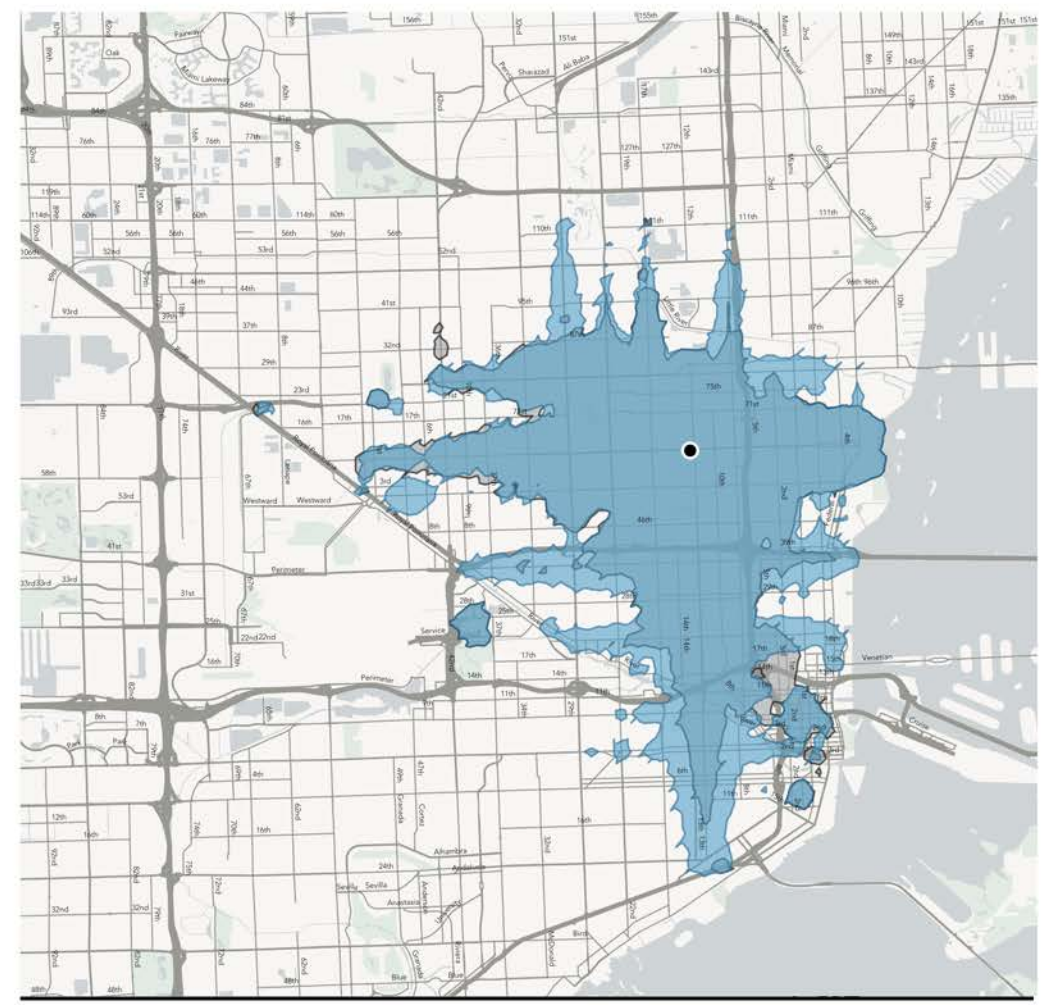


Ridership Concept



Change in jobs reachable	+125,010	+165%
Change in residents reachable	+148,275	+90%

Coverage Concept

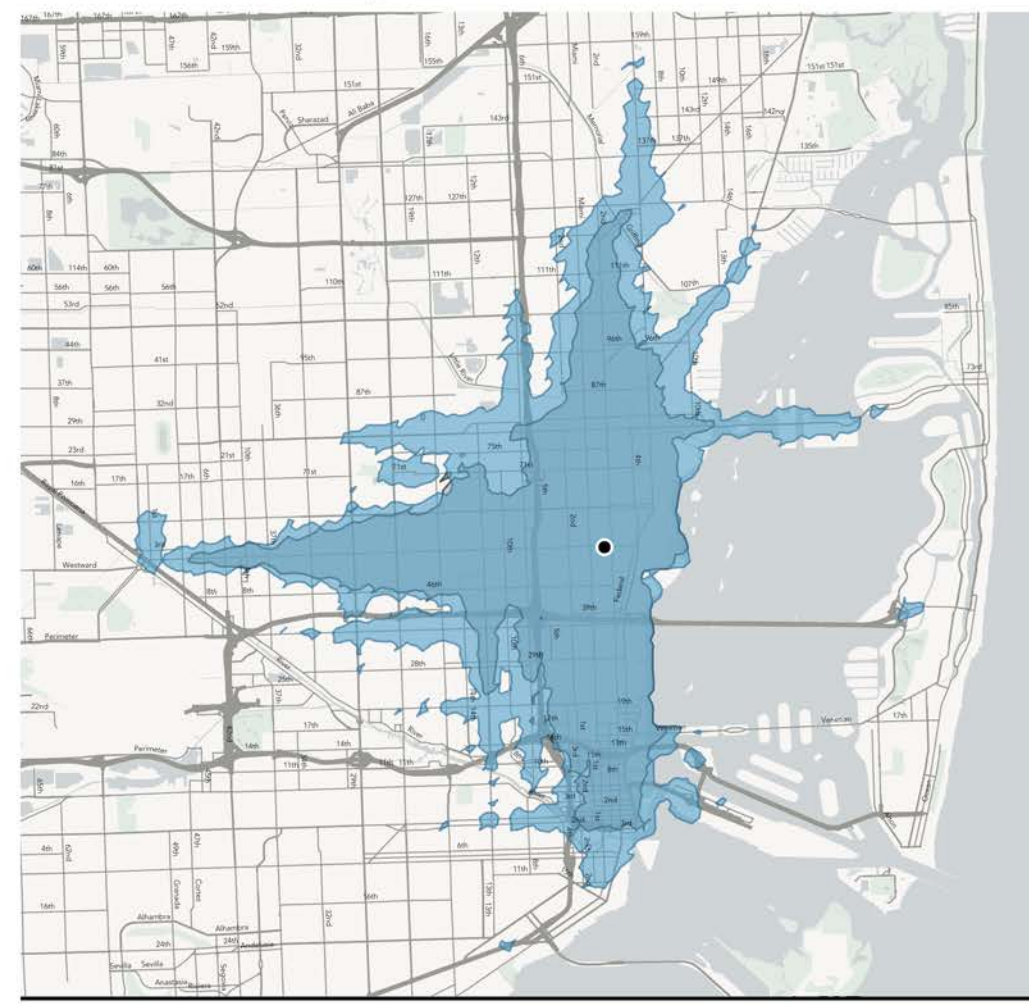


Change in jobs reachable	+51,080	+65%
Change in residents reachable	+65,680	+40%

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

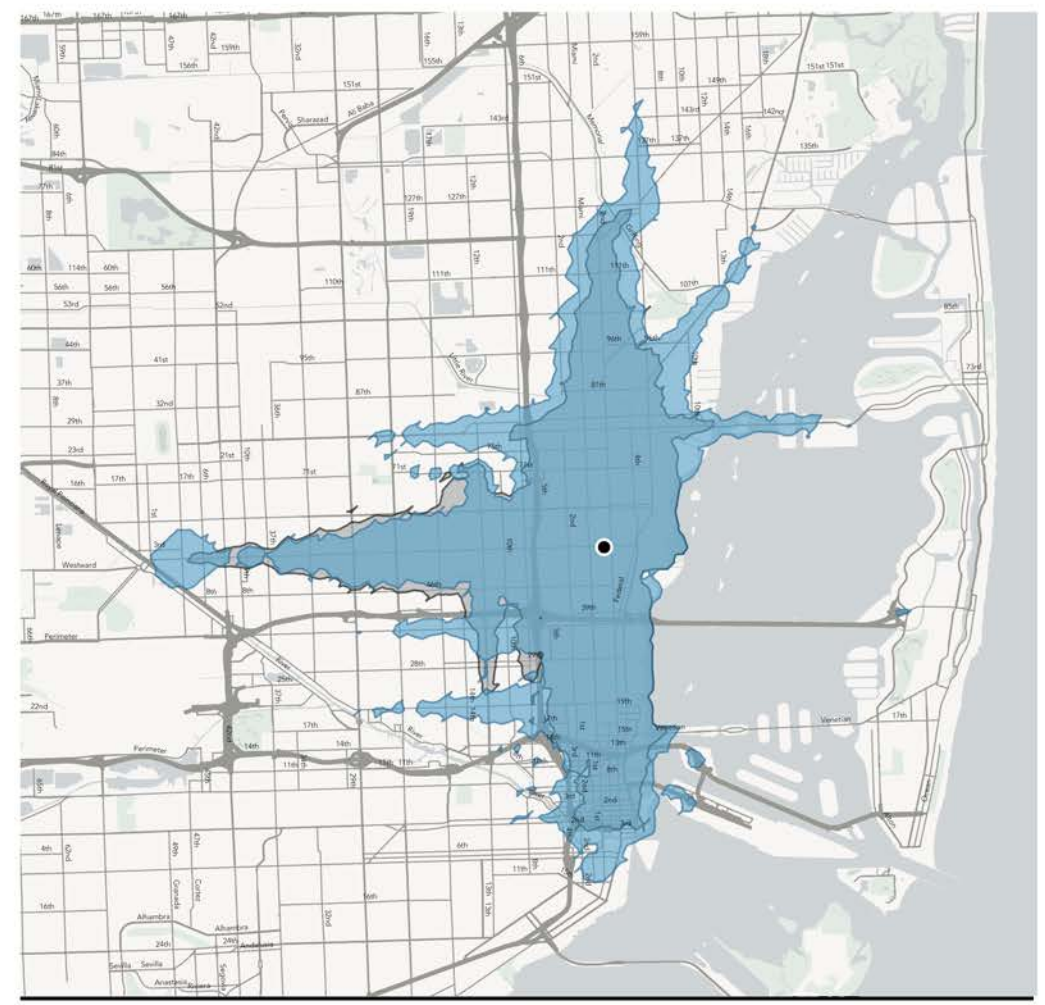


Ridership Concept



Change in jobs reachable	+77,545	+60%
Change in residents reachable	+88,825	+70%

Coverage Concept

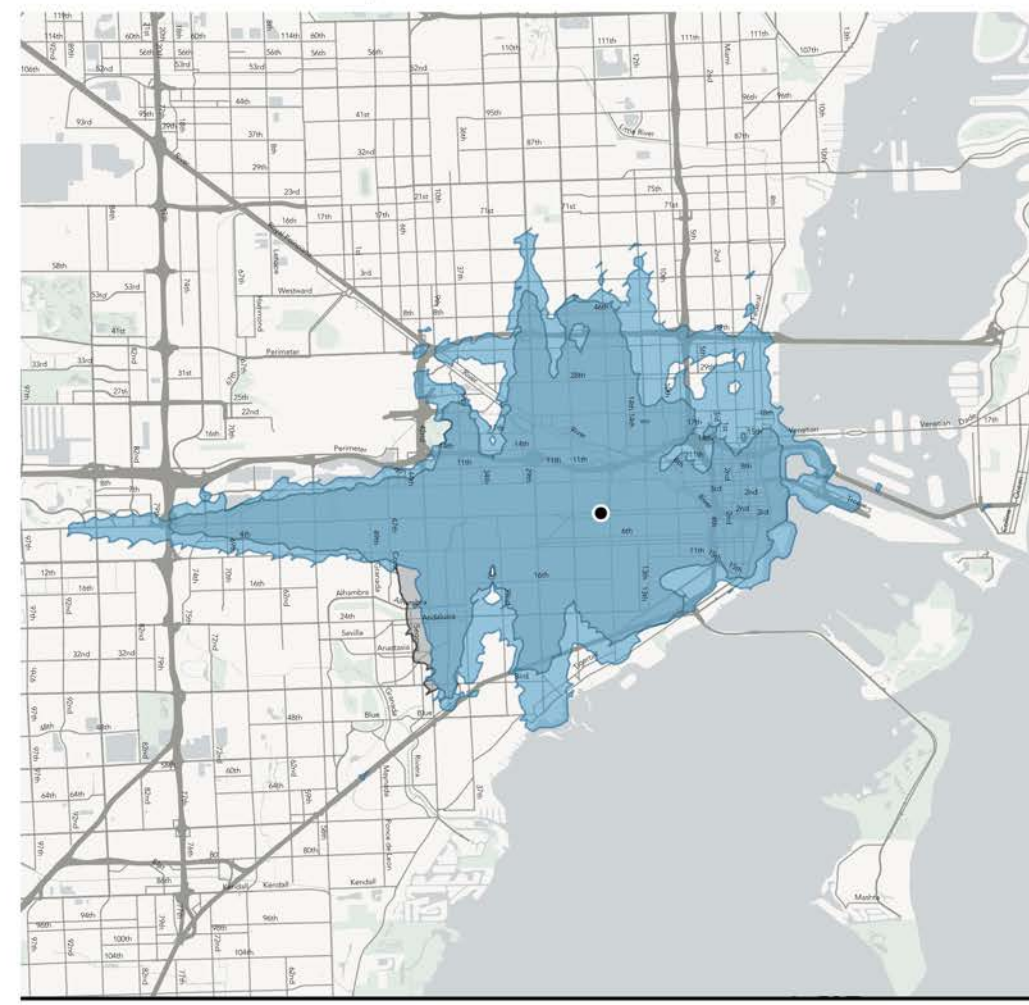


Change in jobs reachable	+58,355	+45%
Change in residents reachable	+45,355	+35%

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

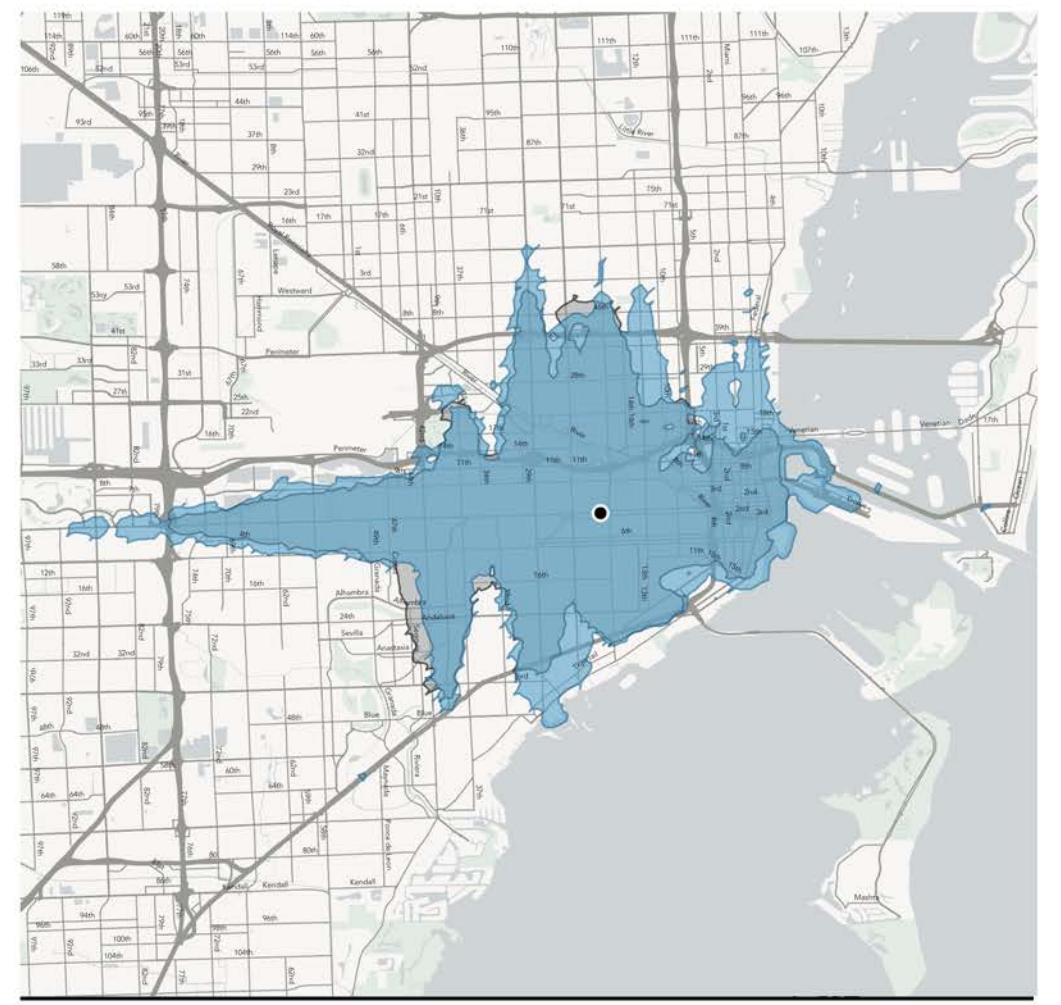


Ridership Concept



Change in jobs reachable	+82,850	+40%
Change in residents reachable	+82,580	+30%

Coverage Concept

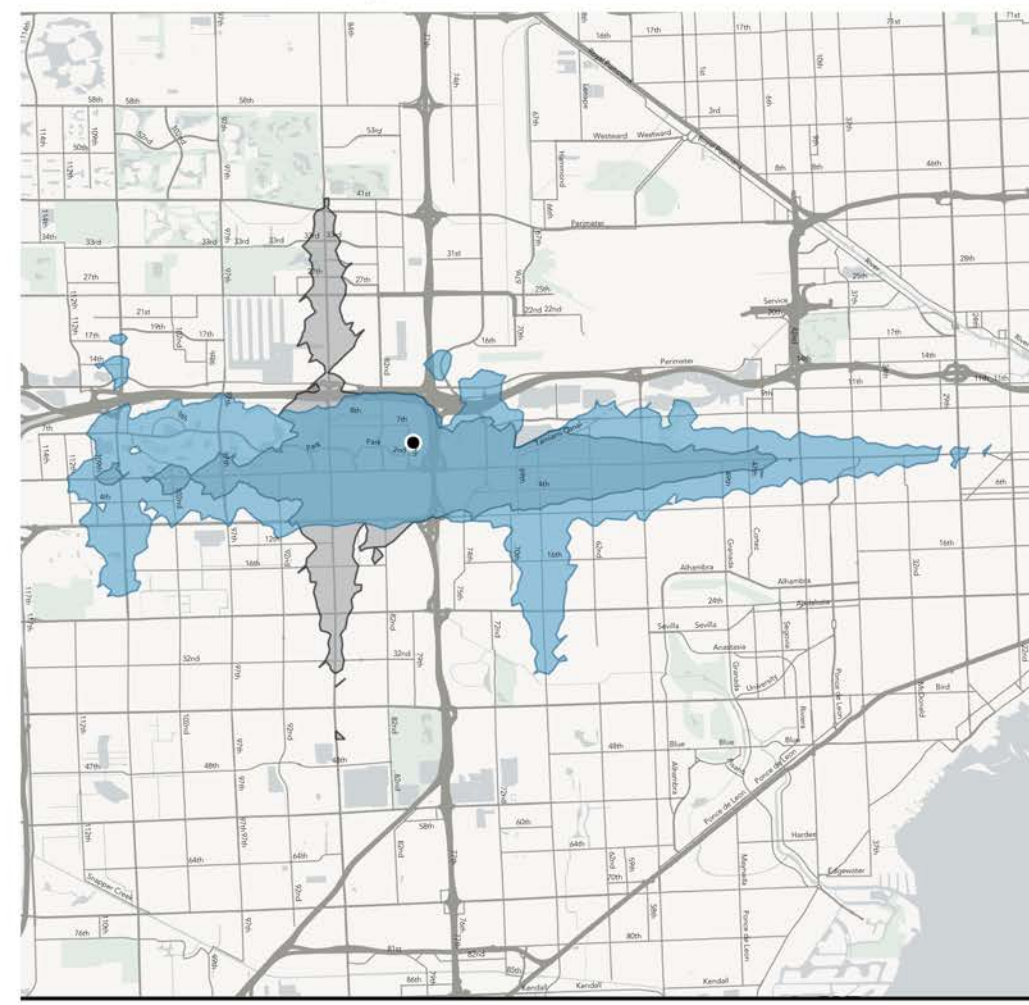


Change in jobs reachable	+71,230	+35%
Change in residents reachable	+56,355	+20%

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

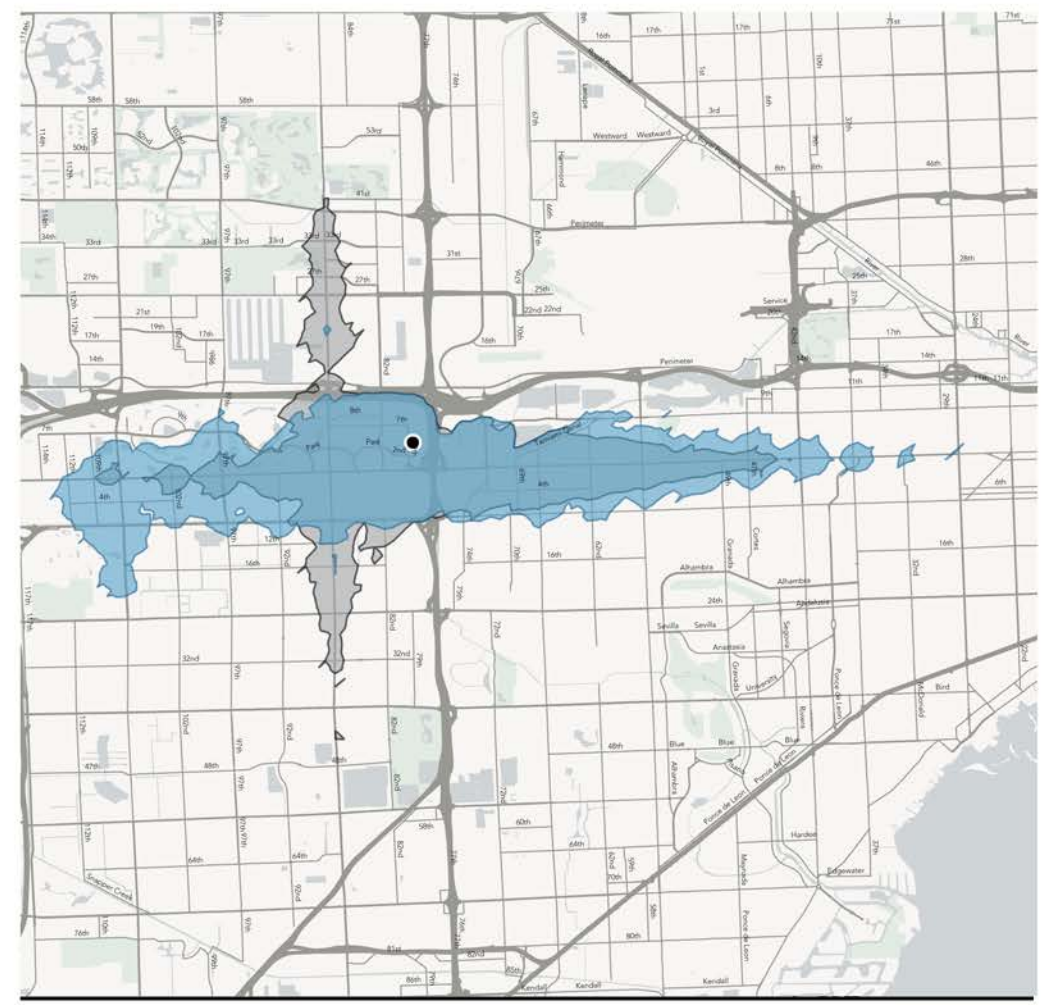


Ridership Concept



Change in jobs reachable	+8,105	+40%
Change in residents reachable	+59,310	+100%

Coverage Concept

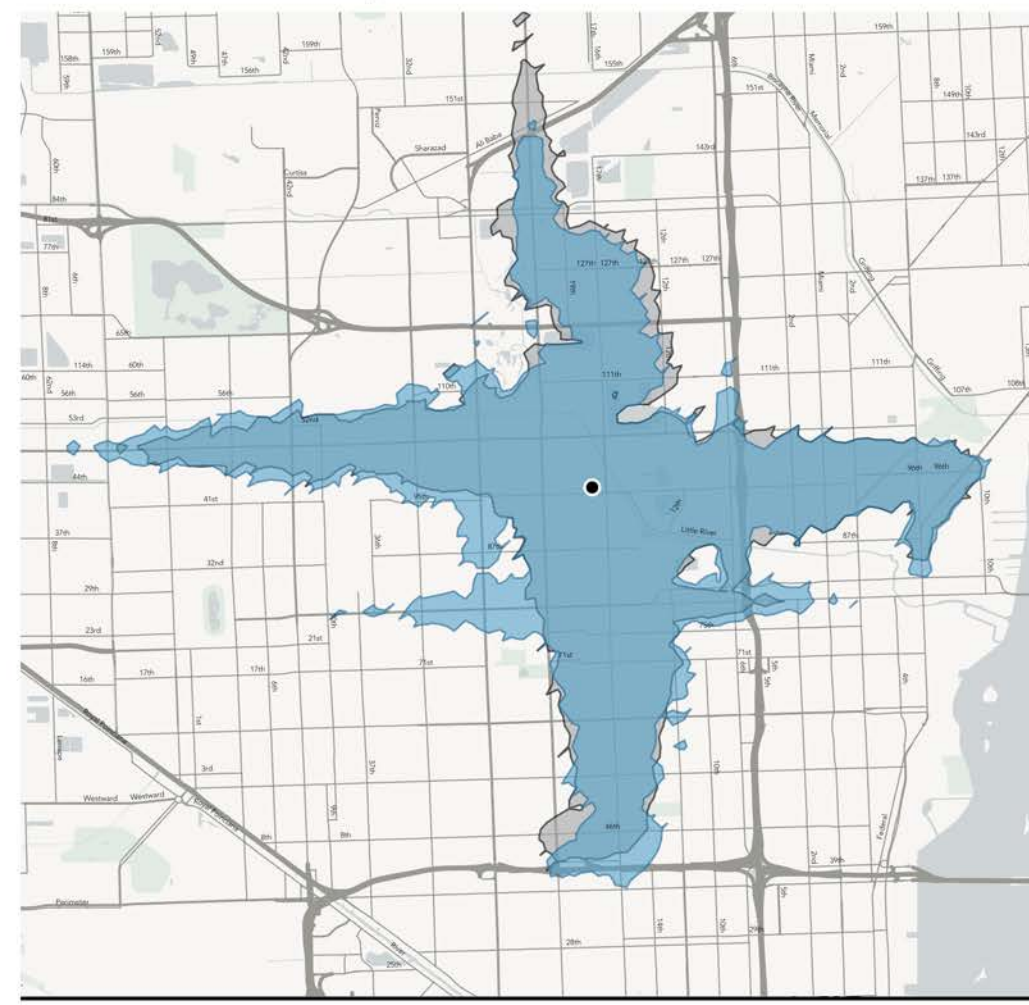


Change in jobs reachable	+1,195	+5%
Change in residents reachable	+32,155	+55%

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

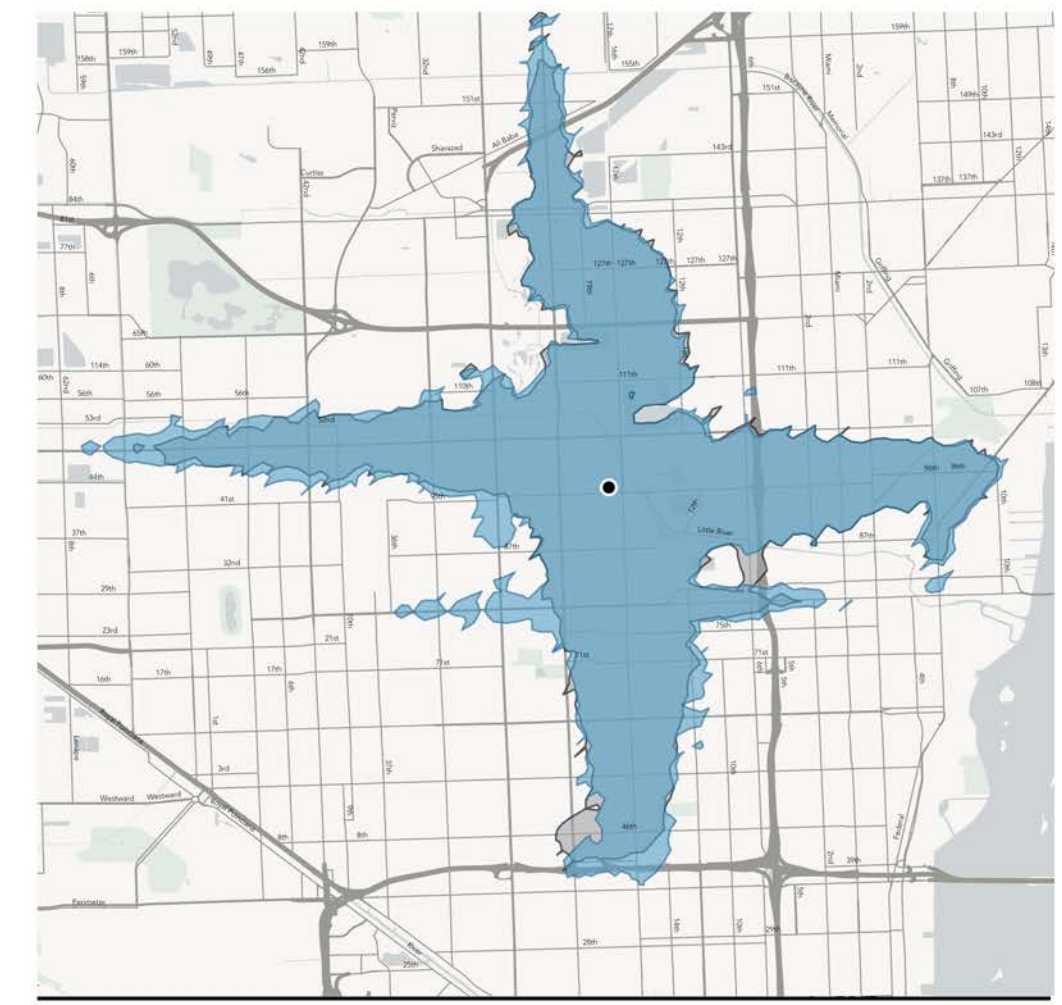


Ridership Concept



Change in jobs reachable	+1,685	+15%
Change in residents reachable	+7,010	+10%

Coverage Concept

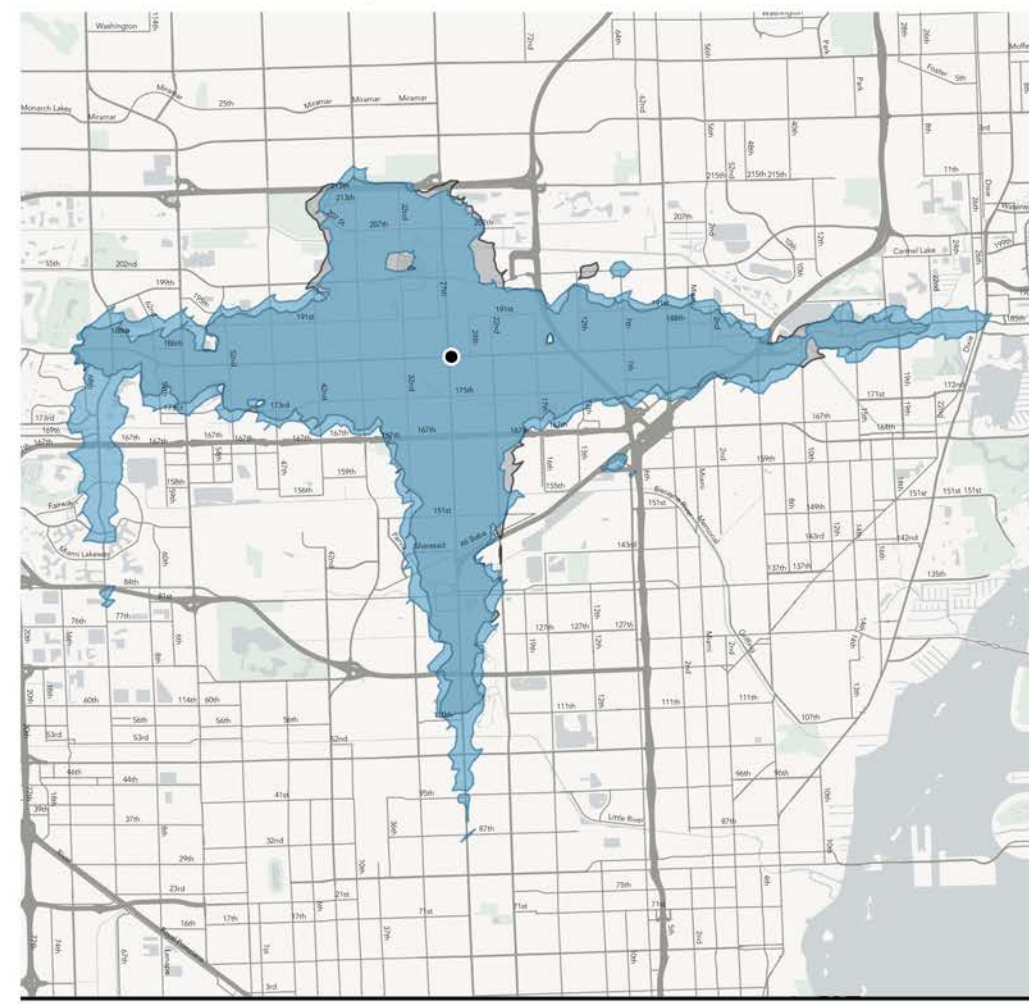


Change in jobs reachable	+1,780	+15%
Change in residents reachable	+9,020	+10%

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

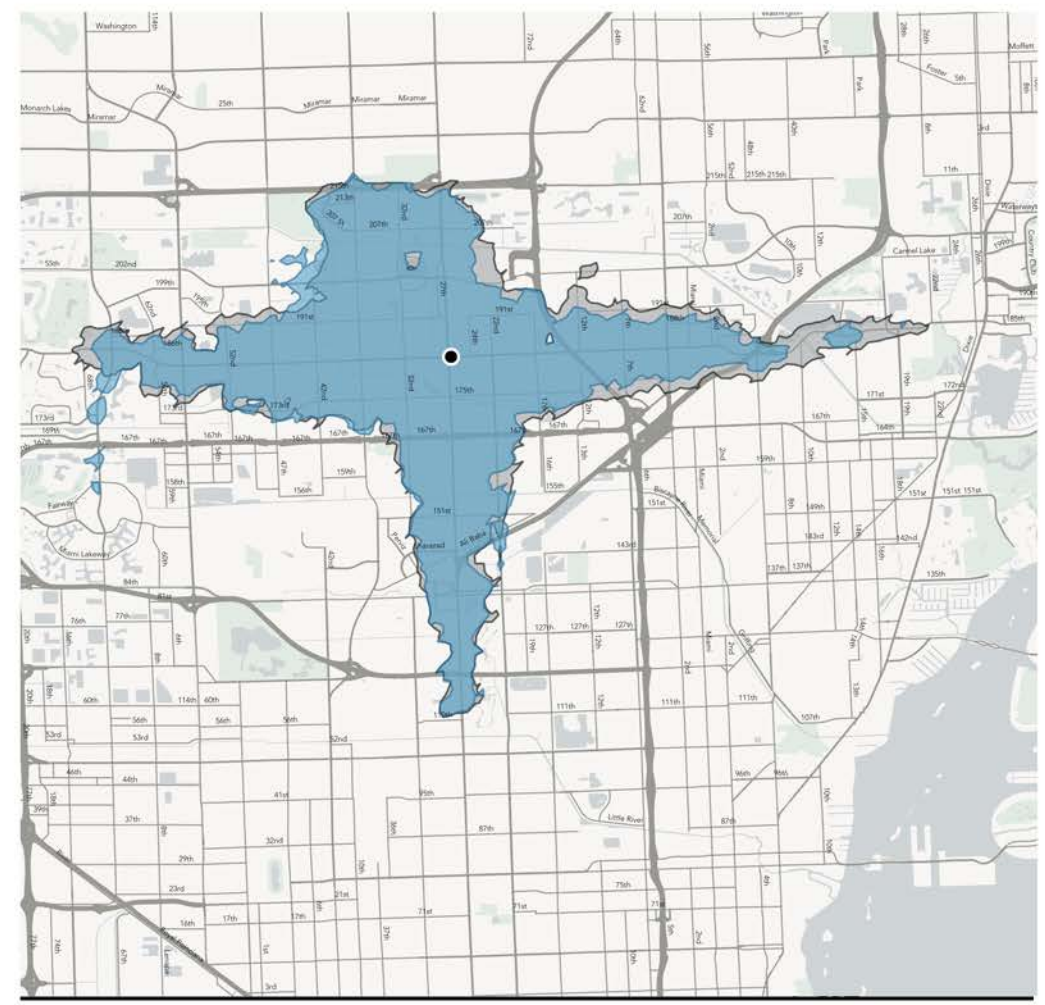


Ridership Concept



Change in jobs reachable	+7,725	+55%
Change in residents reachable	+28,070	+25%

Coverage Concept

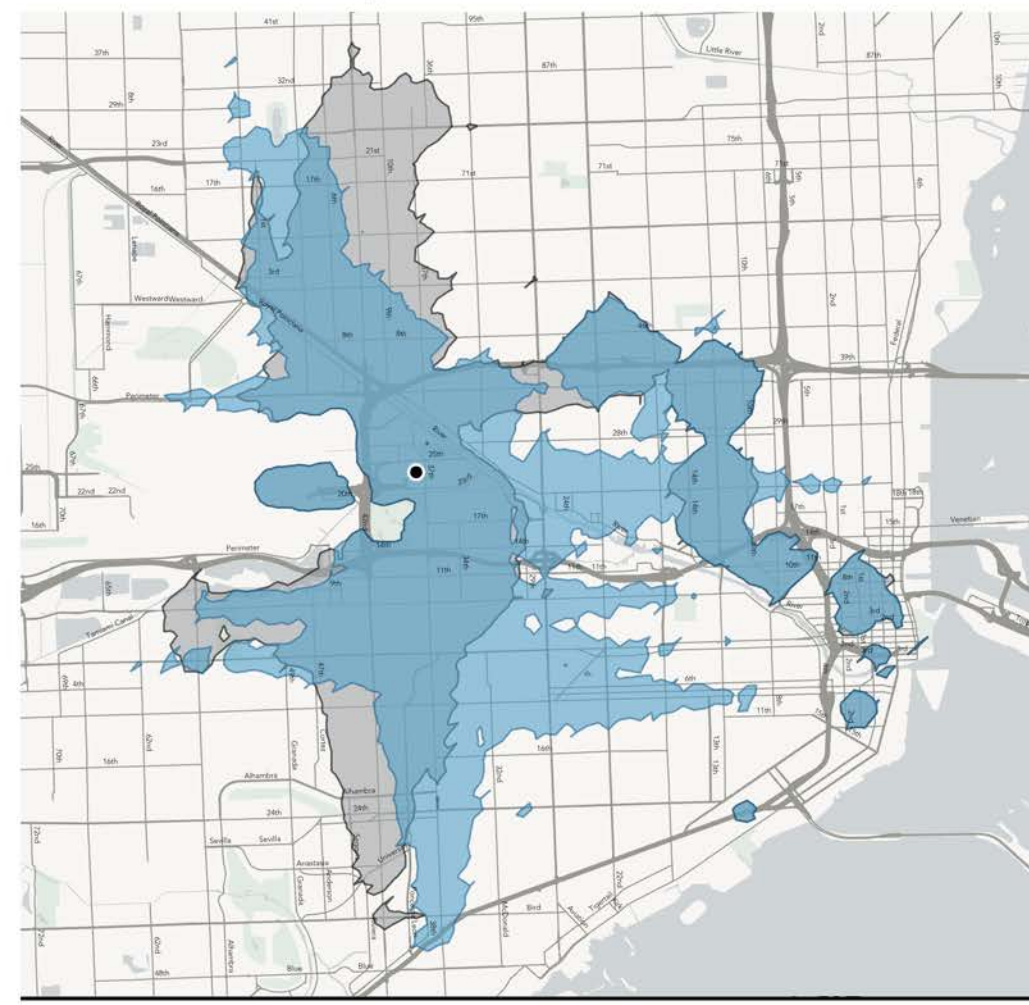


Change in jobs reachable	-2,765	-20%
Change in residents reachable	-10,995	-10%

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

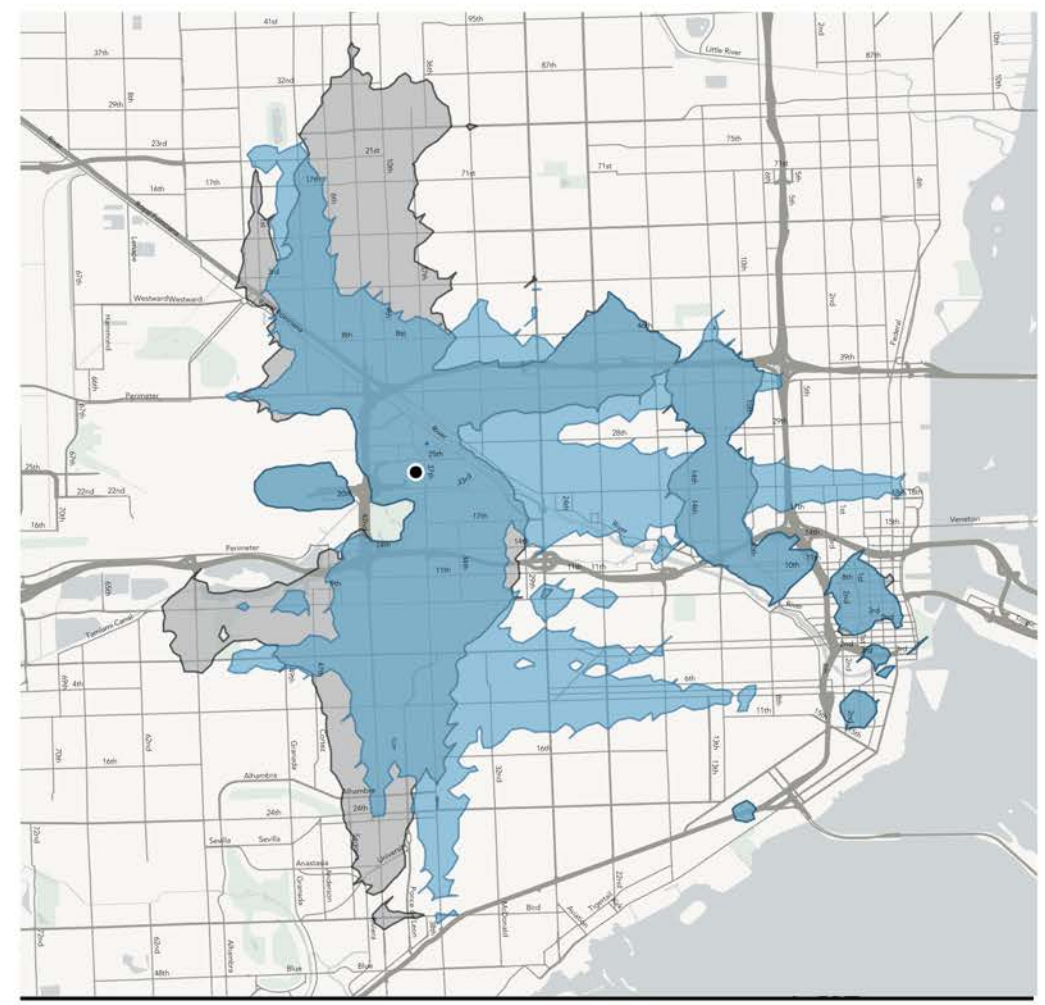


Ridership Concept



Change in jobs reachable	+5,785	+5%
Change in residents reachable	+45,055	+30%

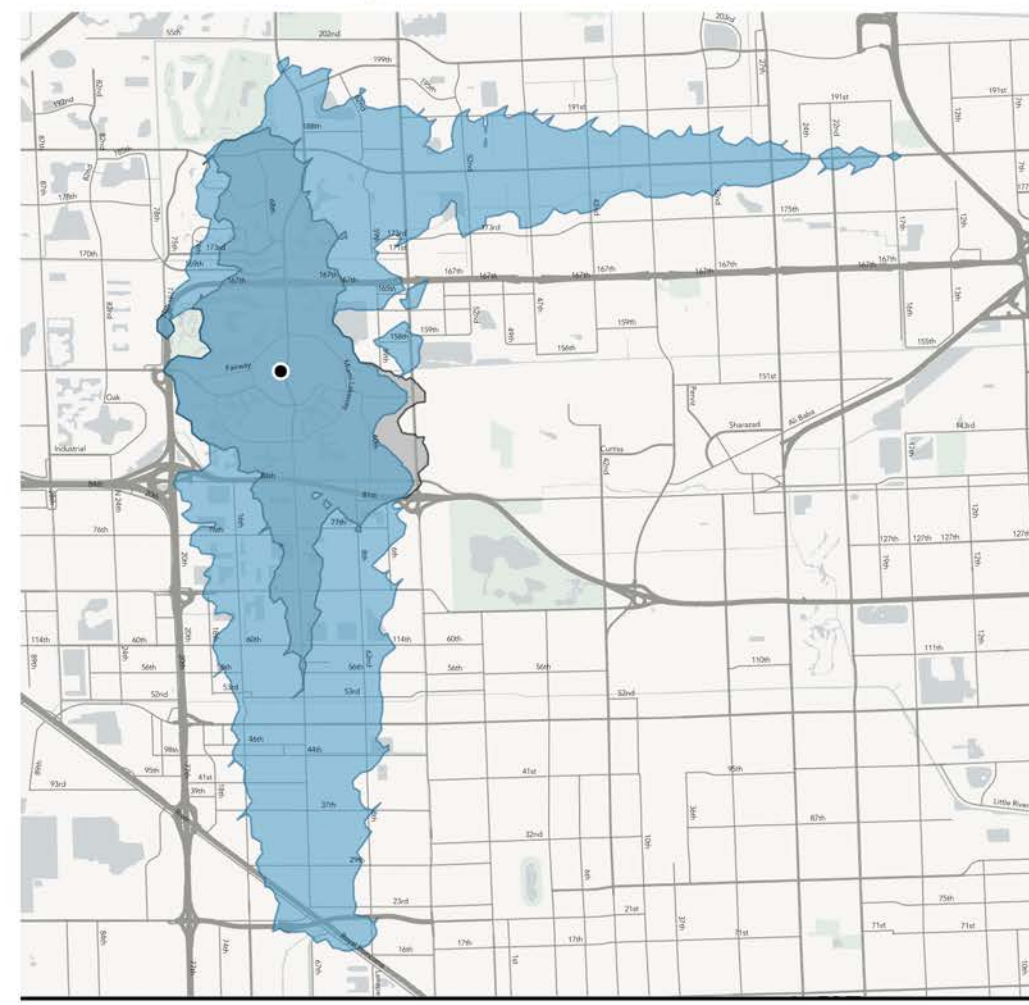
Coverage Concept



Change in jobs reachable	+8,620	+10%
Change in residents reachable	+20,520	+15%

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

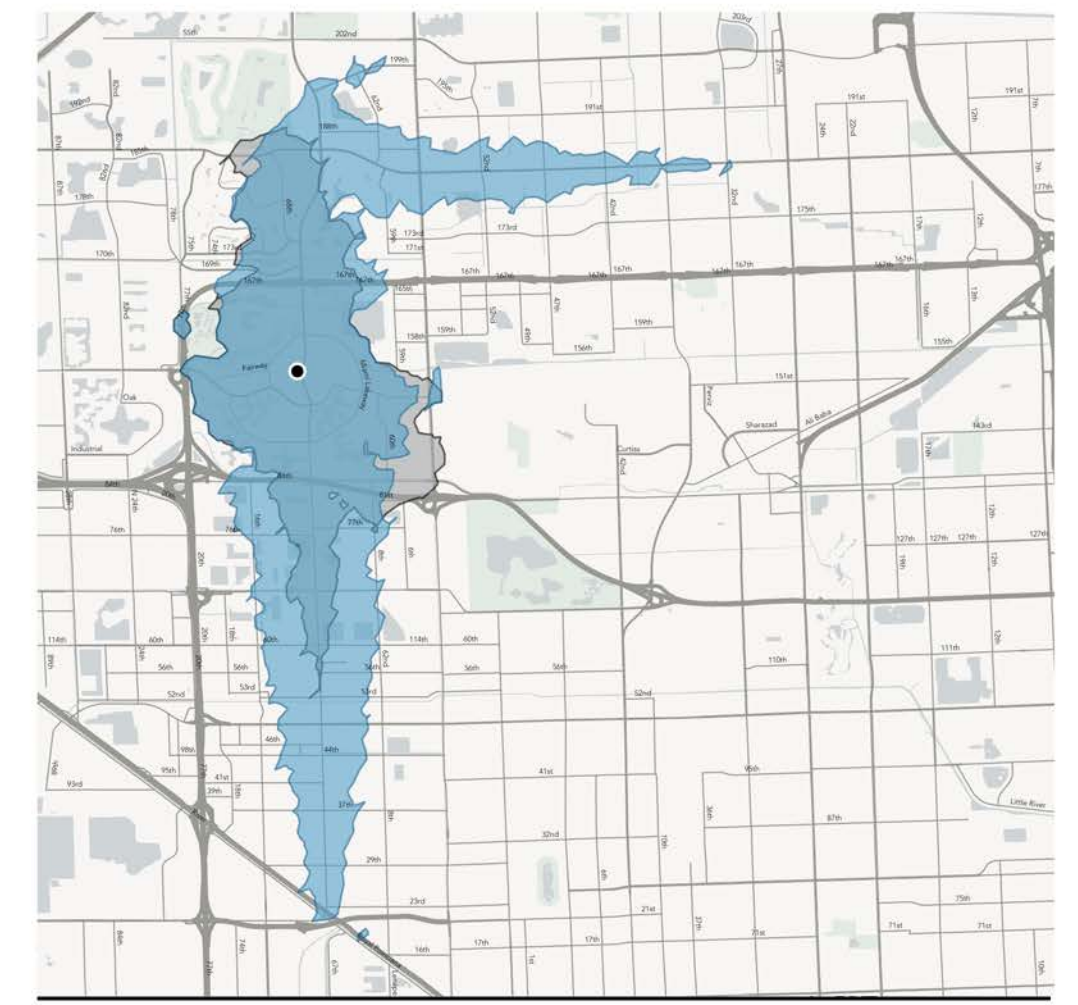
Ridership Concept



Change in jobs reachable	+16,715	+115%
Change in residents reachable	+90,580	+240%



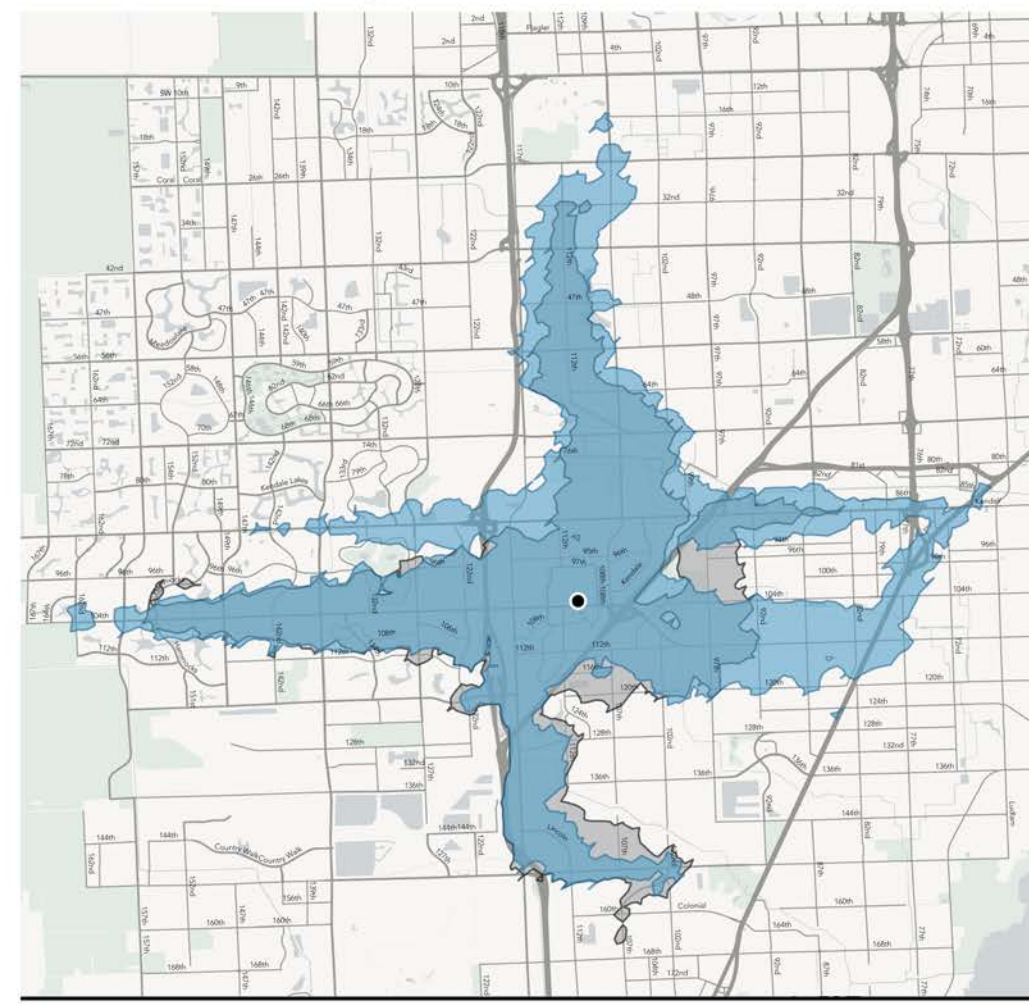
Coverage Concept



Change in jobs reachable	+6,290	+45%
Change in residents reachable	+43,355	+115%

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

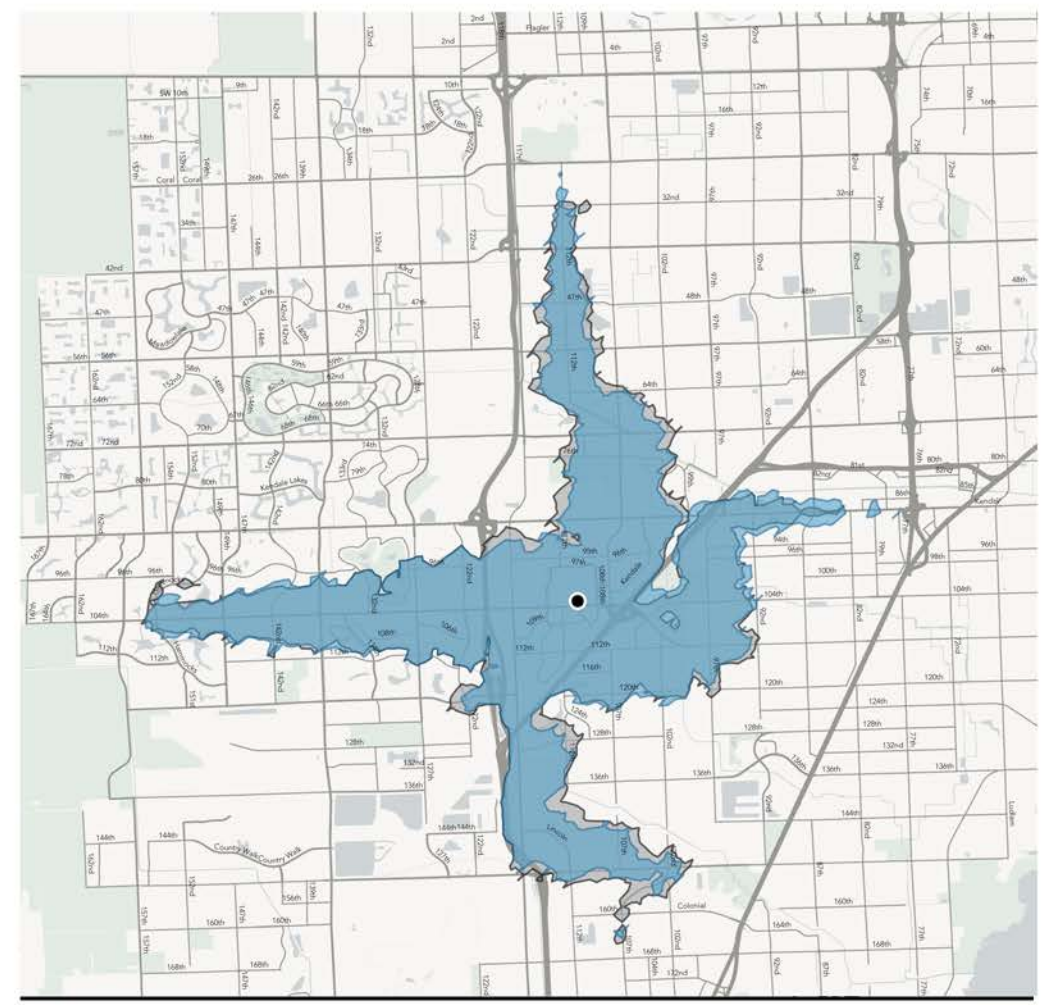
Ridership Concept



Change in jobs reachable	+19,195	+120%
Change in residents reachable	+24,370	+30%



Coverage Concept

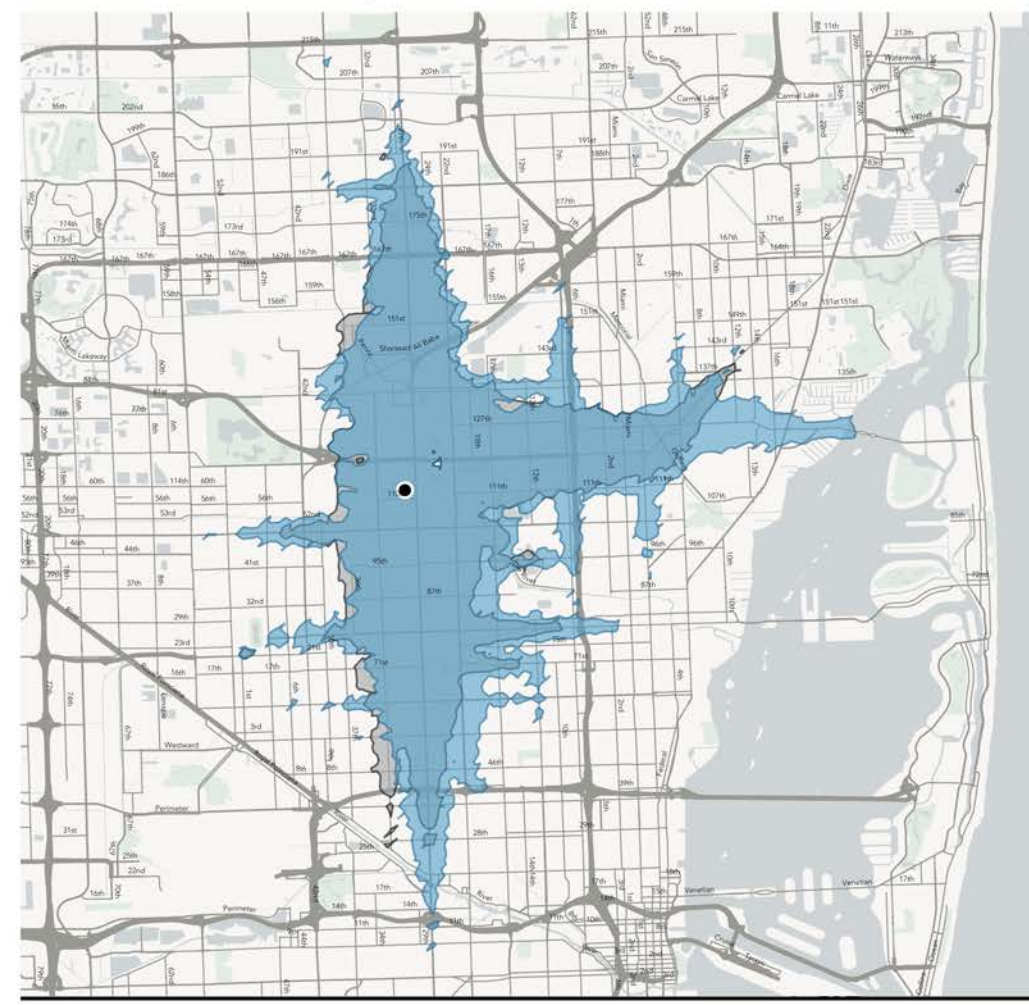


Change in jobs reachable	+355	+0%
Change in residents reachable	-4,770	-5%

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

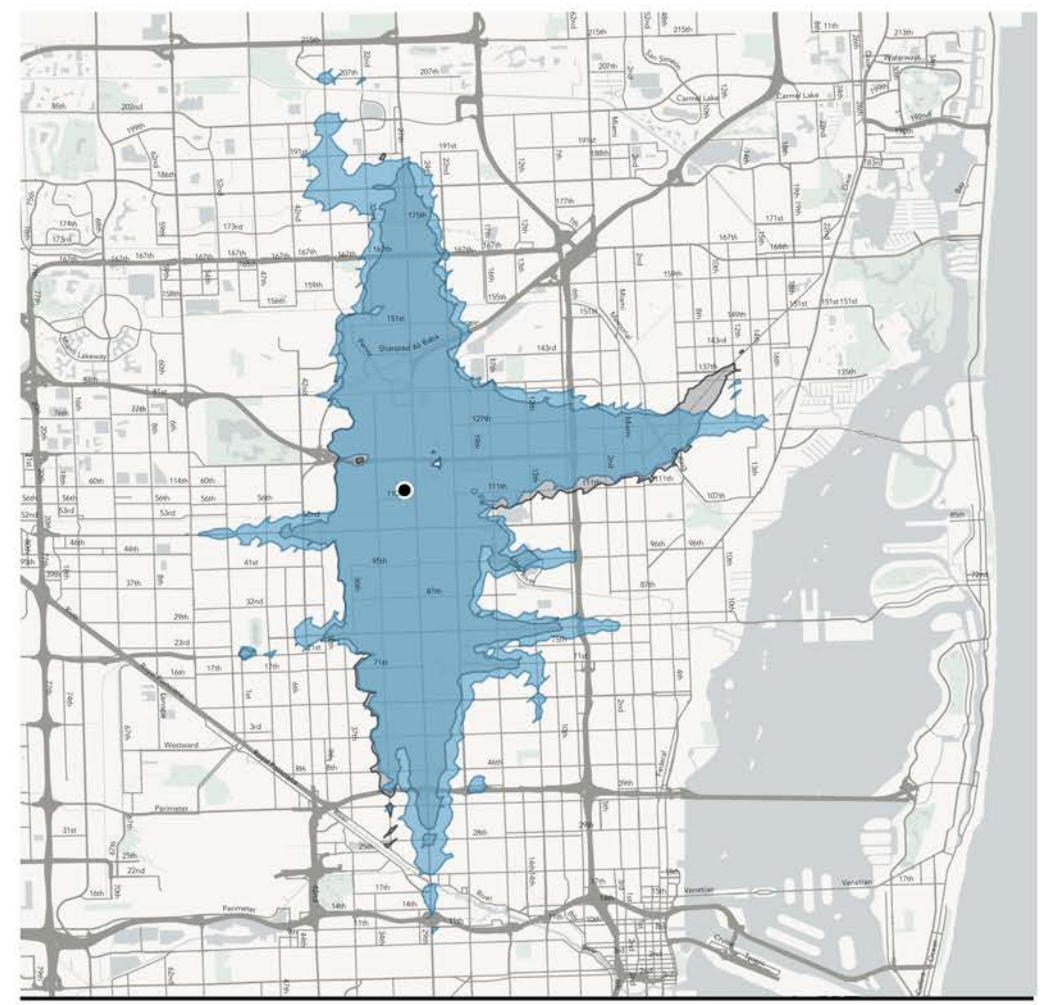


Ridership Concept



Change in jobs reachable	+10,345	+50%
Change in residents reachable	+50,025	+45%

Coverage Concept

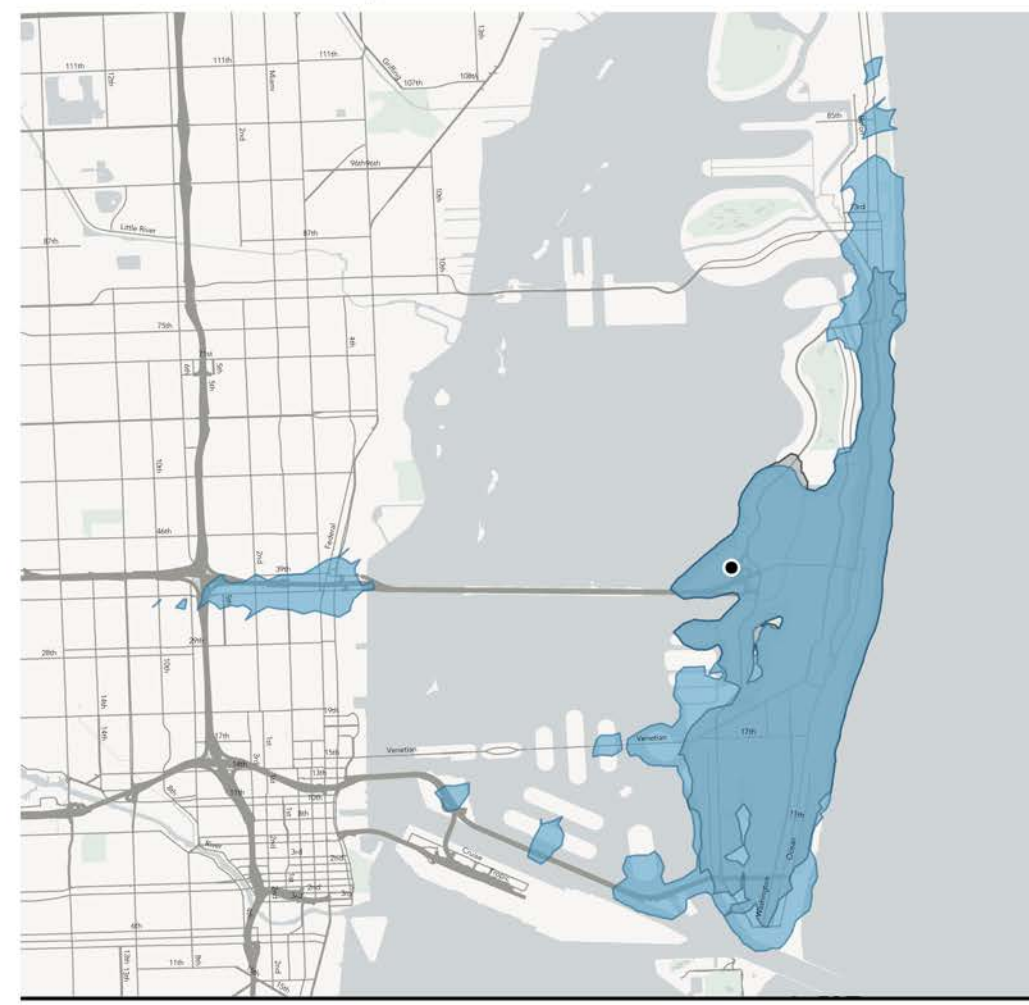


Change in jobs reachable	+5,325	+25%
Change in residents reachable	+29,725	+25%

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

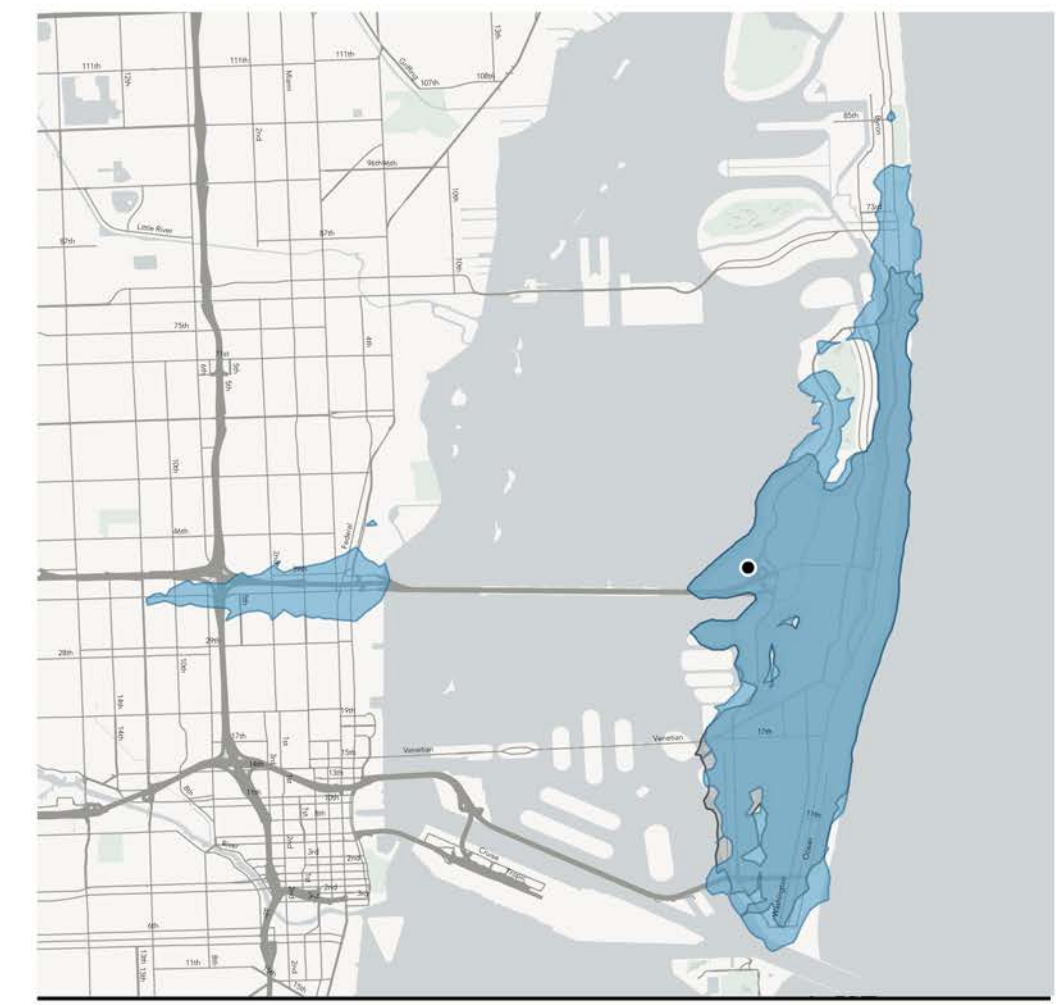


Ridership Concept



Change in jobs reachable	+7,950	+20%
Change in residents reachable	+16,830	+35%

Coverage Concept

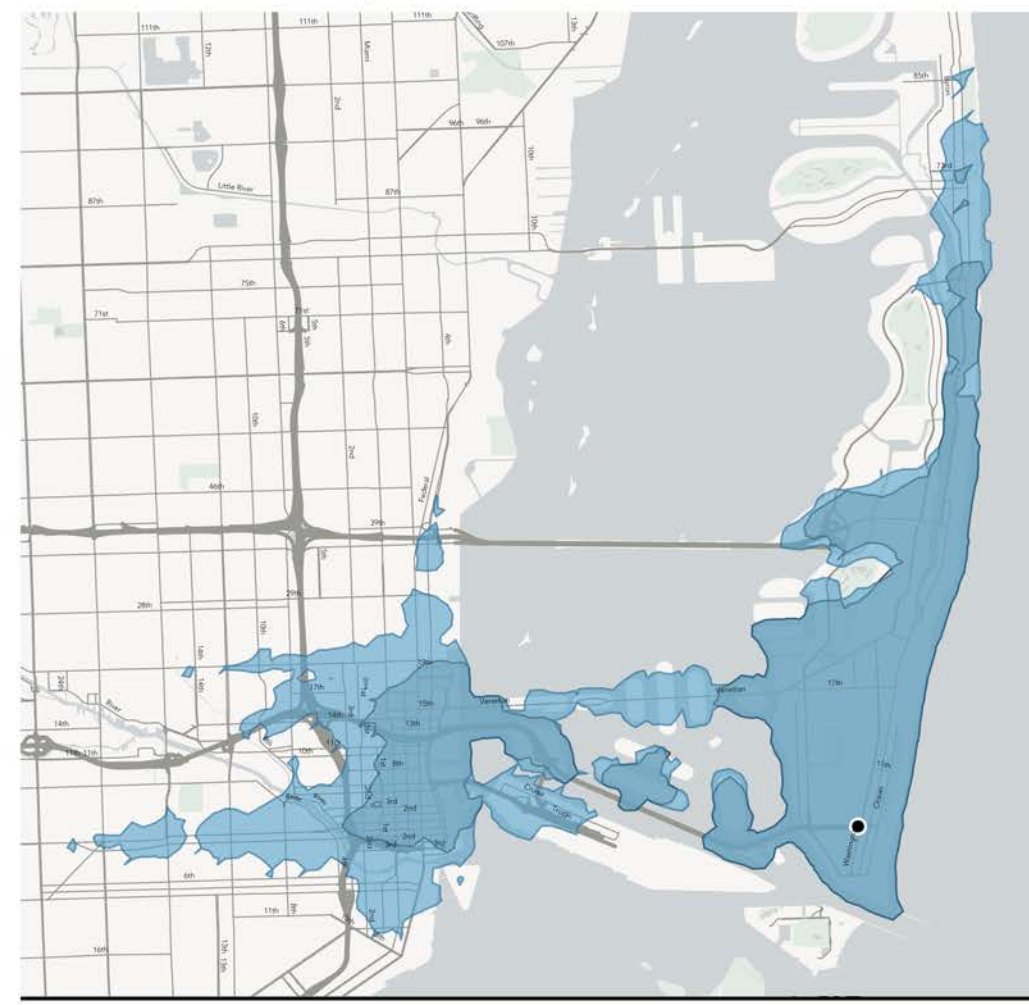


Change in jobs reachable	+6,400	+15%
Change in residents reachable	+12,220	+25%

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

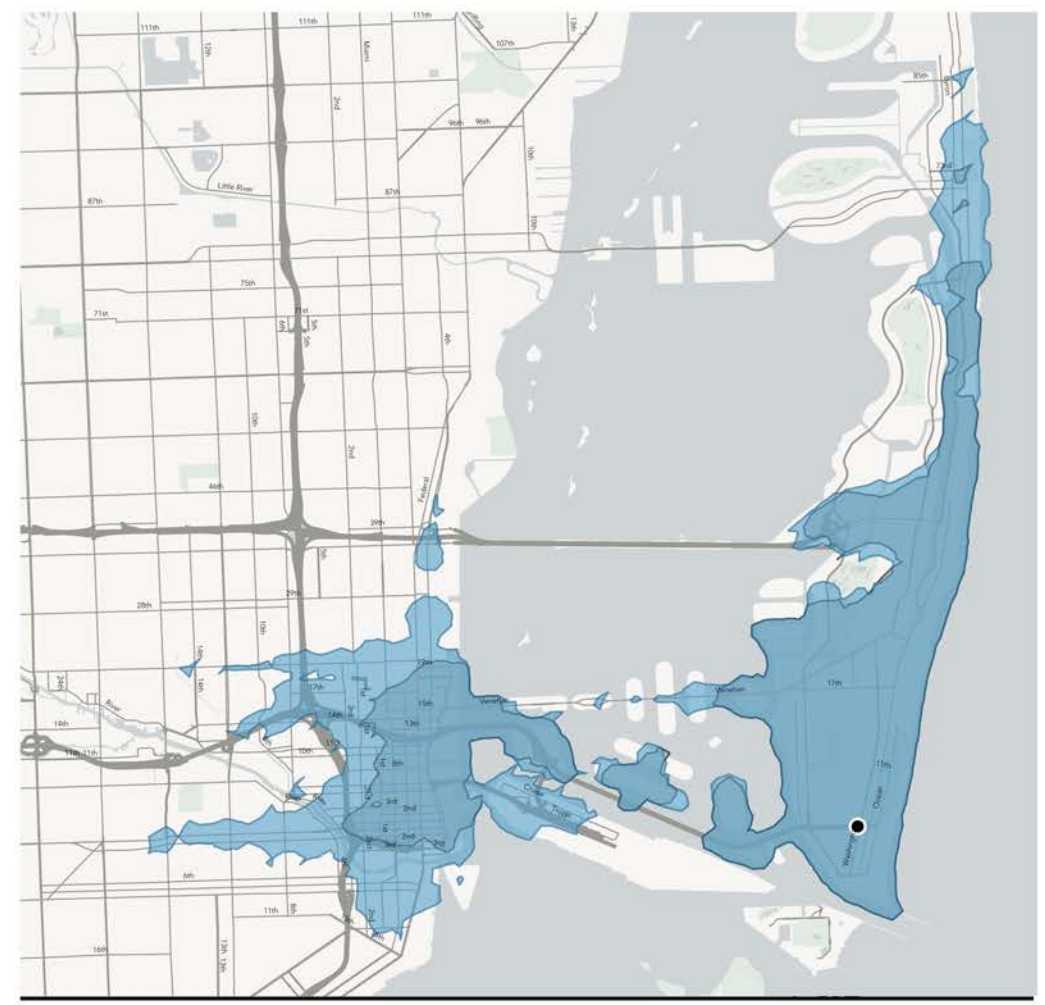


Ridership Concept



Change in jobs reachable	+84,130	+70%
Change in residents reachable	+55,170	+90%

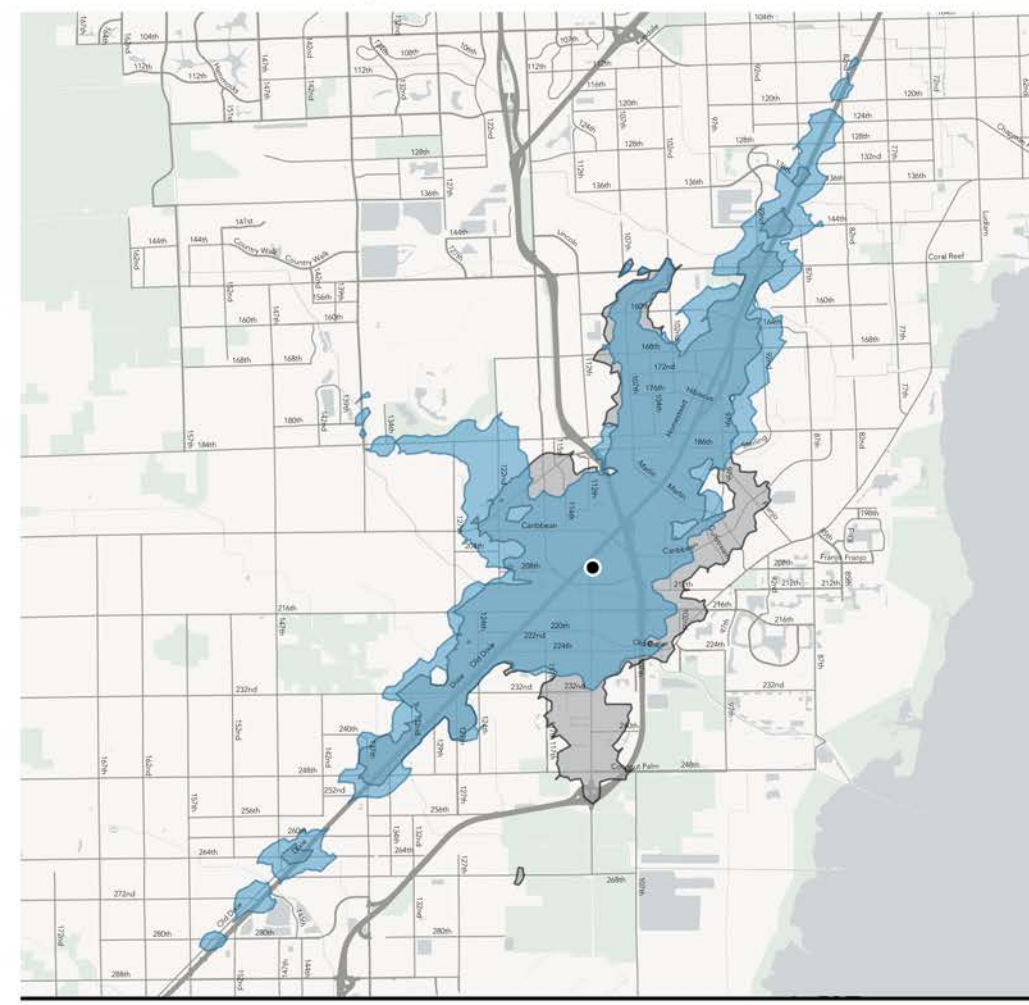
Coverage Concept



Change in jobs reachable	+80,780	+65%
Change in residents reachable	+44,465	+70%

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

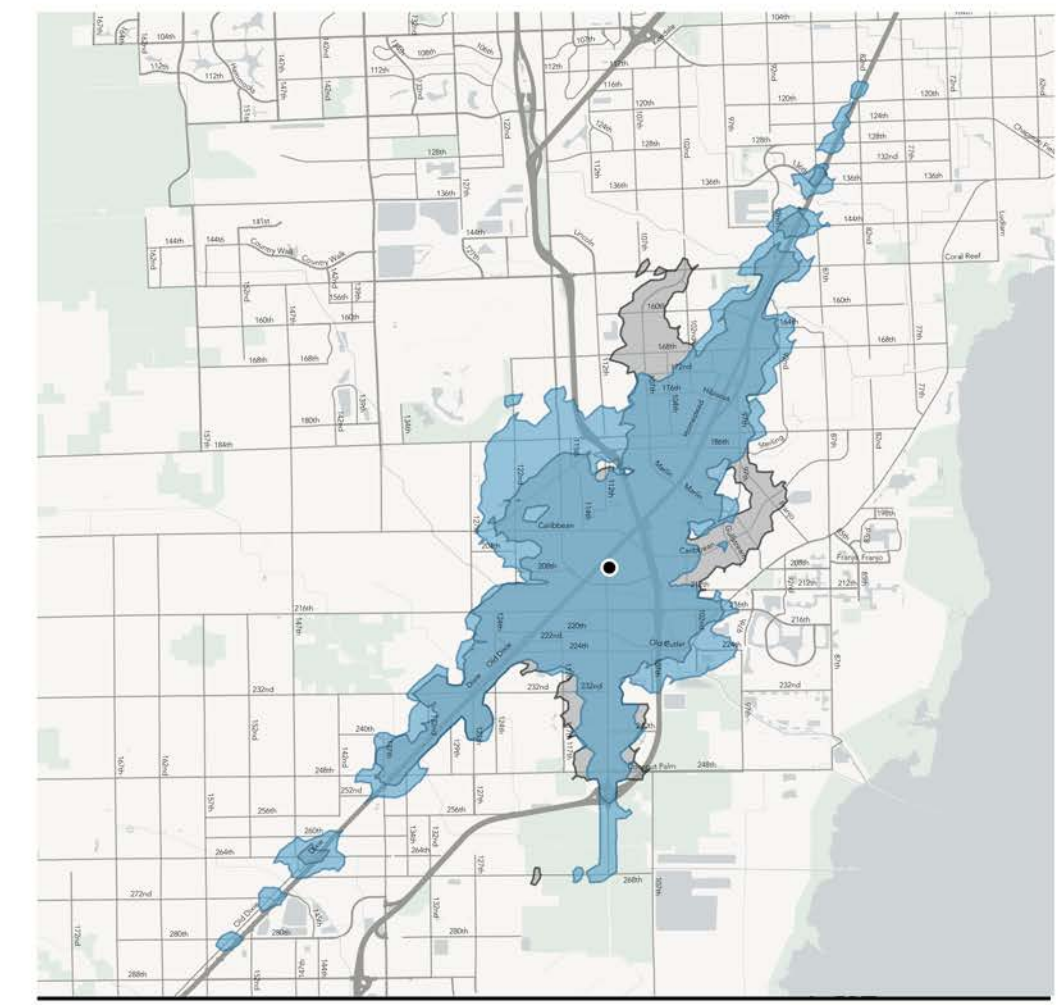
Ridership Concept



Change in jobs reachable	+3,040	+20%
Change in residents reachable	+1,115	+0%



Coverage Concept

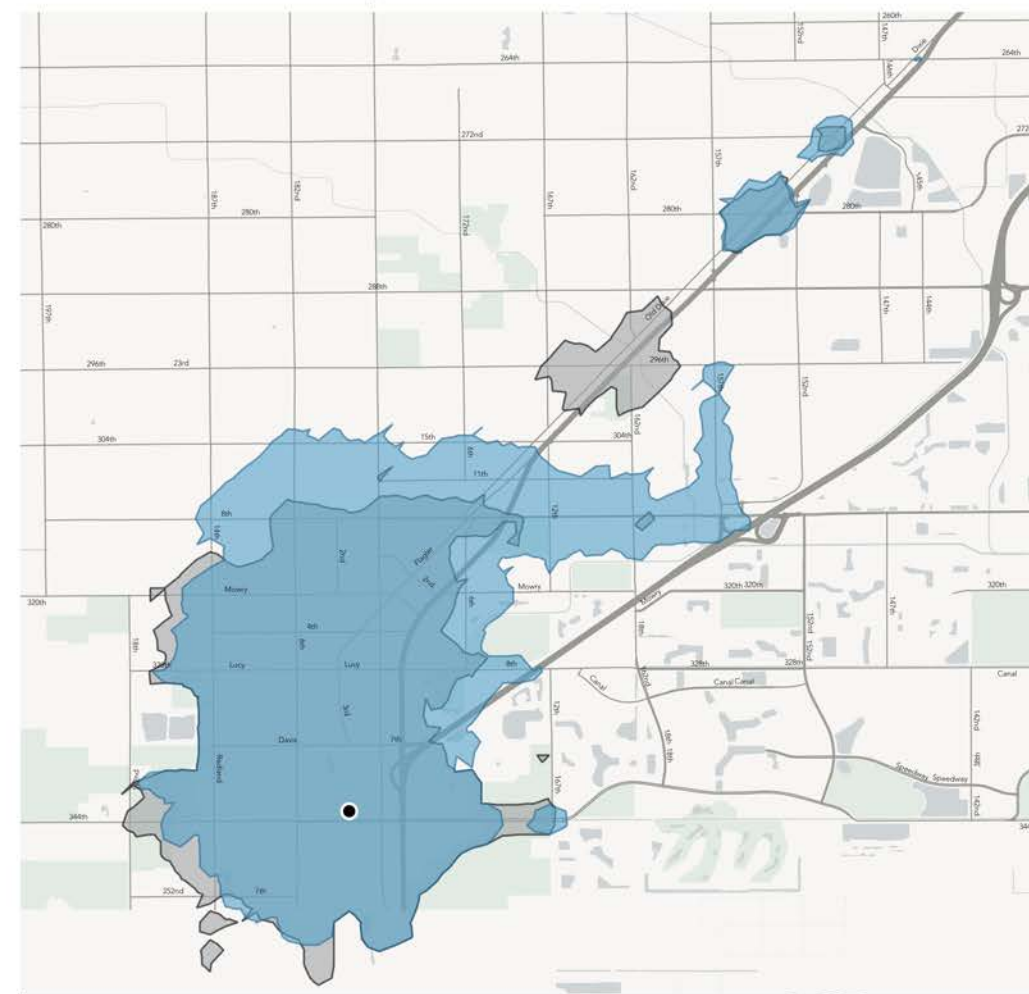


Change in jobs reachable	+3,015	+20%
Change in residents reachable	+8,625	+10%

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

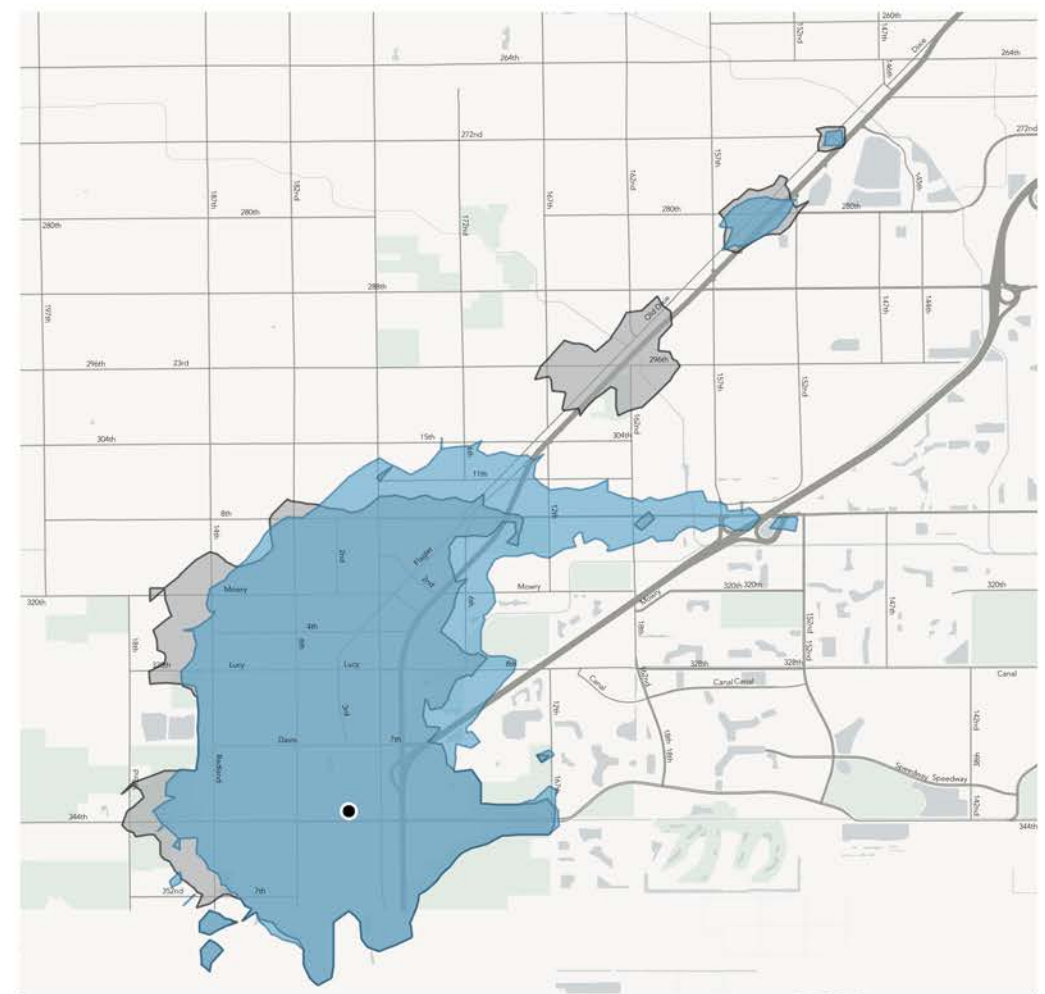


Ridership Concept



Change in jobs reachable	+2,865	+55%
Change in residents reachable	+13,135	+55%

Coverage Concept

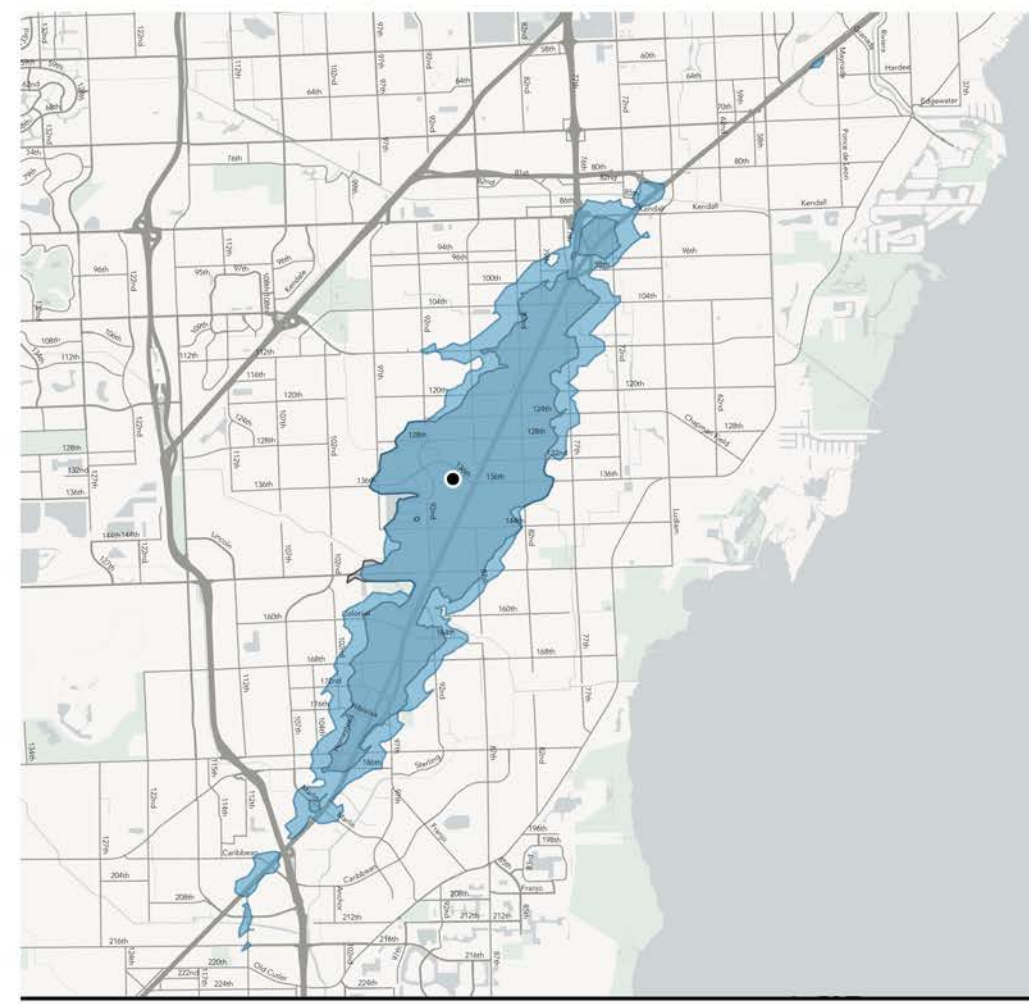


Change in jobs reachable	+1,620	+30%
Change in residents reachable	+4,545	+20%

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

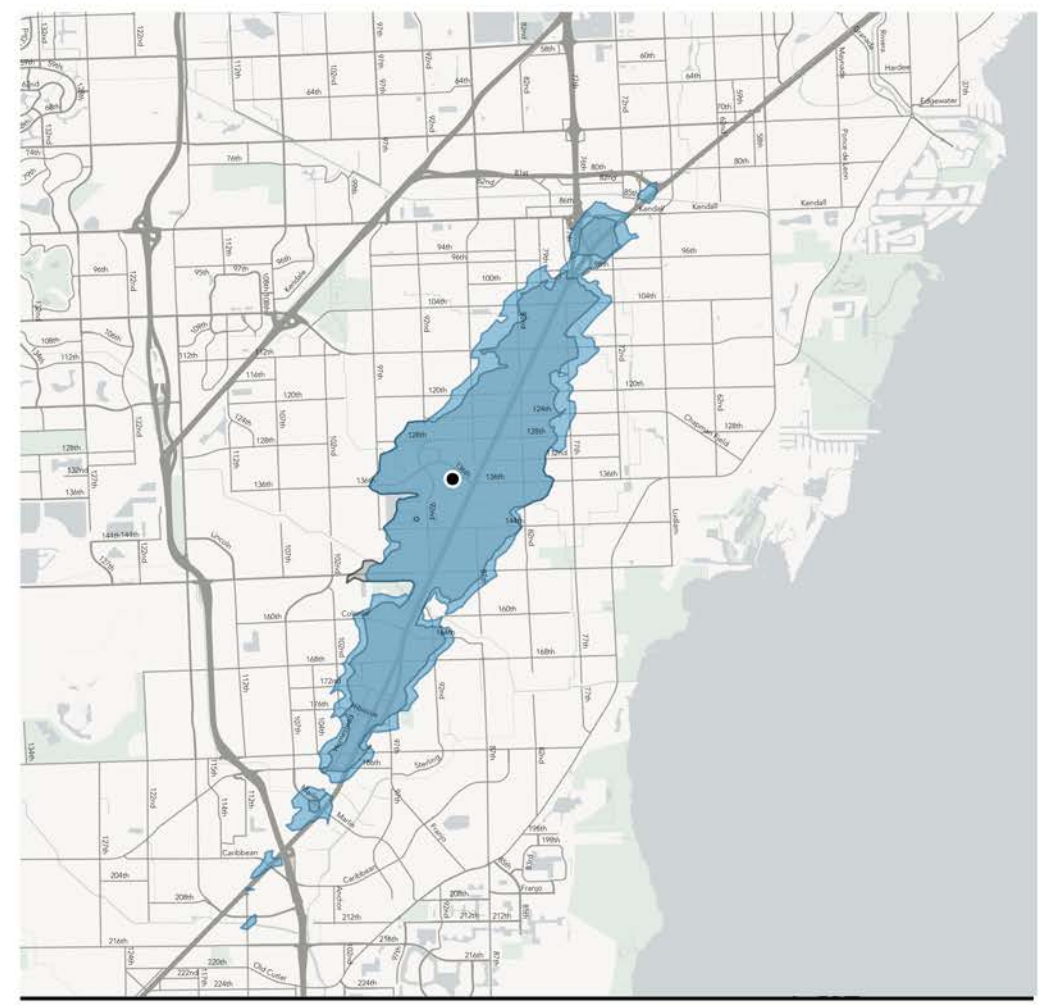


Ridership Concept



Change in jobs reachable	+11,745	+75%
Change in residents reachable	+12,340	+60%

Coverage Concept

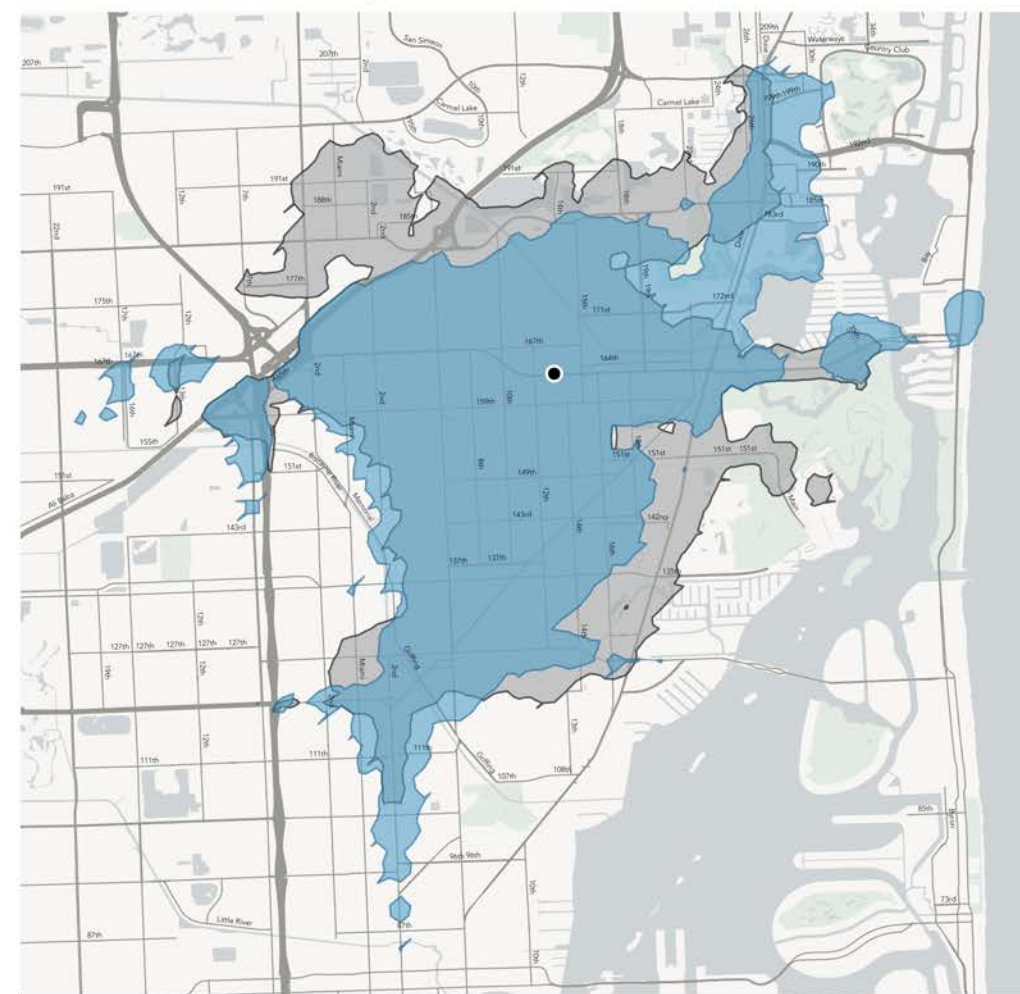


Change in jobs reachable	+6,945	+45%
Change in residents reachable	+6,750	+30%

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

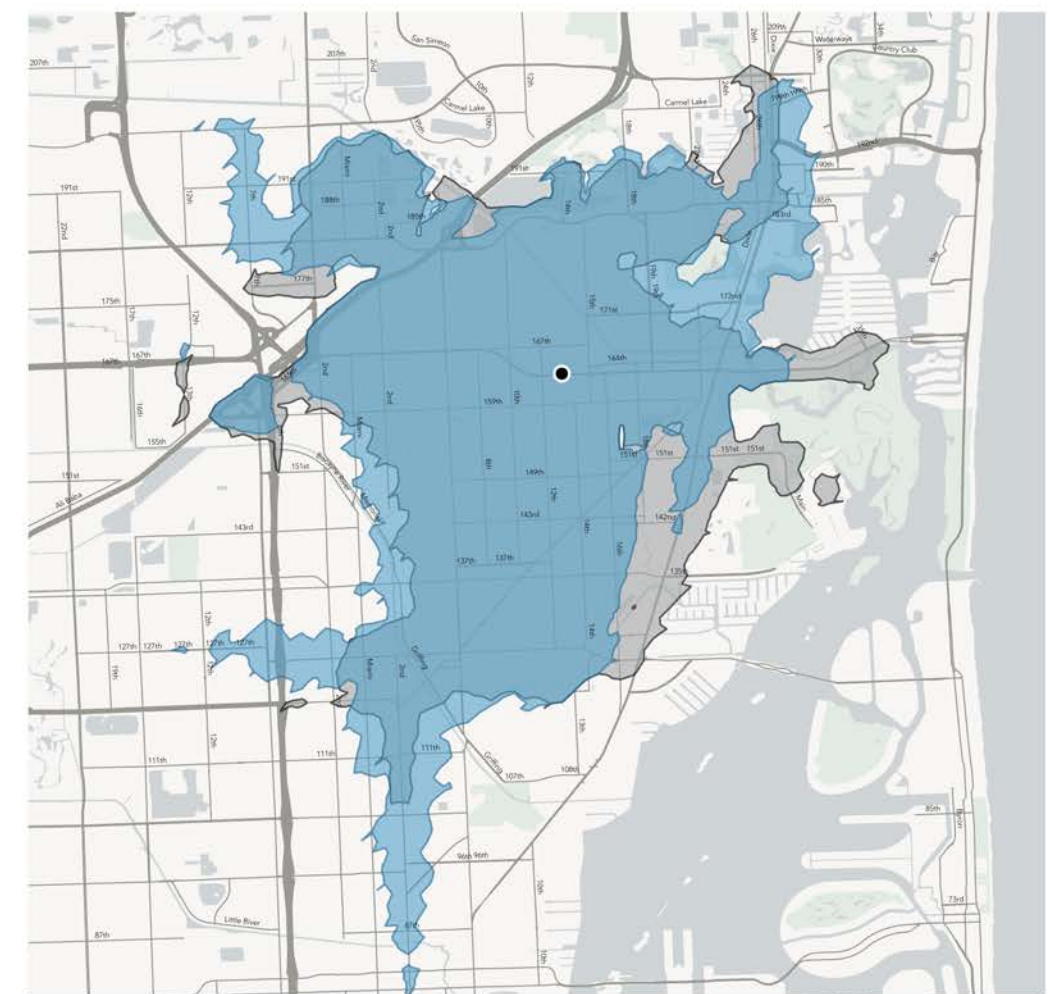


Ridership Concept



Change in jobs reachable	+2,045	+5%
Change in residents reachable	-6,610	-5%

Coverage Concept

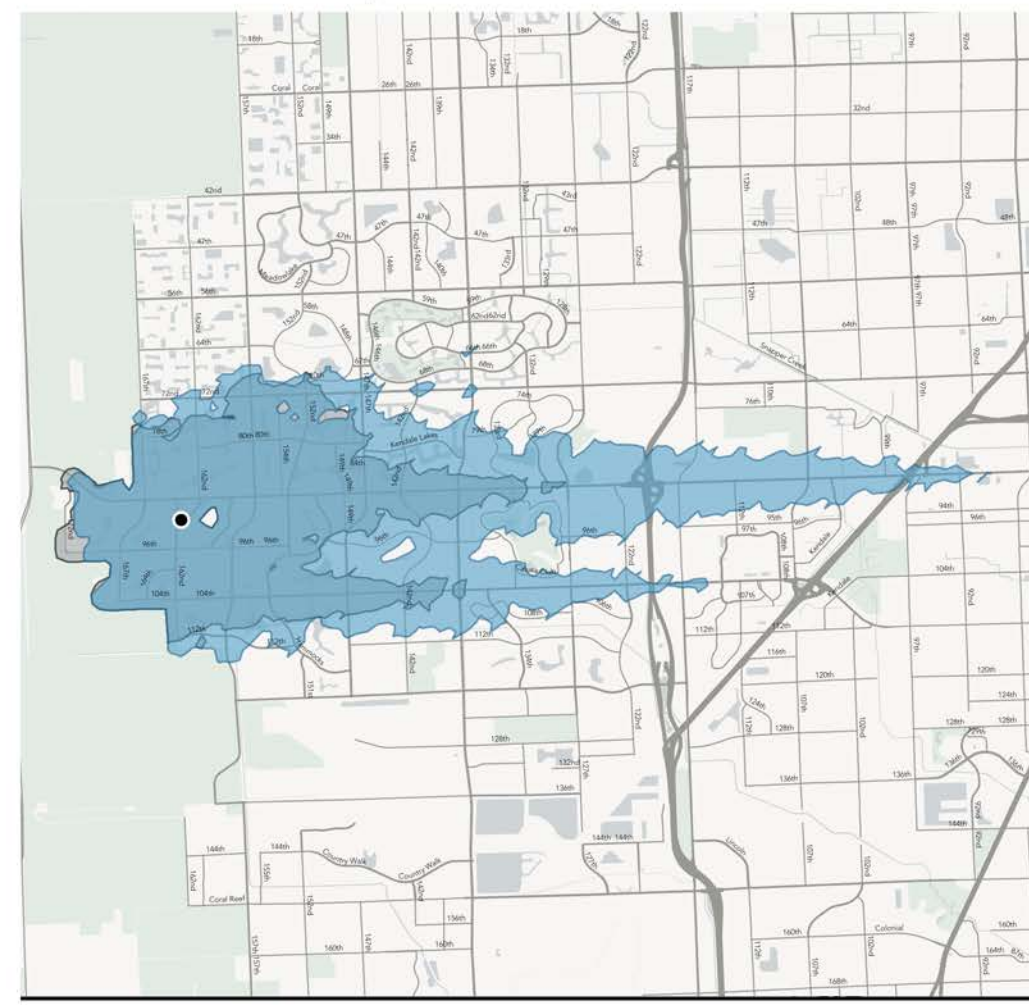


Change in jobs reachable	+2,165	+5%
Change in residents reachable	+16,345	+15%

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

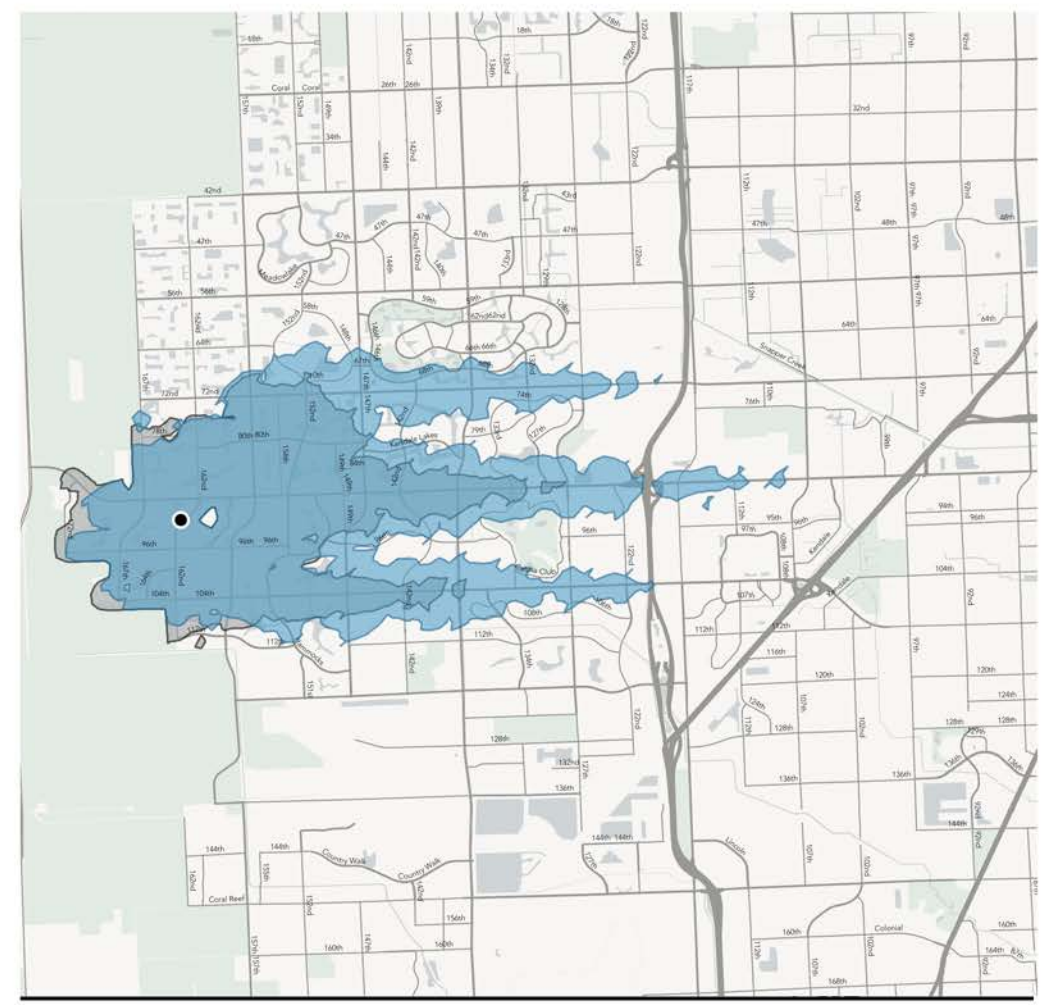


Ridership Concept



Change in jobs reachable	+10,390	+165%
Change in residents reachable	+44,795	+70%

Coverage Concept

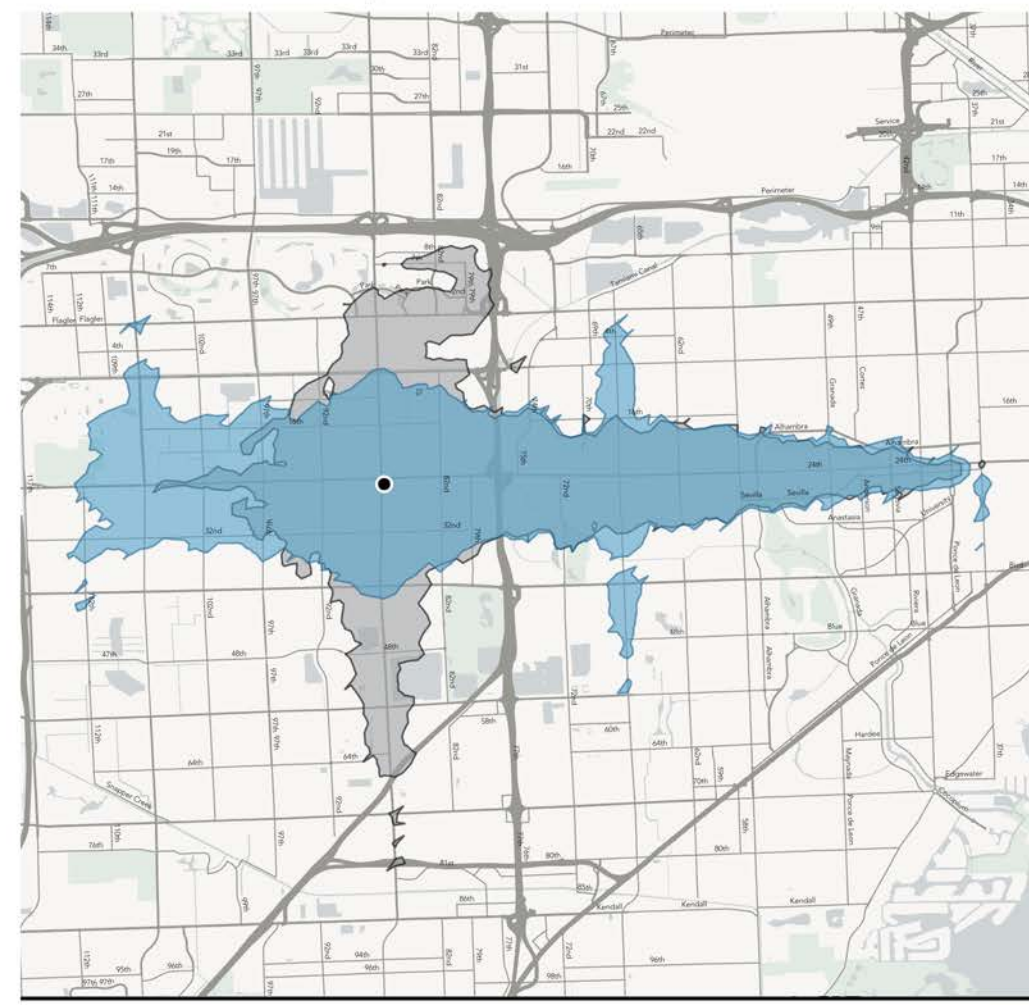


Change in jobs reachable	+4,275	+70%
Change in residents reachable	+32,520	+50%

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

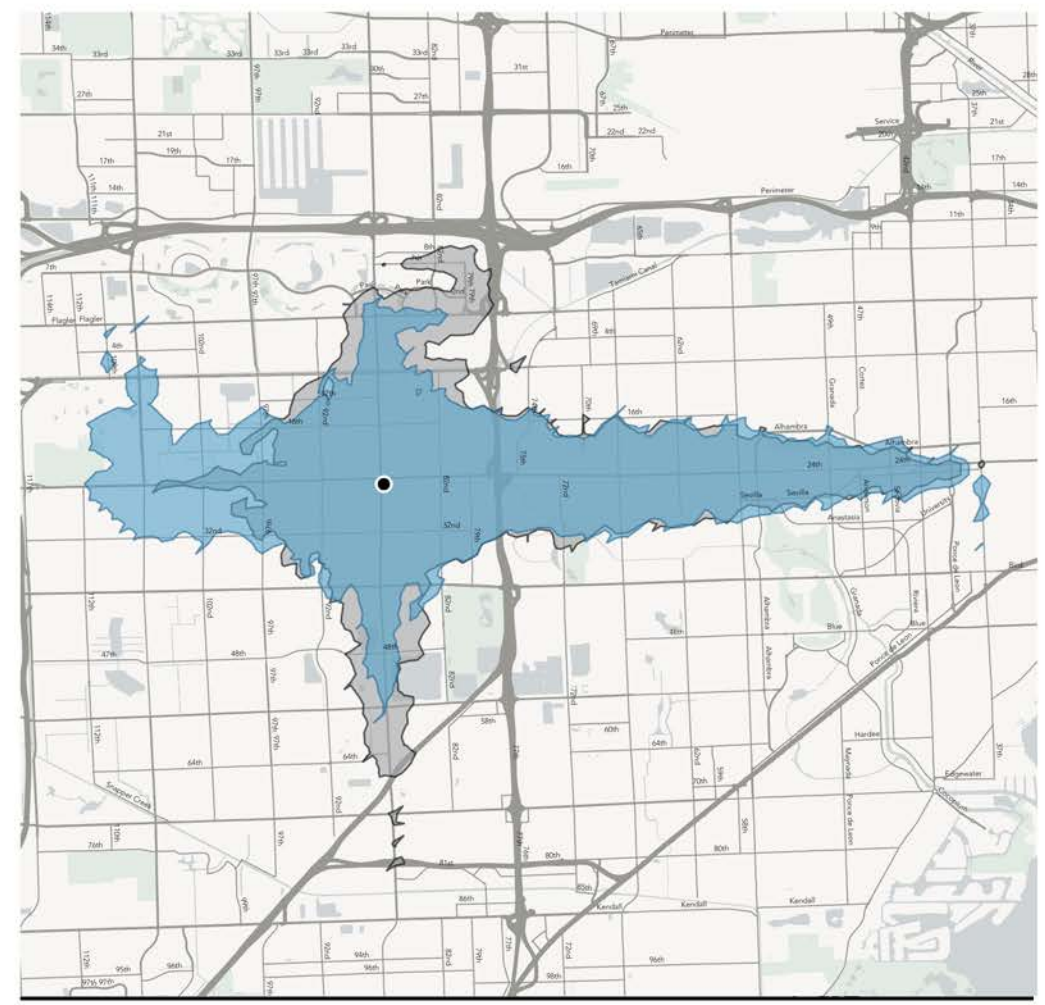


Ridership Concept



Change in jobs reachable	+1,610	+5%
Change in residents reachable	+4,235	+5%

Coverage Concept

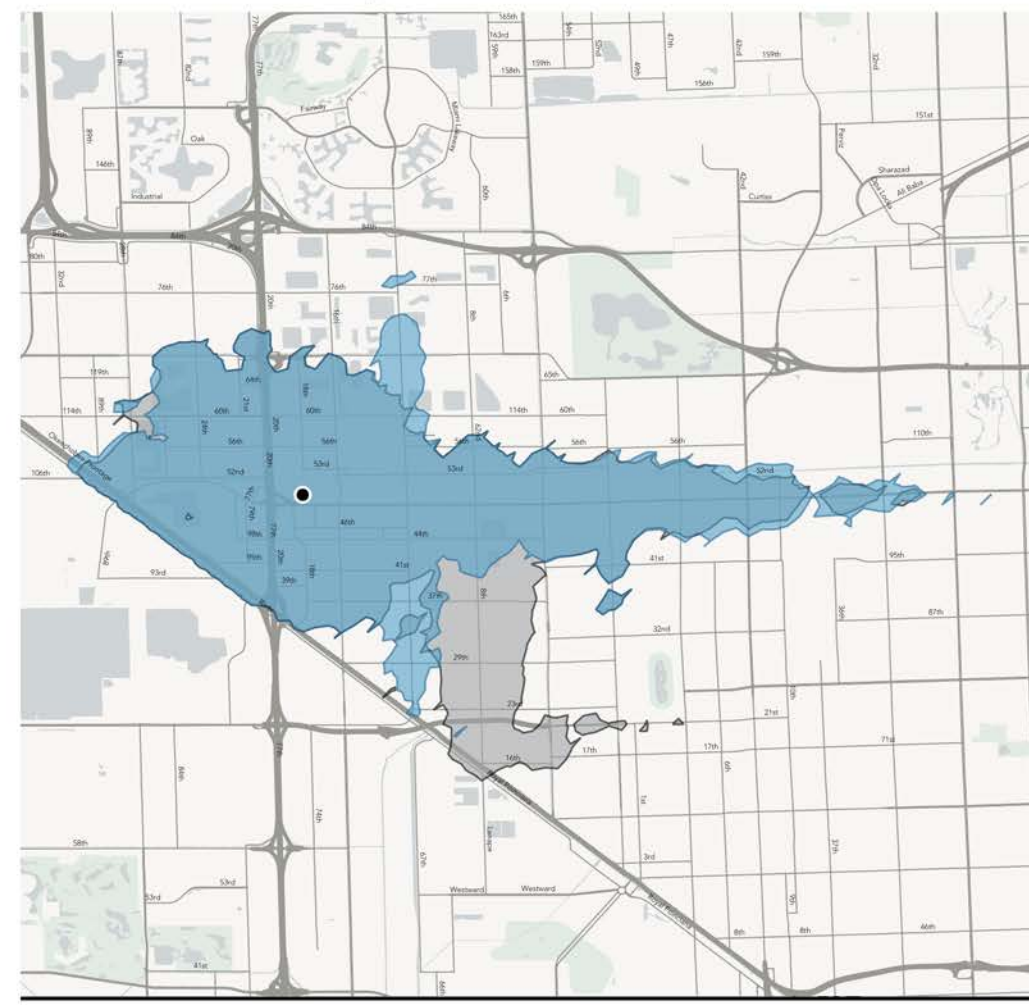


Change in jobs reachable	+1,660	+5%
Change in residents reachable	+2,230	+5%

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

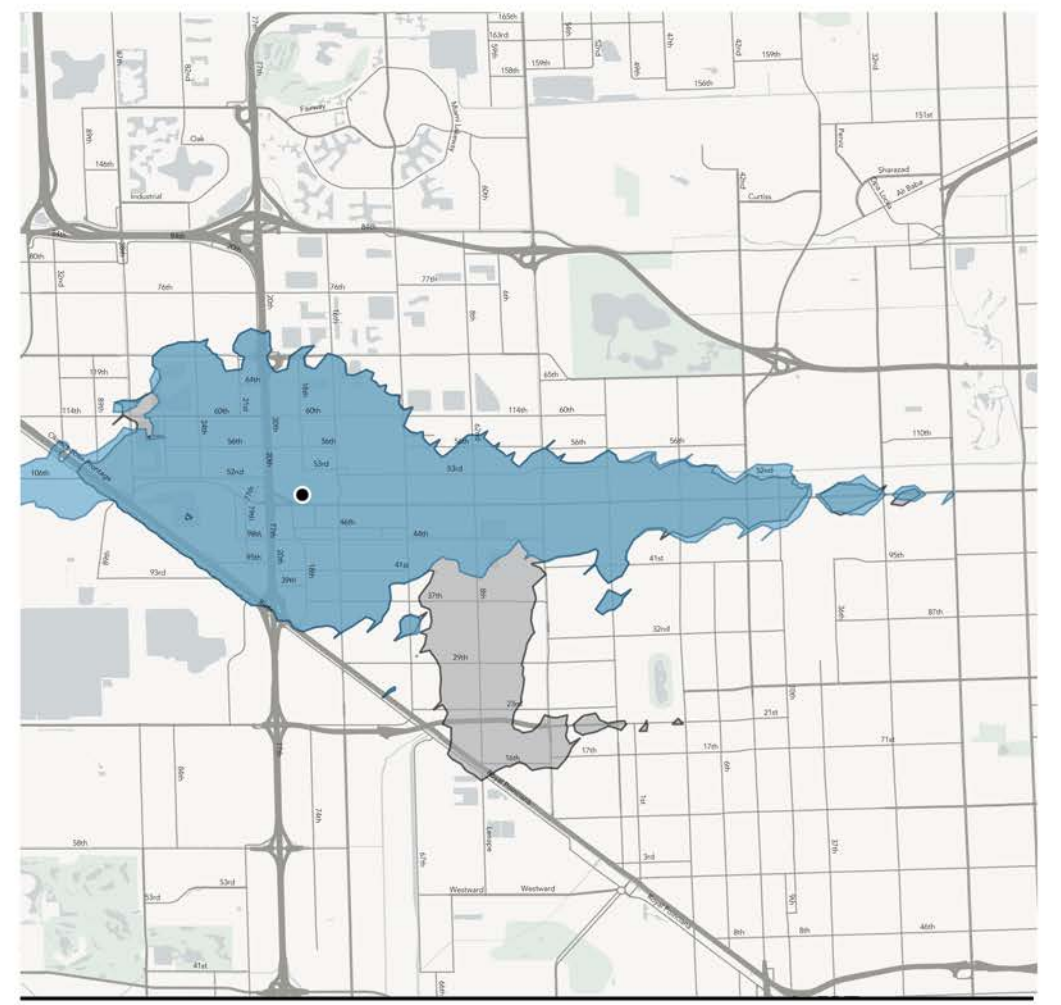


Ridership Concept



Change in jobs reachable	-2,155	-10%
Change in residents reachable	-4,155	-5%

Coverage Concept



Change in jobs reachable	-2,295	-10%
Change in residents reachable	-13,095	-15%