# Memphis 3.0 Transit Vision
# Draft Recommended Network
**APRIL 2018**

For Innovate Memphis and the City of Memphis

JARRETT WALKER + ASSOCIATES

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# 1 Introduction

# Introduction



## Where are we now?

This Draft Recommended Network Report is the third step in the Memphis 3.0 Transit Vision. This plan is part of the Memphis 3.0 comprehensive planning process, a process that will develop a new vision to guide the growth and development for the third century of Memphis. The Transit Vision is being led by the City of Memphis and Innovate Memphis, in partnership with the Memphis Area Transit Authority (MATA).

The Memphis transit network has not been thoroughly redesigned in decades, and many of its features were designed for a city that is much different than today. Previous efforts to redesign the system, like the 2012 Short Term Plan, have not been implemented because of the natural challenges to making large changes to long established habits and systems.

In addition, there has been a pattern of disinvestment in transit over the last ten years, leading to less transit service. These factors have combined to reduce ridership on the transit system and create a sense of crisis over how and whether transit can or should be a relevant part of the city's life.

In this context, the City of Memphis and Innovate Memphis began a conversation in 2017 with stakeholders, riders, community members and elected officials about whether to change the city's transit network, in what direction the system should be changed, and how to invest in the future of transit in Memphis.

The goal of this process has been to

- Assess the existing transit network and the geometry of today's city;
- Engage the public, stakeholders and elected officials in a conversation about the goals of transit in Memphis;
- Develop recommendations for changing the transit network; and
- Consider the cost and financing options for improving transit in Memphis.

Ultimately, the City of Memphis wants a blueprint for how to change and grow the existing transit system to best meet the needs and goals of today's city, and develop a long-term plan for the future transit network that meets the needs of the Memphis of tomorrow.

The Draft Recommended Network in this report is the result of those conversations and the direction received from the public, stakeholders and elected officials about the values that Memphians want transit to achieve.

## Who designed this network?

This network was designed through collaboration among City of Memphis planning and transportation staff, Innovate Memphis multimodal transportation staff, Memphis Area Transit Authority (MATA) staff, and consulting transit experts from Jarrett Walker + Associates.

This network represents some key choices about the future of transit in Memphis. Those choices were made not by the technical experts, but by Memphis stakeholders. The choices, and the many ways that people weighed in on them, are described in the next chapter.

## How much more transit funding are we recommending?

Based on public and stakeholder input, the Draft Recommended Network assumes that Memphis will invest more funding in transit to provide more service. The network is designed with the assumption that an additional $26 million per year would be provided for transit operations and $4 million for transit capital needs, for a total increase in investment of $30 million per year. This funding level was chosen based on consultation with City, MATA and Innovate Memphis staff as a realistic assumption of what could be provided with additional funding from a mixture of revenue sources approved by the City or by voters.

> The Draft Recommended Network assumes the City will invest an additional $30 million per year in transit.

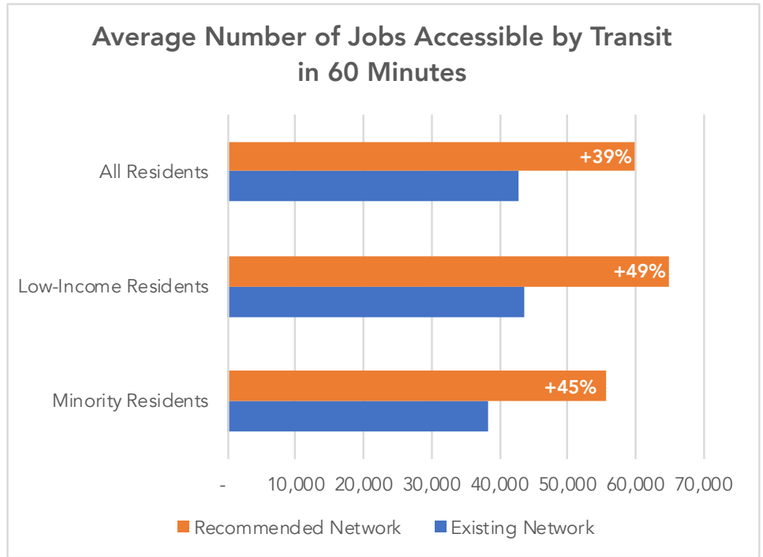
## How does the Recommended Network perform?

For most people and most places in Memphis, the Recommended Network dramatically improves the jobs, people, and opportunities accessible by transit. It does this by providing more frequent service along the busiest and densest corridors and by rearranging service in some areas to consolidate low frequent routes into higher frequency service.

For the average Memphian, the number of jobs accessible by transit in an hour would increase by 39%. For low-income and minority residents, jobs access would increase, on average, by 49% and 45%, respectively.

The number of people and jobs that have access to some service would also increase with the Draft Recommended Network. Access to frequent service would increase dramatically. An additional 79,000 people would have access to frequent service, increasing from 2% of people with the existing system to 14% with the Recommended Network. An additional 103,000 jobs would be near frequent service, increasing from 6% with the existing system to 25% with the Recommended Network.

Figure 1: Change in jobs accessible for all residents, low-income residents, and minority residents




***Takeaway***

**For the average Memphian, the Recommended Network would increase the number of jobs accessible in one hour by 39% — an additional 17,000 jobs.**

# Introduction

## Existing System

The map at right shows MATA's network, with every route color-coded based on its frequency during midday on a weekday.

Low frequencies and limited hours of service are one of the main ways that transit fails to be useful, because it means service is simply not there when the customer needs to travel.

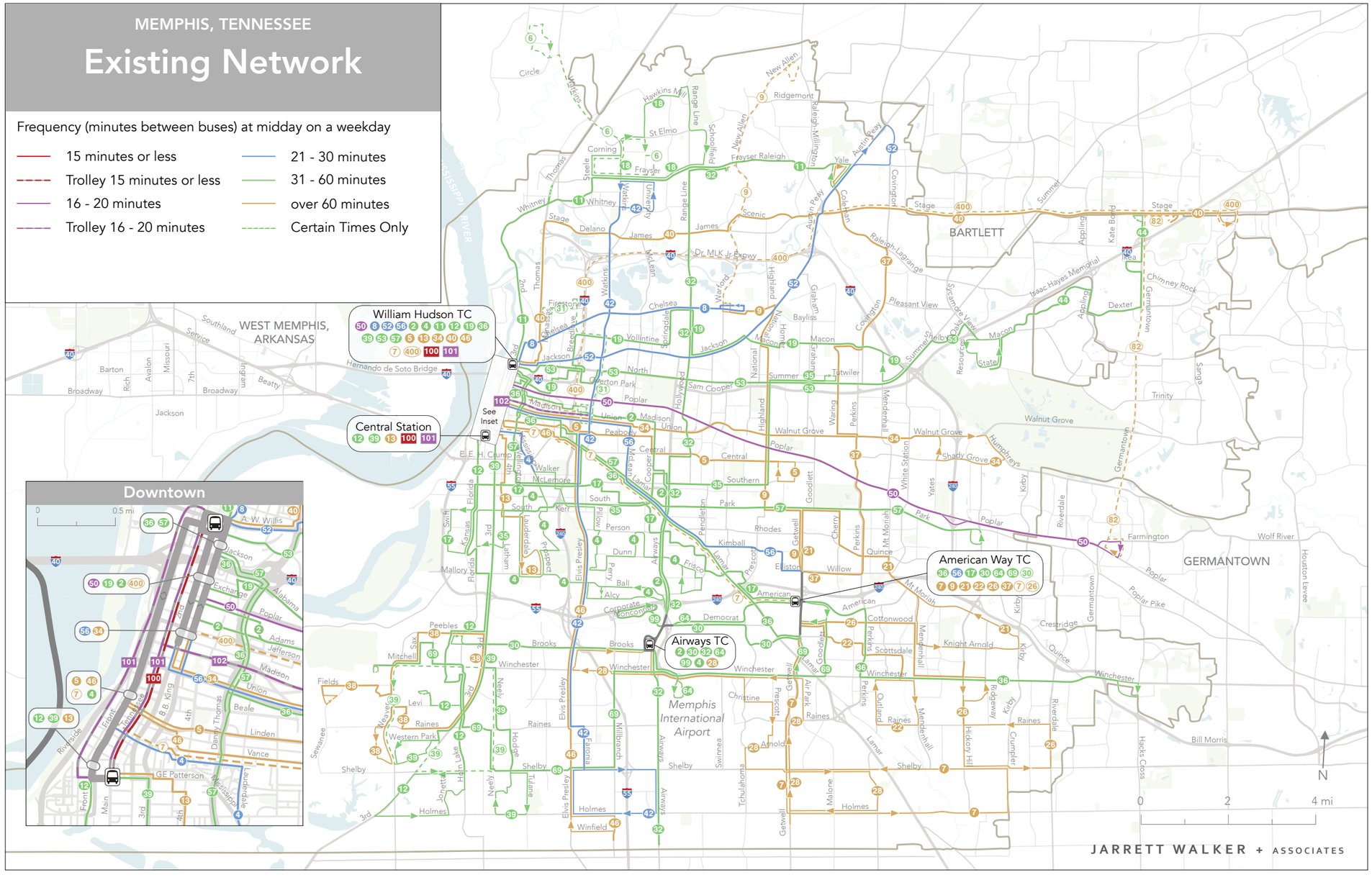
Frequent service:

- Reduces waiting time (and thus overall travel time).
- Improves reliability for the customer, because if something happens to your bus, another one is always coming soon.
- Makes transit service more legible, by reducing the need to consult a schedule.
- Makes transferring (between two frequent services) fast and reliable.

The map at right reveals that only a few MATA routes offer 30-minute frequency; only one offers 20-minute frequency; and only the trolleys offer service every 15 minutes or better (which is the transit industry norm for calling something "frequent").

The Existing Network devotes 40 percent of resources to service that one would expect to get high ridership relative to cost. The other 60 percent of resources is going to service that is not likely to get high ridership relative to cost, but is meeting other important goals, like covering low density areas with severe needs. For a deeper explanation of the ridership-coverage trade-off and balance between those two goals, see the *Choices Report*.

Figure 2: Existing System



# Introduction

## Recommended Network

The Draft Recommended Network assumes a major increase in transit investment — an additional $30 million per year. The additional resources are primarily invested in additional frequency with 70 percent of all resources spent on service expected to get high ridership relative to cost, while 30 percent of all resources are spent on service that is meant to provide coverage to areas where ridership is not likely to be high.

This concept would provide a high frequency grid network with high frequency service on two routes radiating from downtown: Union and Lamar plus 20 minute frequency on Poplar.

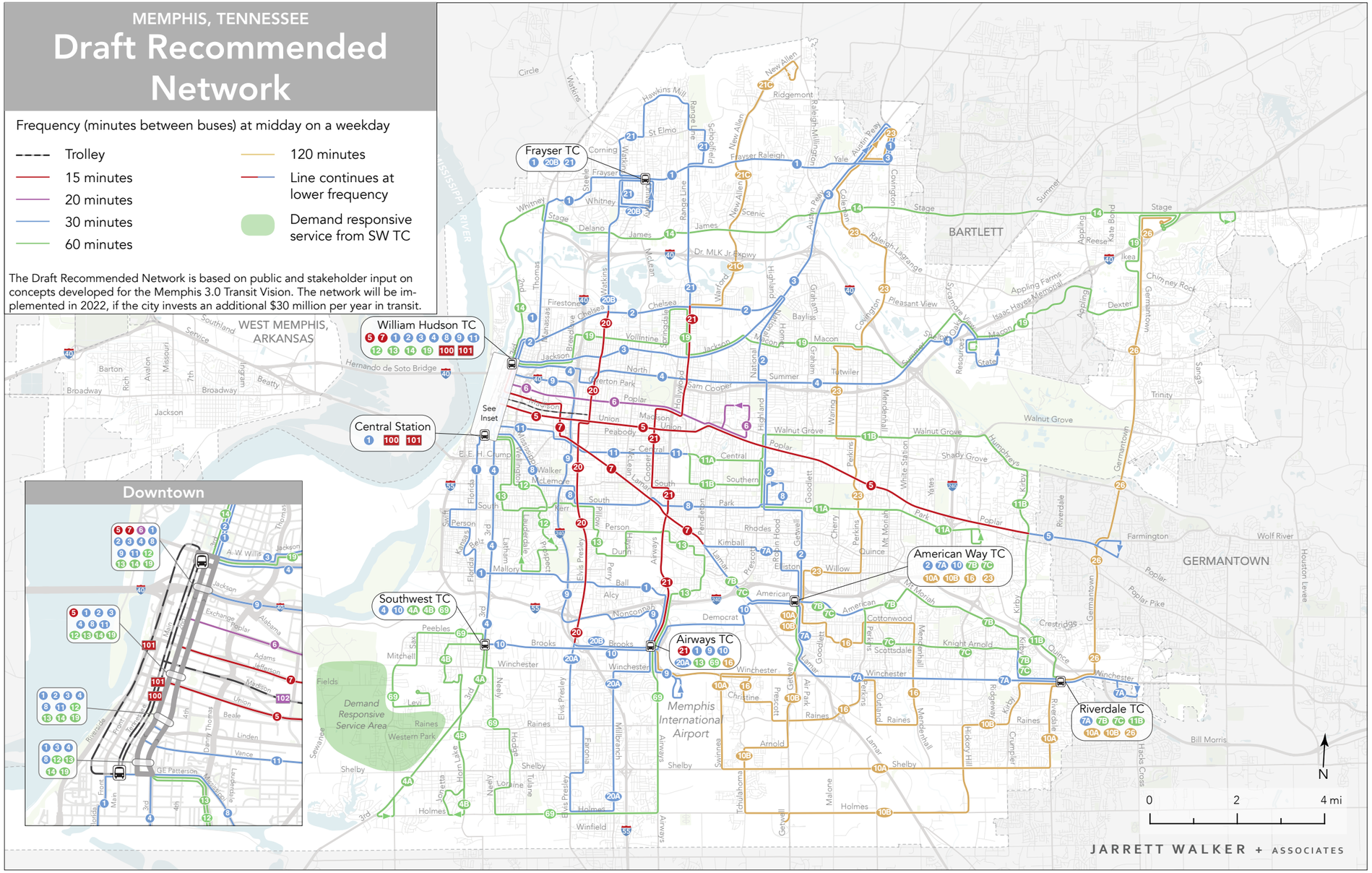
It would provide high frequency service on two north-south crosstown routes: the Watkins/Cleveland/Elvis Presley Boulevard corridor (similar to the current route 42) and the Hollywood/Cooper/Airways corridor (similar to the current route 32).

A benefit of this high frequency grid is how it makes moving around Memphis much easier. Where high frequency routes cross, transfers are fast and easy, so going from Prospect Park (Elvis Presley and Ball) to the Regalia Shopping Center (Poplar and Ridgeway) is much faster because the initial wait and the wait when transferring is much shorter.

The Draft Recommended Network maintains coverage for nearly all parts of Memphis that currently have service, meaning that there is a route within a quarter mile. In some cases, the type of service changes, however.

For example, in far Southwest Memphis, fixed route service is replaced with demand responsive service that would connect to a new transit center near 3rd and Mitchell.

Figure 3: Draft Recommended Network



# Introduction



## What happens next?

The Draft Recommended Network is presented, in this report, for the consideration of the general public, transit riders, community organizations, workers, businesses, and all other transit stakeholders in Memphis.

In April and May, Innovate Memphis and the City are soliciting public input and comments on this Draft Recommended Network. Those comments will be considered before the preparation of the Final Recommended Network.

The Final Recommended Network will be delivered to the City, Innovate Memphis, and MATA later this year, for potential implementation in 2022 and beyond, pending additional investment in transit.

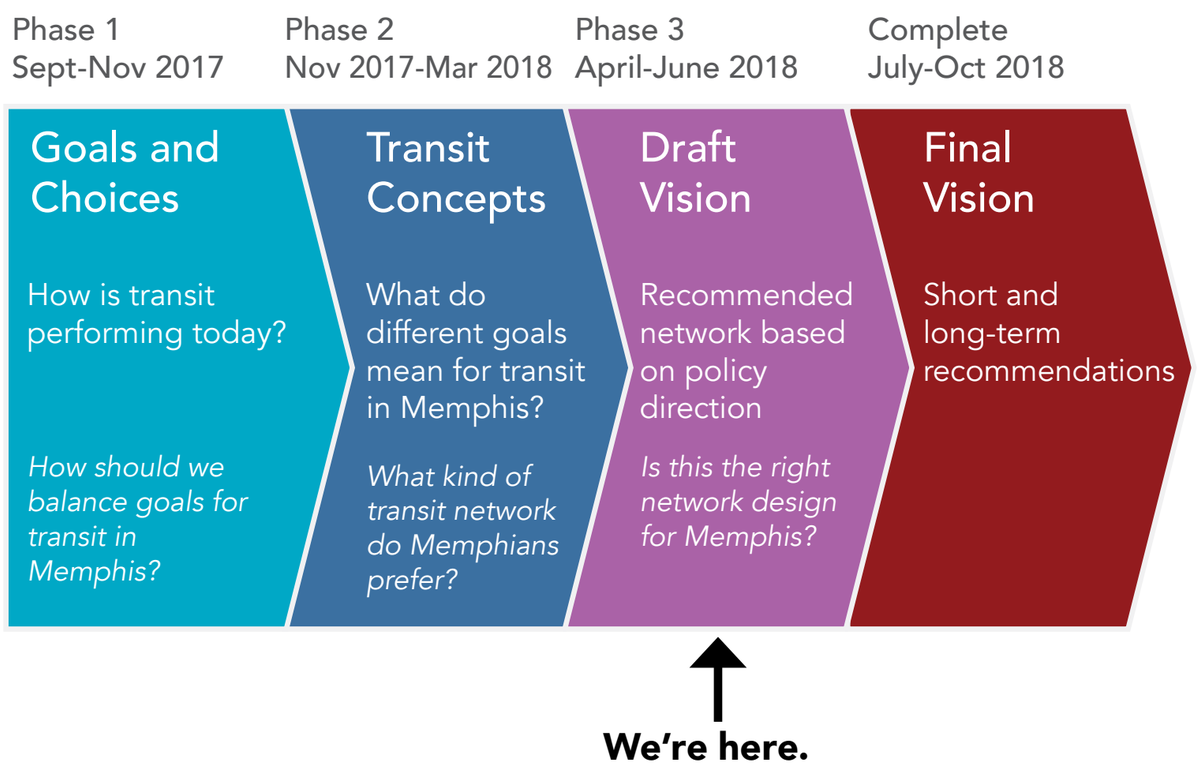
## Learn more

For the full story of this process, we encourage the reader to start with two earlier reports:

- The Choices Report, released in September 2017, available at the project home page: http://www.memphis3point0.com/transit or directly from this link.
- The Concepts Report, released in November 2017, available at the project home page: http://www.memphis3point0.com/transit or directly from this link.

Members of the public are encouraged to attend public meetings and submit comments online, in response to this Draft Recommended Network. To find public meetings and other opportunities for input, visit: http://www.memphis3point0.com/transit.

Figure 4: Process and Timeline for Memphis 3.0 Transit Vision



# 2 How did we get here?

# How did we get here?



Thus far, there have been two phases of public involvement in the Memphis 3.0 Transit Vision process.

In Phase 1, in the fall of 2017, Innovate Memphis, the City and consulting team presented people with abstract choices and trade-offs, and received people's general guidance in response. During Phase 1, input was collected through nearly 1,000 responses to a web and paper survey of the general public and riders and through a Stakeholder Advisory Committee.

In Phase 2, from November 2017 through February 2018, the team presented people with four different, detailed Network Concepts for Memphis, and received people's responses to the specific trade-offs and ideas shown in those Concepts. During Phase 2, input was collected through 1,200 responses to a web and paper survey of the general public and riders.

Input received during both of these phases was used, in early 2018, to develop this Draft Recommended Network.

## Choices Report and Phase 1 Input

The Choices Report provided a lot of background on the existing system and then asked some key questions about what Memphians value about transit. These questions were posed to the general public in our Phase 1 Survey.

**Walking vs. waiting**

In any transit network, there is a basic trade-off between walking farther to service, or waiting longer for service.

A transit agency can concentrate its service into fewer, more frequent routes...but they will be spaced farther apart. Or it can spread its service out into more routes, that are closer together...but then they run infrequently. Within a fixed budget, the basic math of transit forces a trade-off between offering shorter waits and offering shorter walks.

When asked how they would like to see this trade-off made, Memphis stakeholders and members of the general public tended to support shorter waits and longer walks.

***Takeaway***

**65% of public survey respondents and 71% of stakeholders mostly or definitely preferred shorter waits.**

Figure 5: Most survey respondents preferred less waiting to less walking

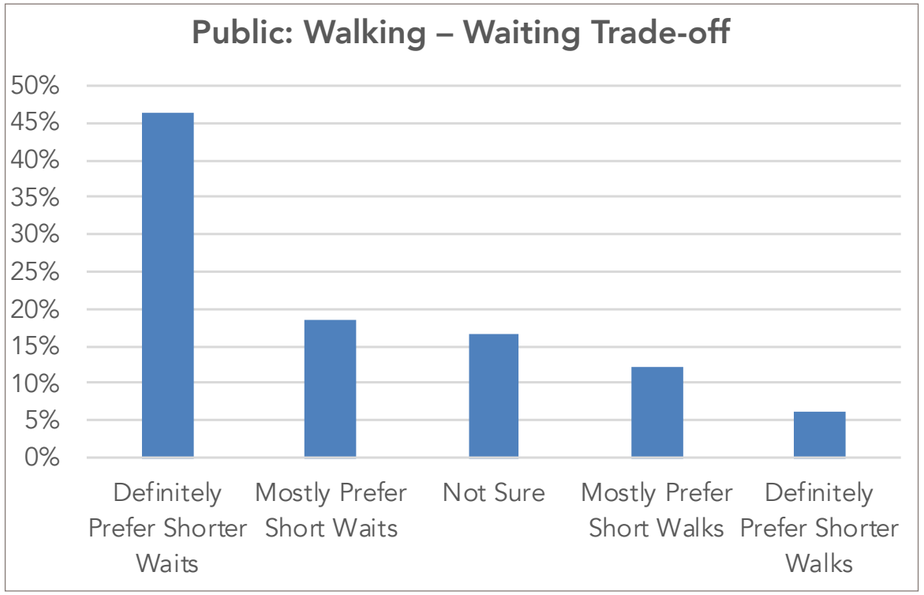
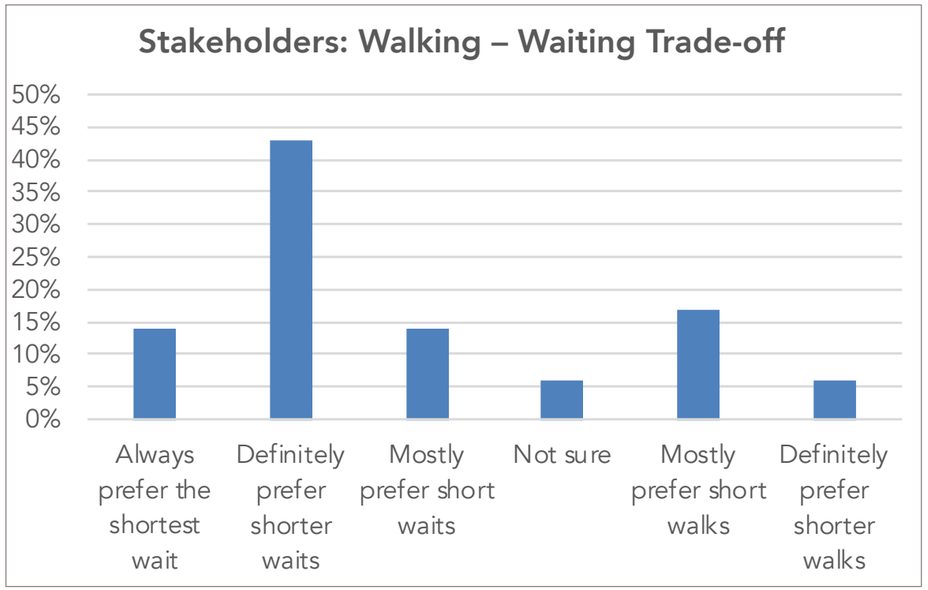



Figure 6: Most stakeholders preferred shorter waits even if it meant longer walks to transit



# How did we get here?



**Maximizing ridership vs. maximizing coverage**
The trade-off between walking and waiting can also be described as a trade-off between maximizing ridership and maximizing coverage.

When transit agencies concentrate their service into fewer, but more frequent, routes, it nearly always leads to higher ridership. In addition, when transit agencies focus their service on the places and corridors where there are the most people and jobs, higher ridership is the typical result. Yet, within a fixed budget, this means less service can be spread out to cover everyone.

This trade-off between maximizing ridership (and frequency) and maximizing coverage was presented to people during the first phase of public input, in the *Choices Report* and in surveys.

Today, the City of Memphis and MATA spend about 40 percent of its budget pursuing high ridership, and 60 percent providing coverage in places where high ridership is not a reasonable expectation. The Stakeholder Committee was asked whether this was the right balance. Their responses are shown below. In general, most Stakeholder Committee members wanted to shift toward a higher ridership system.

In surveys of the public, the responses were less clear. Many people responded that they weren't sure. Slightly more people responded by saying they preferred or strongly preferred a high ridership system.

**What do Memphians want new transit resources spent on?**
In Phase 1, we also asked Memphians to prioritize their top three improvements for transit service if more money for transit was found. The top priority identified by respondents was higher frequency service on weekdays. The second was covering places that don't have service today. These results suggest that survey respondents would prioritize higher frequency service when adding more dollars to the transit budget. But adding coverage is still a high priority as it outweighed adding frequency in the evenings or on weekends.

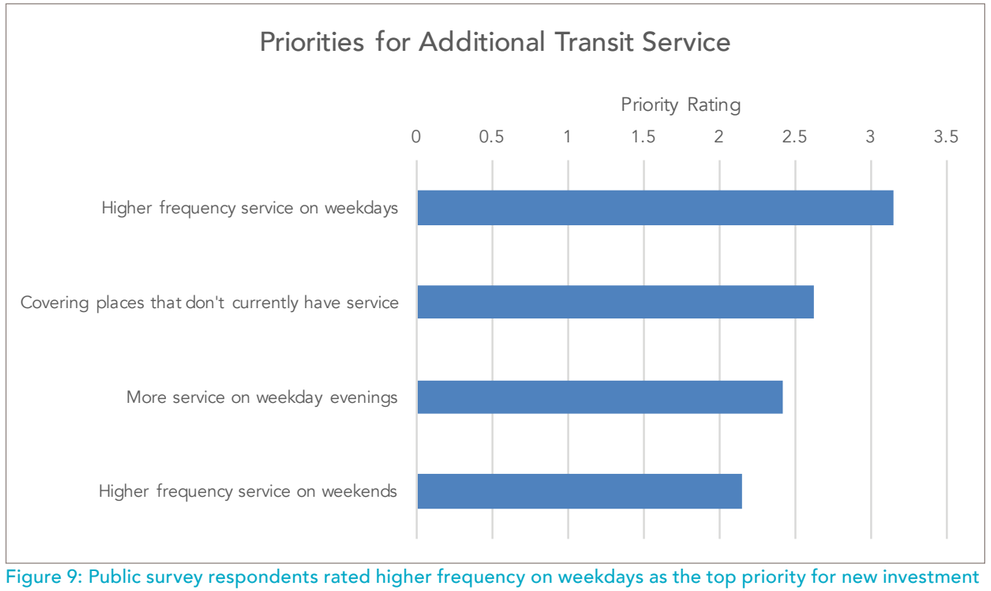



Figure 9: Public survey respondents rated higher frequency on weekdays as the top priority for new investment

Figure 7: Stakeholders generally preferred a shift toward ridership and away from coverage

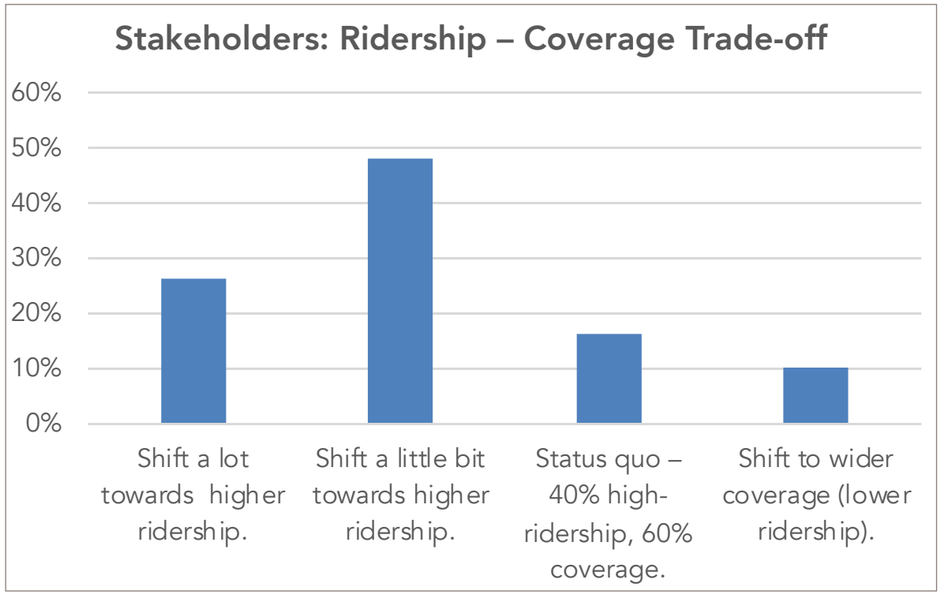
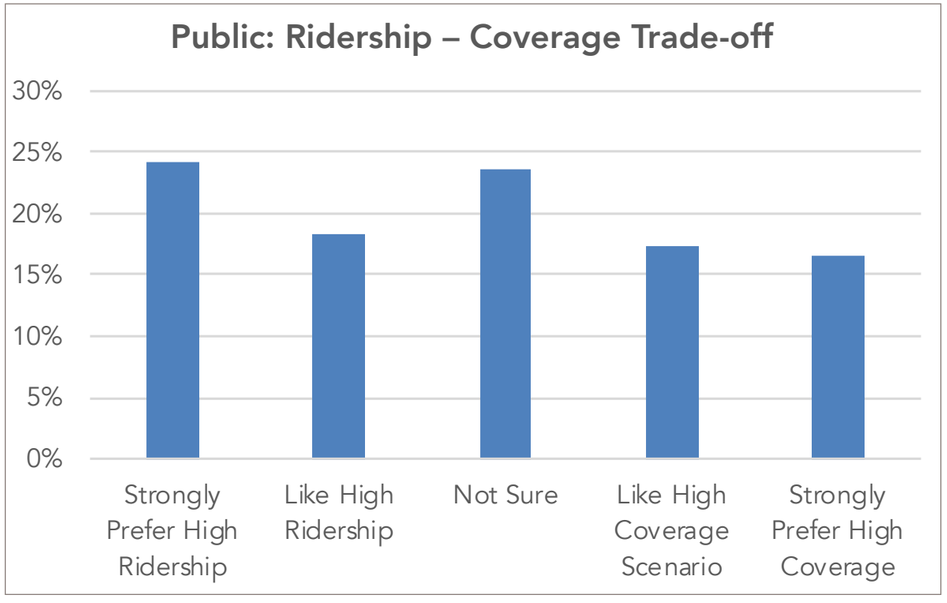



Figure 8: Many respondents were unsure about the Ridership – Coverage trade-off in Phase 1



# How did we get here?

## Concepts

In order to help people understand key trade-offs and develop confident opinions, the consulting team created four different "Network Concepts."

These four Concepts illustrated two separable choices, as illustrated in the square below:

- How should Memphis balance ridership and coverage goals? (And, relatedly, how should walking and waiting be traded-off?)
- How much should Memphis invest in transit service.

Understanding that everyone's preference would be for higher frequency *and* wider geographic coverage, both are simply not possible within the existing budget. And even with additional funding, having more frequency means that the ability to expand coverage is limited.

The existing budget is already being used effectively by the agency to deliver existing levels of frequency and coverage. There are no significant "inefficiencies" or "low-hanging fruit" that would allow MATA to meet such demands with existing resources. So any higher frequencies or coverage of new neighborhoods would have to come at the expense of service elsewhere, unless additional funding was provided for transit.

There were two concepts that assumed the existing level of transit funding:

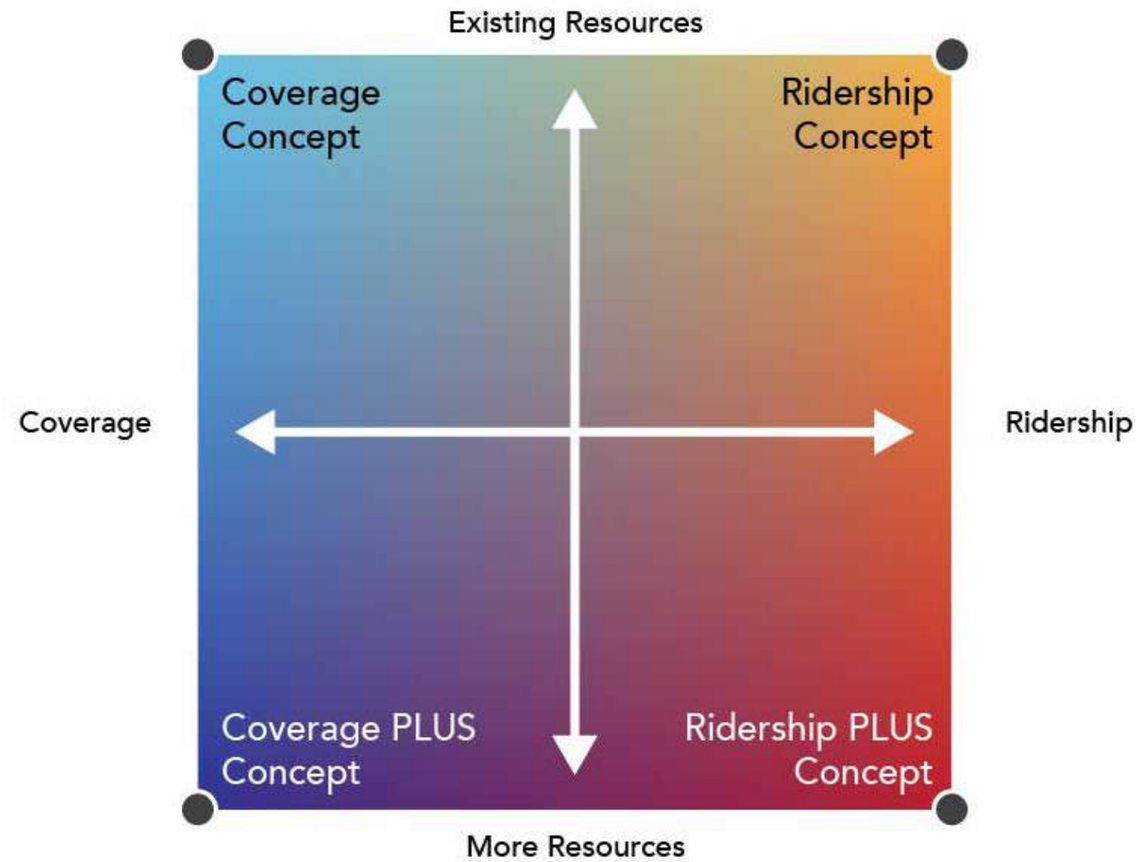
- **Coverage Concept** - 40% Ridership, 60% Coverage: This concept is very similar to the existing system and matches the current way that resources are split between ridership and coverage.
- **Ridership Concept** - 80% Ridership, 20% Coverage: This is the most extreme change from the current network, with the highest ridership potential (without additional funding) but also the greatest reduction in low-ridership coverage services.

There were two concepts that assume additional funding for transit:

- **Coverage PLUS Concept** - 50% Ridership, 50% Coverage: This concept is similar to the existing system in its balance between ridership and coverage. With more resources, both coverage and frequency can be improved, with more focus on coverage.
- **Ridership PLUS Concept** - 80% Ridership, 20% Coverage: With more funding and a ridership focus, this concept shows how more frequency can provide better and faster connections within the core of Memphis, while maintaining coverage in less dense areas.

Maps of the Concepts are shown on the following page. For more detailed maps and analysis of how each concept would serve Memphis, see the *Concepts Report* at www.memphis3point0.com/transit.

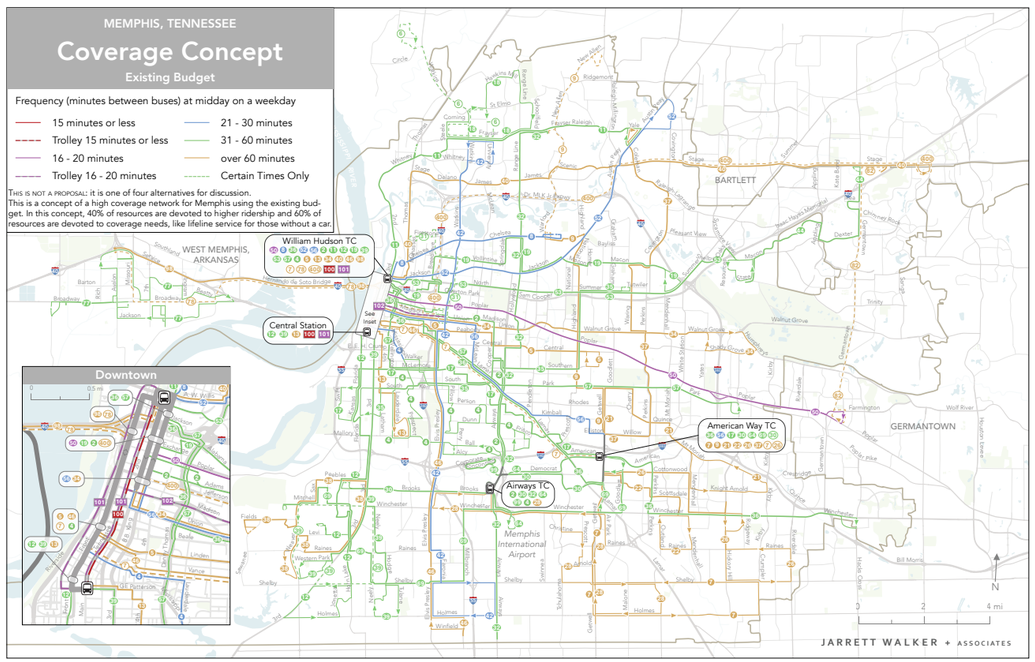
Figure 10: Decision space showing where the four concepts are in the realm of choices for the Memphis transit network

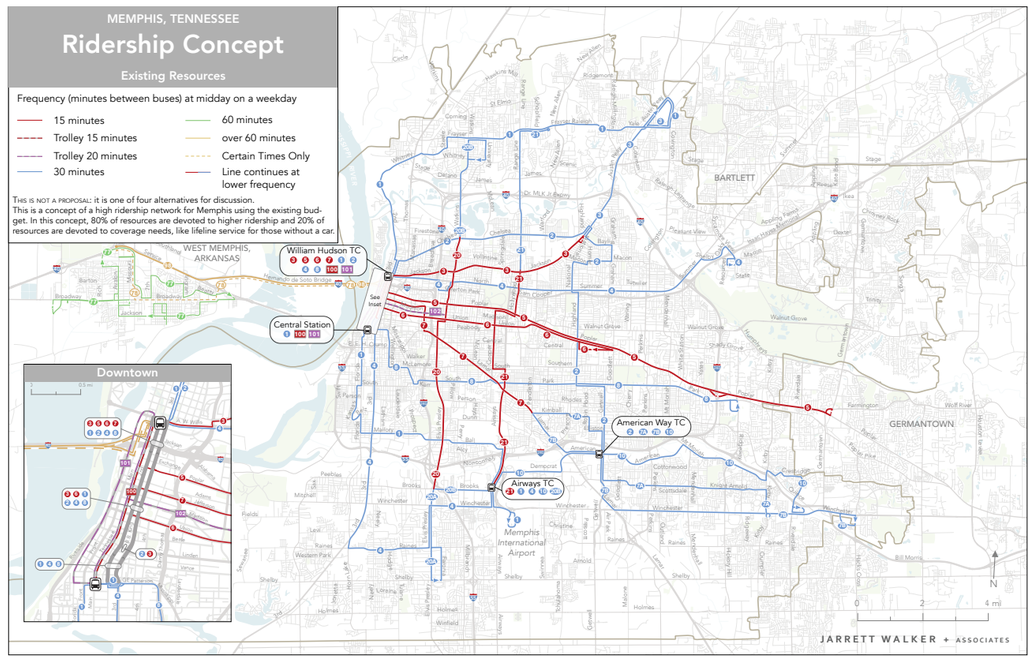


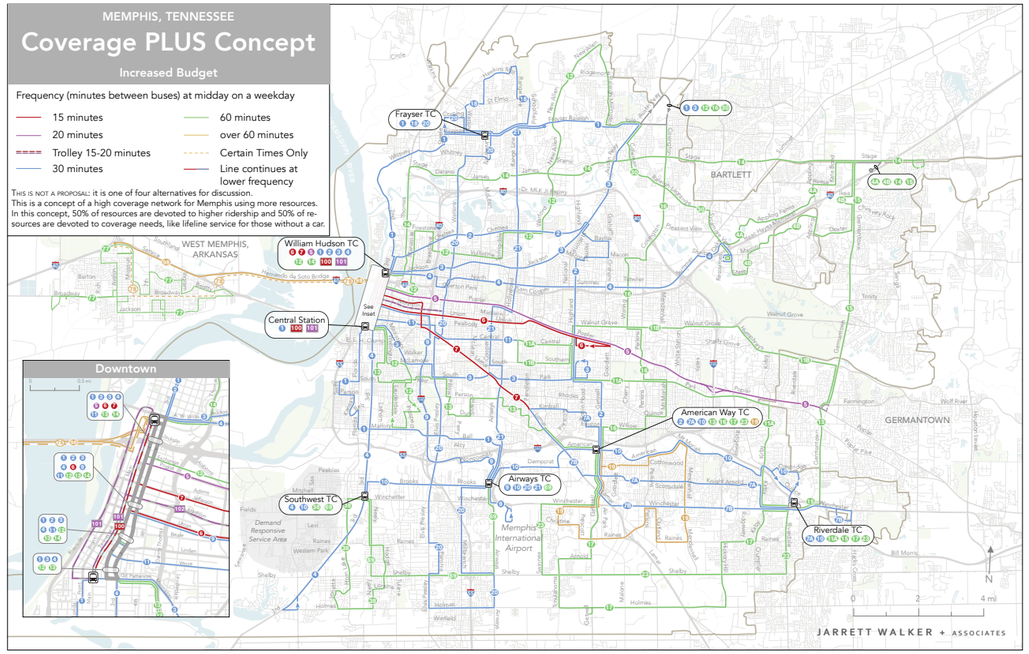
# How did we get here?

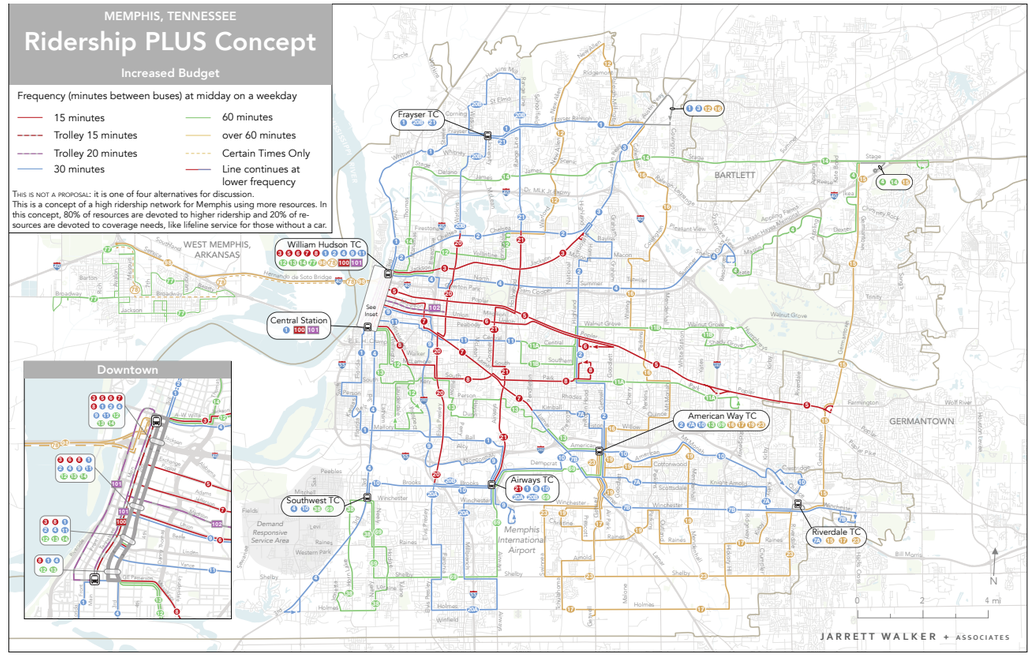


Figure 11: Maps of the four network concepts



# How did we get here?



## Response to Concepts

**Ridership and Coverage, No Additional Funding**
When presenting these concepts to the public and stakeholders, we asked them to respond first to whether they preferred the Coverage or Ridership Concepts and their responses are shown at the right.

When comparing the concepts with no additional funding, the general public responses were strongly split between the ends of the spectrum. The "definitely like the Ridership Concept best" answer received the highest response at about 41%. The "definitely like the Coverage Concept best" response received the second highest response at 27%. The median point of the responses is about the mid-point between the Ridership and Coverage Concepts.

Stakeholders tended to respond more in the middle. A plurality of stakeholders said they'd prefer a balance of 60% ridership and 40% coverage when comparing concepts with no additional funding. Slightly more stakeholders responded toward the coverage end, either at 40% or 50% ridership, as indicated by the slightly higher bars on the left side of the graph. Fewer stakeholders responded toward the ridership end, at 70% or 80% ridership, as indicated by the shorter bars on the right side of the graph. The median point of opinion from stakeholders was about 60% ridership.

***Takeaway***

**Stakeholder and public responses indicate a willingness to shift to 60% Ridership and 40% Coverage, if there was no additional funding for transit.**

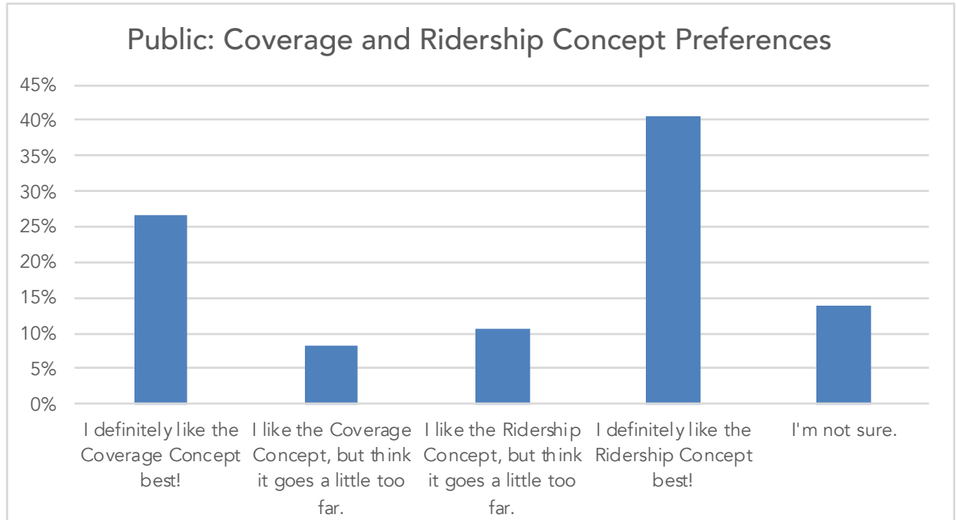



Figure 12: Public respondents diverged significantly on the Coverage and Ridership Concepts

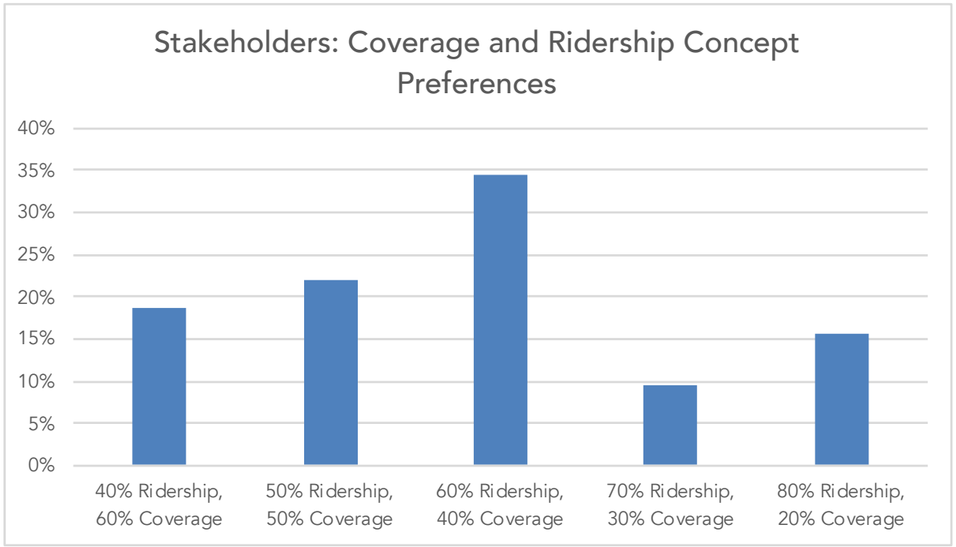



Figure 13: Stakeholder responses tended to be in the middle of the Coverage-Ridership Concepts

# How did we get here?



**Ridership PLUS and Coverage PLUS, With Additional Funding**
When presenting these PLUS concepts (which assume an additional $45 million per year for transit service) to the public and stakeholders, we asked them to respond to whether they preferred the Coverage PLUS or Ridership PLUS Concepts and their responses are shown at the right.

The general public responses were strongly toward the ridership end of the spectrum, with the "definitely like the Ridership PLUS Concept best" answer getting the highest response at 48%. The "definitely like the Coverage PLUS Concept best" response received the second highest responses, but only 23% of respondents chose that answer. The median point of the responses is closer to the Ridership PLUS Concept, at about 70% ridership focus and 30% coverage focus.

Stakeholders tended to diverge more in their responses to the PLUS Concepts. When we asked Stakeholders the same question we identified the percentage of resources that would go toward ridership goals and coverage goals in each concept and the answers in between.

Stakeholders split evenly at 25% of stakeholders wanting the Coverage PLUS Concept (50% ridership/50% coverage) and 25% of stakeholders wanting the Ridership PLUS Concept (80% ridership/20% coverage)

Almost a third of stakeholders wanted something in between the two concepts, with about 16% saying they would split resources at 60% ridership/40% coverage and another 16% saying they wanted to split resource at 70%/30%. About 12% said they wanted even more ridership focus, with resources split at 90% ridership/10% coverage. And 6% said they wanted to keep today's split at 40% ridership/60% coverage.

Thus, stakeholders had a wide range of opinion on this question of how to invest if more funding were available. The median point of opinion, however, was about 70% of resources toward ridership and 30% toward coverage, which is similar to the median point of the public responses.

***Takeaway***

**Stakeholder and public responses indicate a willingness to shift to 70% Ridership and 30% Coverage, if there was additional funding for transit.**

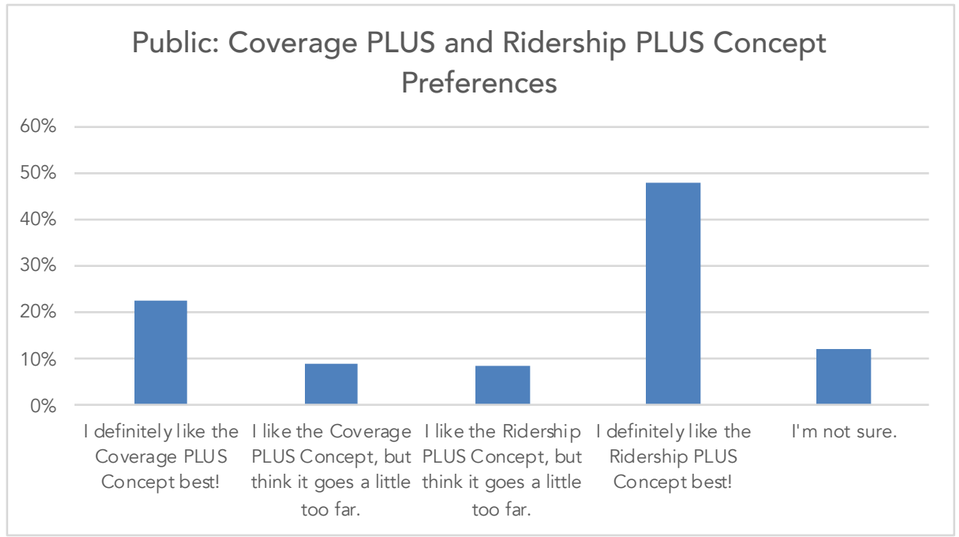



Figure 14: Public respondents strongly favored the Ridership PLUS Concept

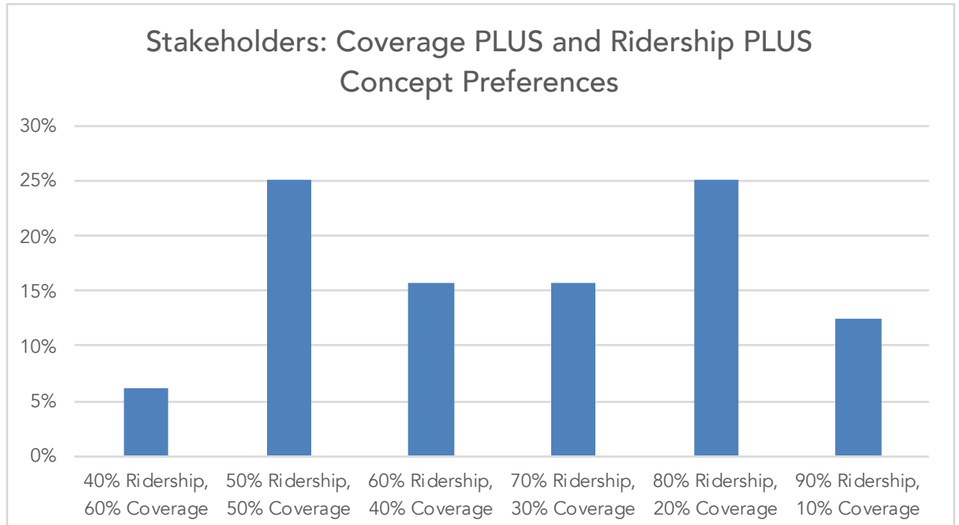



Figure 15: Stakeholders were more divided in the response to the Coverage PLUS and Ridership PLUS Concepts

# How did we get here?



**Additional funding for transit**

We also asked about the willingness of people to pay for more transit service. The additional funding concepts assumed that an additional $35 million per year would be provided for transit operations and $10 million for transit capital needs. This funding level was chosen based on consultation with City, MATA and Innovate Memphis staff.

Therefore a key question to the public and stakeholders was, are you willing to pay enough to provide additional transit service? This question was asked in the following form:

"The Coverage PLUS and Ridership PLUS Concepts would both require additional funding for transit. That funding would have to come from some kind of local tax or revenue source. Thinking about your own preferences, how much on average per month would you be willing to pay for more transit service?"

The charts to the right show the responses from the public and from stakeholders. Nearly 80% of public respondents were willing to pay more to invest in transit service. The median response would equal about $6-7 more per month to support transit.

If a sales tax source were the main revenue source to support expanded transit, a 0.5% sales tax would cost the average Memphis household about $6-7 per month. And the total tax revenue would be sufficient to support an investment of about $40 million per year.

**Policy Direction**

Based on the public and stakeholder input, the City, Innovate Memphis, and MATA staff worked with City leadership to determine the most appropriate policy direction for the Draft Recommended Network. The team decided to follow the general path of the public and stakeholder input and recommend a 70% Ridership/30% Coverage resource split with the assumption that an additional $30 million per year would be invested in transit service. Of that $30 million, we have assumed that $4 million on average would go to capital improvements like new buses and improved shelters, while $26 million per year would go to operating transit service. The exact balance between capital and operating would vary by year and depend on bus replacement and new bus needs.

***Takeaway***

**Nearly 80% of public respondents were willing to pay more to invest in transit service.**

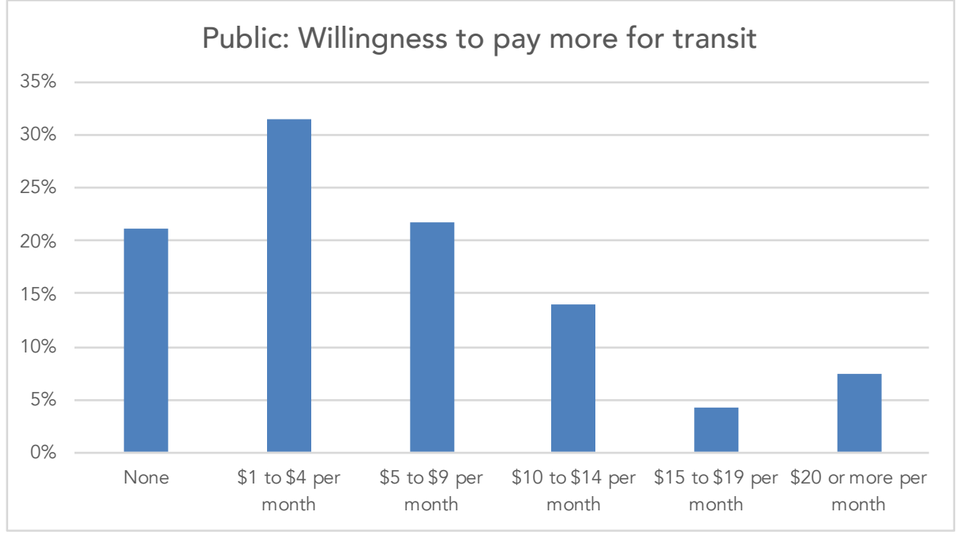



Figure 16: Nearly 80% of public survey respondents were willing to pay more to support transit investment

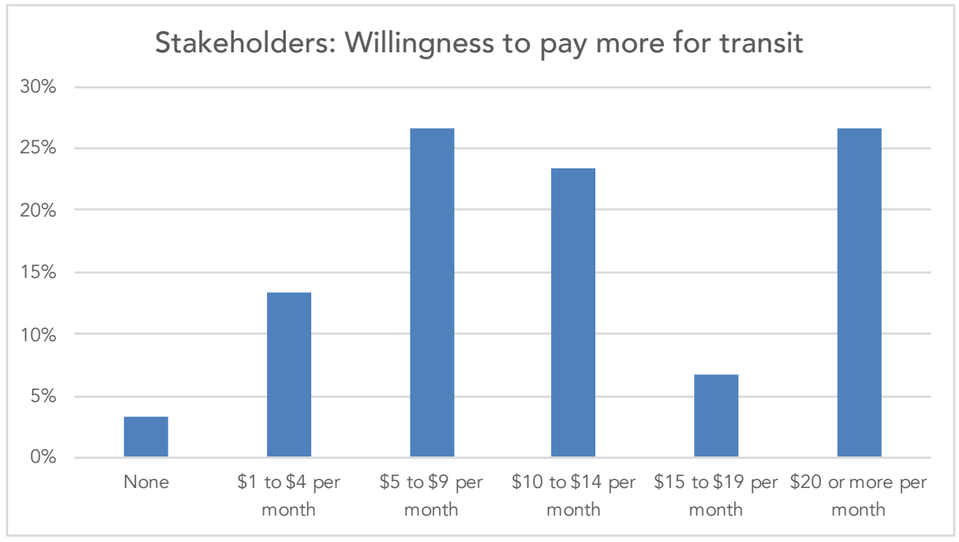



Figure 17: Nearly all stakeholders were willing to pay more to support more transit service

# 3 Recommended Network

# Recommended Network

In this chapter, we present maps of the Draft Recommended Network, and information about how it would operate and how well it meets different goals.

This Network was developed by a team of technical experts from the City of Memphis, Innovate Memphis, MATA, and consulting firms. The policies that guided the design of this network are based on public input on key transit choices, as described in the previous chapter.

In April 2018, this Network will be presented to the public, bus riders, the Stakeholder Committee, and elected and appointed officials. Feedback on the Network in general, and comments on specific details, will be considered in the development of a Final Recommended Network. Also, comments and feedback will guide the development of a longer term plan for the 2040 transit network for Memphis.

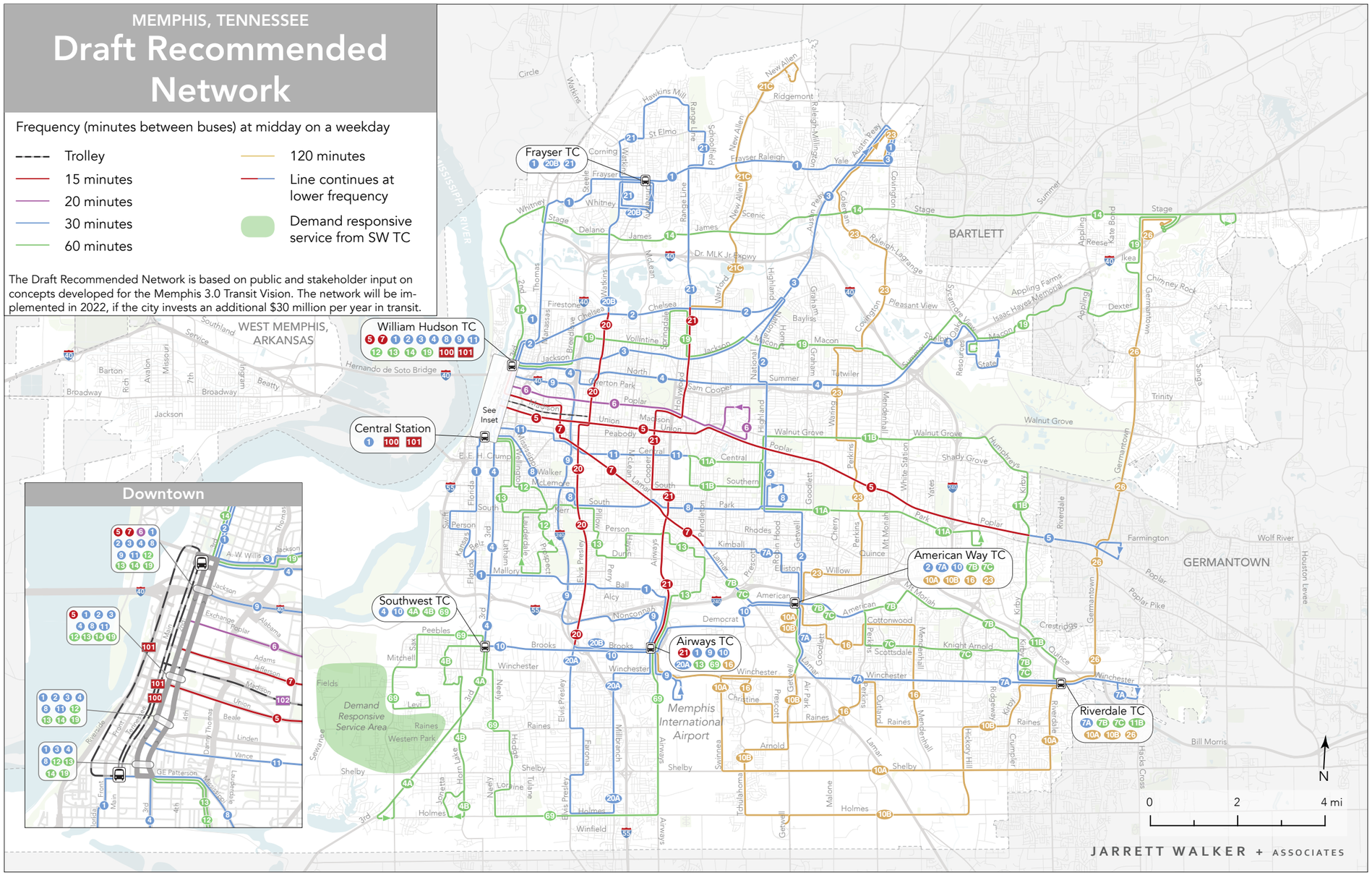
The maps on the following pages show the network at the citywide and downtown scales. The table shows the frequency of each route, and its branches, over the hours of each day and the days of each week.

## Policy basis

This network is designed to fulfill a policy direction that:

- About 70% of the transit budget in the City of Memphis should be spent on maximizing ridership.
- The remaining 30% should be spent covering those places where transit service is valued, even if ridership relative to cost is low.
- The City, either through a ballot measure or other method, will invest an additional $30 million per year in transit service.

Figure 18: Draft Recommended Network



# Recommended Network



## Design principles

In addition to public input, certain principles of good transit design are reflected in the Draft Recommended Network.

**Consistent route spacing**
The spacing between parallel routes should be consistent across the city, to the extent that the street network allows it. However, major barriers to walking (such as uncrossable roads, or a lack of through-streets) may sometimes argue for closer or wider spacing between routes.

**Directness**
Routes are designed to be as direct as possible between major activity centers.

**Consistent frequencies**
Routes will have consistent headways, or frequencies. This means that the number of minutes between arriving buses will be consistent for long periods of the day.

Whenever possible, routes will have "clockface" frequencies that divide evenly into an hour: every 10, 15, 20, 30 or 60 minutes. A bus that comes every half hour will arrive predictably, at approximately 7:02 am, 7:32 am, 8:02 am, 8:32 am, and so on.

**Consistent pulsing**
Consistent frequencies will also help provide consistent pulsing. A transfer between low-frequency routes can be appealing if the routes are designed to meet one another at the same time and the same place, in a recurring pattern.

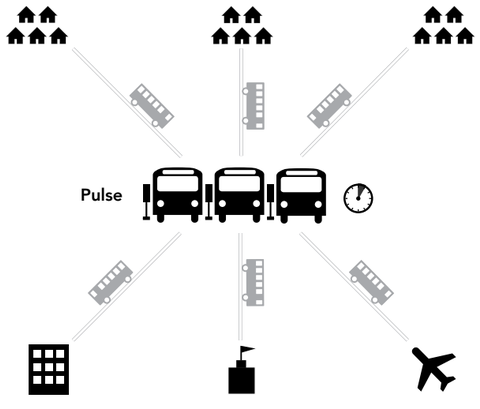



Figure 19: In a pulse, multiple low-frequency routes are scheduled to come together regularly, dwell for a few minutes so that passengers may transfer among them, and then depart again

These timed-connections, or pulses, occur when multiple buses dwell at the same location, allow a few minutes for transfers among them, and then continue on. The Draft Recommended Network includes pulsing at the following transit centers: Hudson (Downtown), Southwest Memphis (3rd and Brooks), Airways, American Way, and Riverdale. The timed connections at Airways and American Way are critical to making easy connections between low frequency routes to major job centers in south Memphis and routes coming from central and north Memphis.

**Downtown Circulation**
A major assumption of the Draft Recommended Network is a simplification of downtown circulation. Currently all routes come to the Hudson Transit Center, which means that many routes from the north do not reach the core of downtown. Also, some routes through downtown use Front Street and others use the 2nd Street and BB King Boulevard. The Draft Recommended Network brings all routes through downtown on the this couplet and assumes that the City and MATA will redesign those streets to provide a dedicated bus lane and superstop amenities (bulb-outs at stops, large shelters) like in the example below from the 2016 plans by MATA for changes to downtown circulation.

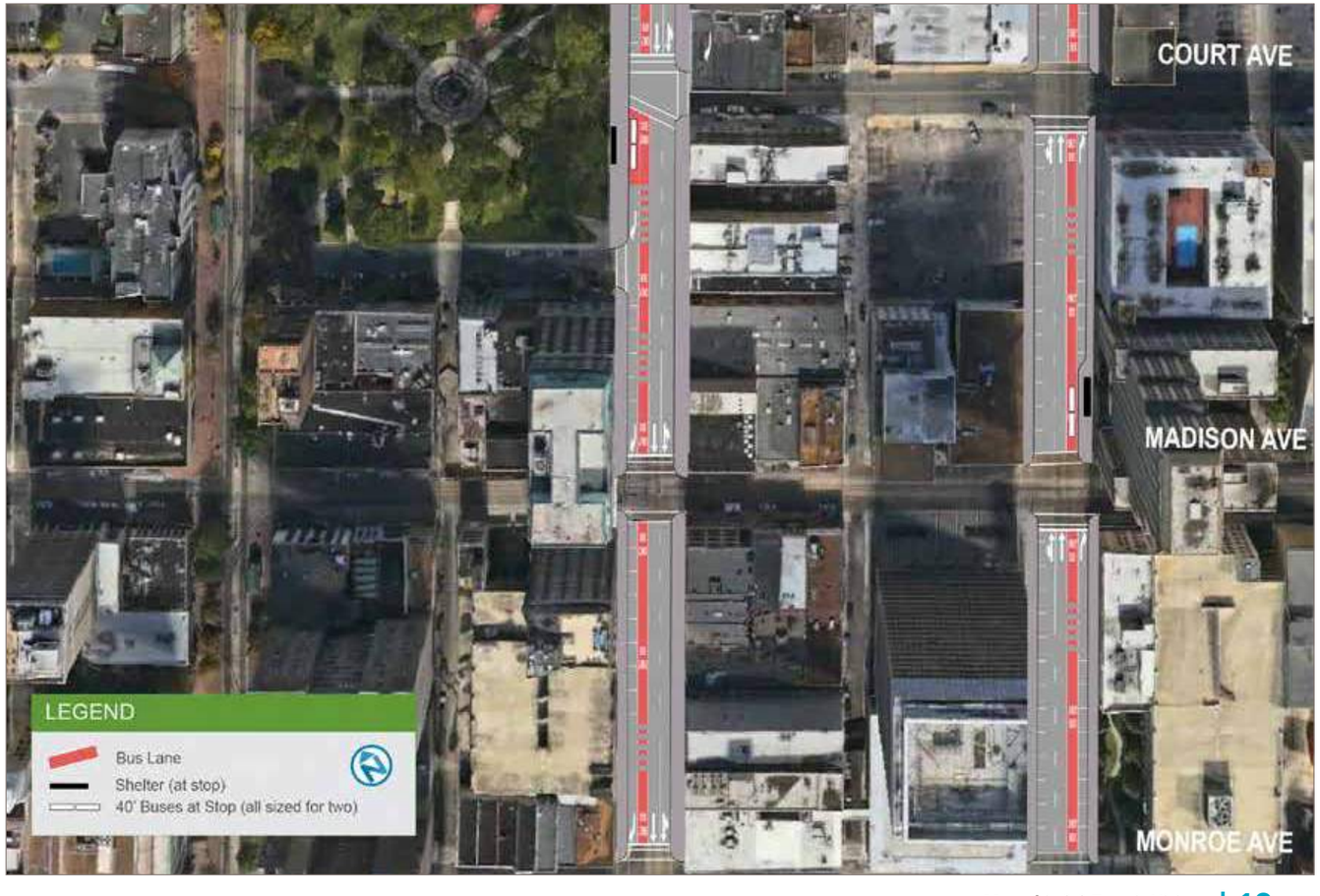



Figure 20: Example of 2nd/3rd couplet bus priority improvements

# Recommended Network



Figure 21 shows how routes would circulate through downtown. This routing and design would speed service through downtown and provide easier connections for people between routes without having to go to Hudson Transit Center. For example, someone wanting to transfer from the Florida route to the Union route could do so at BB King and Union, instead of riding to Hudson Transit Center as is necessary today.

In the Existing Network, routes that approach downtown from Martin Luther King, Jr Avenue, Vance Avenue, Fourth Street, BB King Boulevard and Florida Avenue use Front Street through downtown to reach the Hudson Transit Center. The main downside to shifting routes to 2nd and BB King Boulevard is that people who ride from routes that approach downtown from the south, like the those on Florida Street, and who want to reach destinations along Front Street would have a longer walk than they do today. This issue is most pronounced in the northbound direction where buses would travel on BB King Boulevard, which is farther from Front or Main.

There are a few alternatives to this design. One alternative is to consolidate bus service along Front Street and redesign the street to prioritize buses. This would bring all bus service through the middle of downtown, would bring routes from Union and Poplar across Main Street and minimize walking distances for accessing routes within downtown. Also, It would make it easier to connect between buses and trolleys. The primary downsides to this option include:

- Buses would take a longer route through downtown, costing more for the service.
- Front Street has less space than the 2nd Street and BB King Boulevard couplet and would require more difficult trade-offs in taking space from general traffic, parking, and loading zones.

Another alternative would be to convert 2nd Street and BB King Boulevard to two-way traffic and consolidate bus service onto 2nd Street. This would reduce the walking distance to and from destinations for northbound bus trips and it would keep all bus service on one street, instead of spreading it across two streets. The primary downside to this option is the cost of converting both streets to two-way operation, which includes significant traffic signal system redesign.

## Trolley Service

The focus of the Draft Recommended Network is on the bus network. It was assumed in this process that the trolley network (Main Street, Riverside and Madison Avenue lines) would operate as it is planned to do once all rail service resumes.

This plan is not recommending changes to the trolley service plan at this time. Once rail service is restored on all three lines and the redesigned bus network is operational, more recent and accurate ridership data will be available. Then a study of the trolley network could be conducted to better guide the operations and design of trolley service for Memphis.

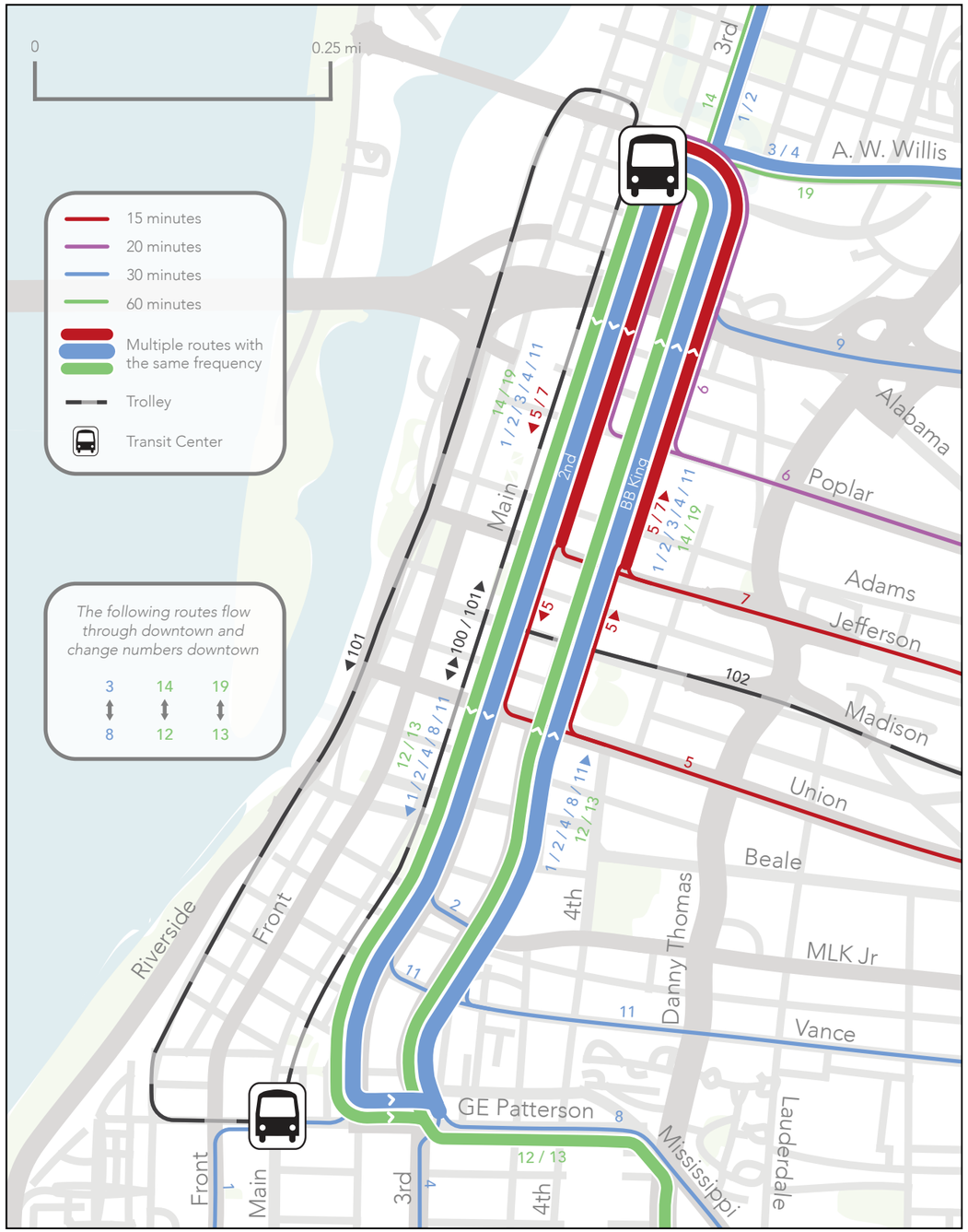



Figure 21: Downtown circulation in the Draft Recommended Network

# Recommended Network

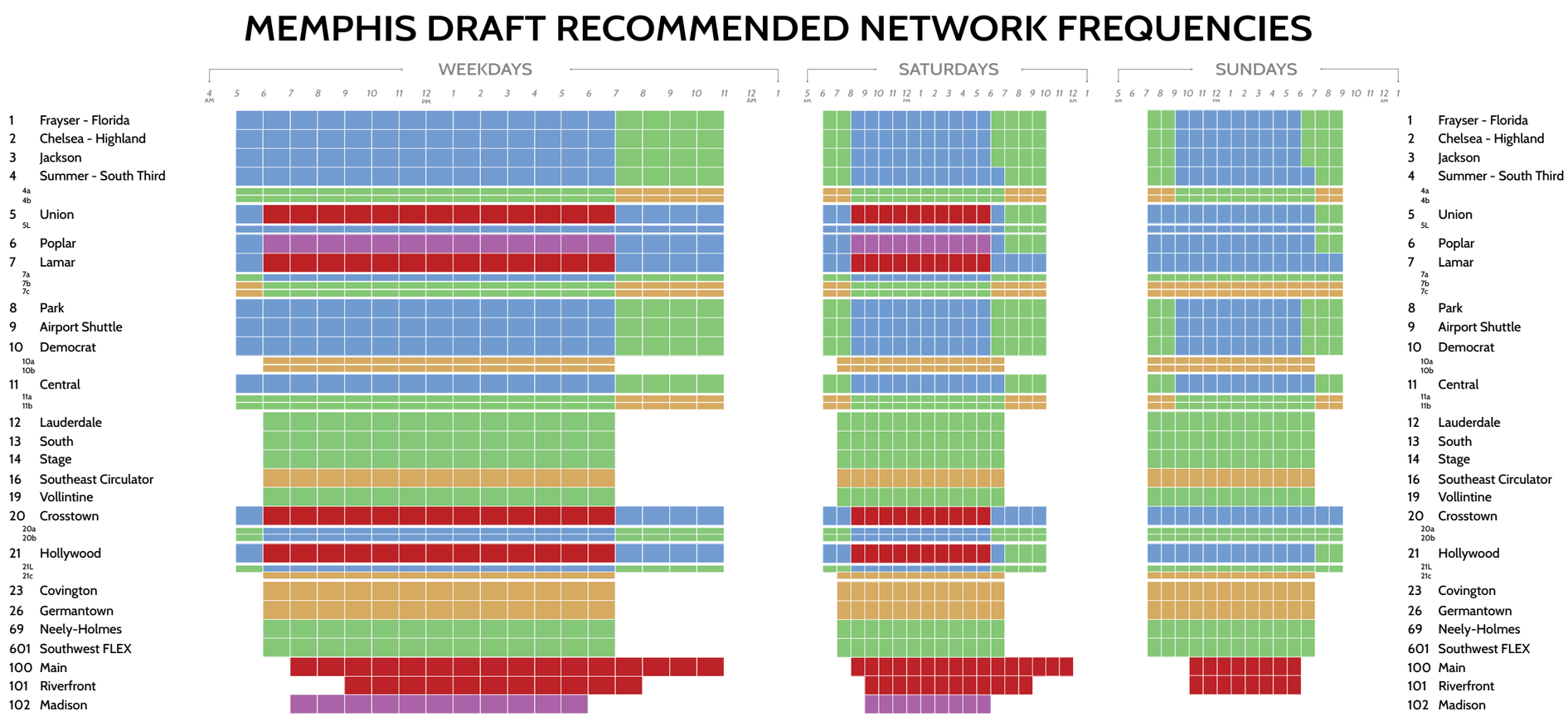
## Span of Service

A key feature of the Draft Recommended Network is the consistency of when service is provided. The chart to the right shows the frequency of service by time of day and day of the week. Looking at this chart, one can see that the 6-Union route would have 15-minute service from 6 am to 7 pm on weekdays and 8 am to 6 pm on Saturdays.

The design of the Draft Recommended Network keeps all bus routes running seven days a week with 18 hours of service for most routes on weekdays, 16 hours on Saturdays and 15 on Sundays.

The Existing Network has less consistency in what time of day routes operate and far fewer routes run on Saturday and Sunday. The improvement in consistency of service across the day and days of the week would help more people find the system useful for more trips and find the system more reliable as a whole.

Figure 22: Draft Recommended Network Frequency and Span of Service




***Takeaway***

**All bus routes in the Recommended Network would run on Saturday and Sunday.**

JARRETT WALKER + ASSOCIATES

Data Source: GTFS feed, April 2017

# Recommended Network

## Comparing Coverage

By simply comparing the maps on the previous pages, it is clear that the Draft Recommended Network covers nearly the same area as today's system. But that's not the whole story of how the networks cover the city. How many residents and jobs does that geographic coverage represent and how many have access to frequent service?

The charts at right illustrate how many residents and jobs that have access to *any* service (no matter how frequent) and to *frequent* service within a half-mile under the Draft Recommended Network and the Existing Network.[1]

The Existing Network provides any service within 1/2 mile of about 80 percent of residents. The Recommended Network expands this to nearly 85 percent. Only about 12,000 people (3 percent of the population) have access to frequent service in the Existing Network. The Recommended Network brings frequent service to 79,000 more people, so that 14 percent of residents are near frequent service.

Job accessibility shows a similar pattern. The Existing Network provides any service near 69 percent of jobs, while the Recommended Network reaches 71 percent of jobs. Only about 36,000 jobs (6 percent of all jobs) are near frequent service in the Existing Network. The Recommended Network provides frequent service near an additional 103,000 jobs, reaching a total of 24 percent of jobs in the city with frequent service.

Access to frequent service is a good estimate of potential ridership. While frequency alone is not enough to cause high ridership, frequency deployed along direct routes, in places that are dense, walkable and proximate to one other, does tend to lead to high ridership and lower operating costs, and thus to high productivity.

***Takeaway***

**The Recommended Network brings an additional 79,000 people and 103,000 jobs within 1/2 mile of frequent transit.**

1 Data limitations requires that this analysis is done using the air distance (also called "as the crow flies" distance) to estimate the people and jobs near transit. We know this is imperfect and that it often corresponds to longer walks in areas with more disconnected street networks.

Figure 23: Chart of Residents with Access to Transit

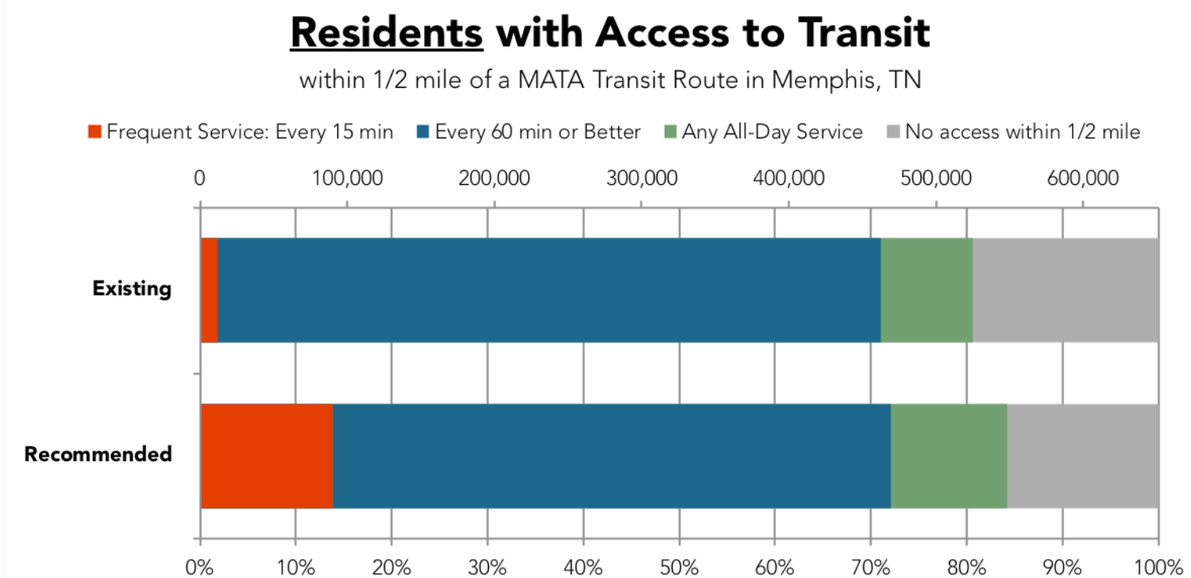
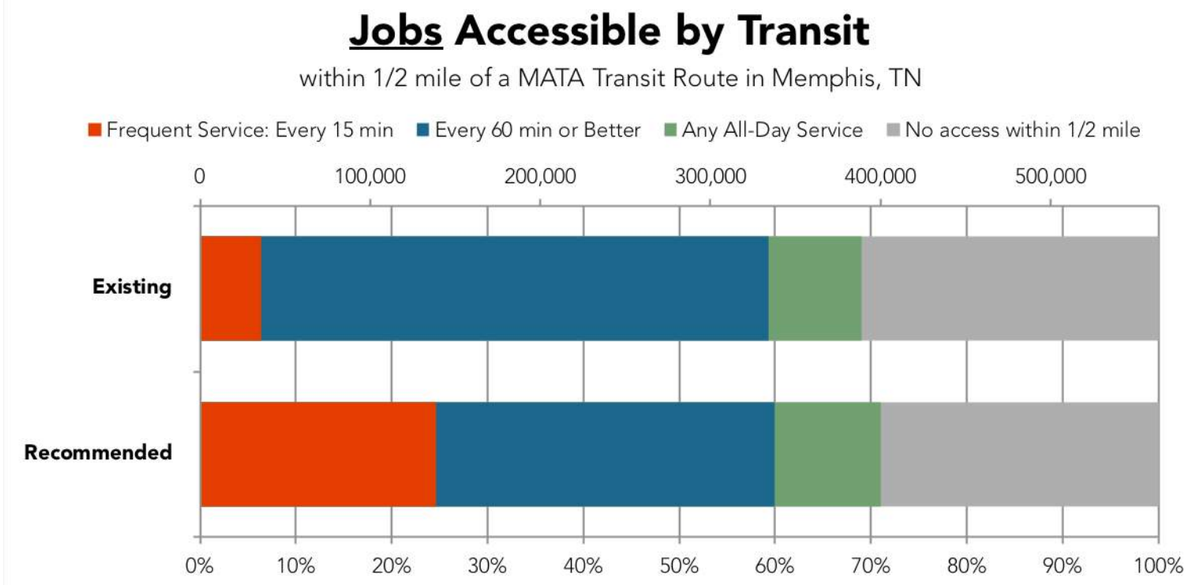



Figure 24: Chart of Jobs with Access to Transit



# Recommended Network



**Coverage for Communities of Concern**

For transit agencies, how a change in service affects racial and ethnic minorities and low-income people is of special concern, in part because of Federal Civil Rights statues like Title VI. The charts to the right show how minority and low-income residents are covered by the Existing and Draft Recommended Networks.

Similar to the effect on all residents, the Recommended Network increases access to transit service for both minority and low-income residents. And the Recommended Network significantly increases the percentage of minority and low-income residents who have access to frequent transit service.

Today, only about 8,000 minority residents are near frequent service with the Existing Network. The Recommended Network expands this by 50,000 people to bring frequent service to 12% of minority residents.

Similarly, only about 4,000 low-income residents are near frequent service with the Existing Network. The Recommended Network expands this by 34,000 people to bring frequent service to 15% of low-income residents.

***Takeaway***

**The Recommended Network brings frequent service close to an additional 50,000 minority residents and 34,000 low-income residents.**

Figure 25: Chart of Minority Residents with Access to Transit

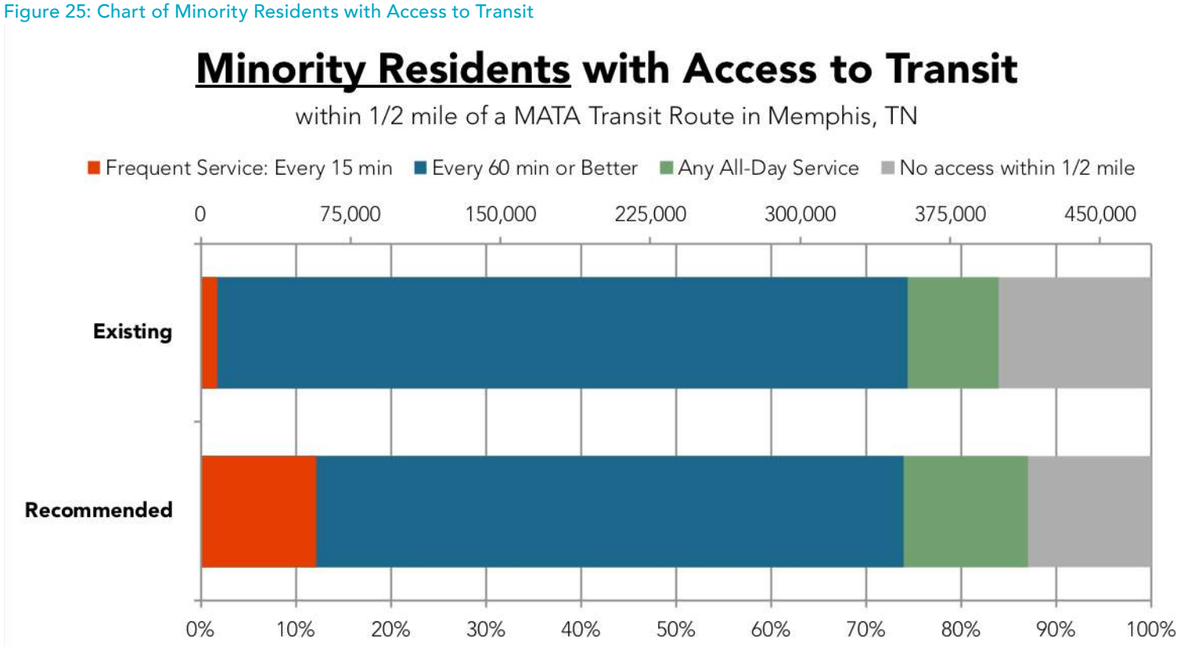
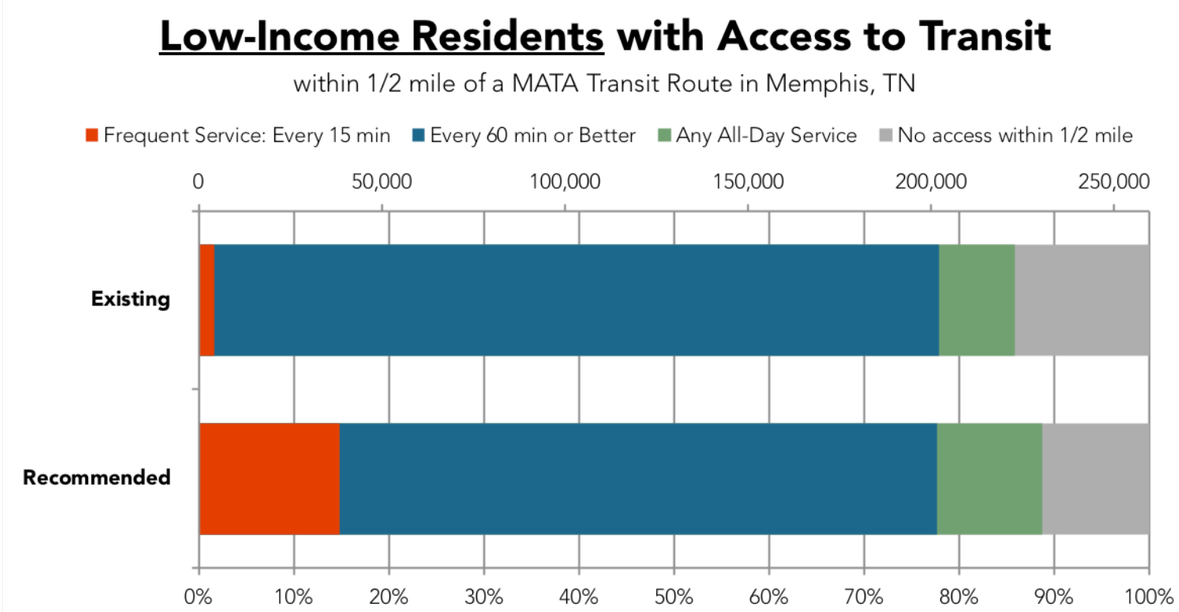



Figure 26: Chart of Low-Income Residents with Access to Transit



# Recommended Network

## Liberty and Opportunity

The Draft Recommended Network increases the number of people and jobs that have access to high frequency service, meaning that people near these routes or connecting to these routes have much shorter waits for service.

High frequency services, especially in a grid pattern where many connections are possible, maximize the range of useful destinations that can be reached quickly, for the maximum possible number of people.

For a person to choose transit over other modes, transit must provide a reasonable travel time to reach their destination. It stands to reason that when transit offers access to more destinations within a shorter travel time, to more people, it will attract higher ridership.

We can visualize this change in travel times and access, and compare concepts to one another using this measure. We have analyzed, for several locations around Memphis, what places can be reached in a fixed amount of time. Maps of this information are called "isochrones."

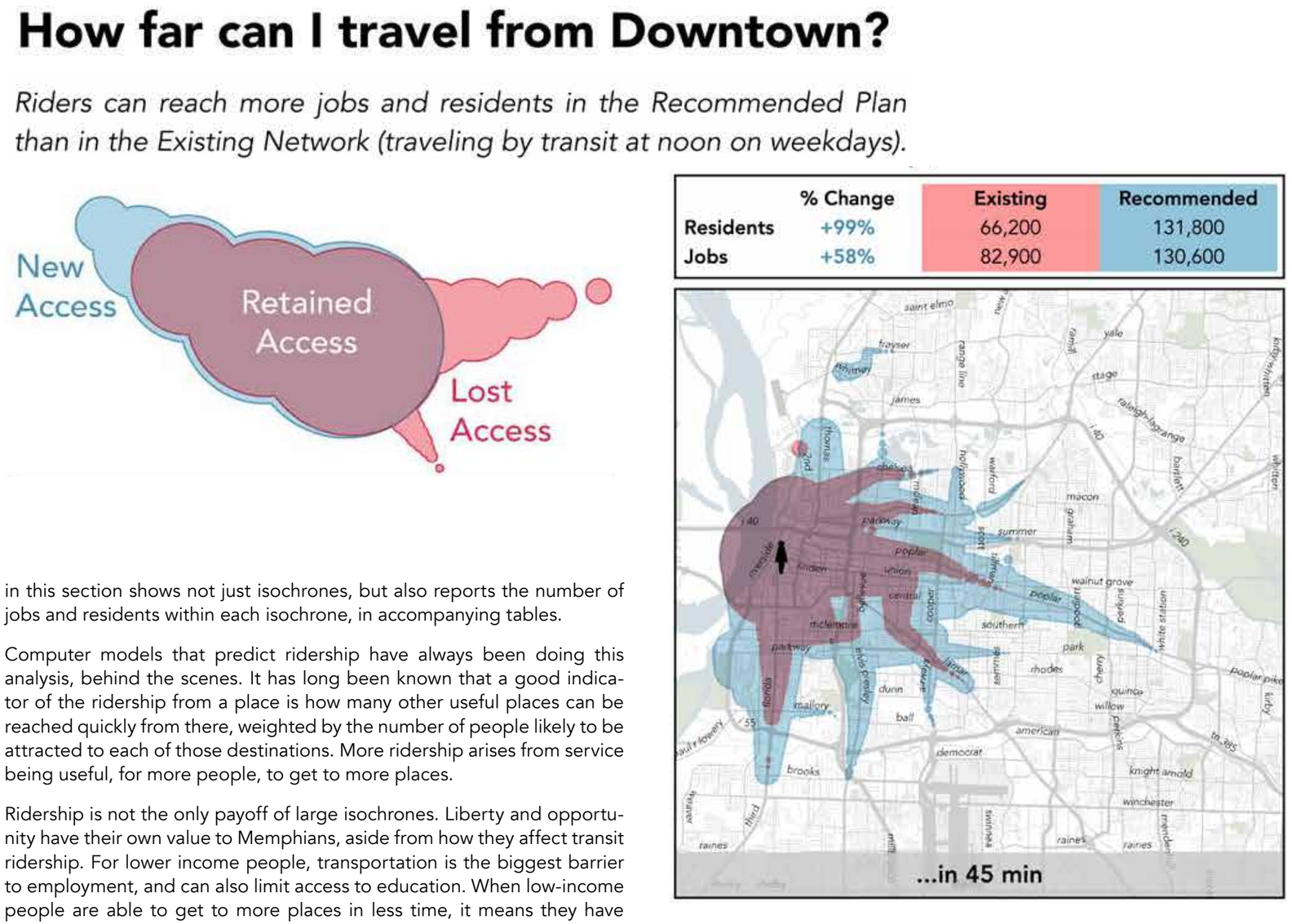
In the example isochrone in Figure 27, you will see a figure (we call her Jane) placed at a key location in Memphis, and a series of maps. Those maps show where you could travel, in a fixed amount of time, by walking and riding transit. The example in Figure 28 shows how far Jane could travel from downtown in the Existing and Recommended Networks in 30, 45, 60 minutes. More importantly, it tells you how many more people and jobs she could reach with the Recommended Network. In total, there are 15 isochrone examples in Chapter 5, showing how the Recommended Network changes access for many different parts of the city.

We sometimes refer to these as maps of liberty and opportunity because that's what they are. If someone chooses to rely on transit, they will be constrained by where transit can readily take them, and will experience the blobs in these images as walls around where they can go and what they can do. For someone to choose to rely on transit, and especially for them to decide to not own a car or to share a car among others, these blobs have to contain enough of the places that make people's lives complete: jobs, education, shopping, services, social opportunities, and so on.

You can use this tool to think about access in the reverse, as well. For a work site or store at the selected point, the blobs show who could readily get there, the employees it can attract, and the customers who might visit.

Of course, the real measure of usefulness is not just how much geographic area we can reach, but how many useful destinations we can access within that space. All geographically accurate maps tend to emphasize land area, when what really matters is population and activity. That's why each page in this section shows not just isochrones, but also reports the number of jobs and residents within each isochrone, in accompanying tables.

Figure 27: Example of Isochrone Maps and Diagram




Computer models that predict ridership have always been doing this analysis, behind the scenes. It has long been known that a good indicator of the ridership from a place is how many other useful places can be reached quickly from there, weighted by the number of people likely to be attracted to each of those destinations. More ridership arises from service being useful, for more people, to get to more places.

Ridership is not the only payoff of large isochrones. Liberty and opportunity have their own value to Memphians, aside from how they affect transit ridership. For lower income people, transportation is the biggest barrier to employment, and can also limit access to education. When low-income people are able to get to more places in less time, it means they have more choices in their lives, and in that sense, more freedom.

# Recommended Network

Figure 28: Job and Resident Access to and from downtown increases significantly with the Recommended Network

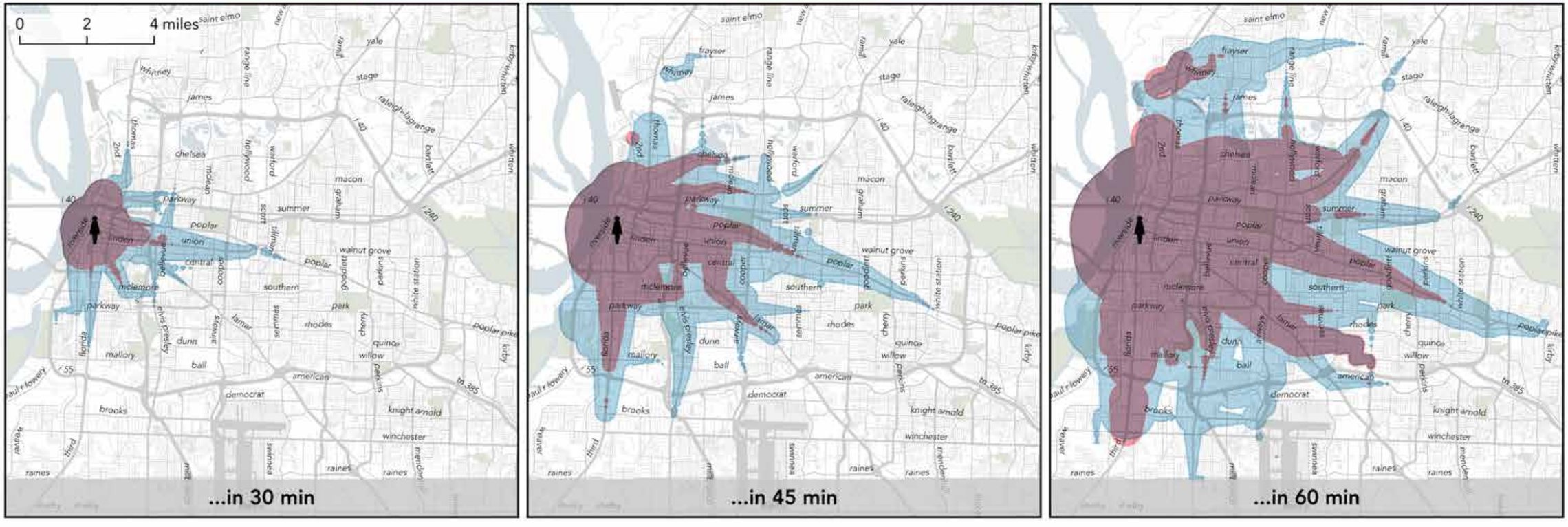
## How far can I travel from Downtown?


*Riders can reach more jobs and residents in the Recommended Plan than in the Existing Network (traveling by transit at noon on weekdays).*

| | % Change | Existing | Recommended |
|---|---|---|---|
| Residents | +159% | 16,000 | 41,400 |
| Jobs | +56% | 48,100 | 75,200 |

| | % Change | Existing | Recommended |
|---|---|---|---|
| Residents | +99% | 66,200 | 131,800 |
| Jobs | +58% | 82,900 | 130,600 |

| | % Change | Existing | Recommended |
|---|---|---|---|
| Residents | +55% | 158,600 | 246,500 |
| Jobs | +54% | 139,800 | 215,600 |



# Recommended Network

## Access to Jobs

A key measure of the usefulness of transit is how it connects people to employment. Job access is an indicator of both the work opportunities that can be reached by transit, and the businesses and services customers or clients could choose to travel to.

The chart below shows how much the Recommended Network improves job access for all residents, for low-income residents, and for minority residents. The average Memphian would see their access to jobs increase by 39% with the Recommended Network, increasing from about 38,000 to about 56,000 the number of jobs they could reach in 60 minutes. Low-income residents see their access to jobs increase by 49% and minority residents see their access increase by 45%.

The map to the right shows the change in the number of jobs someone can reach by walking and transit in 60 minutes when comparing the Existing and Draft Recommended Networks. Each hexagon on the map is shaded by the percentage increase or decrease in jobs reached by walking and transit in 60 minutes from its center point. Most areas of Memphis see enormous increases in job access. A few areas see decreases in job access, such as around Airways and Holmes. The areas that see decreases in access to jobs are generally low density, and thus relatively few people would experience a decrease in job access.

Figure 30: Change in jobs accessible for all residents, low-income residents, and minority residents

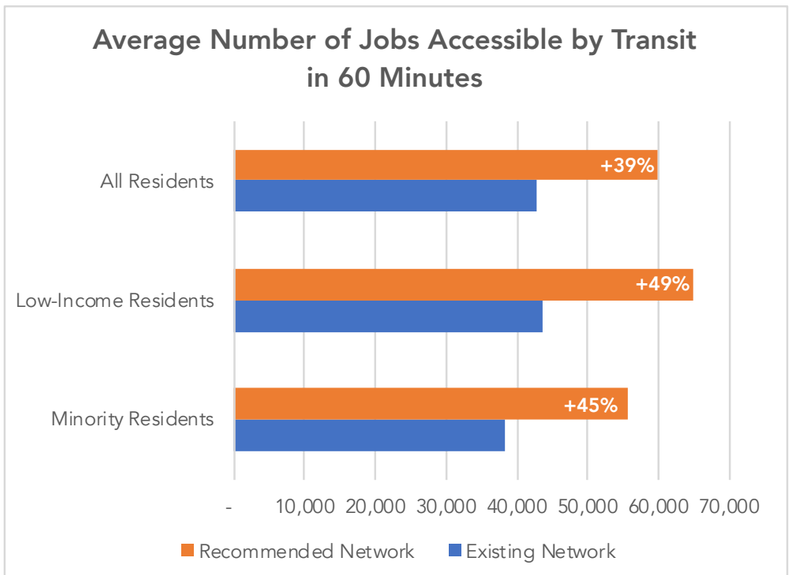
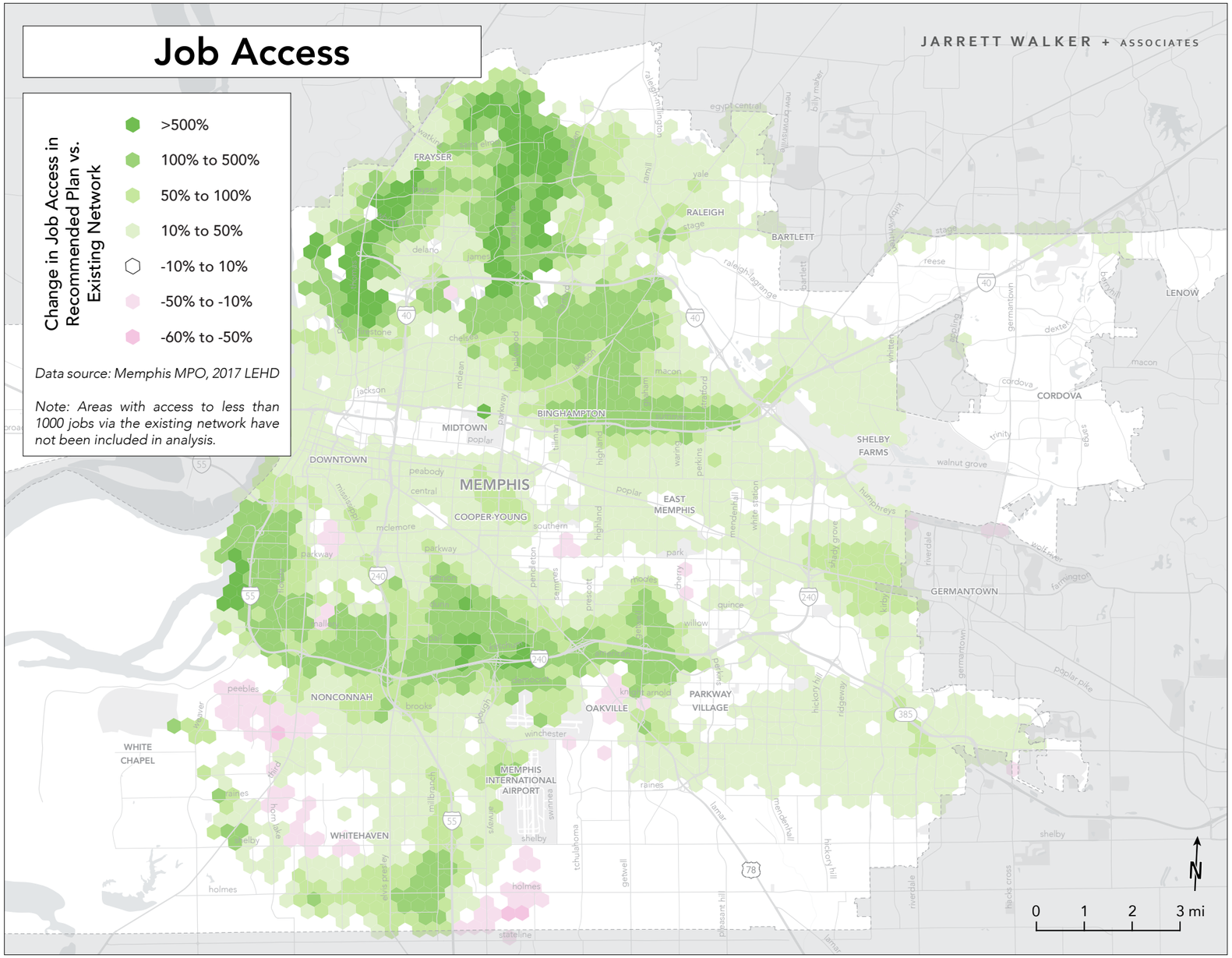



Figure 29: The Draft Network significantly increases jobs accessibility for most areas and most people in the city



# Recommended Network



## Major Capital Improvements

Because the Draft Recommended Network is focused on improvements in bus service, the major capital improvements needed to support it are limited. Nevertheless, the needed improvements are essential to ensure the network operates efficiently and gets people where they are going in a timely manner.

### Airways Transit Center

Airways Transit Center becomes a much more important hub for low frequency routes in the Recommended Network and therefore requires improvements to make space for routes to meet at the same time. The current facility only has four bus bays for local bus routes. To adequately meet the need for the Recommended Network, four additional bays will be needed, likely fit into the grassy median area to the north of the existing bus bays.

In addition, the current egress from the site forces an unnecessarily long travel time for buses that need to go north out of Airways. Currently, any bus that wants to go north must turn right on Airways, right on Brooks, right on Directors Row and then left on Airways. This out of the way travel adds at least 0.5 miles to the distance traveled. To improve access, a signal should be added, the median of Airways rebuilt, and the transit center egress throat widened so that buses can turn left out of Airways Transit Center onto northbound Airways Boulevard.

### Southwest Transit Center

A new on-street transit center will be needed on Brooks at 3rd Street in Southwest Memphis. This transit center will need space for four buses on the curb area along Brooks adjacent to the McDonald's. This will require reusing the current turn lane as a bus only lane for buses to dwell so passengers can transfer easily.

This area provides the most convenient transit access for all routes that converge in this area. The existing access driveway for the McDonald's from Brooks will likely need to be relocated to use the driveway for the adjacent gas station to make room for four buses.

Figure 31: Airways Transit Center Improvements

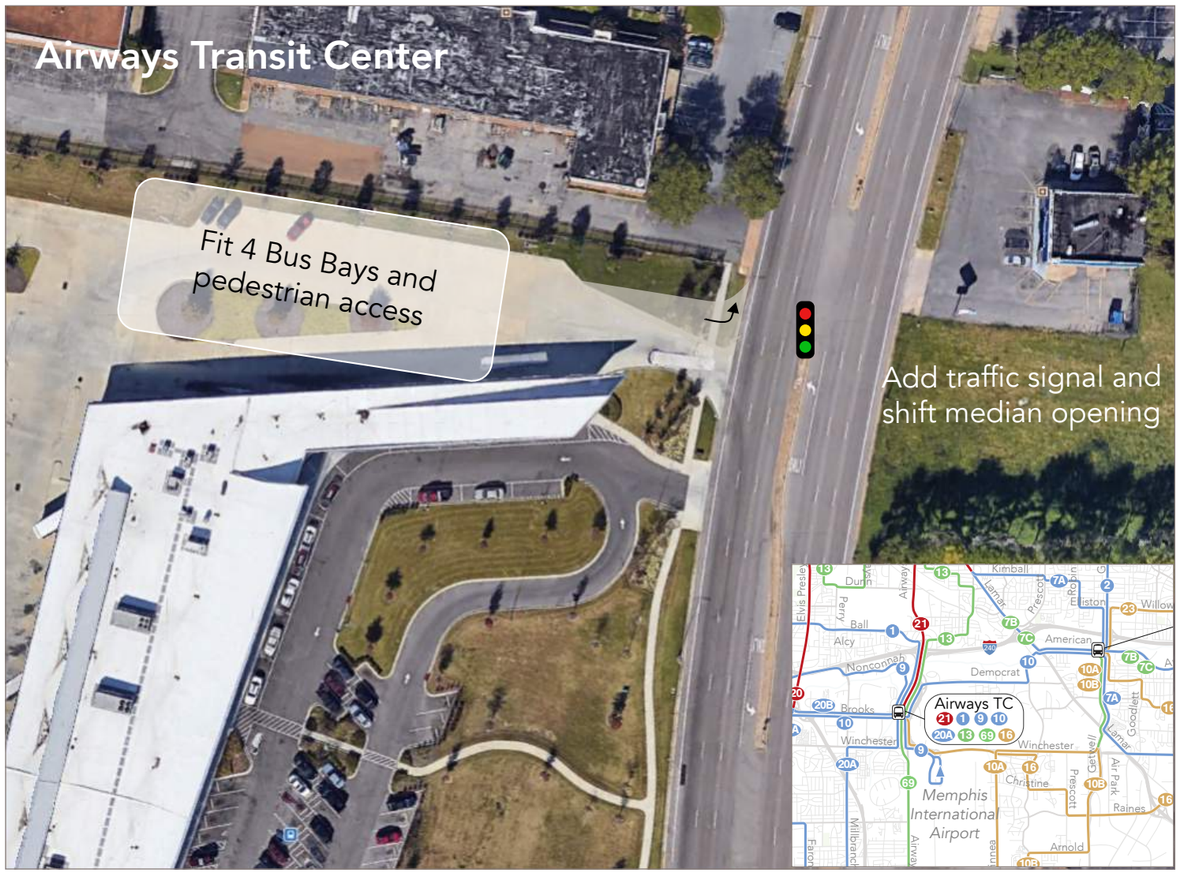



Figure 32: Southwest Transit Center

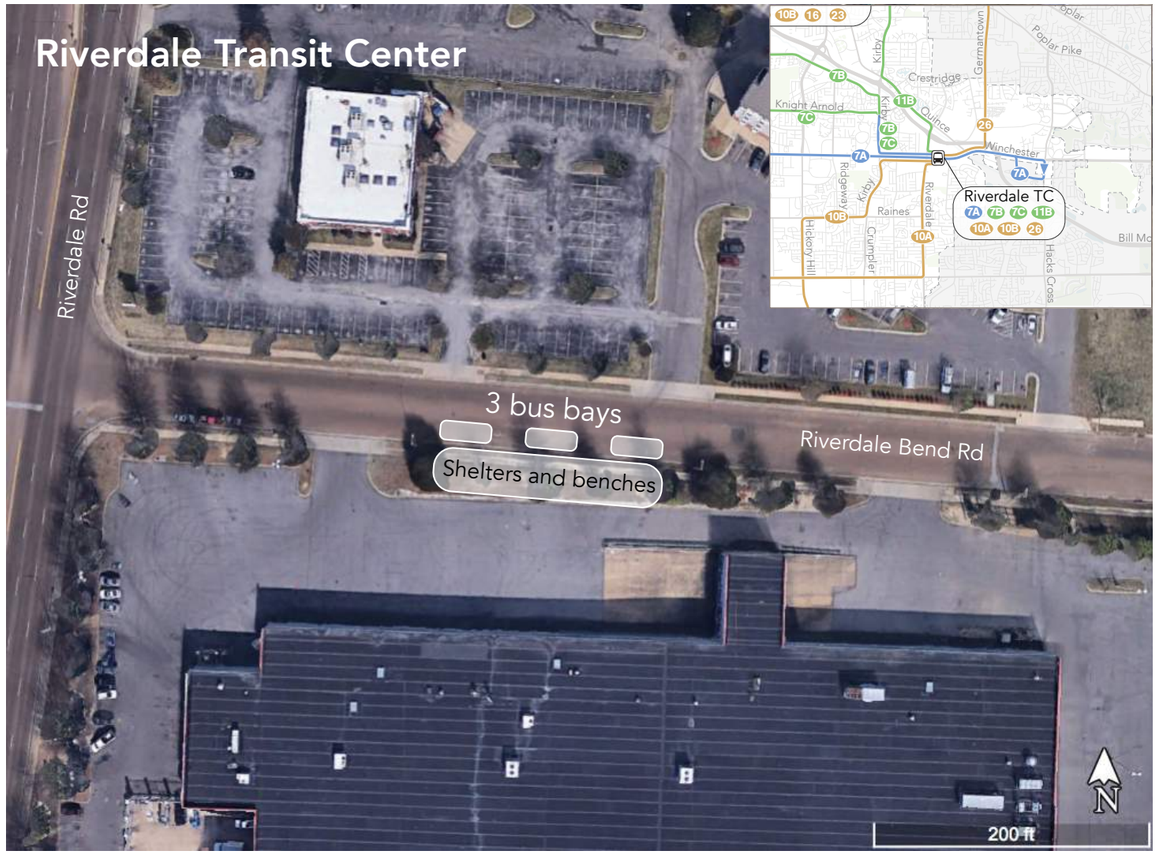
# Recommended Network



**Riverdale Transit Center**

The Riverdale Transit Center will be another important connection point in the transit system in southeast Memphis. At this location routes 7B, 7C, 10A, 10B, 11B, and 26 will all terminate. Because some of these routes run a very low frequency, only three bus bays will be needed to allow for the necessary pulsing of routes at this location. In addition to the on-street space for buses, shelters and other amenities will be needed to provide at least shade and a place to sit for passengers. In the long-term a more permanent transit facility with restrooms and a climate-controlled waiting area would be a valuable investment at this location.

Figure 33: Riverdale Transit Center



# 4 Next Steps

# Next Steps

## What happens next?

The Draft Recommended Network will be presented to the general public, transit riders, community organizations, and other transit stakeholders in Memphis for review and consideration.

The public will have the opportunity to provide comments on the Draft Recommended Network at public meetings, and at other community presentations. In addition, the study team will be engaging bus riders with a survey at busy bus stops and transit centers.

In addition, the Memphis 3.0 Transit Vision team will take any public input and comments on this Draft Recommended Network through the project website until June 30, 2018:

www.memphis3point0.com/transit

All of the comments received will be considered before the preparation of the Final Recommended Network.

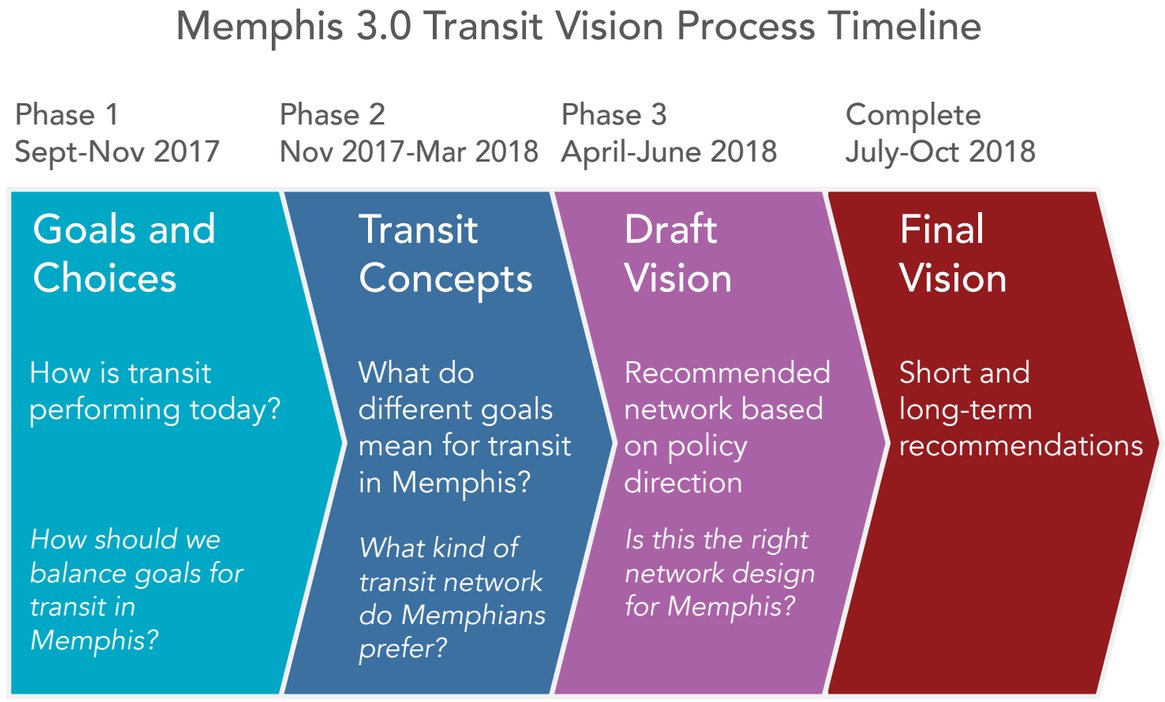
## What about the long term?

The focus of this report has been on the Draft Recommended Network, which could be implemented starting in 2022 after additional funding is secured. By defining high frequency transit corridors for the short term, and identifying possible future high frequency transit corridors, this process has already helped guide discussions about where major new developments, and especially affordable housing and job centers, should be encouraged.

The City has been engaged in that larger and long-term discussion about land use and transportation through the Memphis 3.0 Comprehensive Plan process. That process is expected to result in a refined land use vision for the city by summer 2018. From that vision, the City, Innovate Memphis, MATA and the consultant team will develop a 2040 Transit Vision for Memphis that builds off of the Final Recommended Network.

In most cities, permanent and frequent transit corridors are places where higher density development can be accommodated, which contributes to transit's success and to economic vitality. This Draft Recommended Network is one step in an iterative land use and transit planning conversation for the city, which can and should continue indefinitely, helping to build a more prosperous and livable Memphis.

Figure 34: Process and Timeline for Memphis 3.0 Transit Vision



# 5 Access Maps

# Access Maps

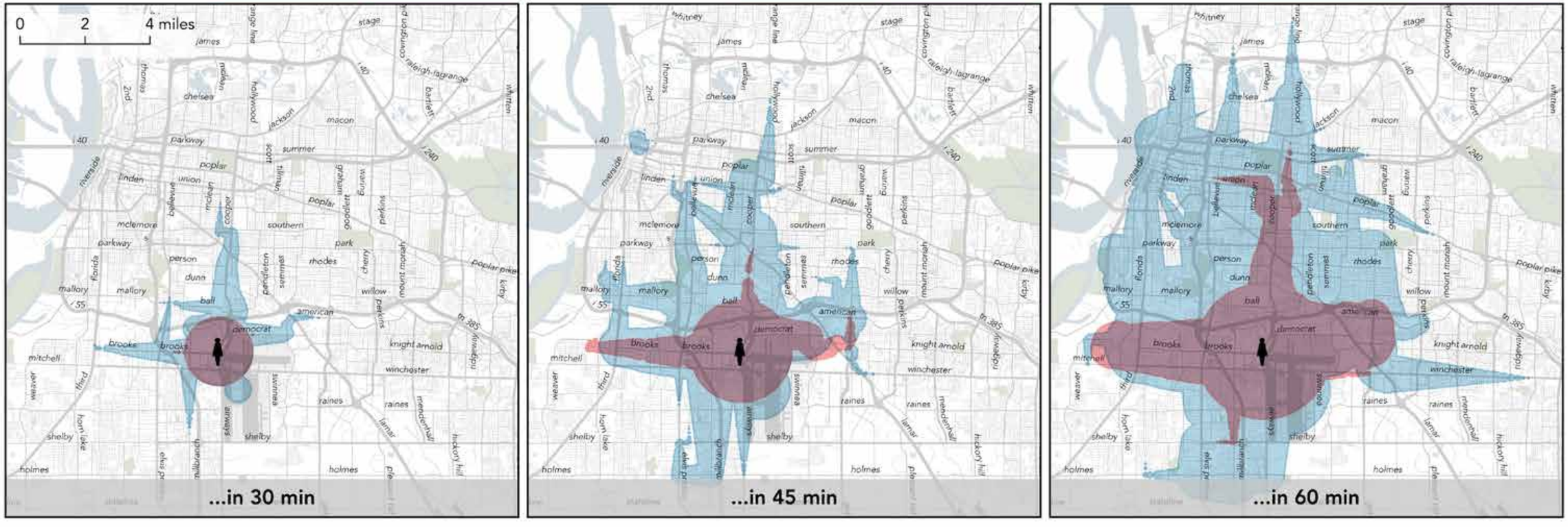
## How far can I travel from Airways Transit Center?


*Riders can reach more jobs and residents in the Recommended Plan than in the Existing Network (traveling by transit at noon on weekdays).*

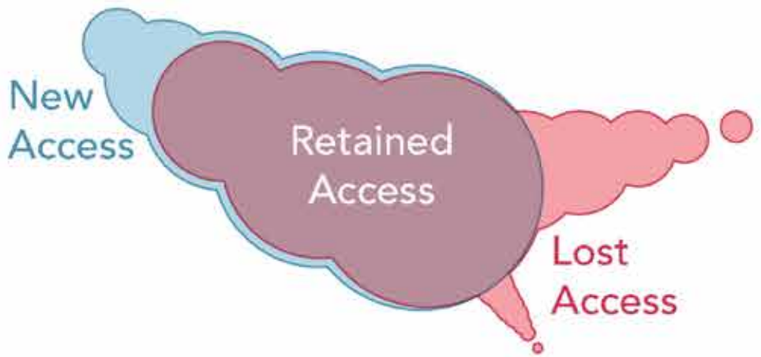
| | % Change | Existing | Recommended |
|---|---|---|---|
| Residents | +789% | 1,600 | 14,300 |
| Jobs | +117% | 14,100 | 30,600 |

| | % Change | Existing | Recommended |
|---|---|---|---|
| Residents | +529% | 14,000 | 88,300 |
| Jobs | +113% | 39,500 | 84,200 |

| | % Change | Existing | Recommended |
|---|---|---|---|
| Residents | +348% | 54,600 | 245,100 |
| Jobs | +193% | 71,900 | 210,600 |



# How far can I travel from American Way Transit Center?

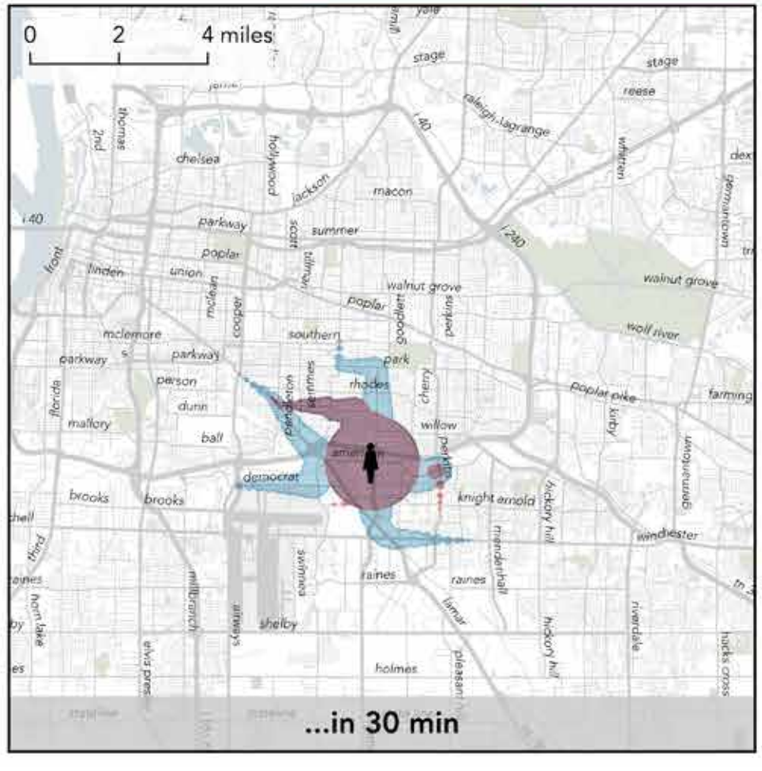


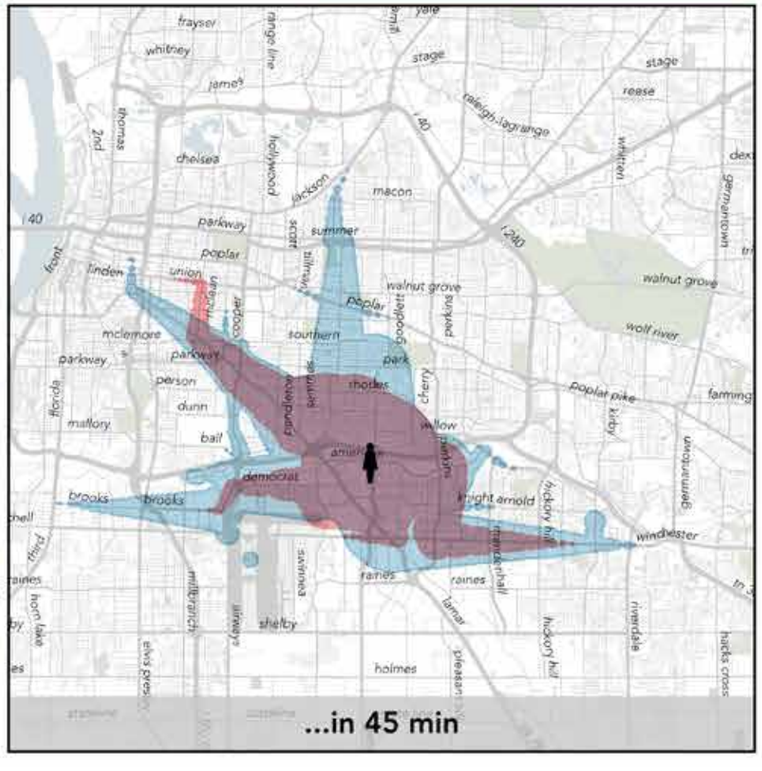

*Riders can reach more jobs and residents in the Recommended Plan than in the Existing Network (traveling by transit at noon on weekdays).*

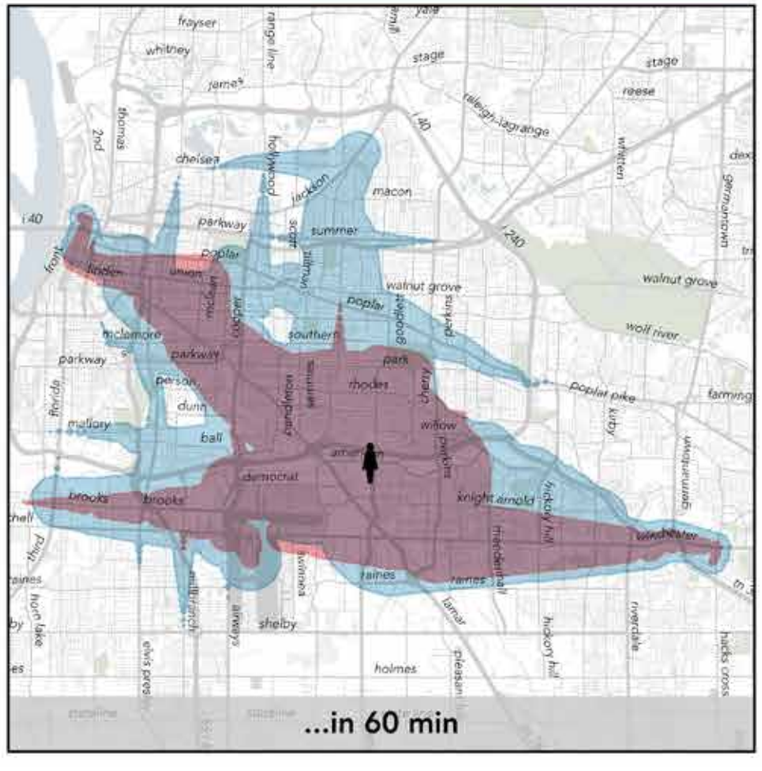
| | % Change | Existing | Recommended |
|---|---|---|---|
| Residents | +70% | 16,600 | 28,200 |
| Jobs | +179% | 6,400 | 17,800 |

| | % Change | Existing | Recommended |
|---|---|---|---|
| Residents | +58% | 64,500 | 102,100 |
| Jobs | +119% | 35,400 | 77,400 |

| | % Change | Existing | Recommended |
|---|---|---|---|
| Residents | +68% | 141,500 | 237,200 |
| Jobs | +62% | 129,800 | 210,500 |



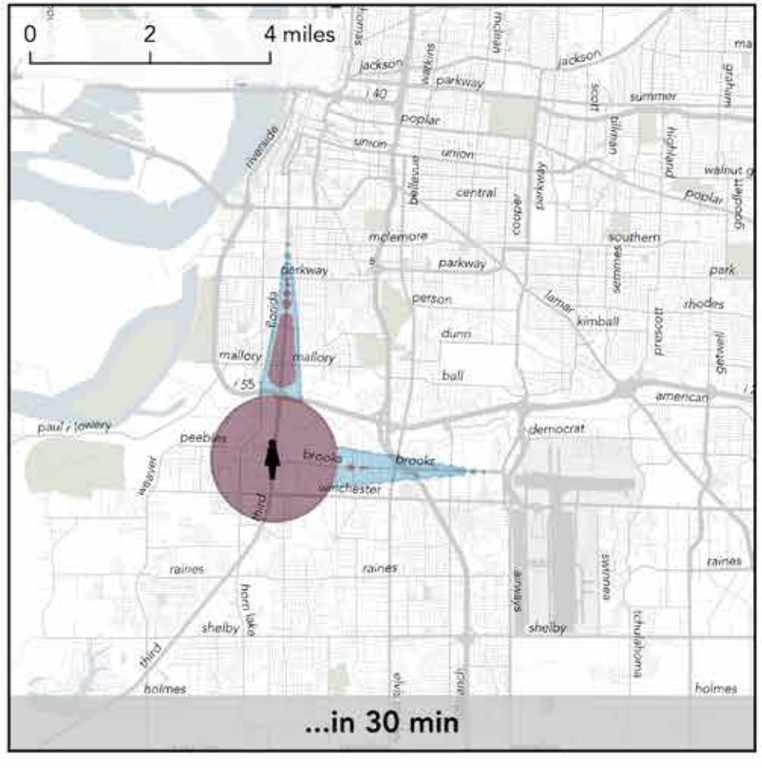



# Access Maps

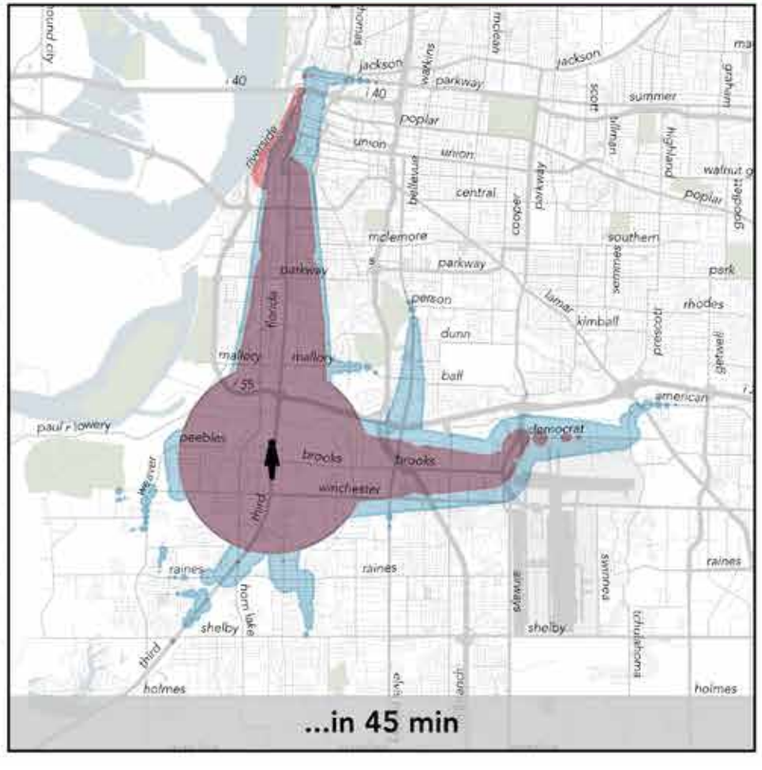
## How far can I travel from Brooks and 3rd in SW Memphis?


*Riders can reach more jobs and residents in the Recommended Plan than in the Existing Network (traveling by transit at noon on weekdays).*

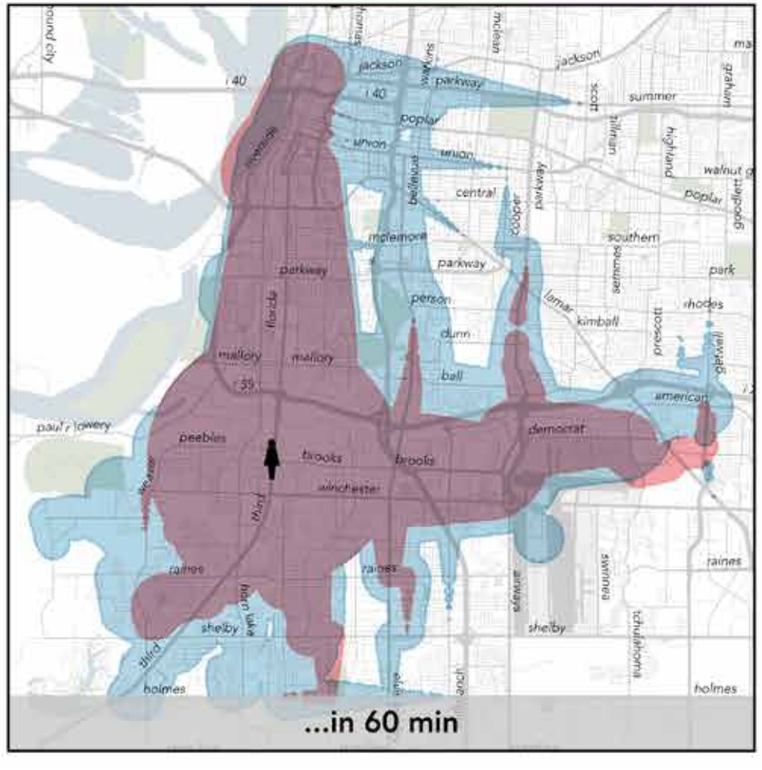
| | % Change | Existing | Recommended |
|---|---|---|---|
| Residents | +42% | 5,000 | 7,100 |
| Jobs | +69% | 4,500 | 7,500 |



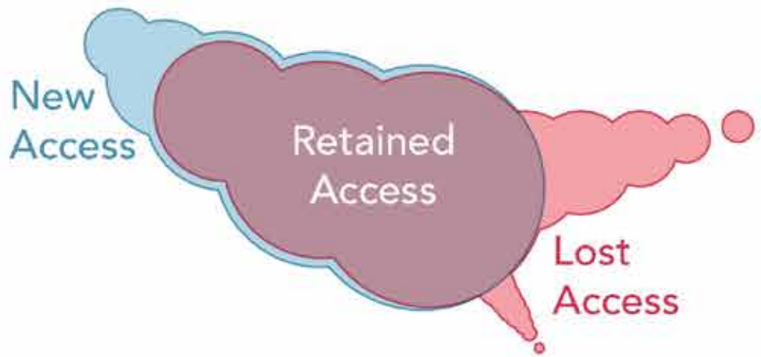

| | % Change | Existing | Recommended |
|---|---|---|---|
| Residents | +59% | 24,200 | 38,500 |
| Jobs | +73% | 37,500 | 64,900 |




| | % Change | Existing | Recommended |
|---|---|---|---|
| Residents | +86% | 74,400 | 138,400 |
| Jobs | +46% | 98,400 | 143,800 |



# How far can I travel from Crosstown Concourse?

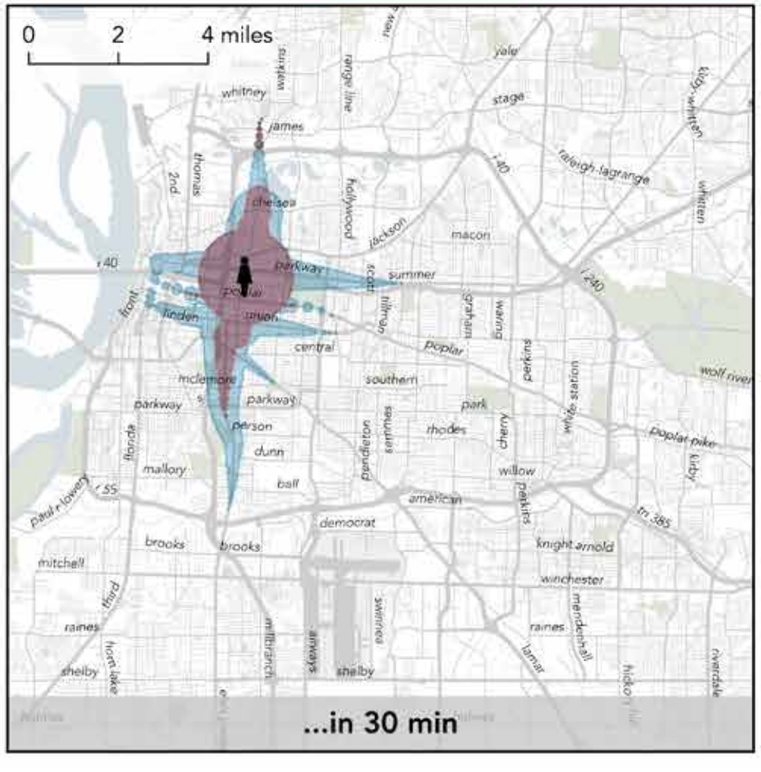


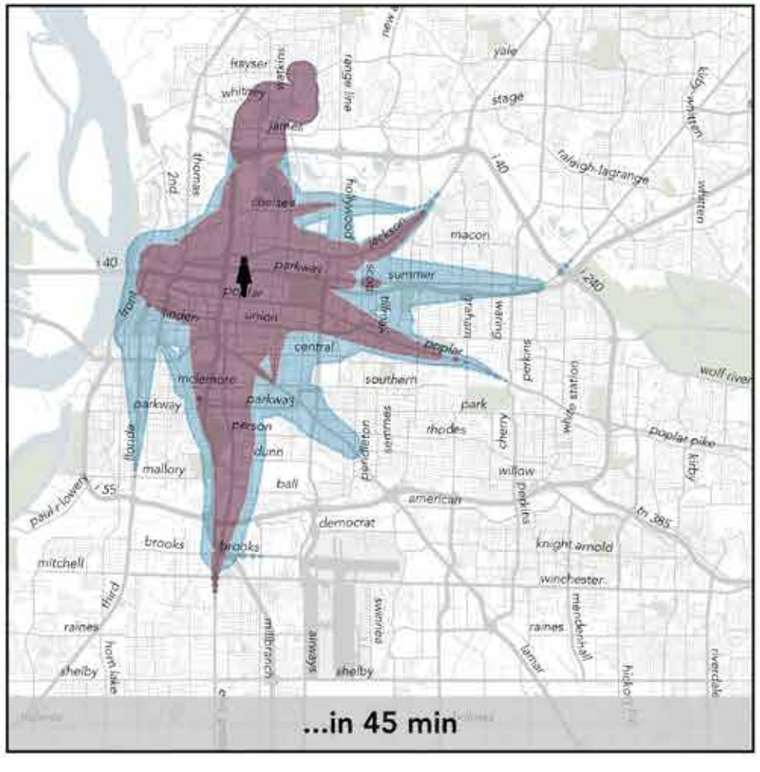

*Riders can reach more jobs and residents in the Recommended Plan than in the Existing Network (traveling by transit at noon on weekdays).*

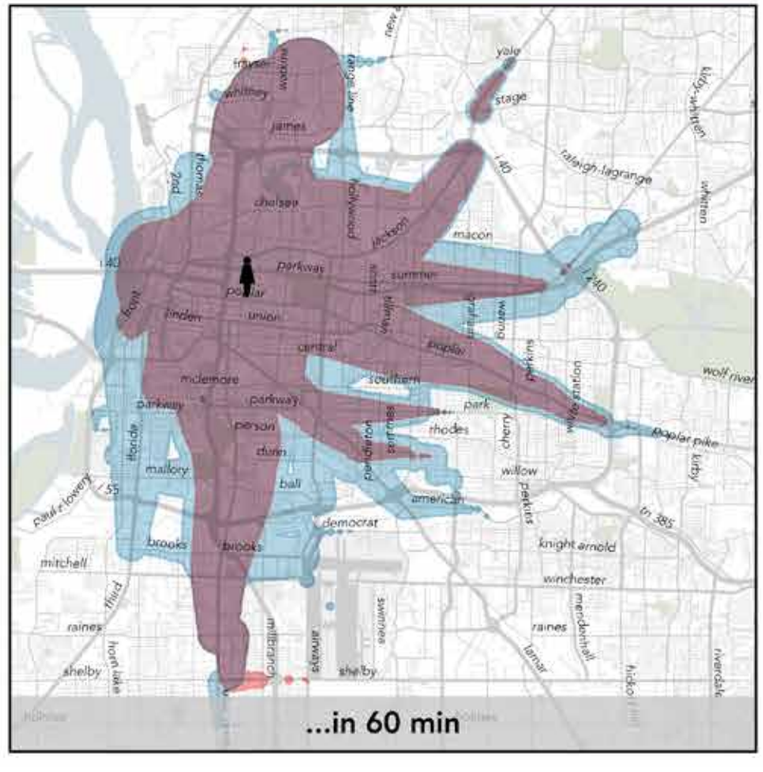
| | % Change | Existing | Recommended |
|---|---|---|---|
| Residents | +70% | 22,400 | 38,200 |
| Jobs | +140% | 16,800 | 40,100 |

| | % Change | Existing | Recommended |
|---|---|---|---|
| Residents | +71% | 79,000 | 135,200 |
| Jobs | +64% | 76,200 | 124,900 |

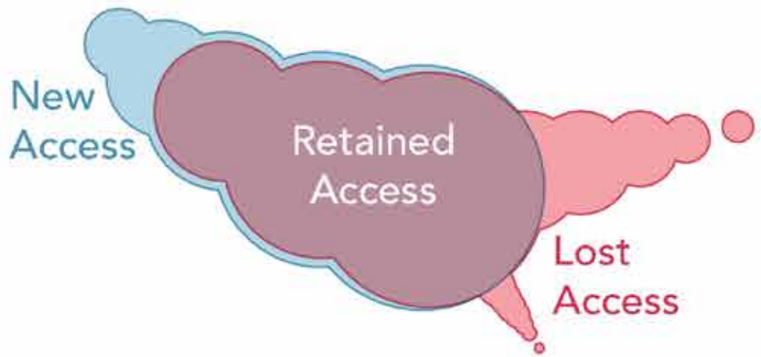
| | % Change | Existing | Recommended |
|---|---|---|---|
| Residents | +34% | 188,400 | 251,700 |
| Jobs | +35% | 153,800 | 208,200 |



# How far can I travel from Downtown?

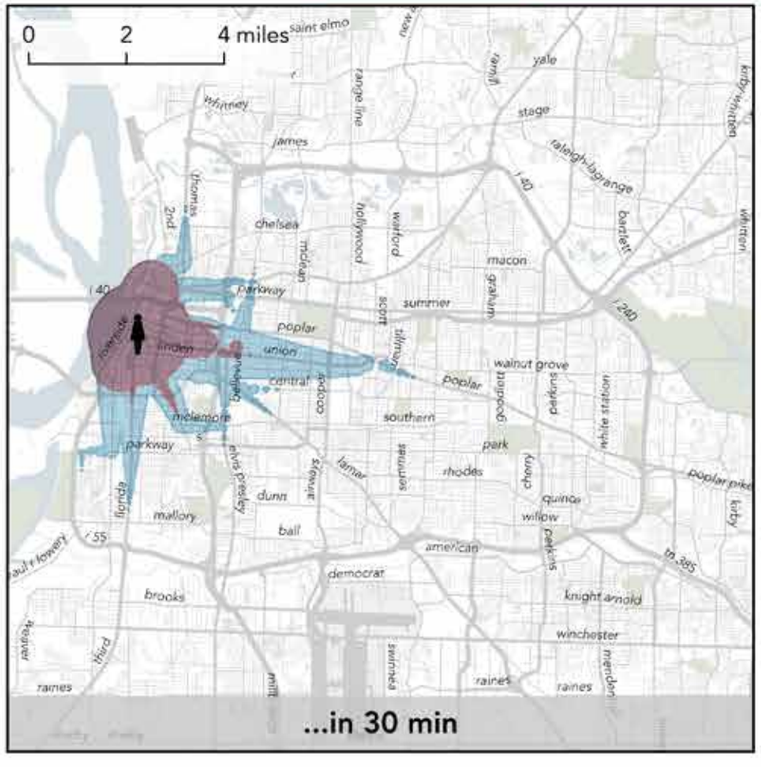


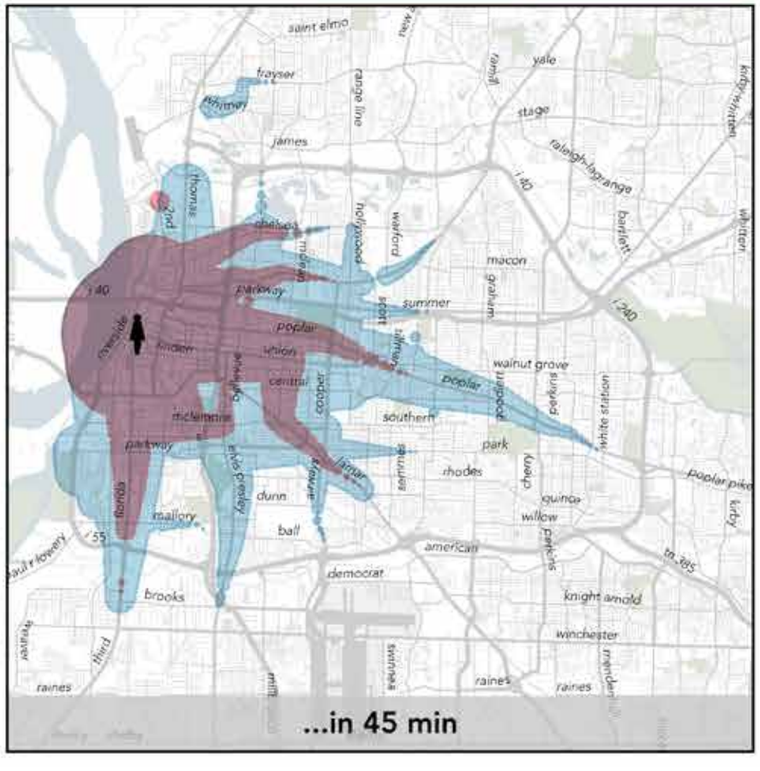

*Riders can reach more jobs and residents in the Recommended Plan than in the Existing Network (traveling by transit at noon on weekdays).*

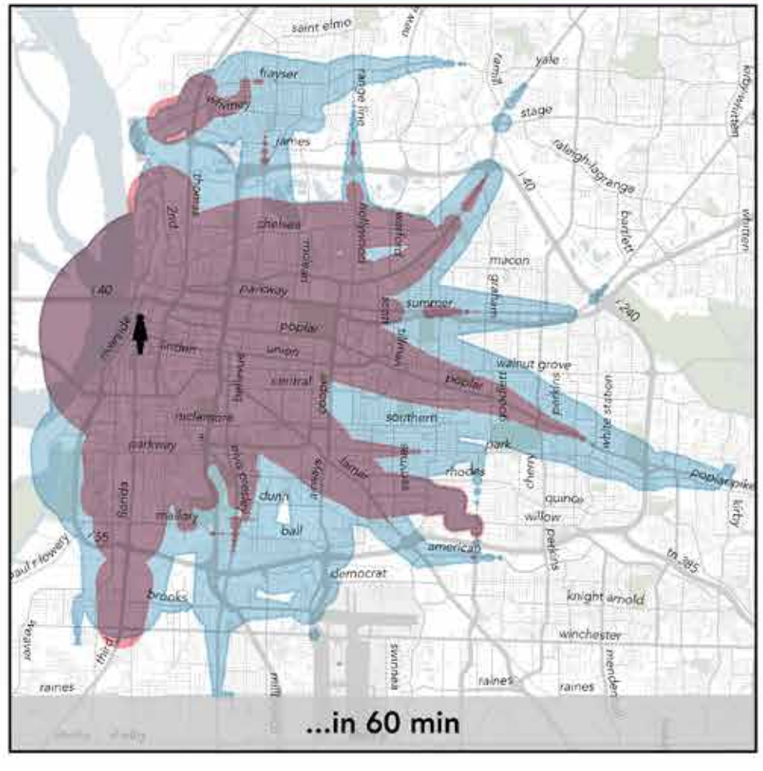
| | % Change | Existing | Recommended |
|---|---|---|---|
| Residents | +159% | 16,000 | 41,400 |
| Jobs | +56% | 48,100 | 75,200 |

| | % Change | Existing | Recommended |
|---|---|---|---|
| Residents | +99% | 66,200 | 131,800 |
| Jobs | +58% | 82,900 | 130,600 |

| | % Change | Existing | Recommended |
|---|---|---|---|
| Residents | +55% | 158,600 | 246,500 |
| Jobs | +54% | 139,800 | 215,600 |

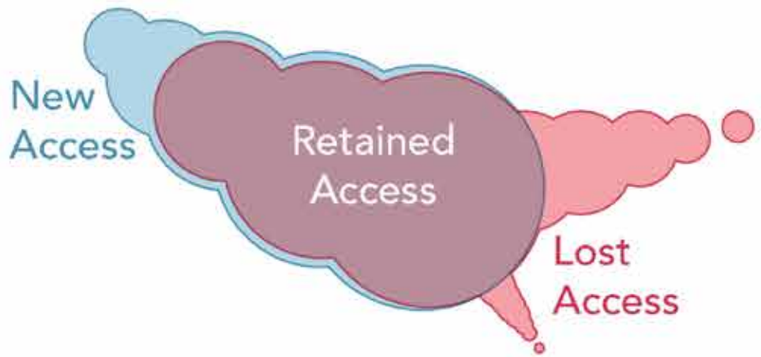


# Access Maps

## How far can I travel from FedEx Hub?

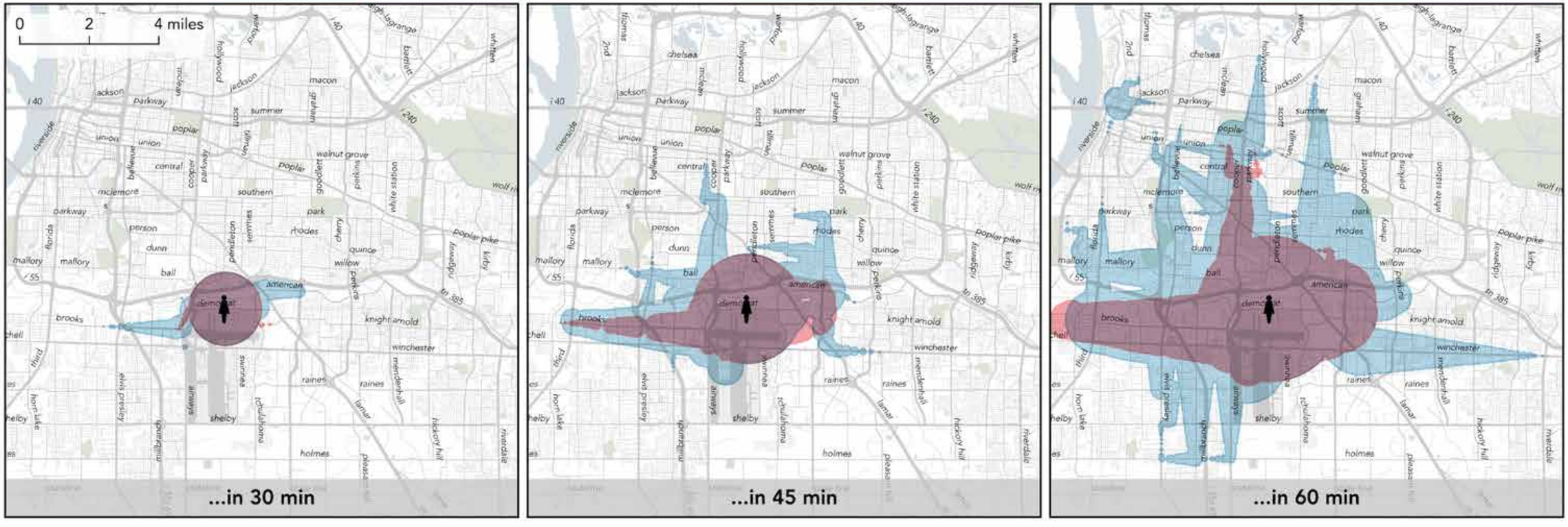



*Riders can reach more jobs and residents in the Recommended Plan than in the Existing Network (traveling by transit at noon on weekdays).*

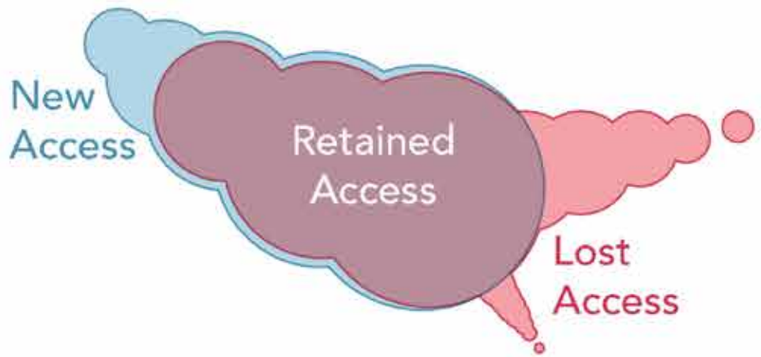
| | % Change | Existing | Recommended |
|---|---|---|---|
| Residents | +55% | 2,000 | 3,100 |
| Jobs | +33% | 18,500 | 24,500 |

| | % Change | Existing | Recommended |
|---|---|---|---|
| Residents | +171% | 15,000 | 40,700 |
| Jobs | +31% | 41,700 | 54,600 |

| | % Change | Existing | Recommended |
|---|---|---|---|
| Residents | +217% | 50,500 | 160,100 |
| Jobs | +99% | 64,000 | 127,300 |



# How far can I travel from Frayser and Overton Crossing?

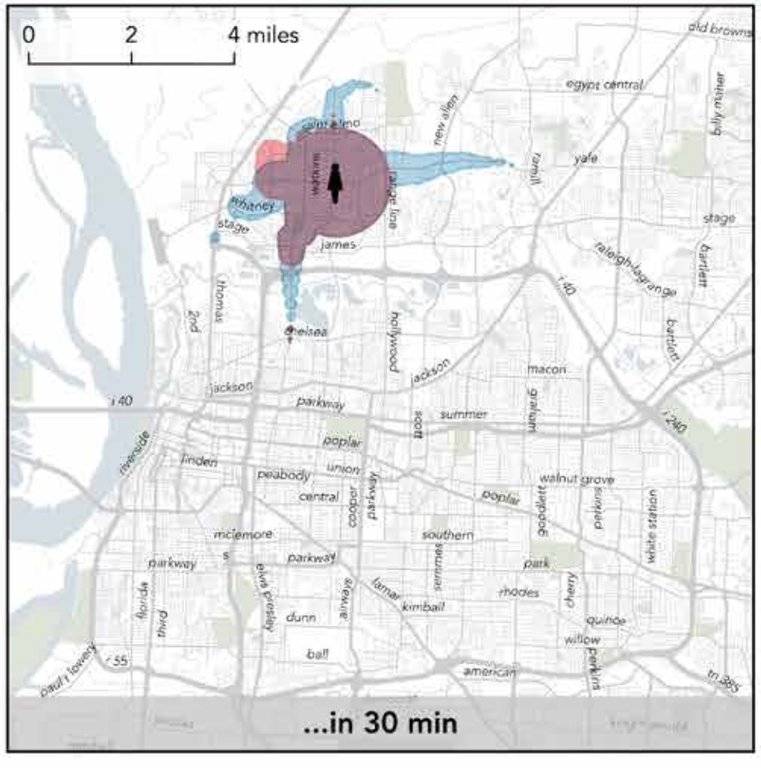


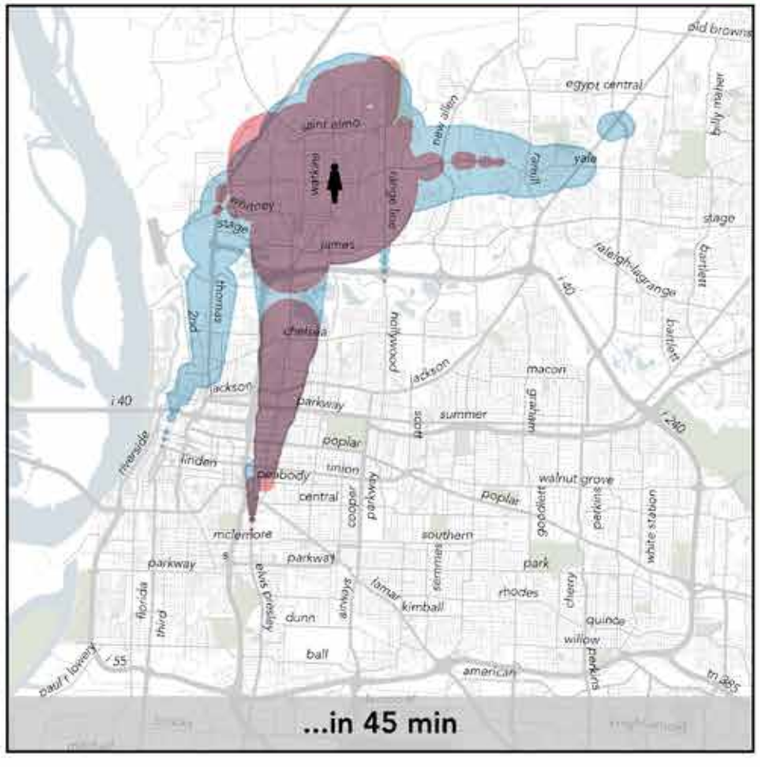

*Riders can reach more jobs and residents in the Recommended Plan than in the Existing Network (traveling by transit at noon on weekdays).*

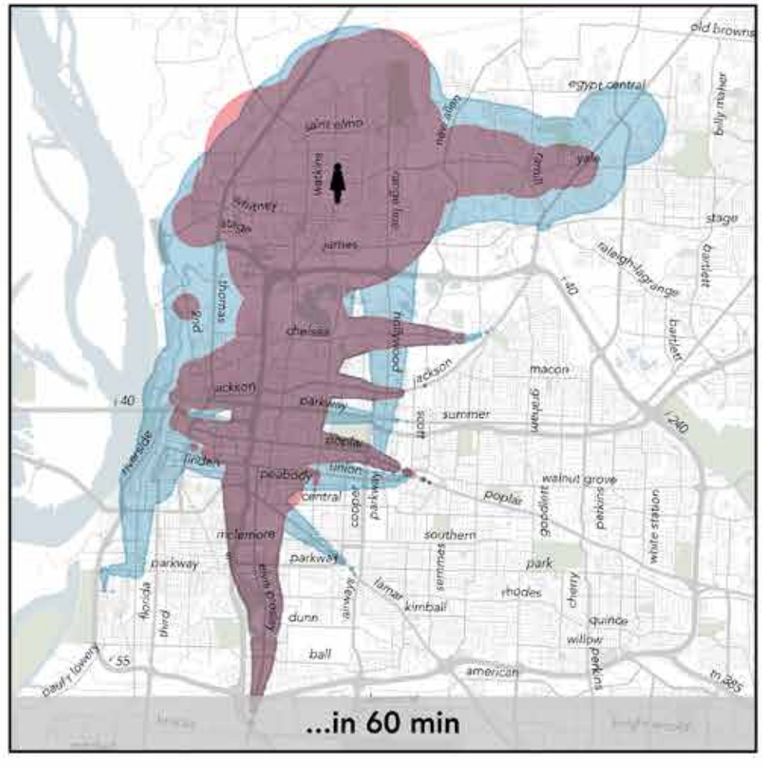
| | % Change | Existing | Recommended |
|---|---|---|---|
| Residents | +27% | 17,300 | 21,900 |
| Jobs | +32% | 2,600 | 3,500 |

| | % Change | Existing | Recommended |
|---|---|---|---|
| Residents | +33% | 46,200 | 61,500 |
| Jobs | +65% | 12,700 | 21,000 |

| | % Change | Existing | Recommended |
|---|---|---|---|
| Residents | +34% | 107,100 | 143,200 |
| Jobs | +92% | 55,200 | 105,700 |

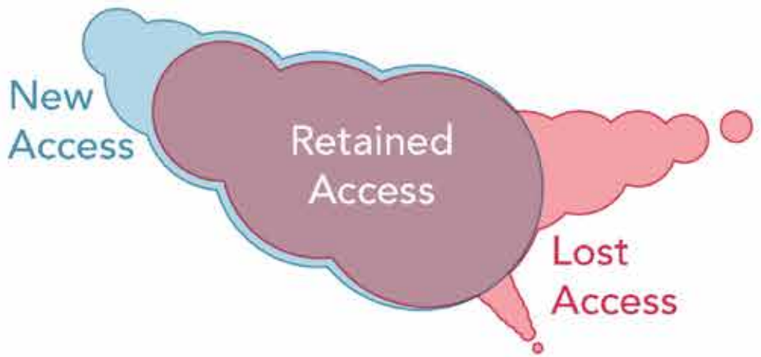


# Access Maps

## How far can I travel from Jackson and Bayliss?

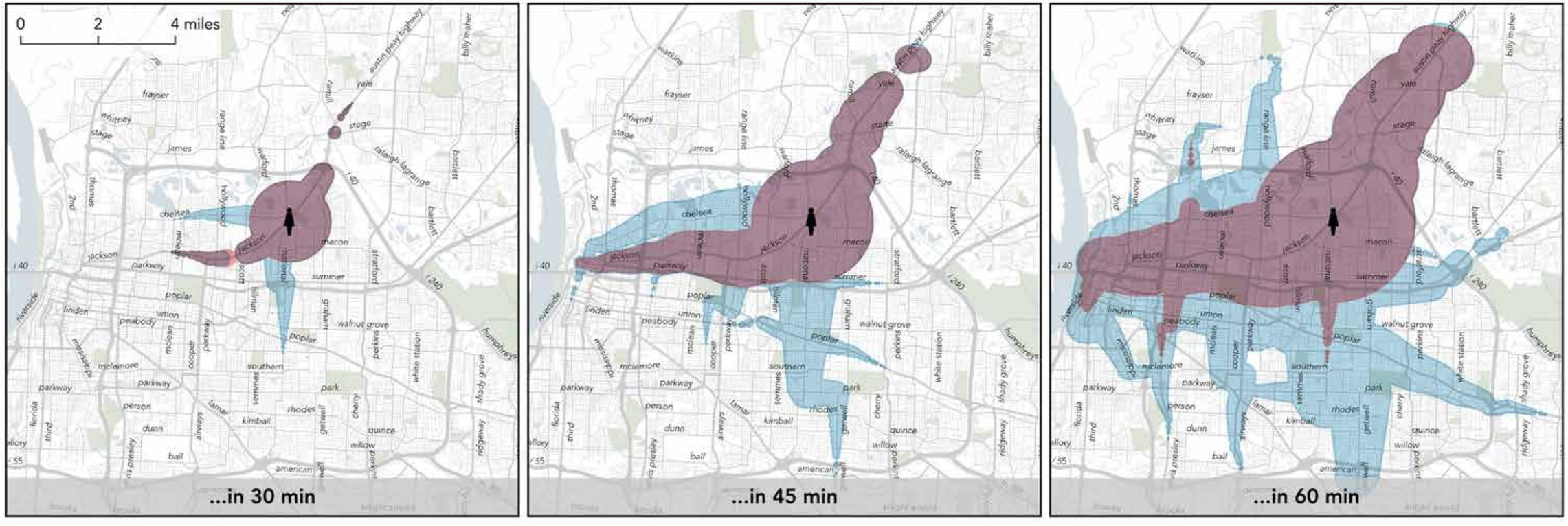



*Riders can reach more jobs and residents in the Recommended Plan than in the Existing Network (traveling by transit at noon on weekdays).*

| | % Change | Existing | Recommended |
|---|---|---|---|
| Residents | +31% | 16,100 | 21,100 |
| Jobs | +31% | 6,200 | 8,100 |

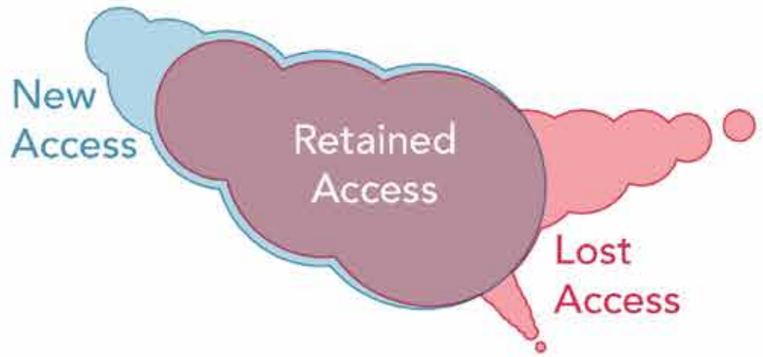
| | % Change | Existing | Recommended |
|---|---|---|---|
| Residents | +68% | 55,900 | 94,000 |
| Jobs | +104% | 21,500 | 43,900 |

| | % Change | Existing | Recommended |
|---|---|---|---|
| Residents | +95% | 107,000 | 208,600 |
| Jobs | +141% | 67,200 | 162,000 |



# Access Maps

## How far can I travel from Madison and Cooper?

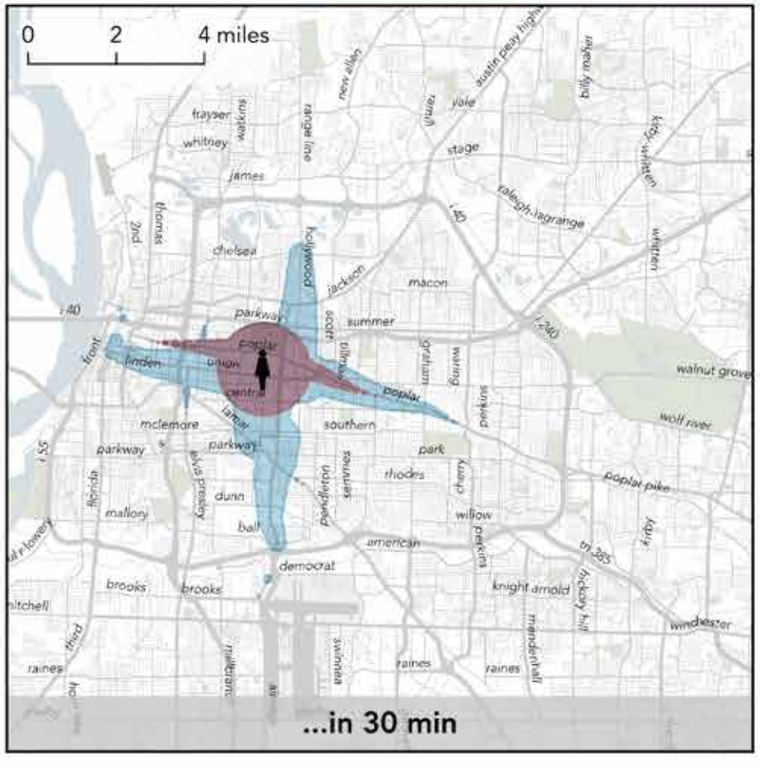


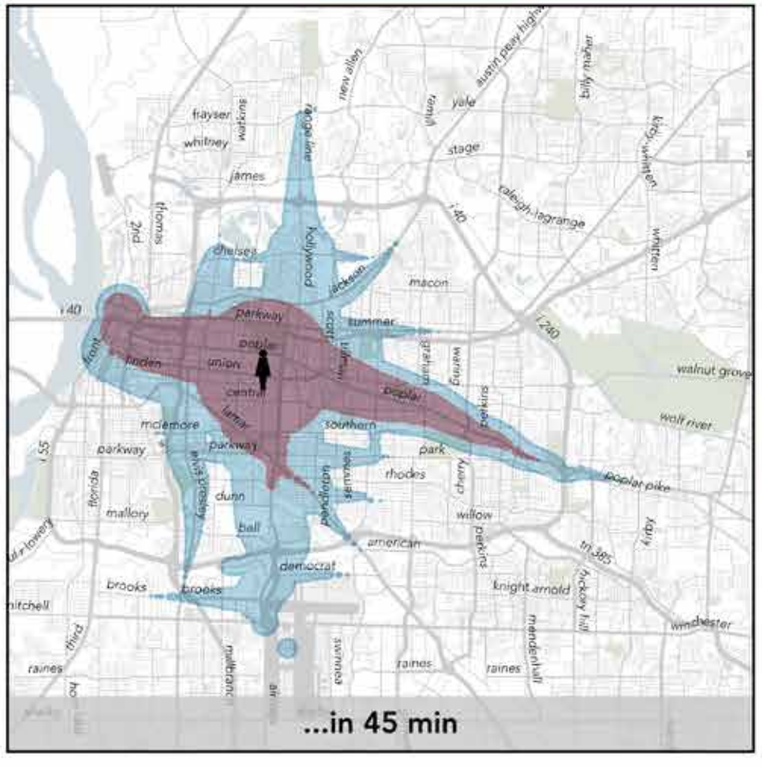

*Riders can reach more jobs and residents in the Recommended Plan than in the Existing Network (traveling by transit at noon on weekdays).*

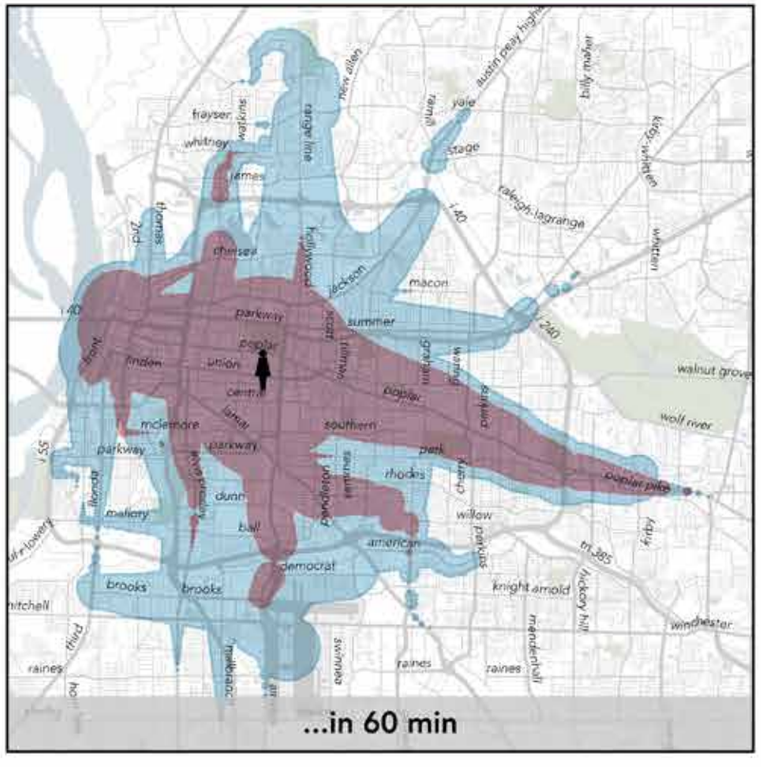
| | % Change | Existing | Recommended |
|---|---|---|---|
| Residents | +163% | 17,200 | 45,300 |
| Jobs | +199% | 18,500 | 55,300 |

| | % Change | Existing | Recommended |
|---|---|---|---|
| Residents | +120% | 61,800 | 135,800 |
| Jobs | +91% | 78,600 | 150,100 |

| | % Change | Existing | Recommended |
|---|---|---|---|
| Residents | +90% | 139,700 | 265,500 |
| Jobs | +60% | 153,700 | 246,300 |

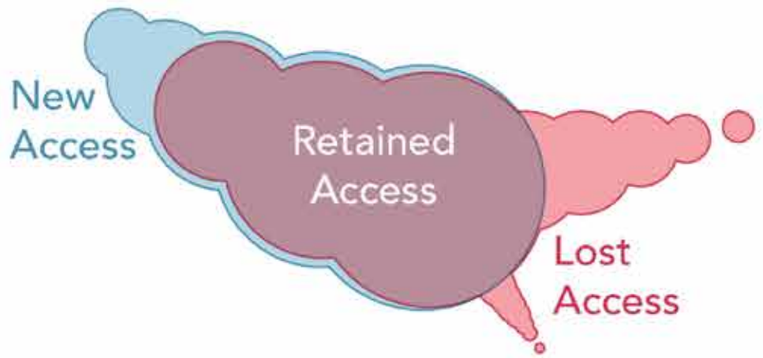


# Access Maps

## How far can I travel from Medical District?

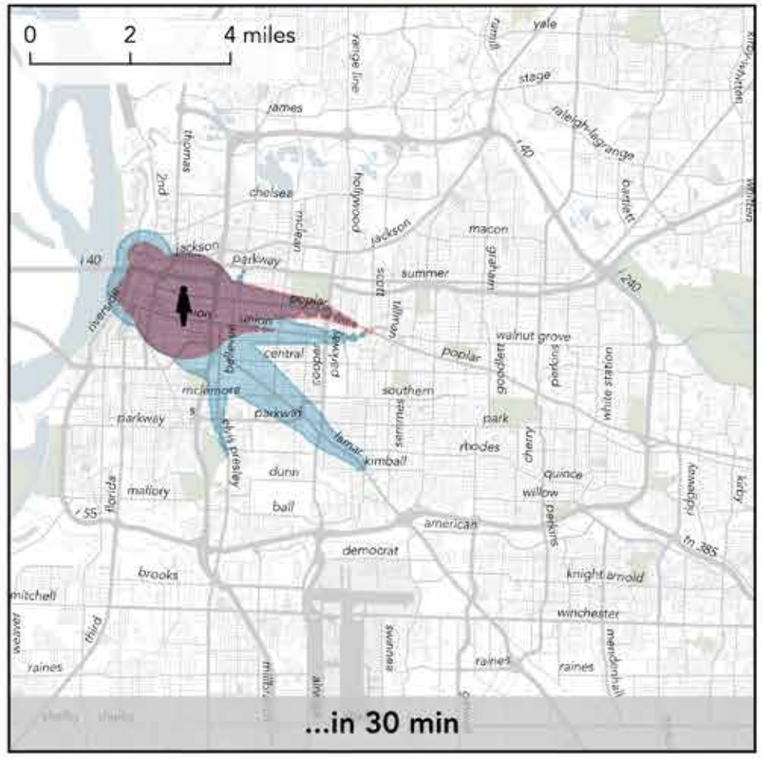


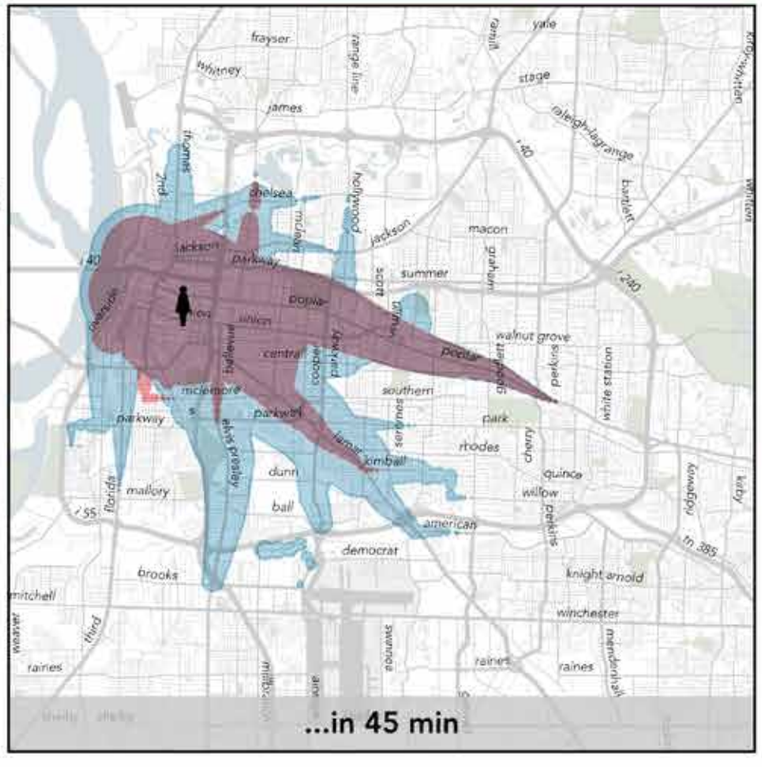

*Riders can reach more jobs and residents in the Recommended Plan than in the Existing Network (traveling by transit at noon on weekdays).*

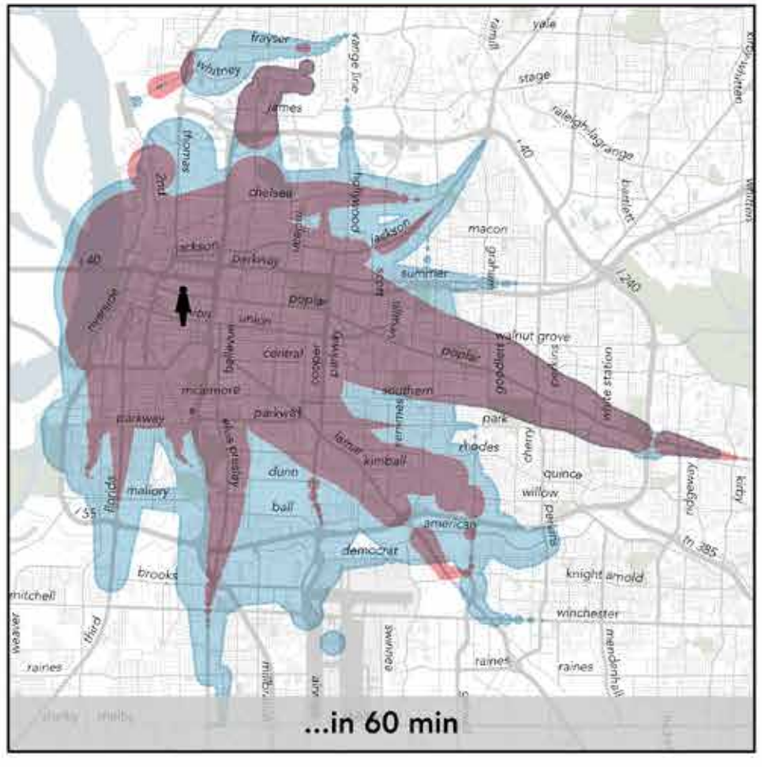
| | % Change | Existing | Recommended |
|---|---|---|---|
| Residents | +73% | 24,100 | 41,800 |
| Jobs | +30% | 50,800 | 65,900 |

| | % Change | Existing | Recommended |
|---|---|---|---|
| Residents | +71% | 69,600 | 118,800 |
| Jobs | +34% | 90,400 | 120,800 |

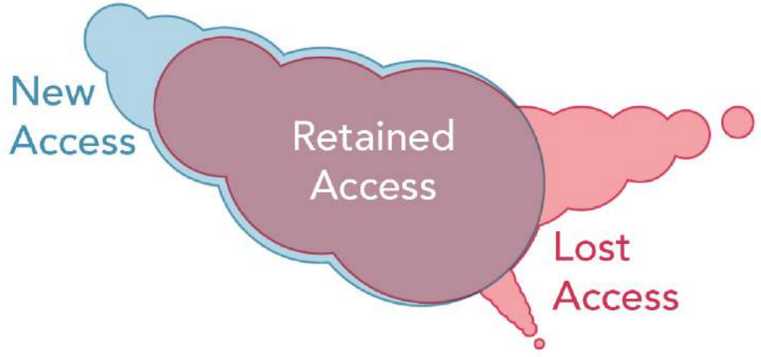
| | % Change | Existing | Recommended |
|---|---|---|---|
| Residents | +48% | 159,900 | 236,500 |
| Jobs | +39% | 155,600 | 216,900 |



# How far can I travel from New Chicago Neighborhood?

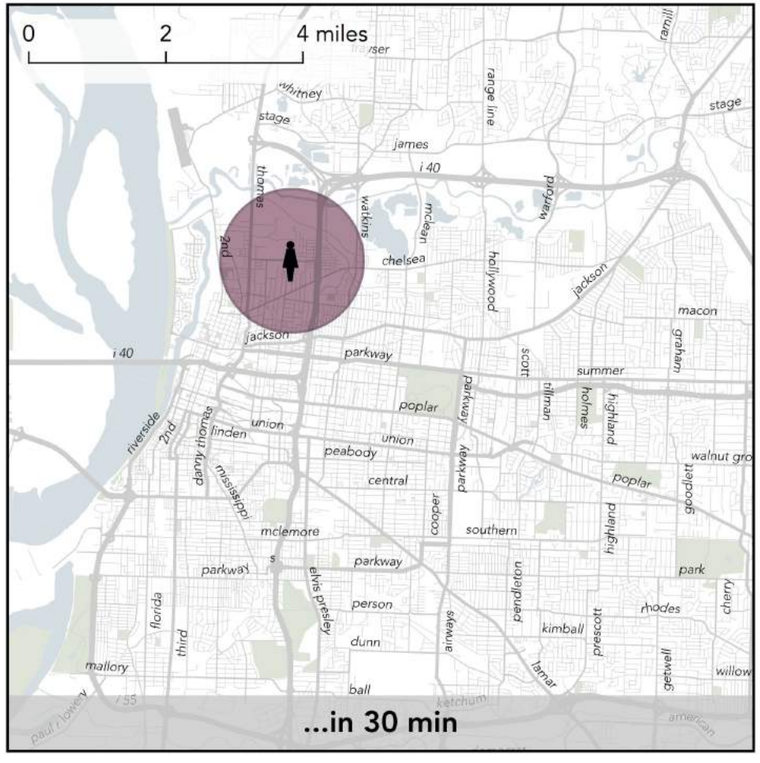


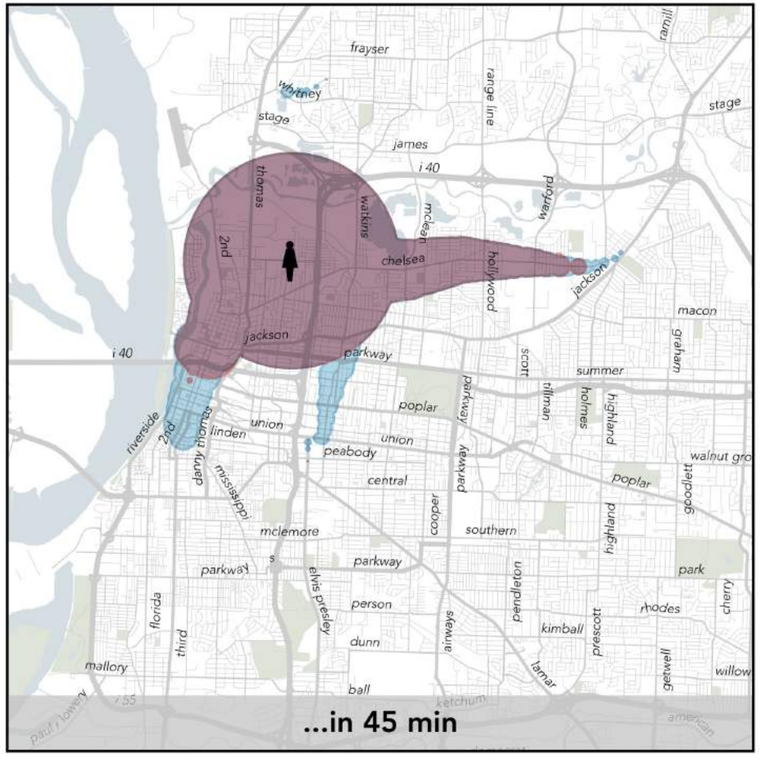

*Riders can reach more jobs and residents in the Recommended Plan than in the Existing Network (traveling by transit at noon on weekdays).*

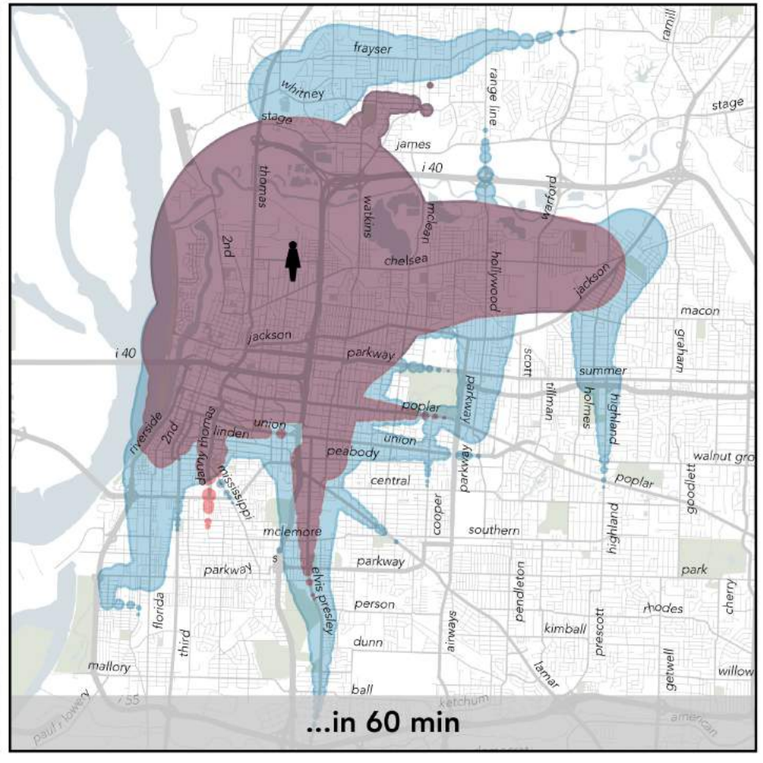
| | % Change | Existing | Recommended |
|---|---|---|---|
| **Residents** | 0% | 7,100 | 7,100 |
| **Jobs** | 0% | 5,400 | 5,400 |

| | % Change | Existing | Recommended |
|---|---|---|---|
| **Residents** | +30% | 23,900 | 31,000 |
| **Jobs** | +115% | 19,300 | 41,600 |

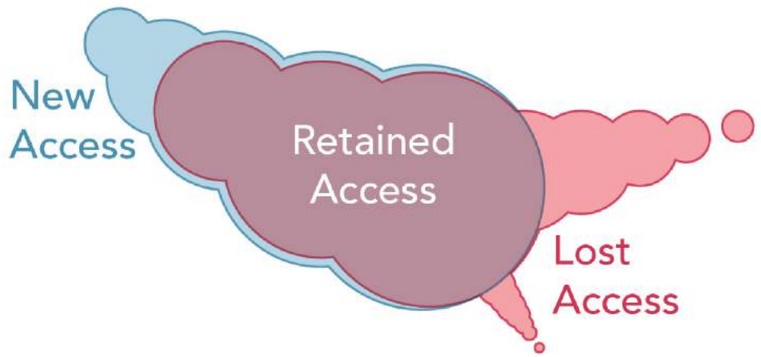
| | % Change | Existing | Recommended |
|---|---|---|---|
| **Residents** | +63% | 63,600 | 104,000 |
| **Jobs** | +31% | 75,900 | 99,100 |



# How far can I travel from Poplar and Ridgeway?

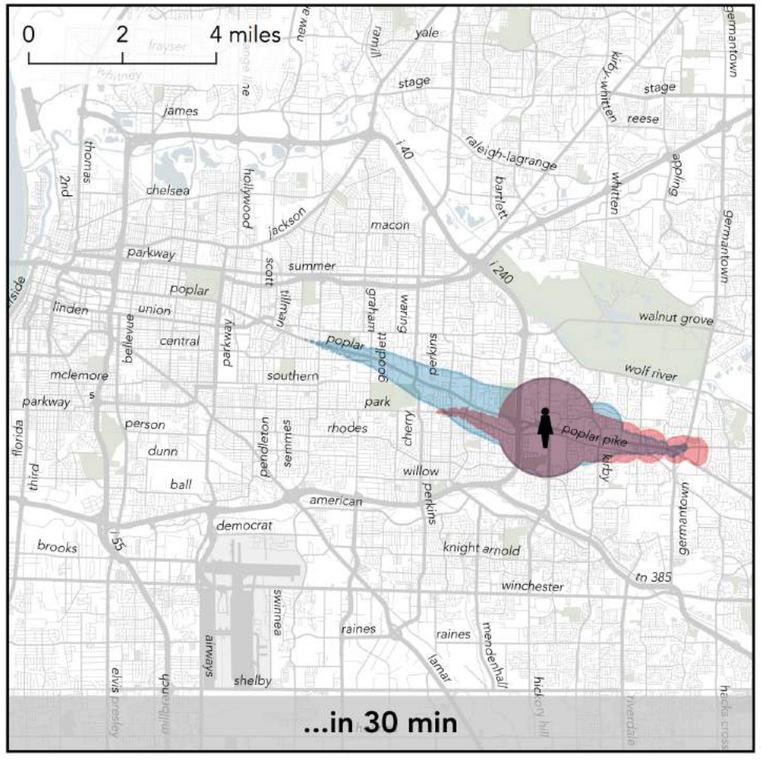


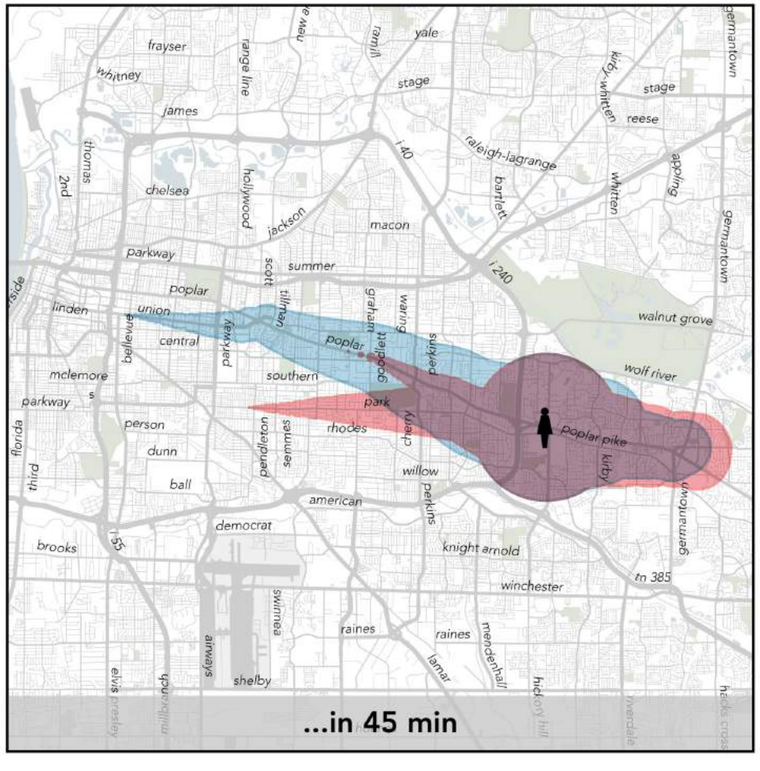

*Riders can reach more jobs and residents in the Recommended Plan than in the Existing Network (traveling by transit at noon on weekdays).*

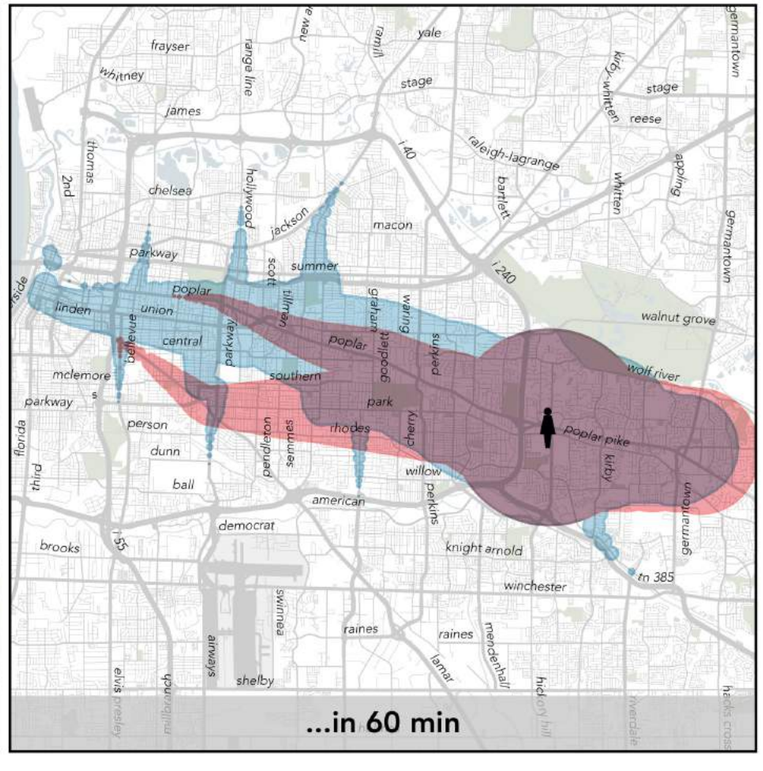
| | % Change | Existing | Recommended |
|---|---|---|---|
| Residents | +38% | 13,200 | 18,200 |
| Jobs | +29% | 35,300 | 45,500 |

| | % Change | Existing | Recommended |
|---|---|---|---|
| Residents | +26% | 40,100 | 50,500 |
| Jobs | +35% | 60,200 | 81,500 |

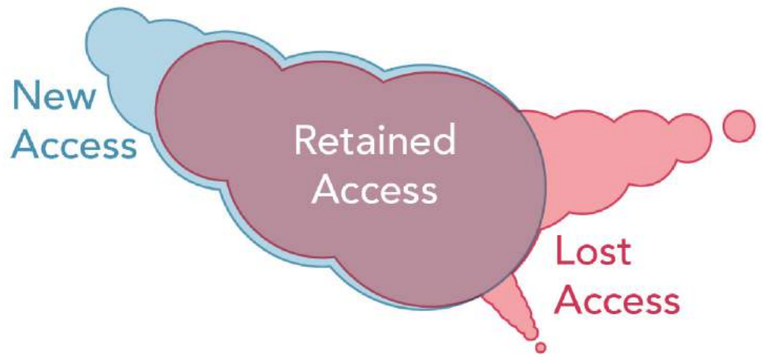
| | % Change | Existing | Recommended |
|---|---|---|---|
| Residents | +35% | 94,100 | 126,600 |
| Jobs | +60% | 94,700 | 151,800 |



# How far can I travel from Riverview Neighborhood?

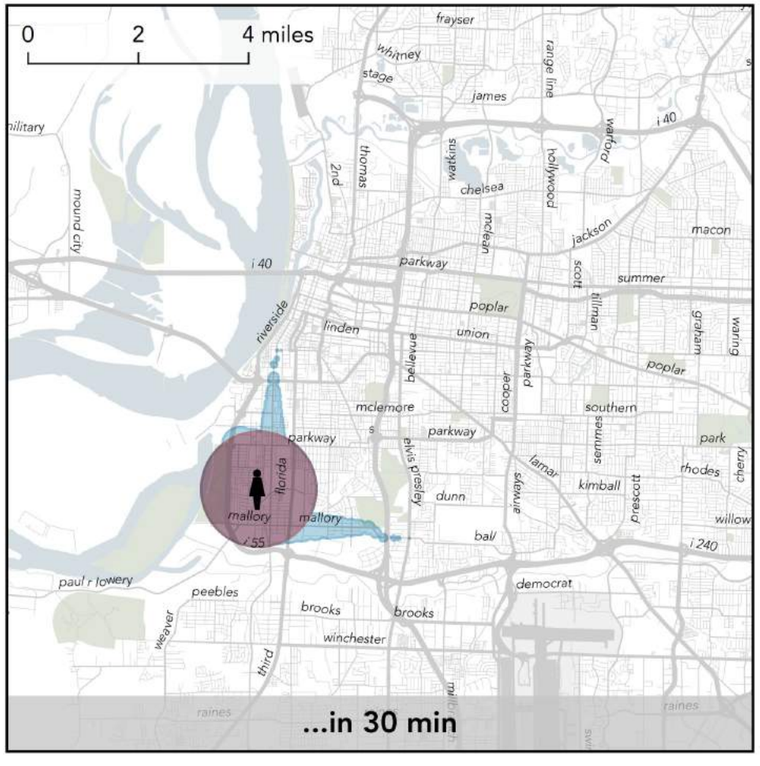


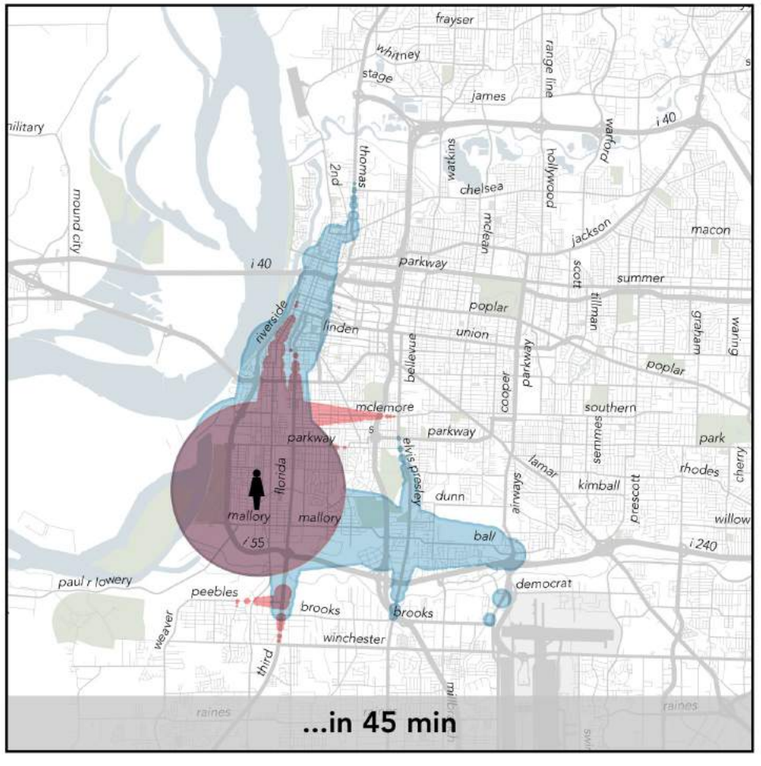

*Riders can reach more jobs and residents in the Recommended Plan than in the Existing Network (traveling by transit at noon on weekdays).*

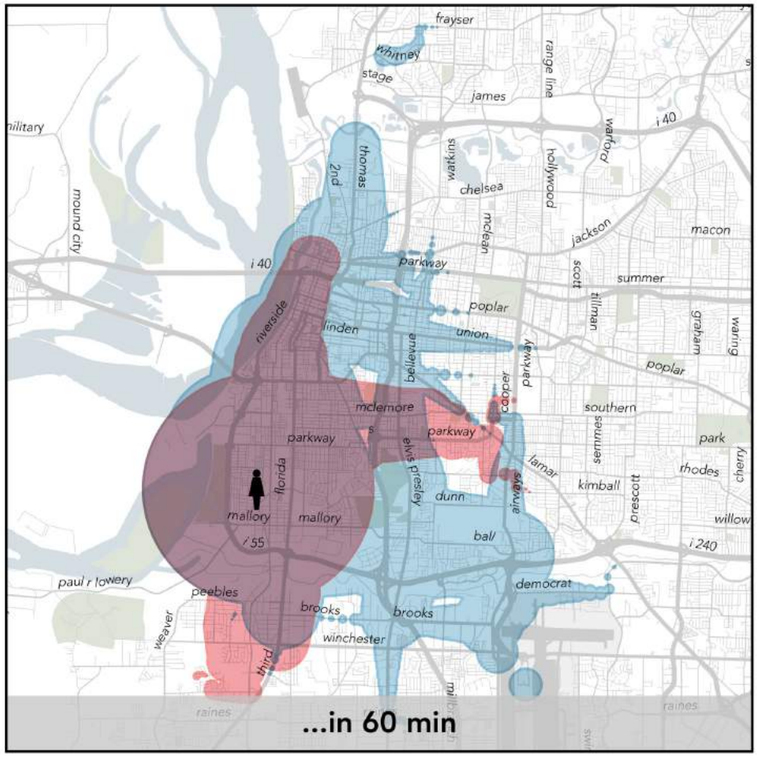
| | % Change | Existing | Recommended |
|---|---|---|---|
| Residents | +18% | 8,400 | 10,000 |
| Jobs | +33% | 6,100 | 8,200 |

| | % Change | Existing | Recommended |
|---|---|---|---|
| Residents | +103% | 17,500 | 35,500 |
| Jobs | +266% | 14,400 | 52,900 |

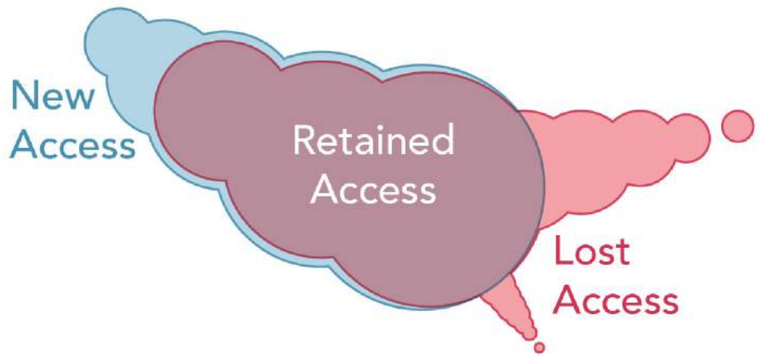
| | % Change | Existing | Recommended |
|---|---|---|---|
| Residents | +71% | 52,100 | 89,200 |
| Jobs | +107% | 59,100 | 122,200 |



# How far can I travel from Southwest Tennessee Community College?

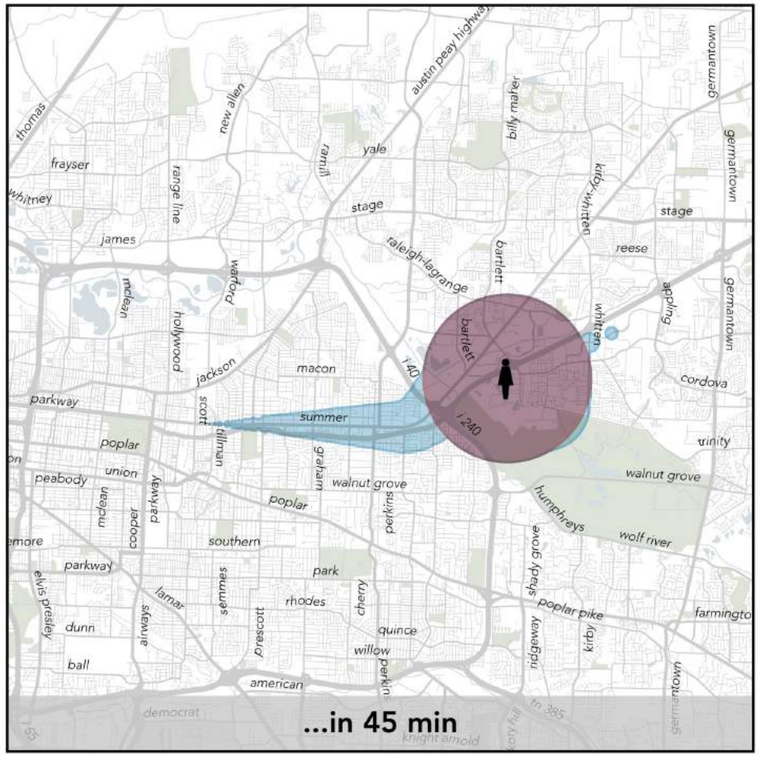


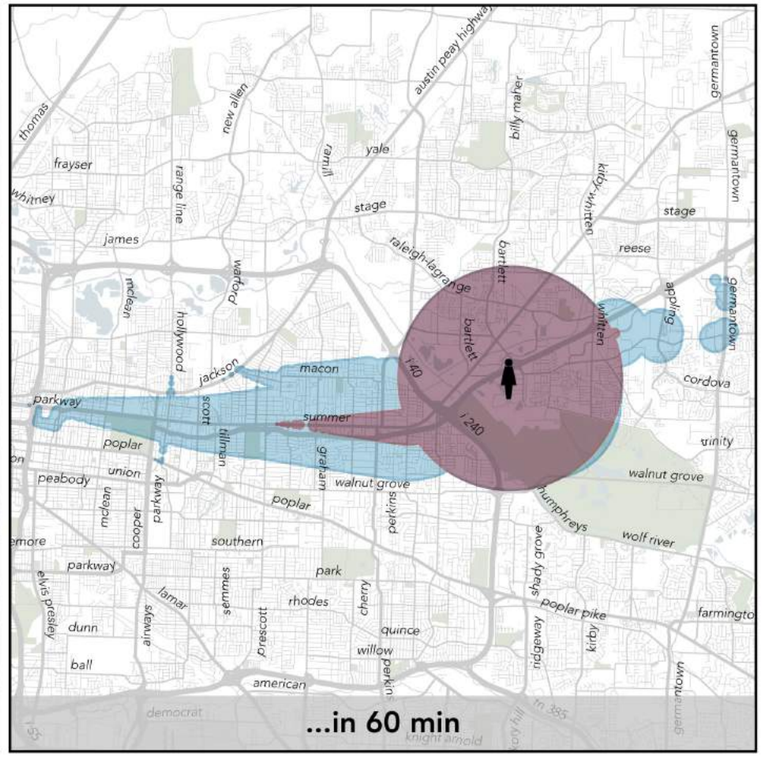

*Riders can reach more jobs and residents in the Recommended Plan than in the Existing Network (traveling by transit at noon on weekdays).*

| | % Change | Existing | Recommended |
|---|---|---|---|
| Residents | +2% | 8,700 | 8,900 |
| Jobs | +1% | 8,800 | 8,900 |

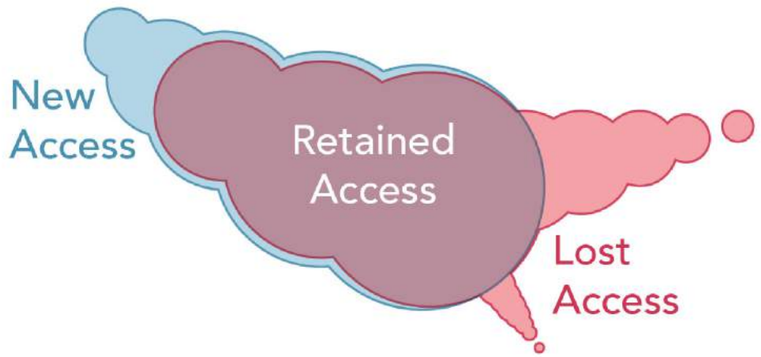
| | % Change | Existing | Recommended |
|---|---|---|---|
| Residents | +55% | 17,400 | 26,900 |
| Jobs | +37% | 15,100 | 20,700 |

| | % Change | Existing | Recommended |
|---|---|---|---|
| Residents | +105% | 35,300 | 72,100 |
| Jobs | +55% | 26,400 | 40,900 |

# How far can I travel from University of Memphis?

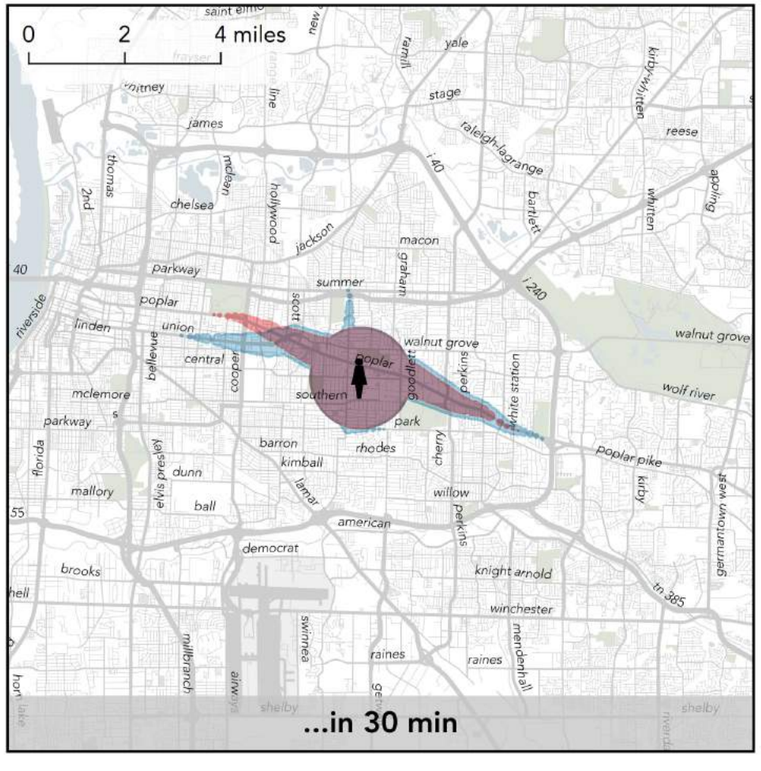



*Riders can reach more jobs and residents in the Recommended Plan than in the Existing Network (traveling by transit at noon on weekdays).*

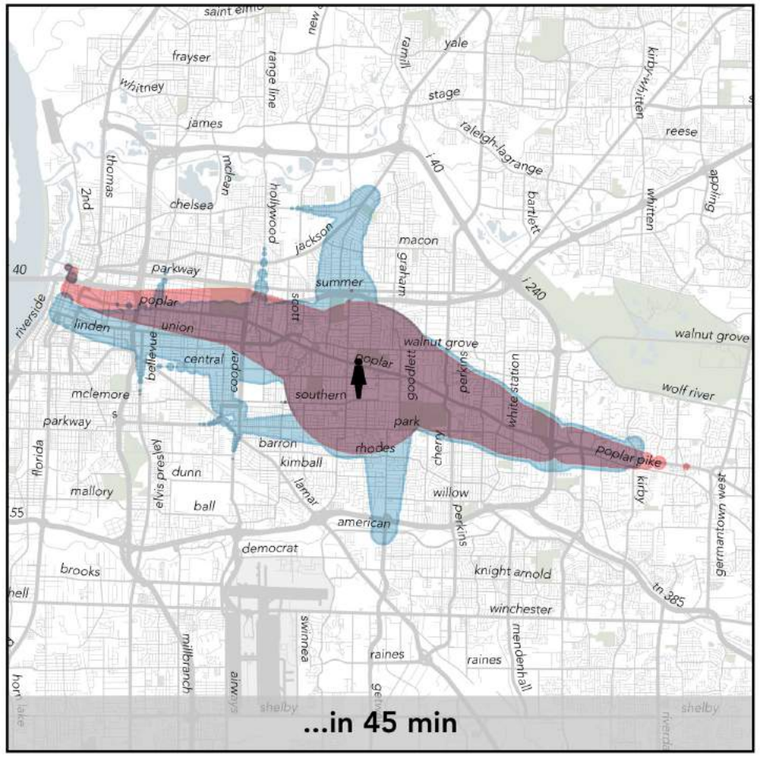
| | % Change | Existing | Recommended |
|---|---|---|---|
| Residents | +20% | 17,600 | 21,100 |
| Jobs | +47% | 16,500 | 24,200 |

| | % Change | Existing | Recommended |
|---|---|---|---|
| Residents | +53% | 60,800 | 92,700 |
| Jobs | +41% | 75,200 | 105,800 |

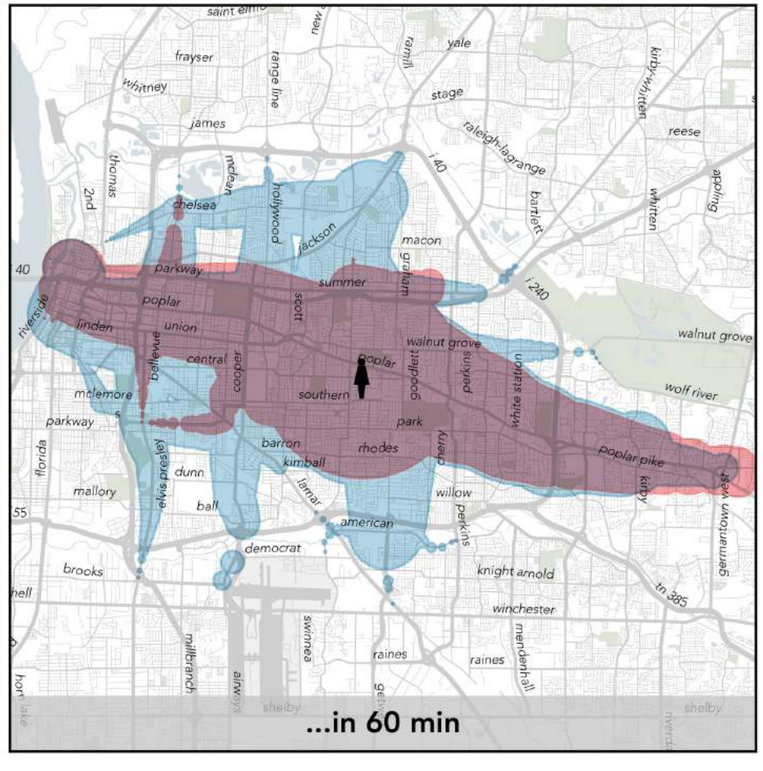
| | % Change | Existing | Recommended |
|---|---|---|---|
| Residents | +58% | 131,800 | 207,700 |
| Jobs | +25% | 153,900 | 192,400 |




...in 30 min



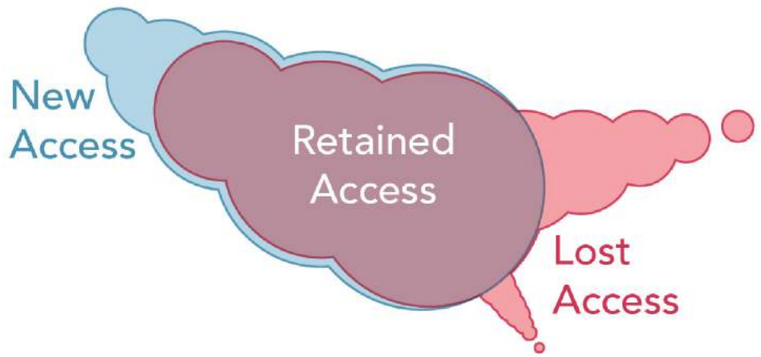
...in 45 min



...in 60 min

# Access Maps

## How far can I travel from Winchester and Riverdale?

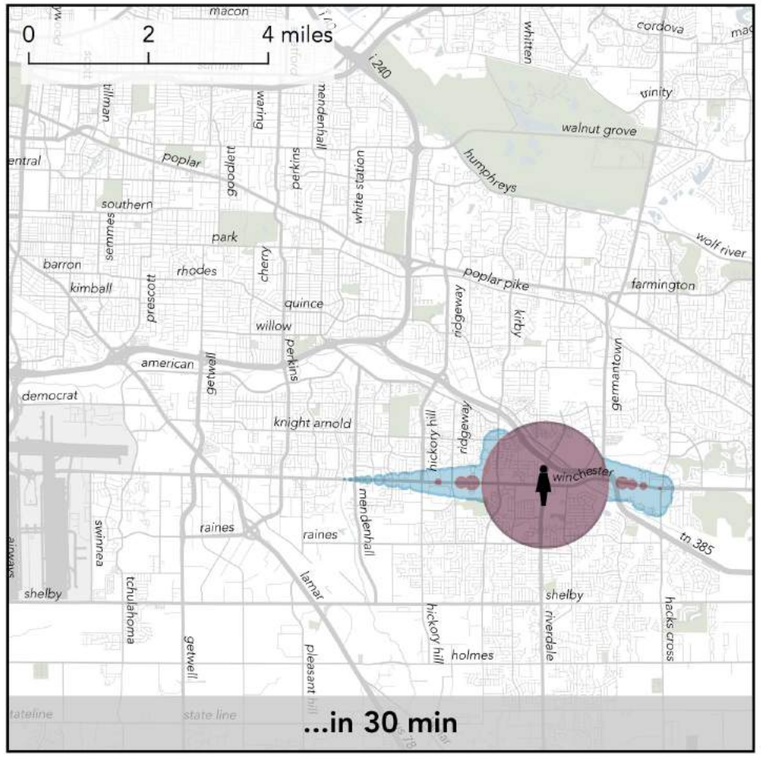


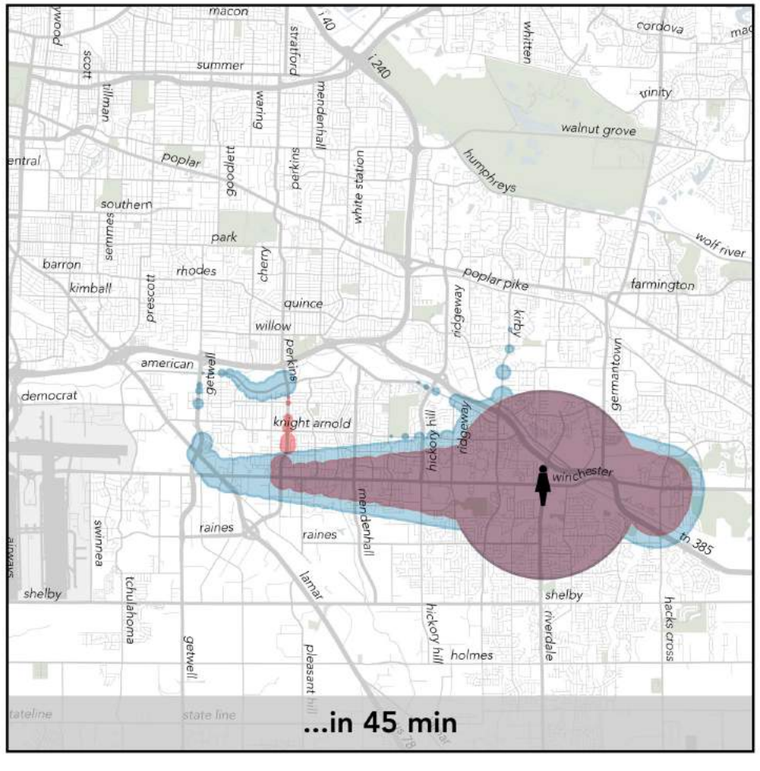

*Riders can reach more jobs and residents in the Recommended Plan than in the Existing Network (traveling by transit at noon on weekdays).*

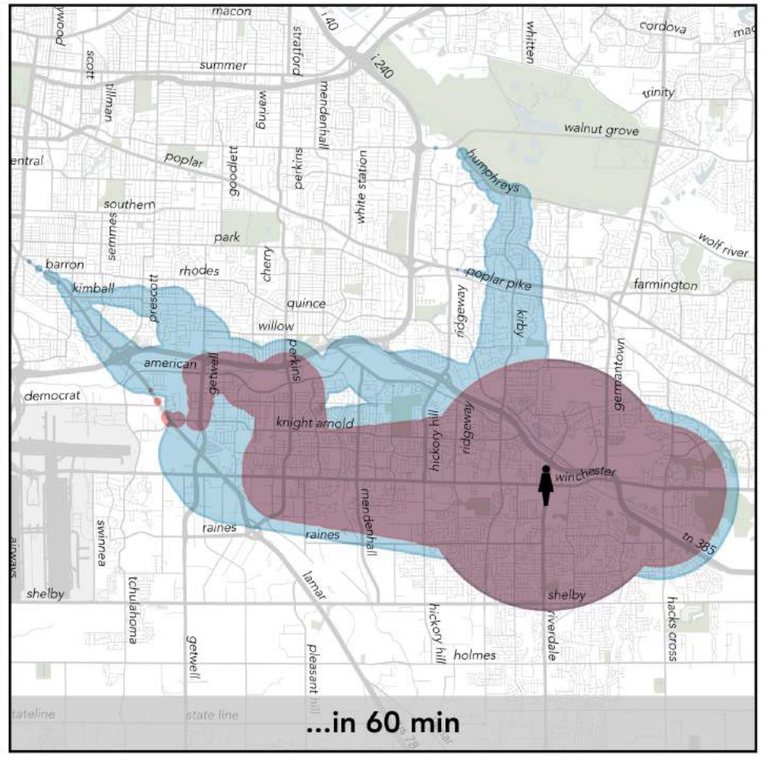
| | % Change | Existing | Recommended |
|---|---|---|---|
| Residents | +43% | 13,100 | 18,700 |
| Jobs | +63% | 5,700 | 9,200 |

| | % Change | Existing | Recommended |
|---|---|---|---|
| Residents | +31% | 45,100 | 59,200 |
| Jobs | +48% | 17,400 | 25,800 |

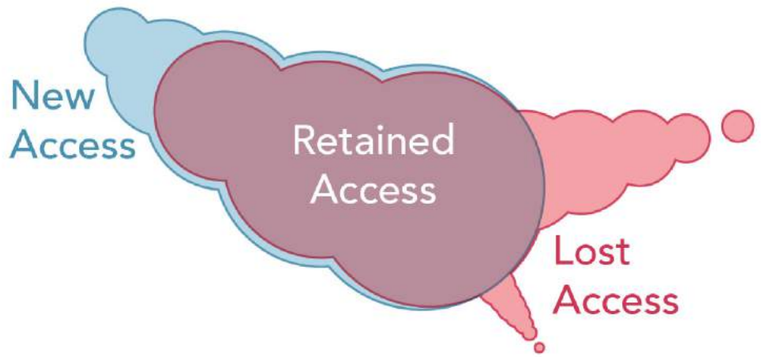
| | % Change | Existing | Recommended |
|---|---|---|---|
| Residents | +44% | 90,200 | 129,500 |
| Jobs | +87% | 37,800 | 70,600 |



# How far can I travel from Wolfchase Galleria?




*Riders can reach more jobs and residents in the Recommended Plan than in the Existing Network (traveling by transit at noon on weekdays).*

| | % Change | Existing | Recommended |
|---|---|---|---|
| Residents | 0% | 3,600 | 3,600 |
| Jobs | 0% | 13,100 | 13,100 |

| | % Change | Existing | Recommended |
|---|---|---|---|
| Residents | +12% | 11,400 | 12,800 |
| Jobs | +2% | 20,000 | 20,300 |

| | % Change | Existing | Recommended |
|---|---|---|---|
| Residents | +27% | 34,500 | 43,800 |
| Jobs | +10% | 28,000 | 30,800 |