

# Choices & Concepts Report



## Executive Summary

SEPTEMBER 2023

Prepared for Greensboro Transit Agency

JARRETT WALKER + ASSOCIATES

# What is GoBORO?

GoBORO is the 2045 Long-Range Transit Plan for Greensboro. It will create a new vision for public transit that supports the community's goal to become a **car-optional city**.

This is a **collaborative effort** among the

- City of Greensboro,
- Greensboro Transit Agency (GTA),
- regional partners like the MPO and PART,
- transit riders, and
- stakeholders in the community.

GoBORO will set goals and priorities for the City's investment in its transit system and it will create a framework for decisions about:

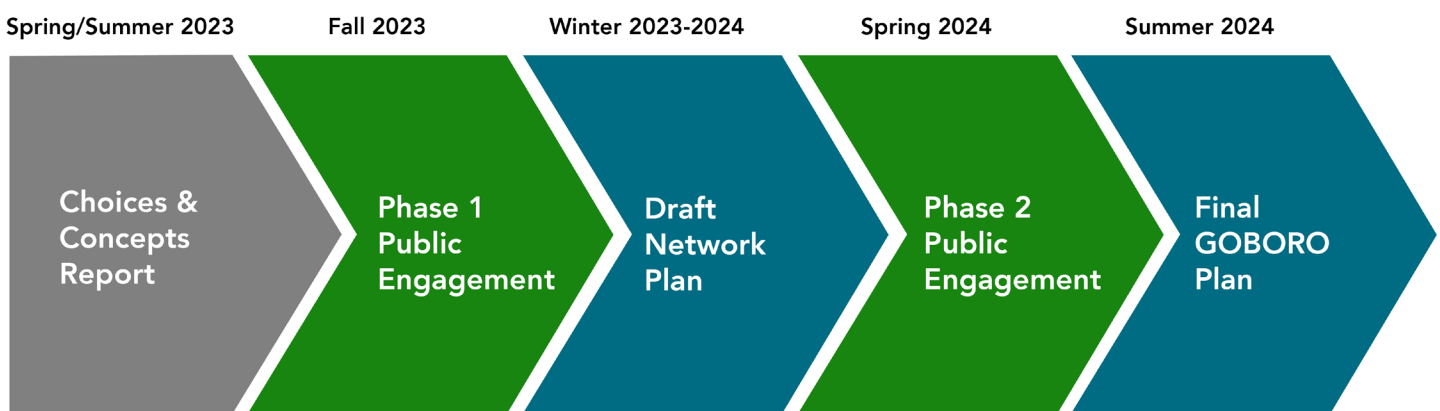
- how the City's investment in transit can match the community's values and goals;
- how these resources are invested—where bus routes will go, what times they run, and how frequently they run;
- how to phase and prioritize changes to the bus network; and
- how to plan for future growth to support the City's car-optional vision.

The **Choices & Concepts Report** assesses the existing transit network, demographics, and geometry of Greensboro and describes two concepts for a drastically improved bus network.

This report sets the groundwork to engage the public, stakeholders, and elected officials in a conversation about the goals of transit in the Greensboro community. It represents the first step in a two-phase process of balancing goals and priorities for Greensboro's future transit network.

Transit can deliver many different outcomes, but some of these outcomes trade-off against others. **Learning how the community values different outcomes is an essential step in deciding where to run service, what kind of service to run, and how to define success.**

Figure 1: Process of Technical Work and Public Engagement That Will Guide GoBORO.



# What is a Transit System?

No single transit line or project can, by itself, transform a city. Transit in cities is often referred to as a “system” because it is a combination of many parts, working together.

The graphic below describes what makes a transit system. In Greensboro, transit lines are all well connected, yet are also limited in their usefulness in ways we’ll explain in this report.

## Why Focus on the Bus?

This planning effort is heavily focused on network design. Transit network design addresses where routes are operated, how frequently they run, during what hours and days, and how they connect with one another.

Every successful transit system includes a sizable layer of bus service in the network. Bus service is less expensive to operate, faster to deploy, and easier to expand than other capital-intensive transit technologies like trains, trolleys or even Bus Rapid Transit (BRT). Bus networks are a major part of transit

systems in even the biggest American cities like Chicago, San Francisco or New York. And many, if not most, of the transit trips within those cities are made by bus, not rail.

**Successful capital-intensive transit lines like BRT, light rail or commuter rail almost always follow on the heels of successful bus lines.** Bus service allows a city to grow around transit, shaping development, the economy and people’s habits.

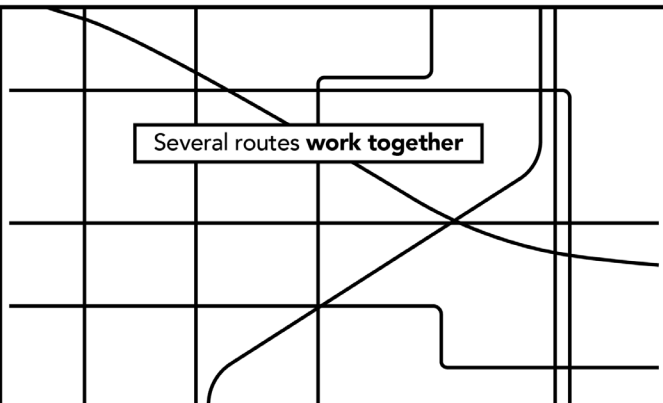
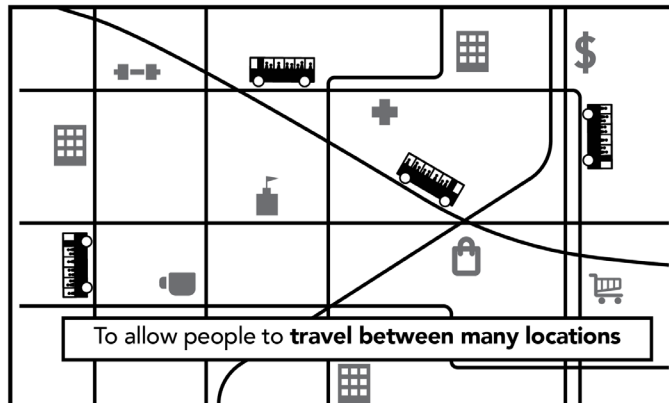
Other factors affect the usefulness and success of a transit system, such as reliability, safety, vehicle quality, transit fares, car parking prices, and other factors that are within and beyond the control of the City.

GoBORO will intentionally be focused on network design: **where and when bus service runs, how it connects to form a network, and how the success of that network should be measured.**

## A transit system is...

<p>A set of <b>routes</b> with</p>  <p><b>fixed stops</b> and <b>set schedules</b></p>	<p>Usually operated by</p>  <p><b>Buses</b> or <b>Trains</b></p>	<p>In which <b>many people</b> share the <b>same vehicle</b></p>  <p>at the <b>same time</b> to go to <b>different places</b></p>	<p>And is available to any member of the <b>general public</b></p> 
---	---	---	--

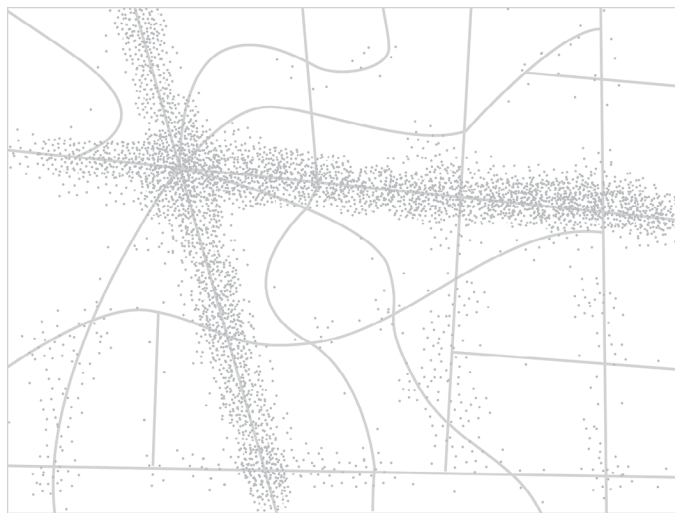
## A transit network forms when...

 <p>Several routes <b>work together</b></p>	 <p>To allow people to <b>travel between many locations</b></p>
--	---

# Ridership and Coverage Goals Conflict.

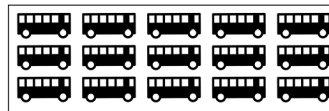
All transit agencies must balance the competing goals of high ridership and extensive coverage. Within a limited budget, if an agency wants to do more of one, it must do less of the other.

The illustration below shows how ridership and coverage goals conflict with one another due to geometry and geography. A city pursuing only a high-ridership goal would focus service where geometry and geography



make it efficient to serve large numbers of people with useful service. If the agency were pursuing only a high-coverage goal, it would spread out services so that every street had a bus route.

On a fixed budget, designing transit for both ridership and coverage is a zero-sum game. The more it does of one, the less it does of the other. These two scenarios cost the same, but deliver very different outcomes.



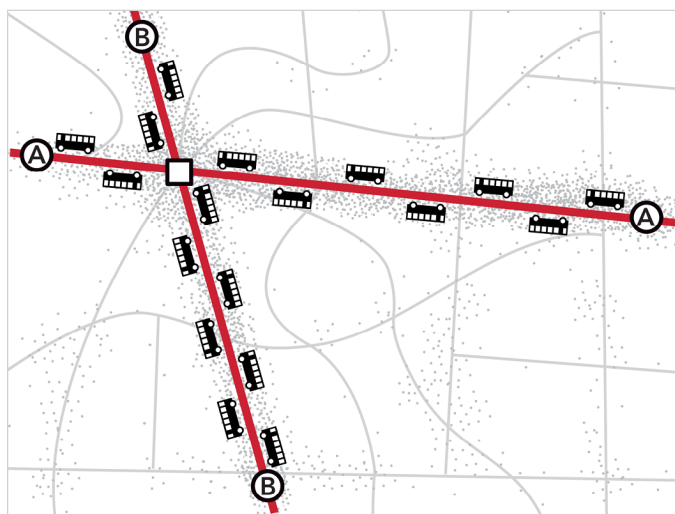
Imagine you are the transit planner for this fictional neighborhood. The dots scattered around the map are people and jobs.

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

Before you can plan transit routes, you must first decide:

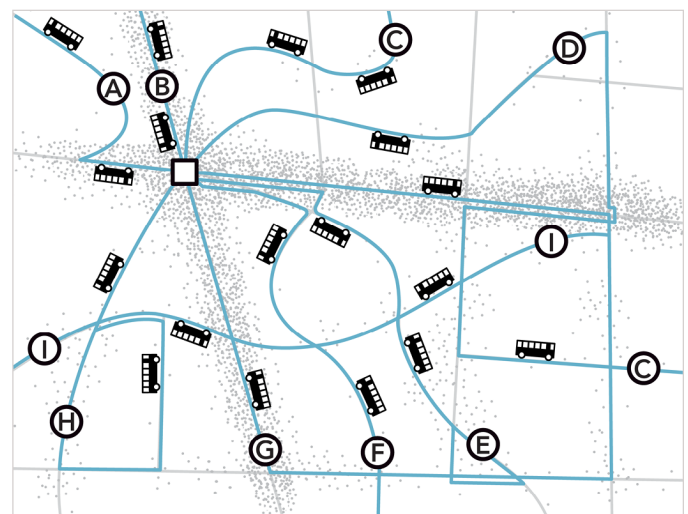
**What is the purpose of your transit system?**

*If you maximize ridership...*



...all 18 buses are focused on the busiest streets. 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.

*If you maximize coverage...*



...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.

# Why invest in more transit?

The trade-off between transit’s ridership and coverage goals is inevitable when there are limited resources. **A growing resource pot means the City could provide additional coverage or additional frequency, or some of both.**

## Service and Ridership Relate

GTA has seen an decrease of 5% in service investment (total annual bus service hours) between 2012 and 2021. In this time, Greensboro’s population has grown 10%. Thus, on a per person basis, **the investment in transit in Greensboro was 14% lower in 2021 than in 2012.**

Greensboro has quite a low level of service investment relative to its population. **GTA’s nearby peer, GoDurham, operates 40% more service per capita than Greensboro.**

Generally, places that invest more in transit service see a higher level of ridership relative to their population, in a “you get what you pay for” relationship (see “Relevance Chart”). Transit is more relevant as a travel option for more people if a community invests more in transit.

Figure 2: GTA Service Hours. Source: NTD, 2021.

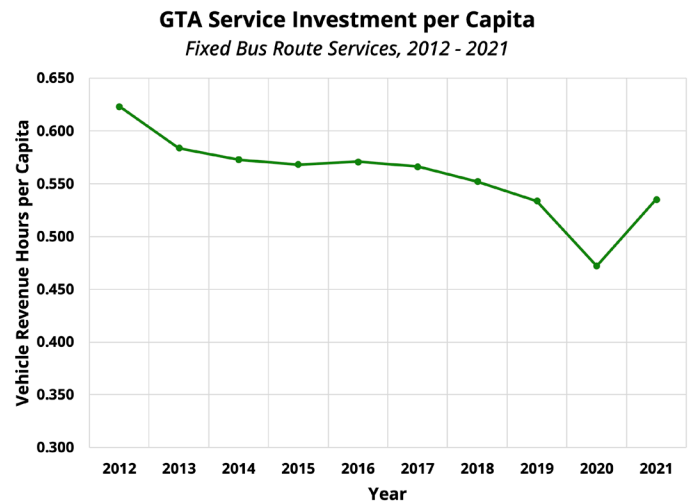
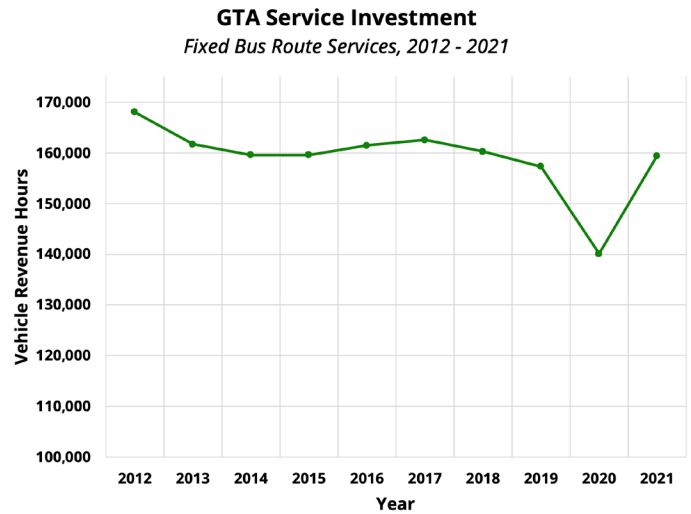
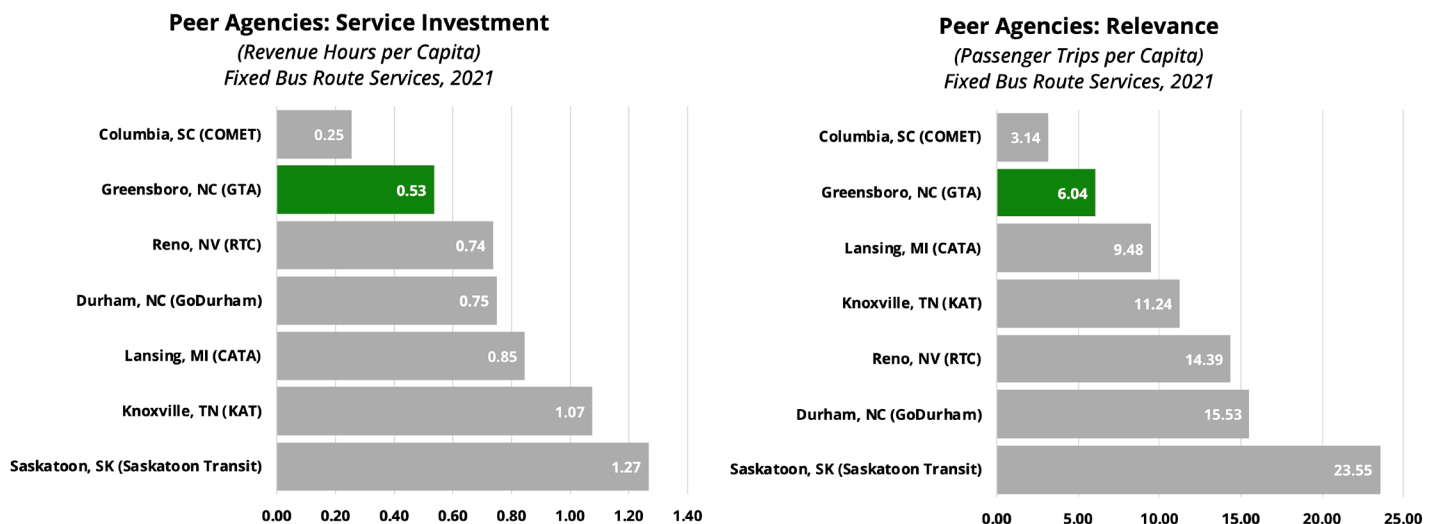


Figure 3: Peer City Investment and Relevance Comparisons. Source: NTD, 2021.





## Existing Network

Greensboro has a big concentration of jobs, activities, and residents in and around Downtown, or located close to one of the many arterial roads that radiate outward from Downtown. Therefore, many of its bus routes run radially along these arterials and meet downtown, at the Depot.

Since most routes only have frequencies of every 30 or 60 minutes, route schedules are coordinated so that people don't have to wait very long at the Depot to transfer to another route. **Without this "pulsing" pattern of scheduling, waits to transfer between infrequent routes would be extremely long.**

With radial networks, some journeys from outlying areas near each other require such a long time to get into and out of downtown, that they become impractical by transit. This is when agencies start adding orbital or cross-town routes for more direct connections outside of downtown. Yet, if orbital routes are not frequent, the long waiting time will cancel out any time savings over traveling to downtown to transfer.

Therefore, **the key to significant improvement in travel times by transit is improved frequency of service, not necessarily more routes.**

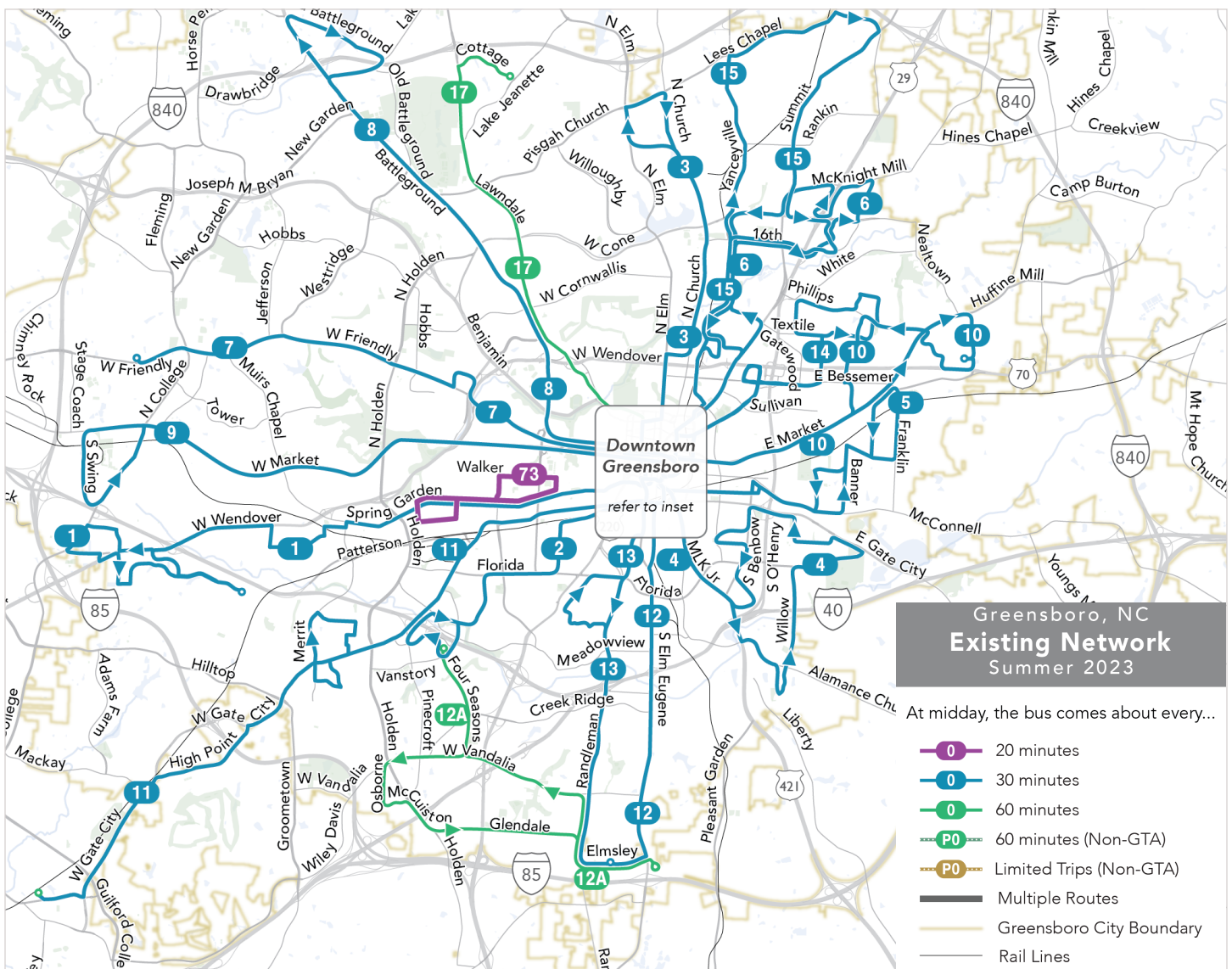


Figure 4: The radial network of GTA routes is stretched thin to cover lots of territory.

## Two Big Value Questions

### Invest More In Transit?

Today, Greensboro invests relatively little in transit. Compared to peer cities, Greensboro has the second-lowest investment in transit service relative to its population.

With limited resources, and a large area to cover, service is spread thin, with primarily 30-minute routes, to get transit near as many people and jobs as possible, across a wide area. Other than the new Hopper Trolley, there are no frequent routes in the system. Weekend and evening frequencies are even lower. **Transit is not very useful for the journeys of large numbers of people, so ridership is low.**

Despite the service being spread so thin, only about 52% of residents and 64% of jobs are near some level of transit service. **The current level of investment makes it hard to achieve either many coverage goals or many ridership goals.**

**What level of investment in transit is needed to meet Greensboro's "car-optional" goal?**

If Greensboro wants more transit service, the City will need more funding from existing or new sources. **The primary cost of transit service is operating the service, a repeating annual cost.** Likely funding sources include:

- **General Fund:** The City of Greensboro could choose to fund more service from its General Fund.
- **County-level Sales Tax:** Guilford County could implement a dedicated ½-cent Sales Tax dedicated to public transportation. **It would cost the average household about \$9 per month,** and provide about \$42 million annually to transit county-wide, and about \$27 million to Greensboro.

### What Does Car-Optional Mean?

In the context of investing in more transit service for Greensboro, what does it mean to try and achieve a Car-Optional future?

#### Does it mean?

*Most people* have a transit option that is **very useful** for reaching many places in a reasonable time?

OR

*Everyone* has a transit option, but it **may not be very useful** for many people for reaching many places in a reasonable time?

This is another way of describing the important and difficult choice between providing useful service with high frequency and long spans that will attract **high ridership**, and providing **wide coverage** in as many parts of Greensboro as possible.

These **key choices cannot be made by technical experts**, but must be based on the values of the community. Therefore GoBORO will be engaging with the public and stakeholders on these questions in the Fall of 2023.

# What Could Vastly Improved Transit Look Like?

What if Greensboro had \$27 million more per year to support additional transit service and associated capital investments like shelters, sidewalks, and bus facilities?

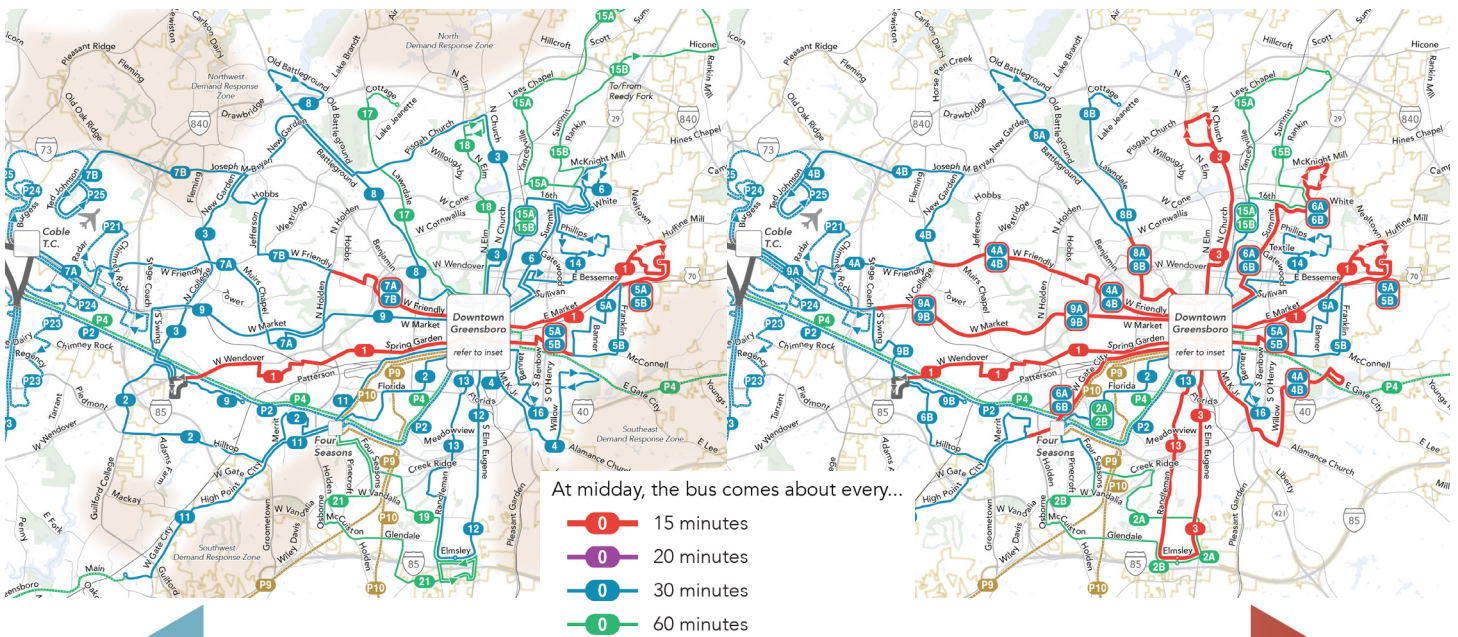
To spark a conversation about transit needs and goals in Greensboro, the maps below present two different Conceptual Networks, which:

- Separately illustrate different ways the City could invest more in transit.
- Together illustrate the kind of transformative changes possible for outcomes that people value, if Greensboro invested significantly more in its transit service.

**The Ridership Concept** concentrates frequent, useful service where there are more residents and jobs, and where transit can run in linear, direct paths. But there will be less resources to expand transit to new areas not served today.

**The Coverage Concept** expands transit service to many new areas in and around Greensboro, which means that many more people and jobs will be closer to transit than they are today. However, most routes will not be frequent, and transit will be less useful to a lot of people.

What is not visible on the maps is that both concepts increase frequency of service in the evenings and weekends and extend hours to be consistently from 6 am to 10 pm on weekdays and weekends. **Consistent service across the week is critical to encouraging more people to rely on bus transit for all kinds of trips.**



High Coverage

High Ridership



# Outcomes of Transit Concepts

The two concepts could make an enormous difference in the usefulness of transit to the community, but in different ways. To show those difference, we have three different measure of how each concept performs.

## Proximity

The first measure is very simple: **How many residents and jobs are near transit?**

Proximity measures the coverage of a transit network. A network that provides better proximity outcomes provides an option of transit to more people and workplaces.

Proximity alone does not tell us how useful transit could be to people, only that it is nearby to them. We also report on proximity to transit by the frequency of service, to show how many people are near service that is more likely to be useful because of its frequency.

## The Wall Around Your Life

Another question a person could ask when thinking about these Concepts is: **Where could I get to with transit, in a reasonable amount of time, from where I am?**

Wherever you live, there is a certain area you can reach in a reasonable amount of time. You could draw a map of this area, and the example at right shows such an area that is reachable from Hampton Homes in 45 minutes today.

In this area are things you can use transit to get to. These can be many things: workplaces, schools, shopping, and anything else you might want to do. **The more things are in this area, the more useful transit can be as an option for travel.**

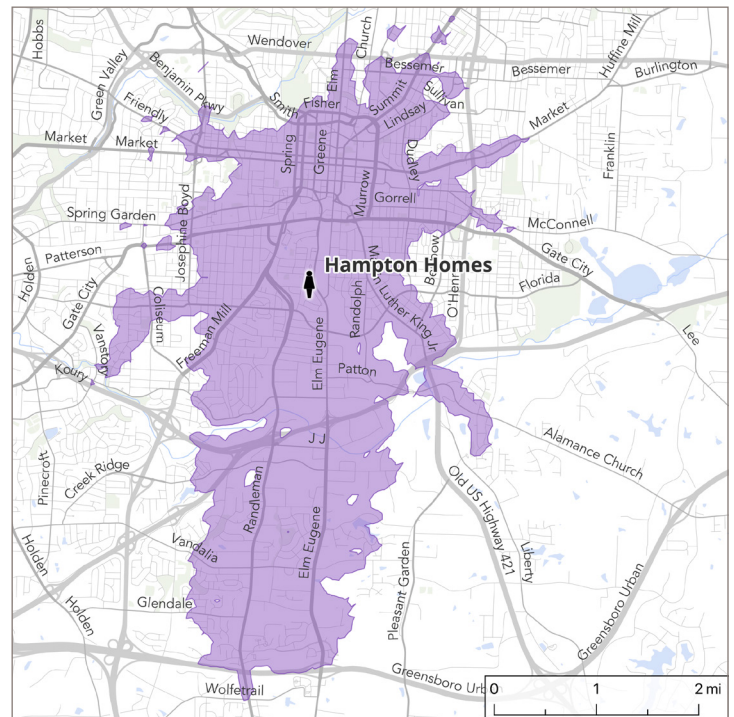
The technical term for this area is an "isochrone". Isochrones provide a visual explanation of how a transit network changes peoples' freedom to travel. An isochrone helps visualize a person's access to opportunity.

## Isochrones to Access

Isochrones show the access for a person from one particular place. **By adding up the access from isochrones across the entire city, we can describe how access would change, on average, for all residents** (or groups of residents) and to all jobs.

**Today from Hampton Homes, you could reach up to 42,700 jobs in 45 minutes or less**

Figure 5: Example Isochrone from Hampton Homes



# Outcomes: Proximity

Today, only 52% of Greensboro’s residents and 64% of jobs are close to transit. The chart below summarizes the people and jobs near transit today and in each concept.

- The **Ridership Concept** slightly improves overall proximity, bringing transit close to 55% of Greensboro’s residents, and 66% of Greensboro’s jobs.
- The **Coverage Concept** significantly improves overall proximity: 76% of residents and jobs are close to transit. A large part of this increase is due to Demand Response Zones (tan bars).

## Proximity to Frequent Service

The portion of people and jobs near frequent service (red bars) is an indicator of ridership potential and usefulness.

- In the **Ridership Concept**, 34% of residents and 48% of jobs are close to frequent service.

- In the **Coverage Concept**, only 15% of residents and 24% of jobs would be near frequent service.

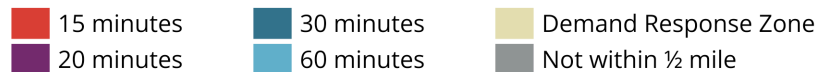
This difference reflects the basic geometric trade-off: the Ridership Concept focuses high frequency, useful service on the best markets for transit to provide useful service to as many, but not all people. The Coverage Concept is trying to expand how many people and jobs are close to transit, no matter the usefulness.

## Proximity by Sub-Group

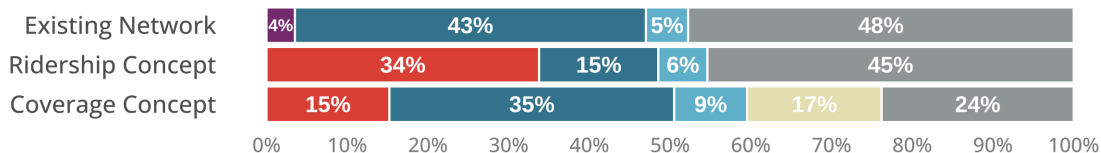
Both Concepts achieve similar proximity results for residents, but slightly larger proportions of residents in poverty are closer to transit in both concepts. The full report dives into more detail for people of color, households without cars, youth, and seniors.

### Proximity to Transit During Weekdays

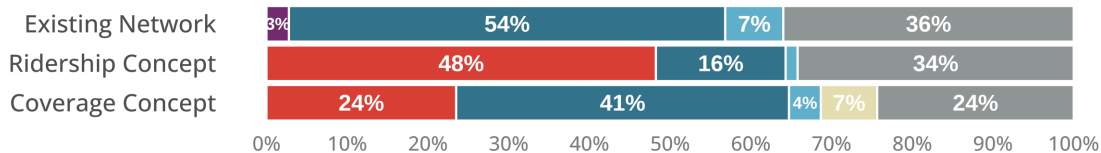
Percentage of the City of Greensboro is near transit that comes every...



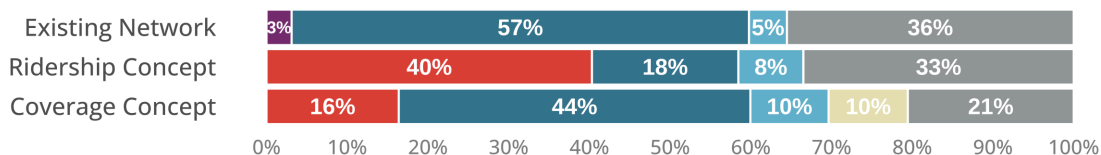
#### Residents



#### Jobs



#### Residents in Poverty



# Outcomes: Expanding Access

People ride transit if they find it useful. For each concept, we have created isochrone examples to illustrate the usefulness of each network.

A more useful transit network is one in which these isochrones are larger and have more in them, so that people are likely to find the network useful for more trips.

The maps below show isochrones from the Hamilton Homes in 45 minutes at midday on a weekday in the Coverage and Ridership Concepts, compared to the Existing Network.

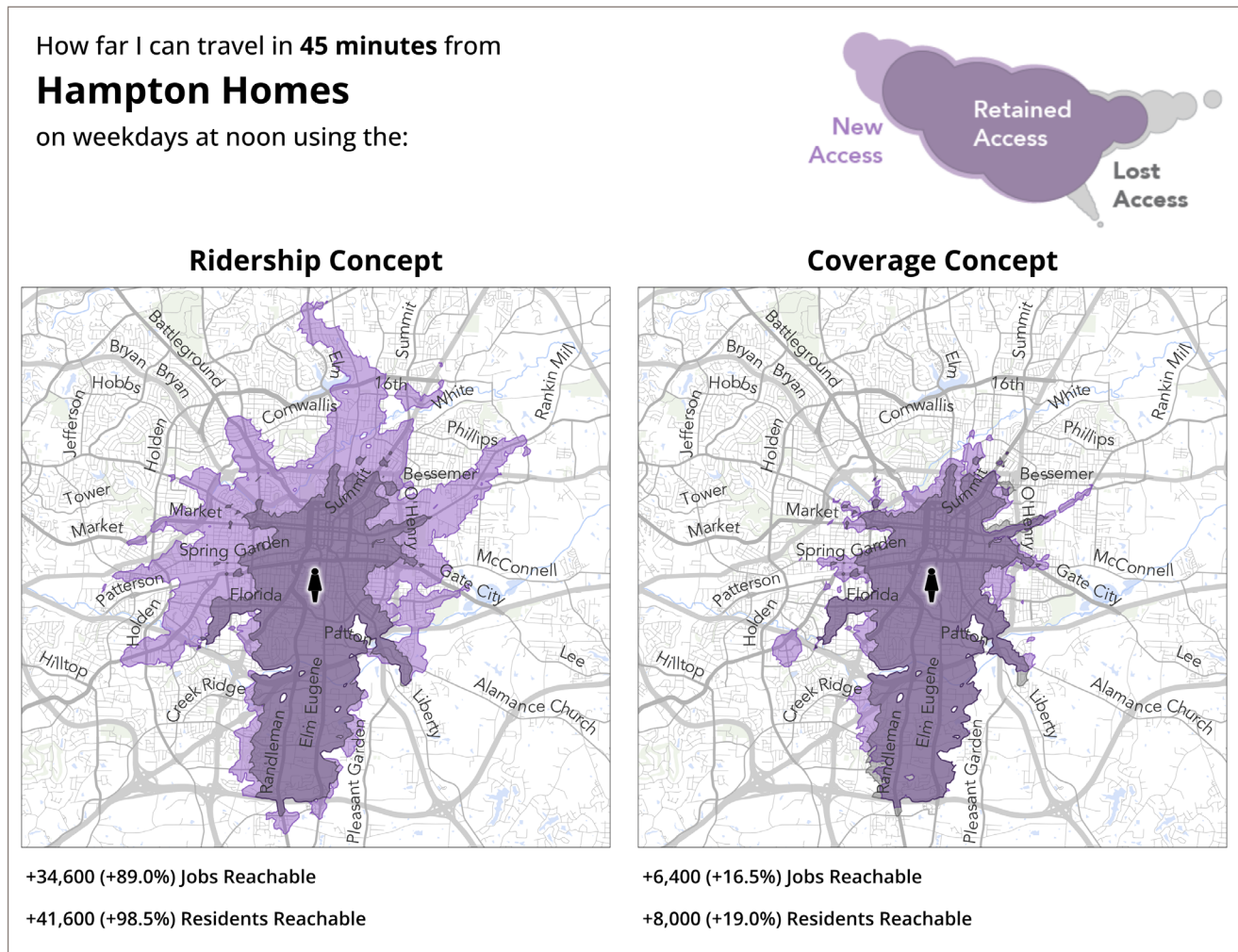
The **dark purple** shows areas that are reachable today and remain reachable in the corresponding Concept. Areas that are newly reachable are in **light purple**, and areas that are longer reachable are in **gray**.

These isochrones include all the different parts of a transit trip that take time:

- Average wait time to use a bus.
- Time riding in the bus.
- Any time needed to make a transfer.
- Time walking to the bus stop where you start your trip, and walking away from the stop where you get off.

Consider not just how large an isochrone is, **but what is inside the isochrone. This is the access from a particular location.** The maps include an estimate of the additional number of jobs and residents you could reach in each Concept, compared to today.

Figure 6: From Hampton Homes, how far could you go in the Ridership or Coverage Concepts?



# Outcomes: Average Access Change

By adding up all the increases and decreases in access across the city, we can estimate how each concept changes the access to jobs for the typical person in Greensboro.

The chart on the right shows the median job access within 45 minutes for Residents and Residents in Poverty. The full report shows the same results for Households Without Cars, Residents of Color, Youth, and Seniors.

Both Concepts lead to large increases in job access. The **Ridership Concept** would increase jobs reachable for

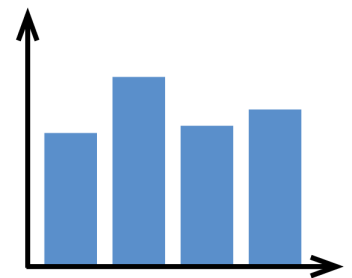
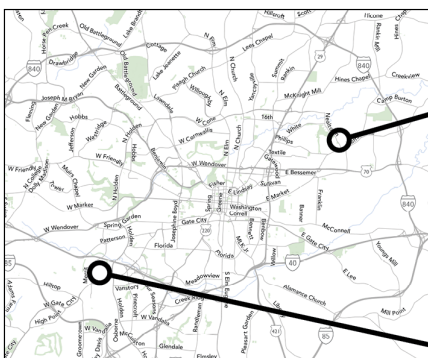
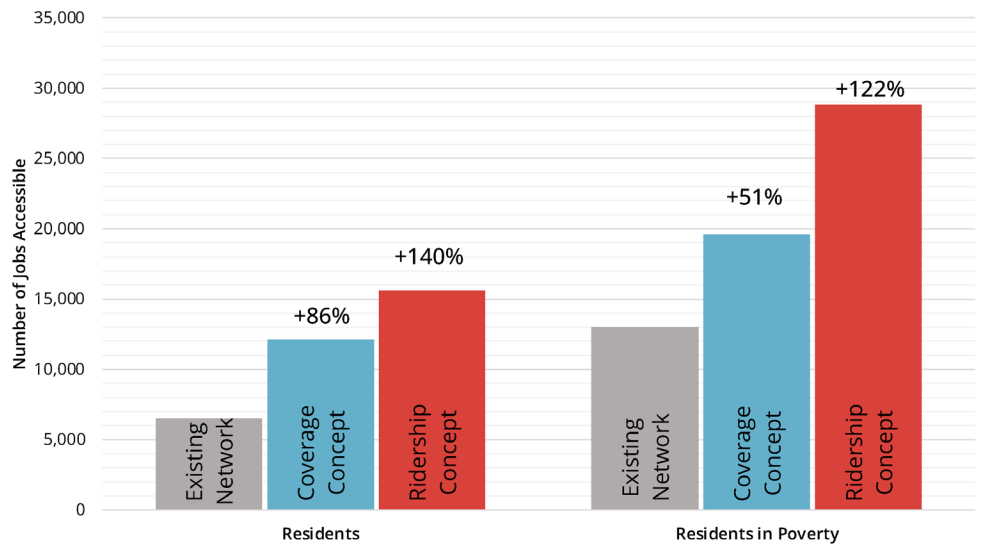
- a typical Greensboro resident by 140%, and
- a typical residents in poverty by 122%.

The **Coverage Concept** would increase jobs reachable for

- a typical Greensboro resident by 86%, and
- a typical residents in poverty by 51%.

The full report dives into more detail for people of color, households without cars, youth, and seniors.

Access to Jobs Within 45 Minutes for the Typical...



For every location, we can calculate an **isochrone**, and estimate how many jobs (or any other measure) are in that isochrone.

This is the **access from that location**.

Then we add up the access across the entire area based on how many people (or people in specific sub-groups) live in each location.

This is the **overall access**.



## Next Steps

This report represents the first step in working with the Greensboro community for GoBORO. It kicks off a round of stakeholder and public engagement asking key questions like:

- Should Greensboro make a larger investment in transit?
- How should Greensboro direct its transit investments: greater frequency or more coverage?

In October and November, members of the project team, GTA and City staff, and others will be engaging the public through media outreach, social media engagement, and surveying at key locations, on buses, and online.

Through this process, we need you to tell us what you think about these concepts and what priorities we should emphasize to guide changes now and for the long-term.

We want to hear from everyone!

If you:

- Ride the bus regularly;
- Don't ride the bus at all;
- Used to ride but don't anymore;
- Have friends or family who ride the bus; or
- Work, live, and play in Greensboro;

### We want to hear from you: Take the survey!

Your input will be crucial in informing the next phase of our work. Based on your feedback, the GoBORO project team will design a single Draft Recommended Network based on the Community's preferences and choices and short and long-term improvements in transit for the city.

**Take The Survey!**

**Scan the QR code below**

**or**

**visit [https://bit.ly/goboro\\_survey](https://bit.ly/goboro_survey)**



**Visit the project website!**

**[https://bit.ly/goboro\\_site](https://bit.ly/goboro_site)**

**Learn more about GoBORO.**

**Ask a question.**

**See our full calendar of events.**

