RTA SYSTEM REDESIGN STUDY

Learn about the High Frequency and Coverage Alternatives

What is the GCRTA System Redesign Study?

What should RTA be trying to do? Different people tell us to do opposite things. We only have so much money, so we need your help figuring out what our priorities should be.

We want everyone's opinions about this. RTA works for all taxpayers, and needs to deliver benefits to the whole region, so everyone has a valid point of view.

This study is about what we should focus on in the next three years, which is why it's mostly about bus service. Many US transit agencies are rethinking their bus services, and sometimes expanding them.

Bus service is important. It carries most of RTA's customers and is our only way to get service to most people. Good bus service can help people who don't have cars, or choose not to rely on them. It can also relieve the impacts of traffic congestion and is better for the environment. Finally, useful transit service, bus or rail, can help influence where people live and businesses locate.

What has happened so far?

In February 2019, we surveyed the public on the priorities RTA should focus on when it designs its network, and designed two alternatives illustrating how the network could look if we emphasized different priorities than today.

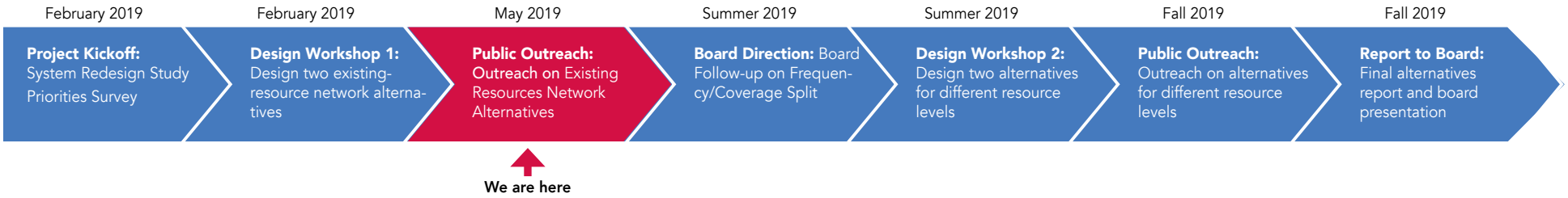
What Happens Next

We want everyone's opinions about this. RTA works for all taxpayers, and needs to deliver benefits to the whole region, so everyone has a valid point of view.

Read on for more information on the alternative, and don't forget to take our survey on the alternatives, available at:

www.riderta.com/systemdesign

In Summer 2019, RTA and the study team will use this input from the public to design two additional alternatives with different levels of resources available for transit. Input on these two alternatives, as well as direction from RTA's Board of Trustees, will guide the network design priorities of the next round of alternatives. All four alternatives will be presented to the board and documented in a report in Fall 2019.



Help RTA Decide!

Like all transit agencies, RTA is asked to pursue opposite goals:

Ridership means attracting as many riders as possible. When we do this, we also achieve these goals:

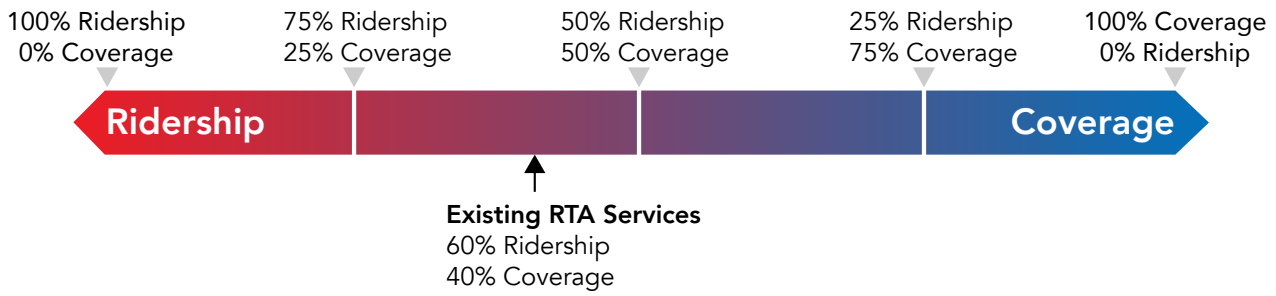
- Reduced air pollution from car and truck traffic, including emissions that cause climate change.
- Lower tax subsidy per rider.
- Better bus service for anyone in denser areas with more people.
- More economic activity without more traffic congestion.
- Support for new dense and walkable development.

Coverage means being available in as many places as possible, even if not many people ride. When we do this, we also achieve these goals:

- Bus service to emerging suburban employment and residential areas.
- Mobility options for people who are located in hard-to-serve places and can't drive or don't have access to a car.
- Bus service to every city, town or neighborhood in Cuyahoga County.

We have to choose between these goals because they lead to different kinds of service.

Today, about 60% of RTA's service is where it would be if ridership were the only goal, while 40% of the service is focused on extending coverage to more people and jobs.



How do we design around these goals?

Designing for ridership

If the goal is **high ridership**, we put most of our service in places that are dense and where walking is easy.

Density means that there are lots of people and activities near each bus stop, which means more people are likely to find service useful. It has to be easy to walk in that area too, so people can get to the stop.

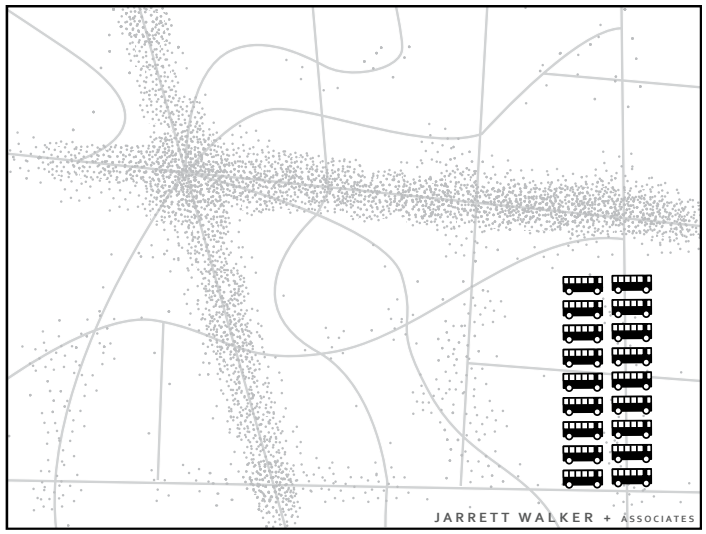
In a network designed for ridership, dense areas get very good service, with the next bus always coming soon. But when we focus on making our high-ridership routes as useful as possible, it means we can't afford to run to a lot of other places.

Designing for coverage

If the goal is **coverage**, we would spread our service out so that there's some service everywhere. But spreading it out means spreading it thin. Because we have to serve such a huge area with our fixed budget, none of the buses can come very often, which means that you have to plan your day around the timetable, which means that fewer people find them useful.

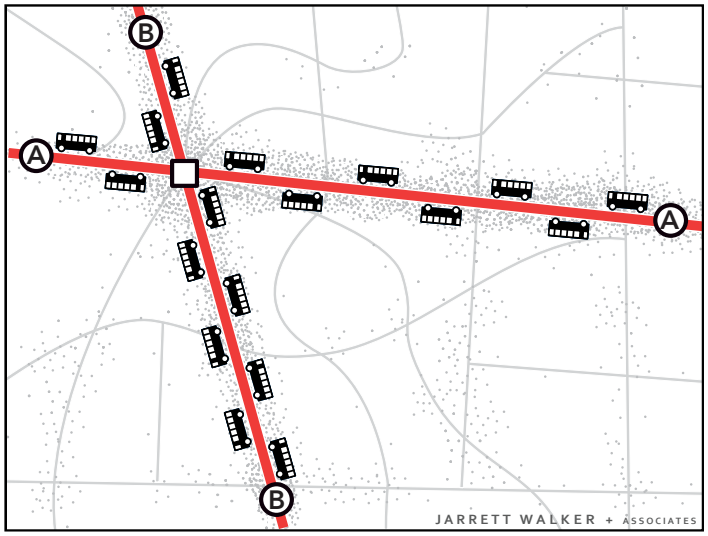
Some people who do use coverage services really need them, and will defend them. Other people may also like the idea that service is available "just in case", even though they don't use it most of the time.

Different goals, different service



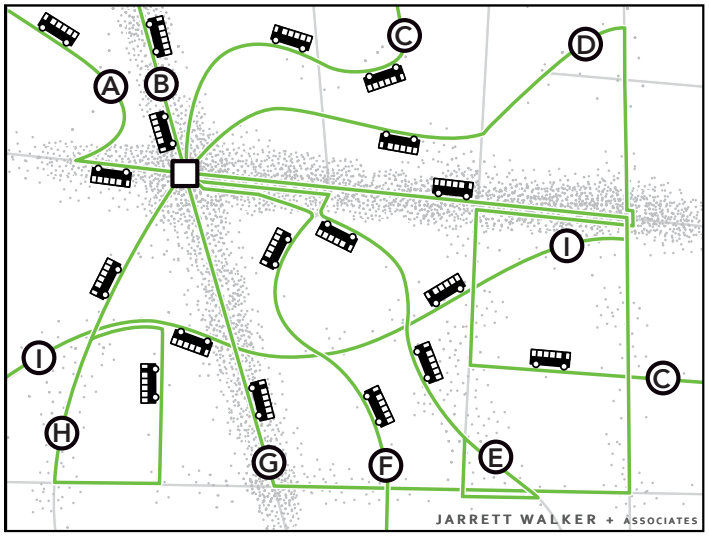
Imagine you are the transit planner for this fictional neighborhood. The dots scattered around the map are people and jobs. Places with more dots close together are places that more people want to travel to.

The buses in the picture are the resources the neighborhood has to run transit. Before you can plan transit routes, you must first decide: what is the purpose of your transit system?



If the goal is ridership,

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



If the goal is coverage,

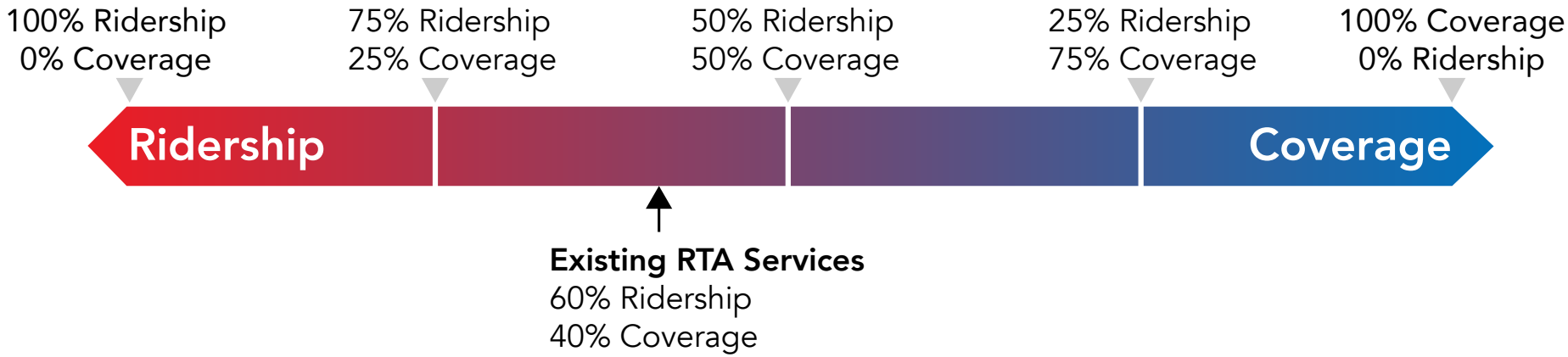
The 18 buses are spread around so that each street has a route. Everyone lives near a stop, but every route is infrequent, so waits for service are long. Fewer people can bear to wait so long, so ridership is low.

Shifting the balance

Today, about 60% of RTA's operating resources are spent on services that are designed to attract high ridership, while 40% is spent on services that are meant to maximize coverage. Suppose we didn't have any money to add service, but we could shift the service we have. Should we spend less on ridership and more on geographic coverage, or vice versa?

Remember, if you tell us to spend more resources on **ridership** services, you are telling us to improve frequency on routes in dense, walkable places, but also to reduce or eliminate some routes in low-density places.

If you tell us to focus more on **coverage** service, you are telling us to run more routes to more places, but we cannot afford to run so many routes at high frequency, so many would come only once an hour. Some routes serving busy parts of the city would run less frequently than they do today.



What we have heard so far

From February 6 to March 18, 2019, we asked the public in an online survey, what high-level priorities they think RTA should focus on.

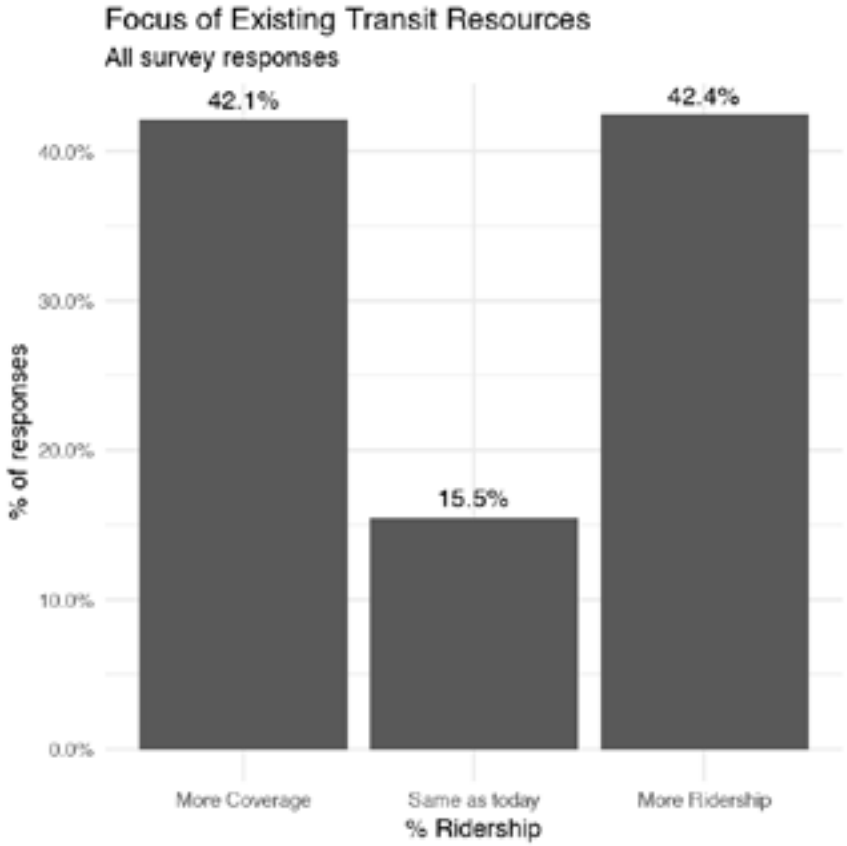
With existing resources, **respondents were evenly split on whether to refocus service design towards ridership (42%) or coverage (41%).**

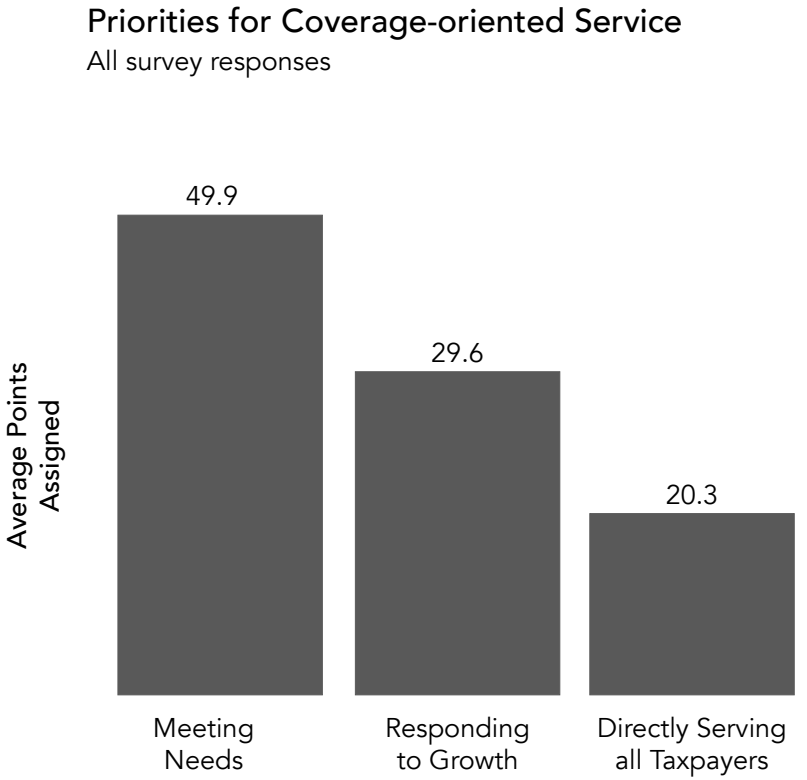
Only 15% chose to maintain the existing balance (60/40 ridership/coverage).

606 phone survey responses

2381 online survey responses

When asked to divide 100 points between three priorities for how to deploy coverage-oriented service, respondents generally selected "Meeting Needs" as the top priority.





"Meeting needs" means transit service that reaches people who can't drive or have limited access to a personal car, even if they are located in a place that is hard to serve with transit.

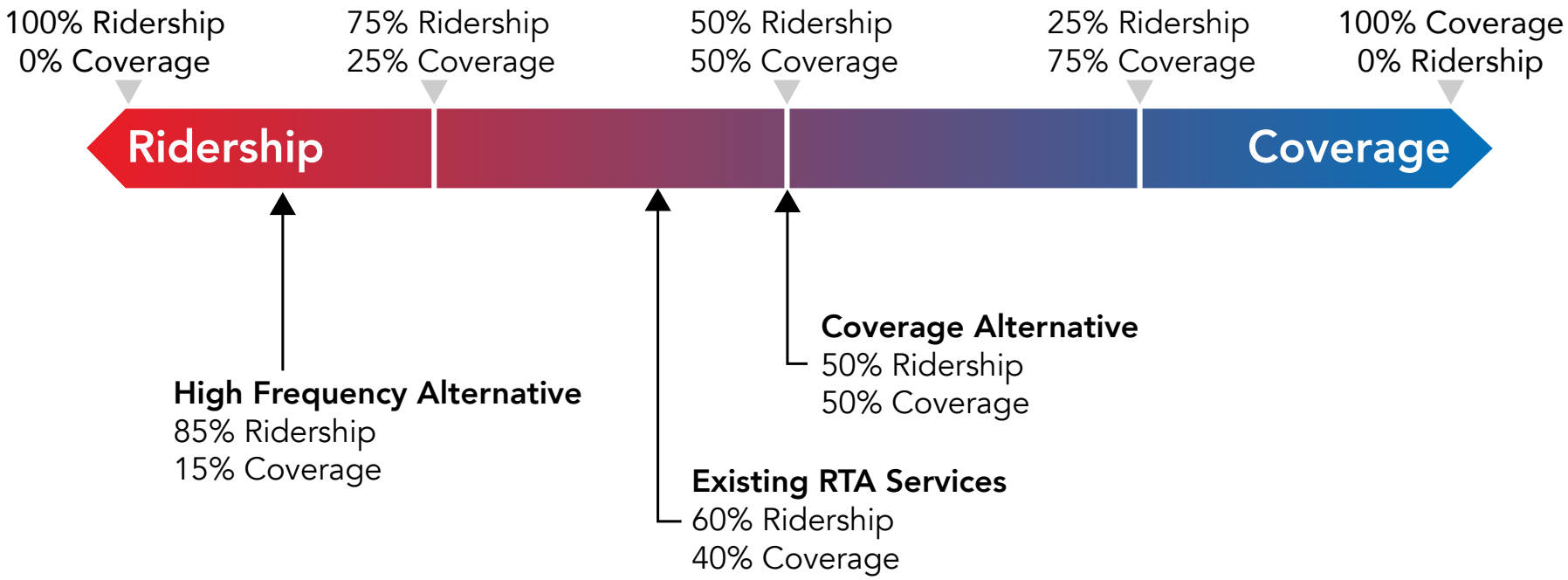
Review the Existing Network

Here is the existing RTA network, mapped by frequency (how often the bus comes). Line colors indicate frequency, with red lines meaning frequent service (every 15 minutes or better).

Some routes have reduced frequency further out from the city center, as indicated by a change in line color. This does not mean passengers have to transfer to another vehicle.

Some routes split into branches, as indicated by the "A" or "B" suffix. As long as the route number remains the same, passengers can ride through the branch without transferring.

Alternative Parameters



To help everyone see the impacts of shifting our priorities, we have developed two pictures of what the network might look like, and what some of the results would be.

These are not proposals. The purpose is to show the general impact of shifting the priorities one way or the other.

High Frequency Alternative

To view a high-resolution version of this map, click here, or visit:

https://jarrettwalker.com/wp-content/uploads/High_Frequency_Annotated_20190428.pdf

High Frequency Alternative

This alternative is designed to focus on the ridership goal, with 85% of the budget spent where ridership potential is high, and 15% spent covering places where ridership would be low but transit is needed.

The High Frequency Alternative concentrates service so that lines run more frequently, reducing waiting times and making travel by transit more convenient. The network would reach fewer places, but where it does reach, trips would be faster than with the Existing Network.

Design Principles

Concentrate convenient, frequent service in the places with the largest potential market. These places are:

- Dense - many people are near each stop.
- Walkable - the street network and pedestrian infrastructure make it possible to reach nearby destinations by walking.
- Linear - so that transit doesn't have to make time-consuming deviations to reach destinations.
- Proximate to other dense areas, so that transit doesn't have to run through long stretches of empty space where few people want to travel.

The **High Frequency Alternative** would offer:

- shorter waits
- more weekend service
- access to more jobs within 60 minutes
- quicker transfers
- higher ridership potential

Access to jobs with typical trips

5,700 more jobs are accessible in 45 minutes for the average person, a 36% increase over the Existing Network

12,800 more jobs are accessible in 60 minutes for the average person, a 29% increase over the Existing Network

Access to jobs with long trips

37,300 fewer jobs are accessible within 2 hours of travel time for the average person, a 16% decrease compared to the Existing Network

People near high-frequency transit

250,000 more people are within 1/2 mi walk of high-frequency service, a 285% increase over the Existing Network

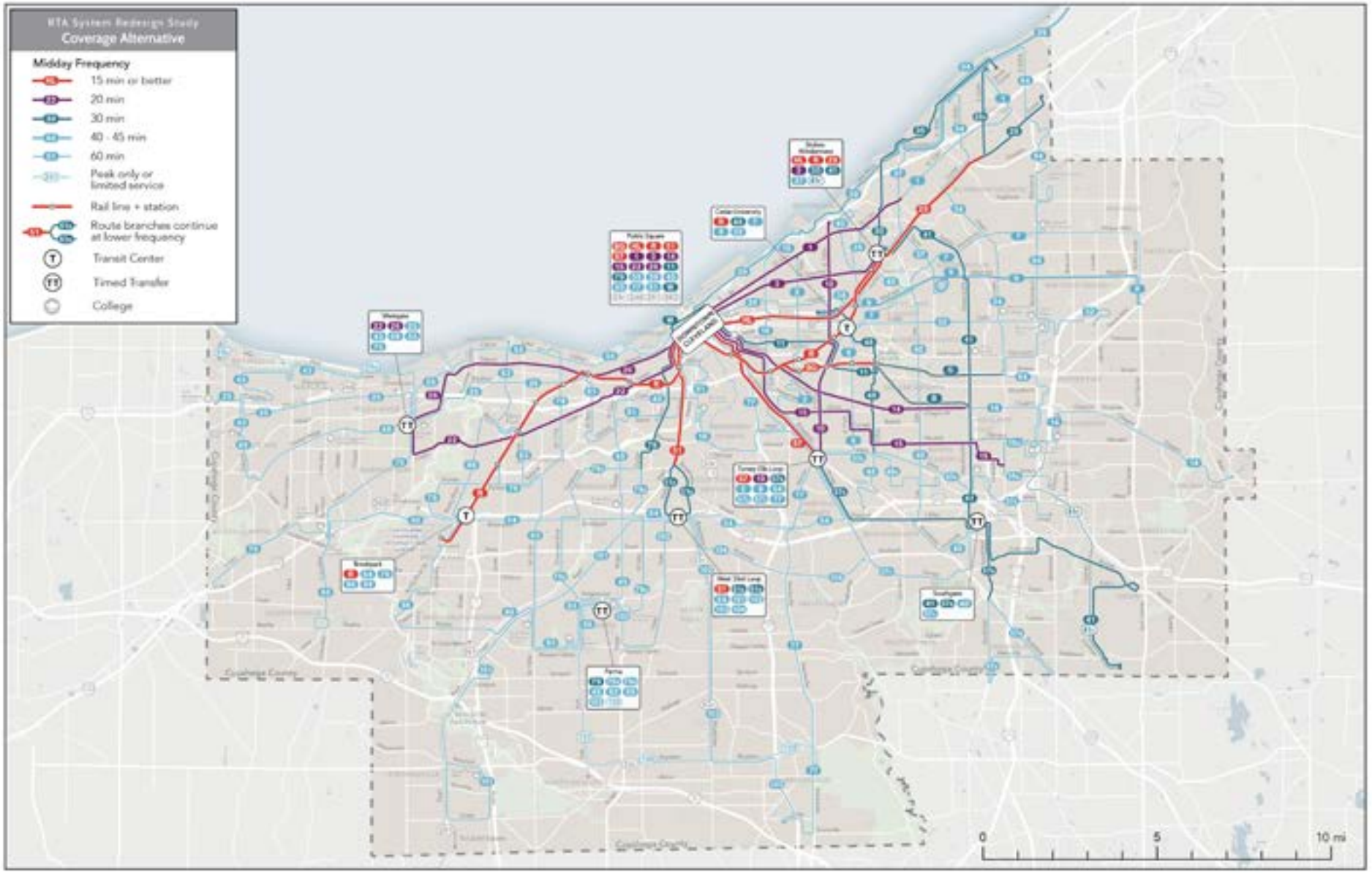
94,000 more jobs are within 1/2 mi walk of high-frequency service, a 151% increase over the Existing Network

People near any transit

209,000 fewer people are near a transit stop served at any frequency, a 24% decrease compared to the Existing Network.

109,000 fewer jobs are near a transit stop served at any frequency, a 22% decrease compared to the Existing Network.

Coverage Alternative



To view a high-resolution version of this map, click here, or visit:

https://jarrettwalker.com/wp-content/uploads/Coverage_Annotated_20190428.pdf

Coverage Alternative

This alternative's goal is to offer service almost everywhere, with 50% of the budget spent where ridership potential is high, and 50% spent covering places where ridership would be low but transit is needed.

The Coverage Alternative spreads out service across the county, but **spreading it out means spreading it thin**. Frequencies would be lower throughout the network. This means that the network reaches more places but some trips would take much longer.

Design Principles

- Reduce duplication (where multiple routes serve the same street or go to the same place) and use savings to extend coverage area.
- Where possible, reduce some frequencies and reallocate to new coverage areas.
- Reach more people and jobs, even if some routes would operate less frequently than they do today, and routes in newly-served areas would operate only every 45 or 60 minutes.

The **Coverage Alternative** would offer:

- shorter walks
- service in more areas
- a familiar network
- at least minimal service close to more residents

Access to jobs with typical trips

About the same number of jobs are accessible in 45 minutes for the average person.

1,600 fewer jobs are accessible in 60 minutes for the average person, a 4% decrease compared to the Existing Network

Access to jobs with long trips

18,000 more jobs are accessible within 2 hours of travel time for the average person, an 8% increase over the Existing Network

People near high-frequency transit

28,000 fewer people are within 1/2 mi walk of high-frequency service, a 21% decrease compared to the Existing Network

5,200 fewer jobs are within 1/2 mi walk of high-frequency service, a 3% decrease compared to the Existing Network

People near any transit

25,600 more people are near a transit stop served at any frequency, a 3% increase over the Existing Network

25,000 more jobs are near a transit stop served at any frequency, a 5% increase over the Existing Network

Alternative Outcomes

How would these alternatives change how people are able to move around Cuyahoga County, compared to the Existing Network? To understand this, we've analyzed five key factors:

- How many residents or jobs are within walking distance of a bus stop with each alternative?
- With each alternative, how many residents or jobs are within walking distance of a bus stop served by a high-frequency route running every 15 minutes or better?
- How many jobs can an average person reach using transit with each alternative?
- How does each alternative change how easy it is to travel to CMSD high schools?

How do we measure access?

When we measure access to jobs, we calculate travel times based on the following factors:

- The walking time to and from each stop along the street network
- ½ headway initial wait (the time you spend waiting for your bus to arrive).
- In-vehicle travel time (the time you spend sitting on the bus).
- We assume that if you need to make a transfer, your wait will be half of the frequency of the route, unless the transfer occurs at a dedicated timed transfer point, where shorter coordinated transfer times are assumed.

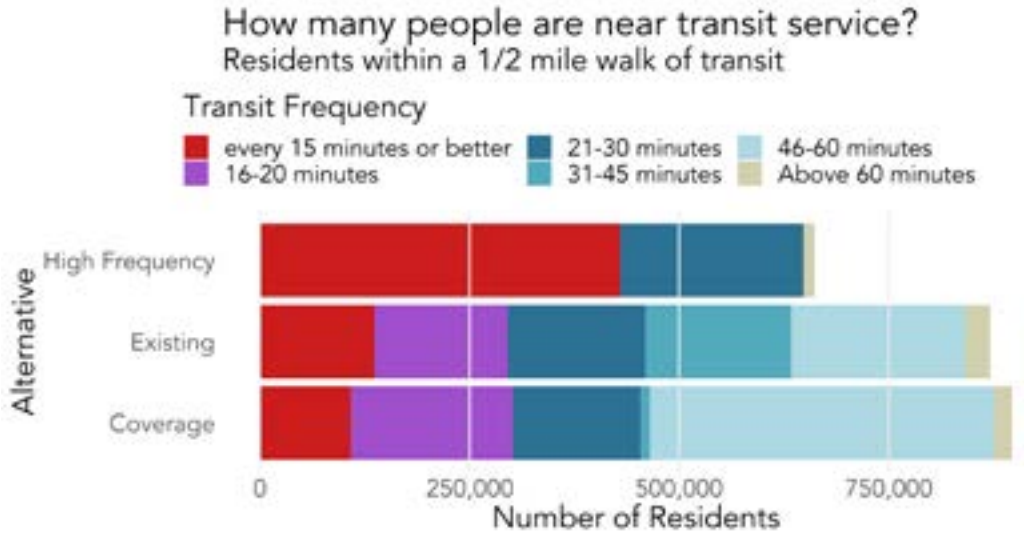
You can "access" the number of jobs located within the area you could reach using transit by this formula in 45, 60, 75 or 120 minutes.

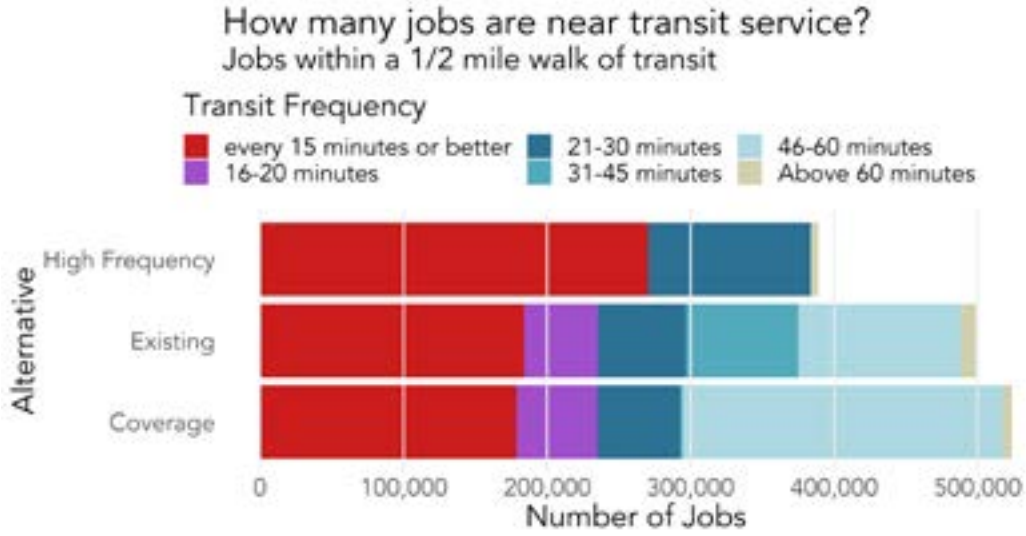
How many people are near transit?

Transit must be present for it to be useful. The graphs on this page show how the number of people and jobs within a 1/2-mile walk of transit and high-frequency service.

The **High Frequency Alternative** would provide frequent routes close to more residents and jobs than the Existing Network, but some people would lose the service that is near to them today. Nearly everyone near transit with this alternative would have access to either high-frequency or 30-minute service.

The **Coverage Alternative** would provide at least some service close to more residents and jobs than the Existing Network, although fewer people would have access to high frequency services. Some existing routes that run about every 45 minutes would have their frequencies reduced with this alternative, which is why the number of people with access to 46-60 minute service increases. Those resources would be reallocated to provide coverage in new areas.





How many jobs can a person reach using transit?

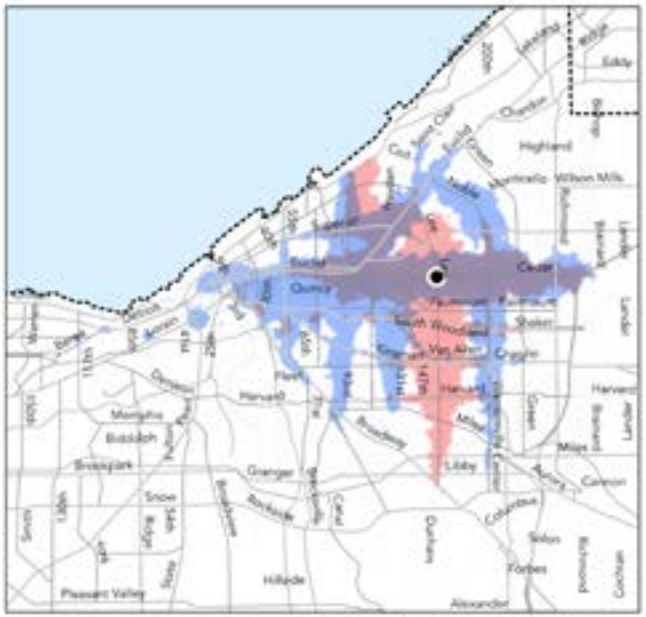
These maps illustrate and example of how each alternative would impact where you could go with transit.

In each map, purple shows the area that would be reachable by transit in 60 minutes with both alternatives, while blue areas and newly accessible with the alternative. Red areas are places reachable with the Existing Network that are out of reach with the alternative.

The tables below each map show how the number of jobs or residents reachable from this location changes compared to the Existing Network.

Where could I travel to in 60 minutes from Cedar & Lee?

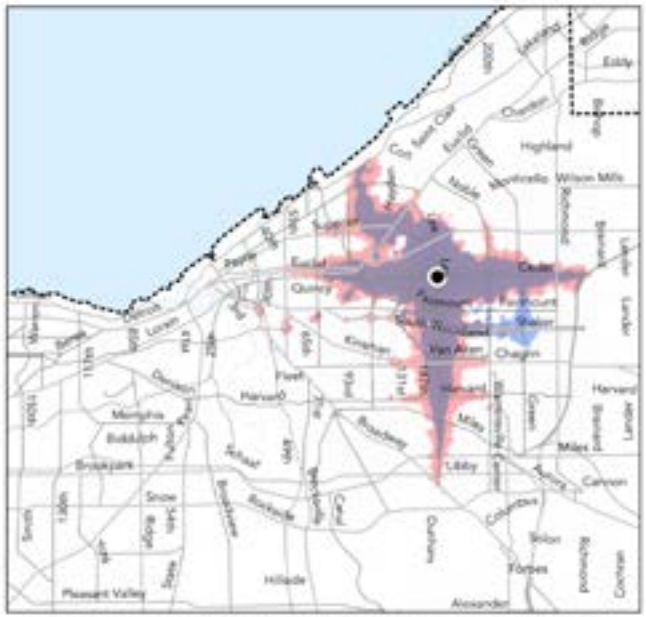
High Frequency Alternative



How many jobs or residents are reachable from this location with the High Frequency Alternative, compared to the Existing Network?

Jobs	Residents
+104%	+50%

Coverage Alternative



How many jobs or residents are reachable from this location with the Coverage Alternative, compared to the Existing Network?

Jobs	Residents
-28%	-33%

From Cedar & Lee, the **High Frequency Alternative** would greatly expand the number of jobs and residents reachable by upgrading the Cedar route to 15-minute service (although there is no service on Lee in this alternative, so it shows up red as a location where access is lost). Because they both run every 15 minutes, it would also be possible to continue a journey along Warrensville Rd. via Route 41 in this alternative, and to travel further west because the Cedar route continues to downtown via Quincy.

In the **Coverage Alternative**, fewer jobs and residents would be accessible from this location, because the Cedar and Lee routes both have their frequencies reduced from 45 minutes to 60 minutes, so that those resources can be reallocated to bring transit service to new communities and employment areas that are not served today.

How many jobs can a person reach using transit?

Measuring Usefulness

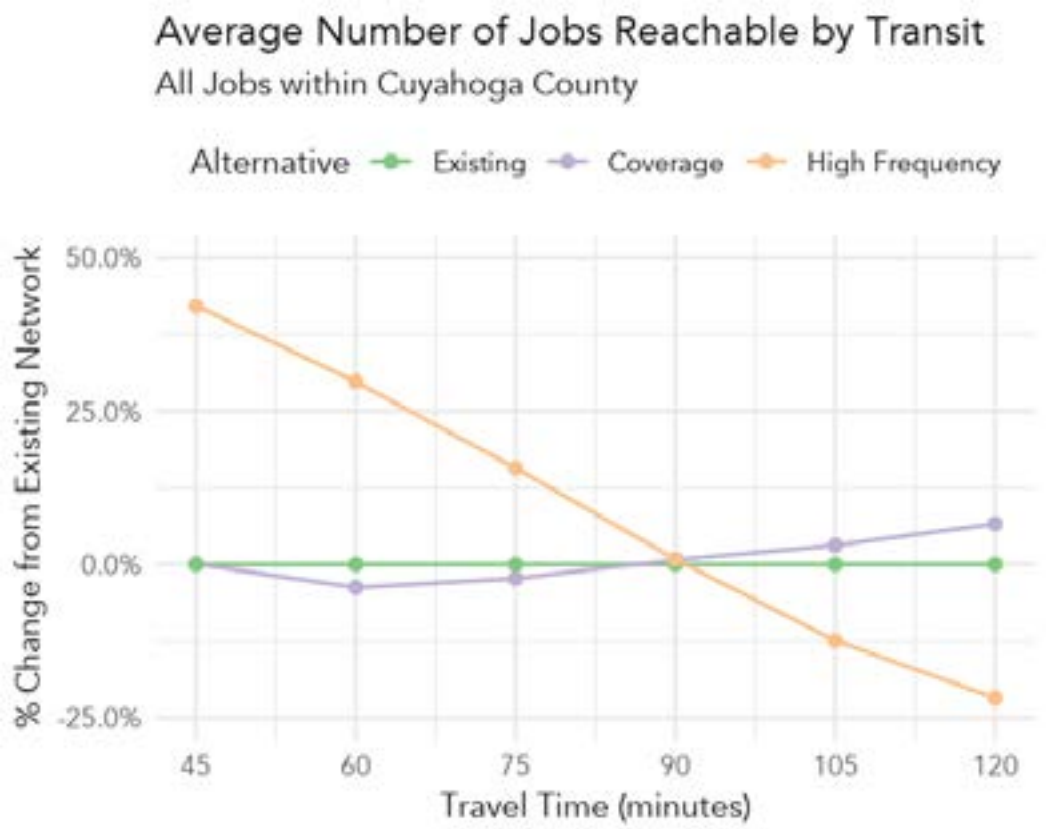
One of the most important measures for how well a transit system can compete with other modes for riders is how useful it is for taking people to jobs. The graph on this page shows how job access would change at different travel times compared to the Existing Network with each alternative.

	On average, how many more jobs can people get to in:			
	45 minutes	60 minutes	75 minutes	120 minutes
Existing	15,600	43,200	84,400	233,700
Coverage	15,700 (+0%)	41,500 (-4%)	82,400 (-2%)	249,200 (+7%)
High Frequency	22,200 (+42%)	56,000 (+30%)	97,600 (+16%)	182,800 (-22%)

Comparing the Alternatives

The **High Frequency Alternative** greatly expands access to jobs in typical travel times, like 45 (+42% more jobs accessible) or 60 minutes (+30%), but because it simply doesn't reach many places that take longer than 90 minutes of travel time to reach, the number of jobs reachable with a very long trip of 2 hours is smaller (-22%).

The **Coverage Alternative** serves all of the sub-urban employment areas the Existing Network does, and expands service to new places. As a result, the number of jobs reachable in two hours is larger (+7%). For most people across the County, jobs far from the center of the region will require a long trip to reach.



How many jobs can lower-income residents of Cuyahoga County person reach using transit?

One of the most important equity benefits of transit is serving as a mobility option to connect lower-income people to jobs and other opportunities.

The table on this page shows the number of jobs that would be reachable at different travel times by people living in households earning up to 200% of the federal poverty level ($25,750 for a family of four in 2019).

The **High Frequency Alternative** invests in higher-frequency in the dense, walkable central areas of the County, including the City of Cleveland and nearby communities. Because lower-income people are generally concentrated in these areas, the job access outcomes for lower-income people are very similar to those for the population as a whole.

The **Coverage Alternative** extends new routes to serve new communities and employment areas in suburban Cuyahoga County. Some current routes' frequencies are reduced in order to provide resources to use to run new coverage routes. As a result, access to jobs in 45, 60 and 75 minutes changes little.

Because the Coverage Alternative reaches new suburban employment areas, more jobs are accessible overall by lower-income people, but these jobs generally take a long time to reach. With a two hour trip, 5% more jobs are reachable than with the Existing Network.

	On average, how many more jobs can people living in households below 200% of the poverty line get to in:			
	45 minutes	60 minutes	75 minutes	120 minutes
Existing	24,800	65,700	119,900	296,000
Coverage	25,300 (+2%)	64,100 (-2%)	118,100 (-1%)	310,600 (+5%)
High Frequency	35,200 (+42%)	84,400 (+29%)	139,800 (+17%)	244,700 (-17%)

How does each alternative help people travel to CMSD high schools?

In the Cleveland Metropolitan School District, students can choose to attend one of many high schools, but whether or not a particular school is a realistic choice for a student may often depend upon whether they can easily travel to and from school and home using transit.

The chart on this page shows the % of residents within the CMSD boundaries who can reach different numbers of high schools.

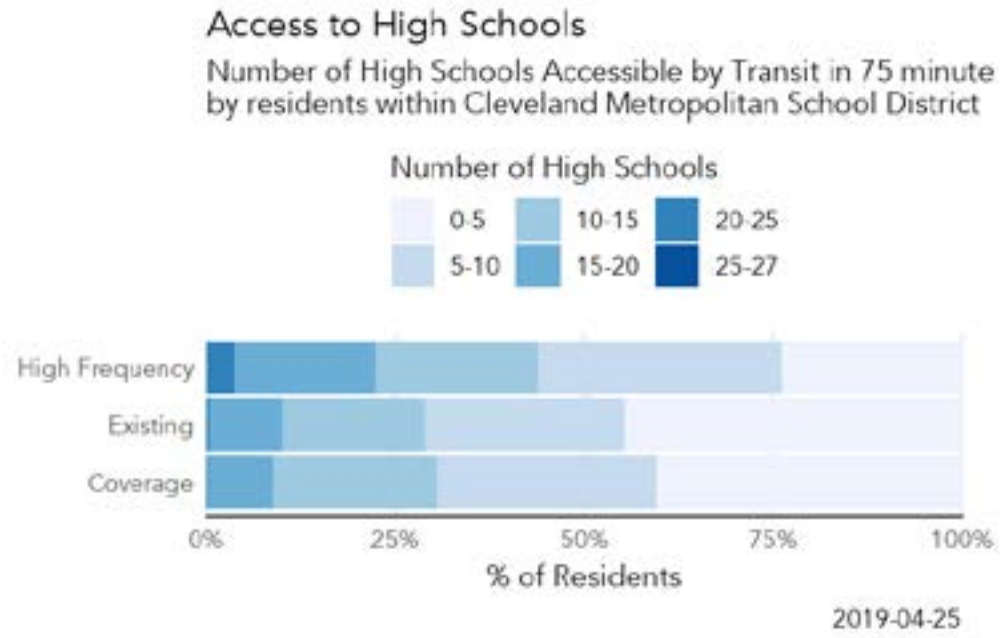
Both alternatives put more people within reach of more educational options compared to the existing network. While the school district is large enough that very few people can reach ***every*** school, these alternatives do increase the number of schools within a viable transit trip for many people.

*With the **High Frequency Alternative:***

87,000 more people within the district would have access to at least 10 CMSD schools in 60 minutes, a 55% increase over the Existing Network

*With the **Coverage Alternative:***

8,200 more people within the district would have access to at least 10 CMSD schools in 60 minutes, a 5% increase over the Existing Network



Access to Tri-C Campuses

Tri-C's campuses are an important educational resource for people in Cuyahoga County. One way of measuring the performance of each alternative is to assess how well each connects people to Tri-C campuses.

The Existing Network puts approximately 21% of Cuyahoga County residents within a 1-hour travel time of a Tri-C campus.

Because several of Tri-C's campuses are near to the edges of the transit network, in lower-density places, even the **High Frequency Alternative** cannot reach them all with frequent service. The High Frequency Alternative would provide frequent connections to the downtown Metro campus and Eastern campus, and 30-minute service to the West campus. The Westshore campus would not be served with this alternative. As a result, 39% people would be able to reach at least one of the campuses within a one-hour trip.

The **Coverage Alternative** would serve every Tri-C campus, and extends all-day service to the new Westshore campus located near the Lorain County boundary. As a result, many more people in the north-western part of Cuyahoga County have reliable, all-day access to this campus. In addition, the West campus in Parma benefits from improved local access as a result of the new timed transfer established at Parma.

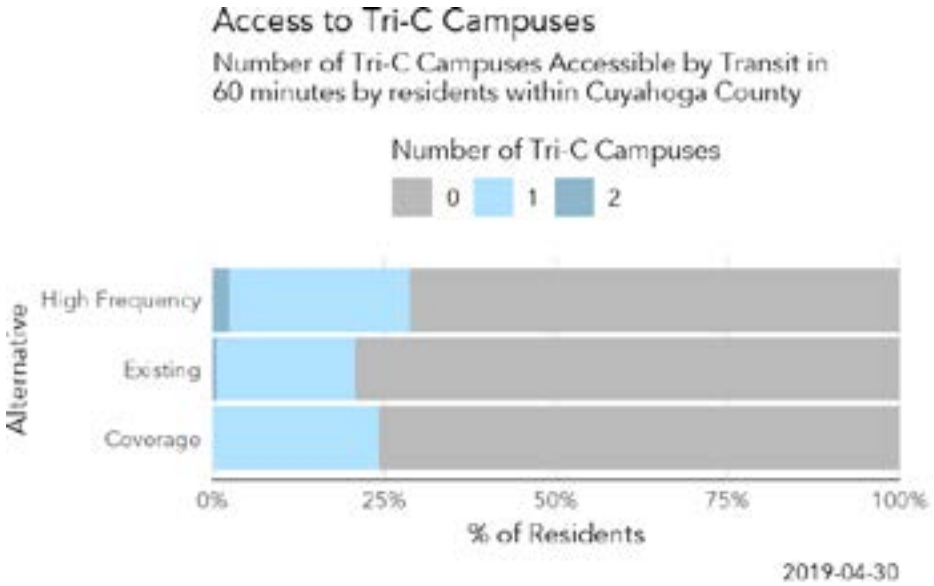
The chart on this page shows the percent of county residents who would have access to 0, 1 or 2 Tri-C campuses with each alternative.

*With the **High Frequency Alternative:***

99,500 more people would have access to at least 1 Tri-C campus within 60 minutes, a 39% increase over the Existing Network

*With the **Coverage Alternative:***

42,000 more people would have access to at least 1 Tri-C campus in 60 minutes, a 16% increase over the Existing Network



We want to know what you think!
Visit riderta.com/systemdesign
to take our survey on the alternatives!