Bus Vision Study
Framing Report

DECEMBER 2023

Chicago Transit Authority

JARRETT WALKER + ASSOCIATES

Table of Contents

Table of Contents

A note on the timing of this report and the data presented within.

This report was prepared in 2022 and 2023, when the most drastic effects of the COVID-19 pandemic have receded in many people's lives, but many of its more indirect consequences – such as persistent inflation and labor shortages – remain very real, both in people's lives and in CTA's everyday operations.

Since March 2020, like most transit agencies throughout the United States, CTA has experienced driver shortages. These shortages motivated the January 2023 service optimization, which does not reflect the level of service CTA would operate if it were fully staffed. CTA's intention remains to return to full levels of service as soon as staffing levels allow.

As such, this report endeavors to avoid references to the "existing" system. Broadly speaking, this report analyzes how the CTA network was performing in late 2019 and early 2020, immediately before the pandemic struck.

The larger conclusions of this analysis remain true in 2023 because most of the things that this report describes have not changed. This includes the broad outlines of Chicago's geography and demographics, the times and places CTA provides relatively more and less service, the math of how transit works, and the need to make clear choices about priorities among different policy goals.

Where data were relevant and reliable – such as on ridership and revenue trends – the authors have described the ways in which the pandemic has changed certain observations, and the recommendations that might flow from them.

1 Introduction

What is the Bus Vision Study and why is CTA carrying out this effort?

In rethinking the bus system, how should CTA prioritize competing goals?

The Bus Vision Study is a chance to rethink Chicago's bus network.

What is Bus Vision?

The Chicago Transit Authority (CTA) is launching the **Bus Vision Study, a review of the entire CTA bus network.** This review seeks to understand:

- How well does the CTA bus network serve the people of Chicago and surrounding communities?
- What goals and priorities should drive CTA's decisions about where and how often the bus operates?
- How could the bus network change and improve in the next two to five years and what would it take for possible improvements to become real?

Why is CTA reviewing its bus network?

Transit is essential to the past, present and future of Chicago. However, the last fifteen years have brought about **increasingly severe challenges to the bus system.**

- Service levels remain low since a major reduction in 2010. This has been exacerbated by staffing shortages since 2020, which created significant service reliability challenges.
- There was a sustained bus ridership decline from 2012 to 2019, linked to reduced service levels and shifts in population and jobs. Because CTA's funding structure requires a focus on ridership first and foremost, restoring bus service was a lower priority than increasing service on rail in the 2010s.
- Since Transportation Network Providers (TNPs) such as Uber and Lyft started operating in 2014, many riders have opted to ride transit less often and use TNPs, further entrenching bus ridership decline.
- Since 2020, the COVID-19 pandemic has created new operational challenges. CTA is addressing these through "Meeting the Moment" – a series of actions including service adjustments and a strong operator hiring push. Service delivery and reliability have improved since the January 2023 service optimization, but this has not reversed the larger historic trends.
- The fallout from the COVID-19 pandemic has exacerbated pre-existing social inequalities, and may change who rides transit and how often for years to come.

Although this study is not a result of COVID-19, it comes at a critical moment. With new travel patterns emerging, there is an opportunity to discuss whether long-established service patterns should change.

This report lays out the facts and issues.

This report is intended to help everyone think about the issues around transit service in the Chicago area. We explore:

- **What the bus network looks like**, and the challenges of the last decade (Chapter 2);
- **What makes bus service useful**, and what goals it can serve (Chapter 3);
- **How the geography of Chicago impacts what the bus network can do** (Chapter 4);
- **What choices underlie the CTA bus network's design** (Chapter 5);
- **What kinds of future change** might create the space for improvements (Chapter 6).

Ongoing CTA efforts to improve bus service quality

The Bus Vision Study focuses on where and how often the bus runs, what outcomes that produces, and how to change those outcomes. At the same time, CTA is also looking at ways to improve service quality on the ground. This includes:

- **Bus Priority Zones.** The Bus Priority Zones (BPZ) program launched in 2019 with targeted street improvements on major bus corridors, and additional funding has been secured to expand and continue the program so buses can run faster and more reliably.
- **Better Streets for Buses.** CTA and the Chicago Department of Transportation (CDOT) developed a citywide plan to identify a toolbox of street treatments to give more priority to buses and bus riders, and the network of streets where those treatments would be targeted. The toolbox includes changes to streets, signals, or sidewalks that can help improve bus stops and make buses run faster and more reliably. Learn more about the plan at betterstreetsforbuses.com.
- **Fleet Electrification.** To help reduce local air pollutants and greenhouse gas emissions, CTA is seeking to electrify its bus fleet. CTA has been operating electric buses since 2014 and continues to expand its electric bus fleet. The award-winning "Charging Forward" plan establishes a strategy to convert the full fleet to electric vehicles by 2040.
- **Corridor-level improvements** including expanded Transit Signal Priority for faster service on Ashland Ave, and a joint study with Pace and CDOT to improve service on South Halsted St from the Pace Harvey Transportation Center to 79th St.

Figure 1: Buses arriving at the CTA terminal at 95th St Station

For most Chicagoans, the bus is the face of public transportation.

Why focus on the bus?

CTA's services includes bus and rail, and both are essential. But the future of transit in Chicago depends heavily on the bus network for a simple reason: **most Chicagoans live near the bus and far from rail.**

This is unlikely to change soon, even if future decisions expand the rail network. According to the CTA Better Streets for Buses Study:

- 96% of residents of the City of Chicago live within a half-mile walk of a CTA bus stop.
- About 30% live within a half-mile walk of a CTA rail station[1].

The CTA bus network is more extensive and has higher ridership than CTA Rail. In 2019:

- The bus network served 1,520 miles of streets, while rail included 210 route miles.
- CTA operated about 1,500 buses every day, compared to 1,100 rail cars.
- Buses operated 5.8 million in-service hours, compared to 0.7 million train hours.
- The bus system generated 237 million boardings, compared to 218 million annual boardings on rail.

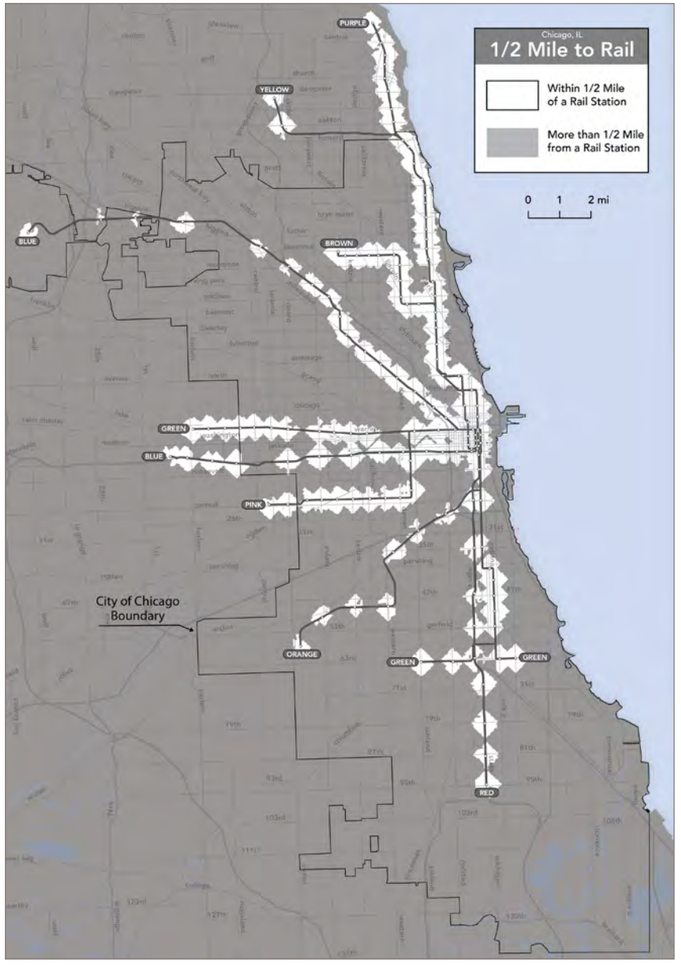
Bus ridership also remained steadier than rail ridership during the pandemic. In 2020, CTA bus boardings declined by nearly 50%, while CTA rail boardings declined by over 65%[2].

Despite this, the bus has often taken a back seat to rail in public discussions about the future of transit. The Bus Vision Study aims to bring the future of bus service into the center of attention.

1 For residents of the CTA's full service area, which includes over 230 square miles in the City of Chicago and about 80 square miles in suburban areas, this report estimates that 86% of residents live within a half-mile of CTA bus (93% any bus), and 21% live near CTA rail.

2 Per the FTA National Transit Database (NTD), 2020.

Areas near Rail
within a half-mile walk to an L station



Areas near Bus
within a half-mile walk to a bus stop with daytime service

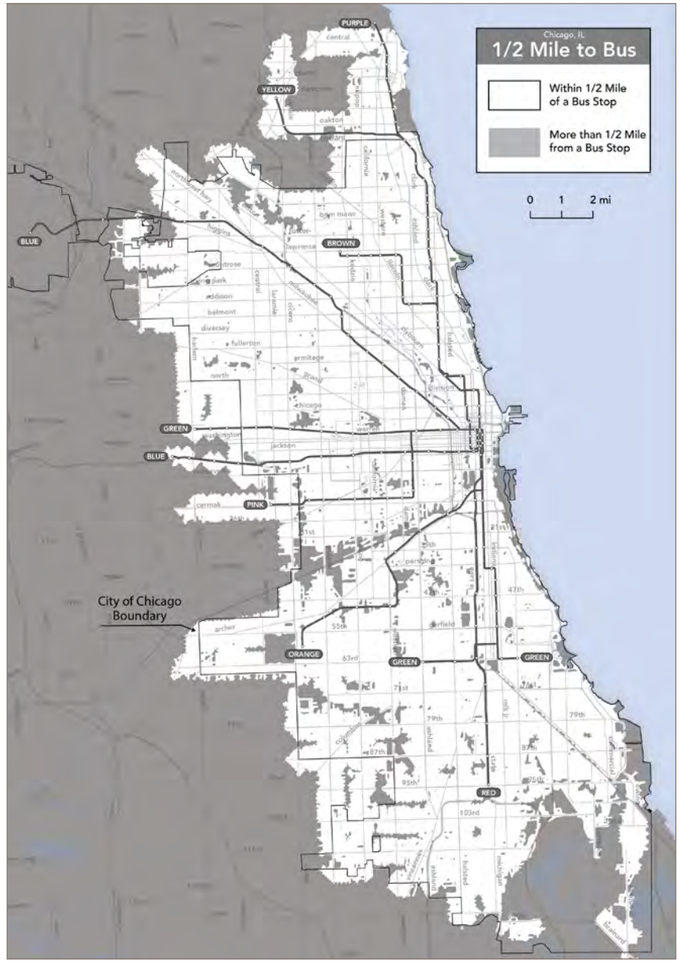


Figure 2: CTA rail lines serve a much smaller area (highlighted at left) than the bus network (at right).

The **bus has often taken a back seat** in discussions about the **future of transit.**

The **Bus Vision Study** aims to **change this.**

The bus network can serve many possible goals.

Transit can serve many different purposes, but which purposes transit should serve depends on your values.

Possible goals of transit

Public transit can serve many different goals, but different people and communities value these goals differently. **Understanding which goals matter most in Chicago is a key step in designing future CTA bus service.**

Some possible goals of transit include:

Social Safety Net

Transit can help meet the needs of people in situations of disadvantage, with access to essential services and jobs. Transit can also alleviate social isolation by providing a basic affordable transportation option.

Economic Opportunity

Transit can give workers access to more jobs; businesses access to more workers; and students more access to education and training.

Climate & Environmental Benefits

By reducing car trips, transit use can reduce air pollution and greenhouse gas emissions. Frequent transit can also support compact development and help conserve land.

Congestion Mitigation

Buses carry more people than cars; transit use can mitigate traffic congestion by reducing Vehicle Miles Traveled (VMT). This is especially important in areas with high jobs-housing imbalances and a preponderance of long commutes.

Health

Transit can support physical activity. This is partly because most riders walk to their bus stop, but also because riders will tend to walk more in between their transit trips.

Personal Liberty

By providing people the ability to reach more places than they otherwise would, a transit system can be a tool for personal liberty, empowering people to make choices and fulfill their individual goals.

Ridership and coverage goals

Some goals are only served if many people use transit. We call these ridership goals because they are achieved through high ridership. For example, transit can only mitigate congestion and pollution if many people ride the bus rather than drive.

Efforts to maximize ridership push CTA to provide very frequent and direct service, focused on the areas where the most people are likely to use them.

Other goals are served by the mere presence of transit. We call these coverage goals. A bus line through a neighborhood can be part of the social safety net for people who have no other means to get around, even if they don't use the service often.

Efforts to maximize coverage push CTA to spread bus service to as many places as possible, even if the bus doesn't come very often, so there's at least some service near almost everyone.

How does equity fit in?

Transit service may also play a part in addressing disadvantages that have resulted from historic discrimination or other injustices.

For example, housing policies and red-lining have historically prevented many African Americans and other people of color from buying homes in neighborhoods with access to more and better jobs and schools.

Openly discriminatory practices have been illegal for decades, but Chicago remains defined by spatial segregation by income and race. For example, Black and Latino people in Chicago tend to live farther from jobs, retail, healthcare and other services compared to people of other races (see Chapter 4).

This kind of inequality makes it harder to connect all people to opportunity, and makes improving the bus network particularly critical.

CTA can't solve all the issues created by decades of segregation. But **by focusing on equity goals, bus service can help reduce the differences in opportunity available to people in different parts of Chicago.**

Figure 3: Is a lightly used bus failing? It depends on why you are running it.

Limited budgets require CTA to make hard choices.

CTA has a defined and limited operating budget.

As will be shown in Chapter 2, CTA has a limited set of funding sources. This structure leaves CTA heavily dependent on fares and local sales tax receipts.

In most years, those revenue sources grow and shrink as a function of the local economy. **Adjusted for inflation, CTA's operating revenues have remained essentially unchanged since 2009**[1].

In the last 15 years before the COVID-19 pandemic, fares have tended to cover about 40% of operating expenses. None of CTA's bus lines generate an operating profit. That means CTA can't expand service at will: almost any amount of new service provided by CTA requires new funding.

With existing resources, if CTA wants to focus more on one goal, it will need to focus less on another. So which goals matter more?

When budgets are limited, different goals compete.

Different goals pull CTA in opposing directions. For example:

- Maximizing ridership may be the most effective way for CTA to help limit congestion and reduce greenhouse gas emissions. But high ridership requires concentrating very frequent service in the areas where the most people might ride.
  - In a limited budget, **maximizing ridership means not providing service in isolated areas**.
- On the other hand, maximizing coverage means operating bus lines in places where CTA can't expect many riders.
  - In a limited budget, providing **coverage everywhere means lower frequencies and less convenient service.**

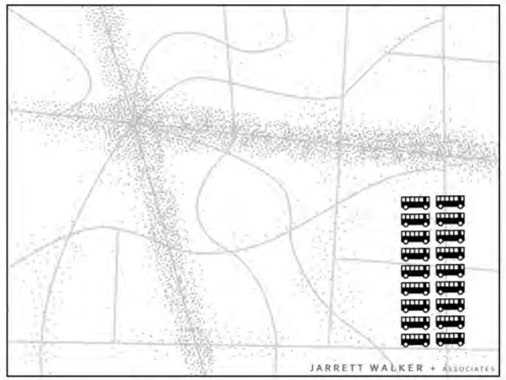
This is the essence of the ridership vs. coverage trade-off, one of the value-based choices CTA planners make on a regular basis in deciding where and how often the bus should operate.

CTA can pursue both ridership and coverage goals within the same budget, but not with the same dollar. Every dollar spent on maximizing ridership is not available to spread coverage out, and vice versa.

In Chicago, **maximizing ridership** sometimes aligns with and sometimes comes into conflict with **providing equitable access** to opportunity to low-income people and people of color.

Ridership vs. Coverage in a Limited Budget

A Hypothetical Example



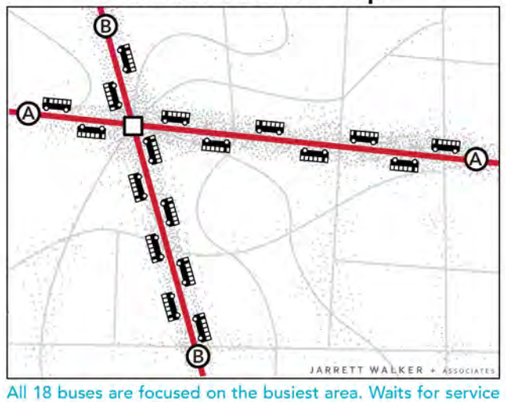
Imagine you are the transit planner working in this fictional neighborhood.

The dots scattered around the map are people and jobs.

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

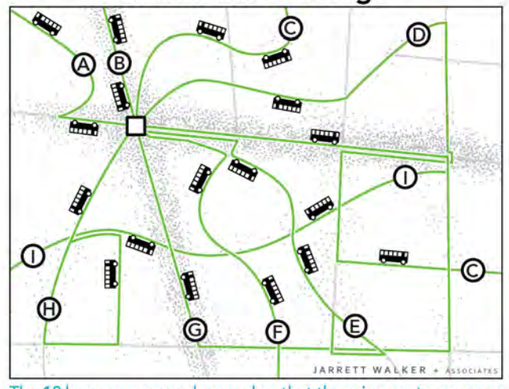
Before you can plan transit routes, you must decide: What is the purpose of your transit system?

Maximum 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, but some places have no service.

Maximum 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.

Figure 4: Example of ridership vs. coverage trade-off, one of the choices CTA must make as a result of a limited budget. Both ridership and coverage are desirable outcomes, but they push CTA in opposite directions. How should CTA decide when to lean in one direction, and when to lean in the other?

1 In 2009, CTA's total operating revenues were $1.53 billion (all figures in this note adjusted to 2020 dollars). In 2021, CTA's total operating revenues were $1.51 billion. In the intervening time period, revenues have fluctuated between $1.50 billion and $1.60 billion, with the high point reached in 2016. In 2022, revenues held steady in nominal terms, but adjusted for inflation they actually decreased to $1.40 billion.

What are the right choices for Chicago?

How does CTA choose which goals to pursue?

CTA's choices about bus service reflect funding constraints, historic expectations, and compliance with the law. For example:

- CTA must meet annual targets for system-generated revenue to receive RTA public funding[1]. This compels CTA to focus on high ridership to maintain fare revenue.
- CTA is also expected to maintain coverage throughout Chicago and its inner suburbs. This requires CTA to spend some of its budget on low-ridership bus lines.
- Federal civil rights law requires CTA to provide similar levels of service quality in minority and non-minority areas.

These constraints are reflected in CTA's Service Standards and Policies[2], which detail how CTA intends to distribute service generally, based on measures like ridership, coverage, on-time performance, and vehicle load.

1 The Regional Transportation Authority manages public funding for transit agencies in the Chicago area, per Illinois state law.

2 Available at: https://www.transitchicago.com/assets/1/6/Chicago_Transit_Authority_Service_Standards.pdf

CTA will use this report to launch a conversation with riders, partner agencies and the general public about how to change and improve the bus network.

What goals should CTA pursue in the future?

The Service Standards and Policies are essential to CTA's ability to adjust service to changing conditions from one year to another. But service standards can't answer the question of what purpose the bus network serves, or what a successful CTA bus network would provide. That requires examining the values and priorities of Chicagoans, by asking questions like the following ones.

To **design a bus network** that **meets the aspirations** of **Chicagoans,** CTA needs to **hear what outcomes people value.**

There are some key questions to consider.

1 Is CTA providing the right levels of service at different places and times?

CTA's bus network structure has remained largely similar for many decades. How does this structure serve Chicagoans, and does it need any changes?

2 How much should ridership matter as a metric of success?

CTA's funding structure requires pursuing the highest possible ridership in any given year. To what extent should CTA focus on other goals – such as equity, economic development, sustainability, or livability – that may require different measures of success?

3 How should the bus network address inequality?

CTA operates in Chicago, a city divided by deep race- and wealth-based inequality. Many of the most deprived areas CTA serves are very far from concentrations of jobs and services. Residents of those areas inherently need more transportation, to the point that many continued riding CTA frequently even at the height of the COVID-19 pandemic. What changes should CTA make to address this?

4 Is CTA providing enough bus service for the needs of Chicago?

Chicago has been built around its transit system and relies on transit to function, but CTA service was cut system-wide in the early 2010s recession. Bus service remains far below historic levels. Should CTA pursue attempts to increase funding levels, in order to provide more service?

2 The Bus Network and Its Major Challenges

Where, when, and how does CTA provide bus service?

How is CTA service funded?

How have bus service levels and ridership changed in the last 15 years, and what challenges does that reflect?

CTA's service area

3.2 million people live in the CTA service area, including 2.7 million in the City of Chicago.

Service area definition

The CTA Service Standards and Policies define the service area as:

- *"the area covered by all census blocks within a half mile of a CTA bus route or rail station as well as all census blocks completely surrounded by these blocks."*

In practice, this includes nearly all of the City of Chicago and parts of 35 inner suburbs.

Although CTA is not an agency of the City of Chicago, it is strongly associated with the City, and four of its seven Board members are appointed by the Mayor of Chicago.

Within Illinois, the CTA service area is bordered on the north, south and west by areas served by Pace, with some overlap between the two agencies on the outer edges of Chicago and in many inner suburbs. The boundary between areas served by CTA and areas served by Pace is largely the result of history and has occasionally shifted.

Some CTA service also overlaps with Metra commuter rail, but Metra and CTA tend to serve different trip types and distances[1].

1 The main exception is Metra Electric, which partly overlaps with CTA service on the Southeast Side. The stop spacing and service patterns on Metra Electric are somewhere in between what CTA provides on the L, and what Metra provides on its other lines.

Bus and rail serve complementary purposes.

CTA provides two kinds of service:

- **Rail** ("the L"). The rail network includes eight lines, with the Loop at their center. Rail lines operate on exclusive (and mostly elevated) rights-of-way.
- **Bus**. The bus network includes 127 lines serving all parts of Chicago. Bus lines typically follow Chicago's main streets, spaced every half-mile to every mile.

All transit exists to connect people and places. But the layout of Chicago's bus and rail systems gives them distinct functions:

- **Rail lines are the backbone of the CTA network.** They help move massive numbers of commuters into and out of central Chicago during peak commuting hours, connecting many distant neighborhood centers. Rail stations often serve as local hubs of activity and transportation.
- **Bus lines allow people to travel all over Chicago.** Many buses go to the Loop and surrounding districts. Nonetheless, most lines run crosstown on long north-south or east-west streets, connecting neighborhoods to one another and to rail.

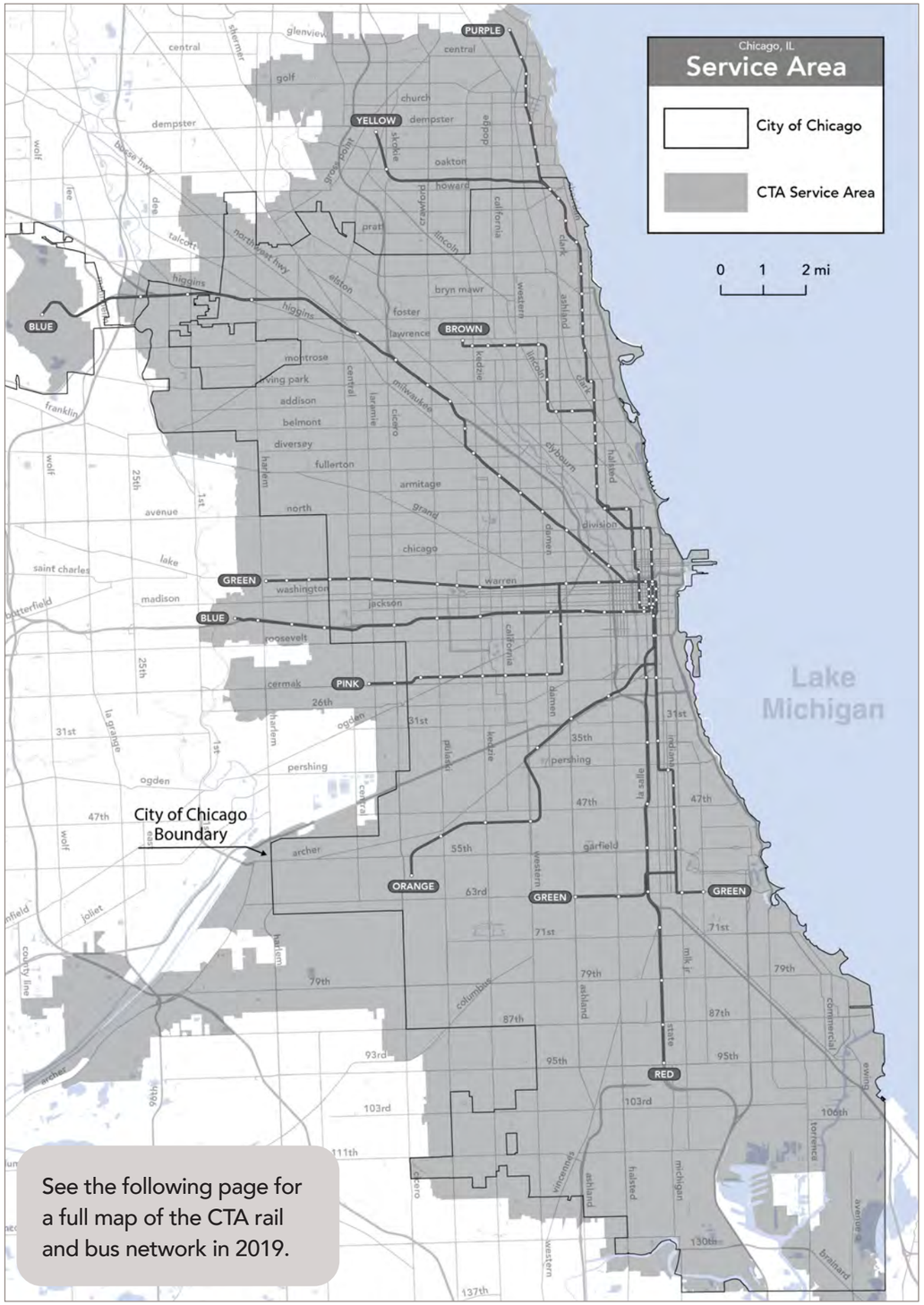
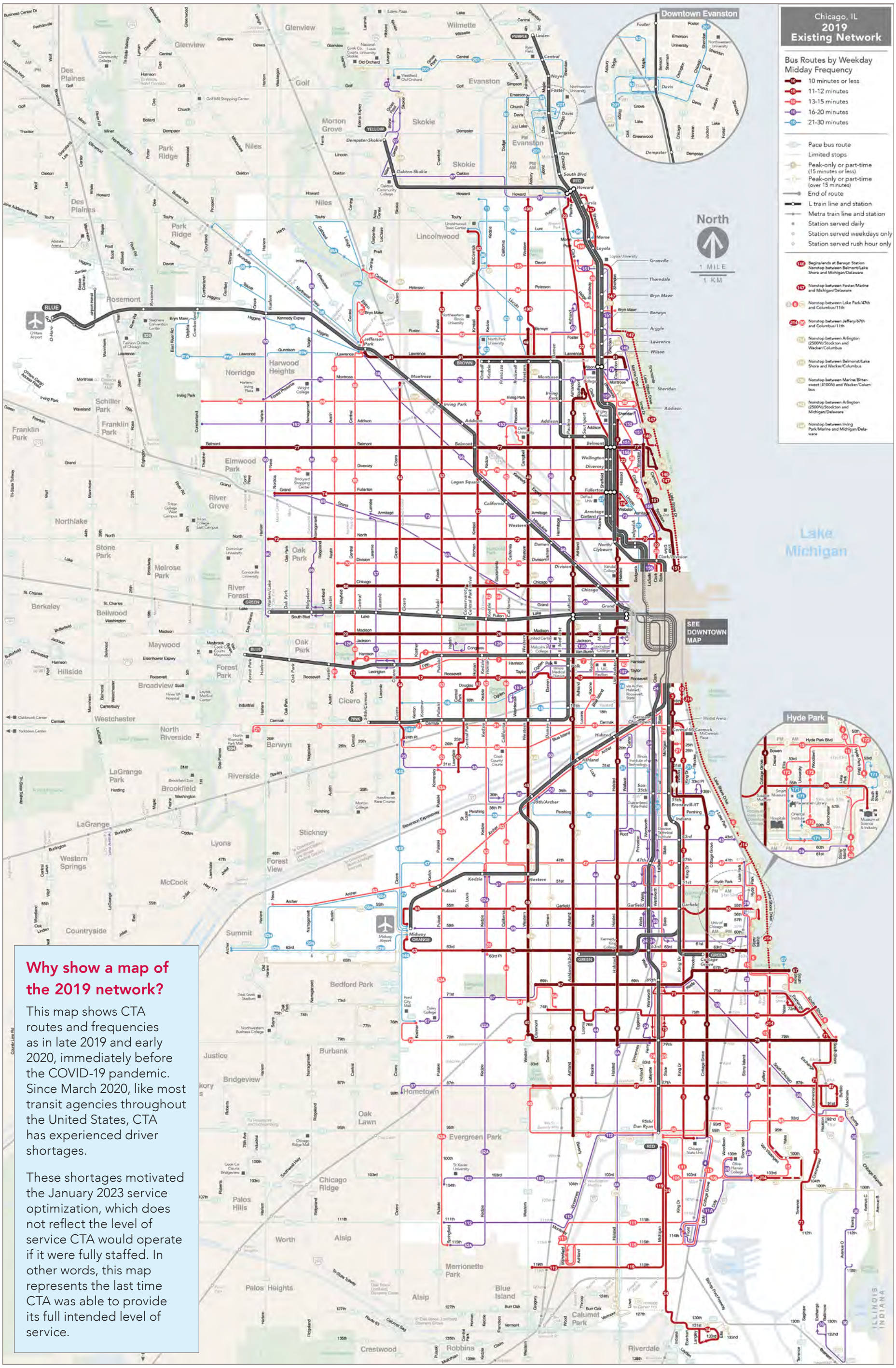


Figure 5: Map of the CTA service area in 2019. This area is slightly smaller since March 2023, when Route X98-Avon Express was discontinued.

Map of the 2019 CTA Network with Bus Frequencies



Why show a map of the 2019 network?

This map shows CTA routes and frequencies as in late 2019 and early 2020, immediately before the COVID-19 pandemic. Since March 2020, like most transit agencies throughout the United States, CTA has experienced driver shortages.

These shortages motivated the January 2023 service optimization, which does not reflect the level of service CTA would operate if it were fully staffed. In other words, this map represents the last time CTA was able to provide its full intended level of service.

The bus network is designed as a citywide grid of frequent lines.

The street grid leads to the bus grid.

Chicago's long and straight main streets are organized on a very regular half-mile grid. This naturally encourages bus service to be organized as a grid of long and straight lines, where each line connects with many others.

This is fortunate, because regular grids are one of the most efficient kinds of transit network structure. On a gridded bus network, riders can go from nearly anywhere to anywhere else with a single transfer.

This effect is reinforced by the CTA rail network, which makes it possible to transfer to faster service to reach areas near rail.

The grid works because buses are frequent.

A gridded transit network relies on passengers' willingness to transfer from one line to another. This means it's essential to minimize the amount of time passengers spend waiting for the second bus to come.

Making this kind of network convenient requires buses to run very frequently on as many lines as possible, so no matter where you are, the next bus is always coming soon.

CTA has recognized this as a key principle for the bus network, by defining the Key Route Bus Network.

Key route bus network

CTA's service standards define a set of Key Routes with minimum frequency standards.

According to CTA's service standards:

- *"Routes in the Key Route network are typically spaced one mile apart, which allows for approximately a 1/2-mile journey to reach a route in this network."*
- *"The vehicle headway standard for the Key Route bus network is to operate at least every 10 minutes during the weekday peak periods, 15 minutes during the weekday midday period, 20 minutes during the weekday evening period, 15 minutes on Saturday afternoons and 20 minutes on Sunday afternoons."*

As a result, the Key Route bus network does two important things:

- **Establishes a standard for the availability of relatively frequent service**. This means that service frequencies are not only based on passenger demand, but also on providing a consistent level of convenience across the service area.
- **Establishes a standard for how far people might walk to reach a consistently frequent service.** CTA runs bus lines every half-mile in most of Chicago. But in areas where demand is relatively low, lines that are not Key Routes run a little less frequently, or their frequency is less consistent across the day and week.

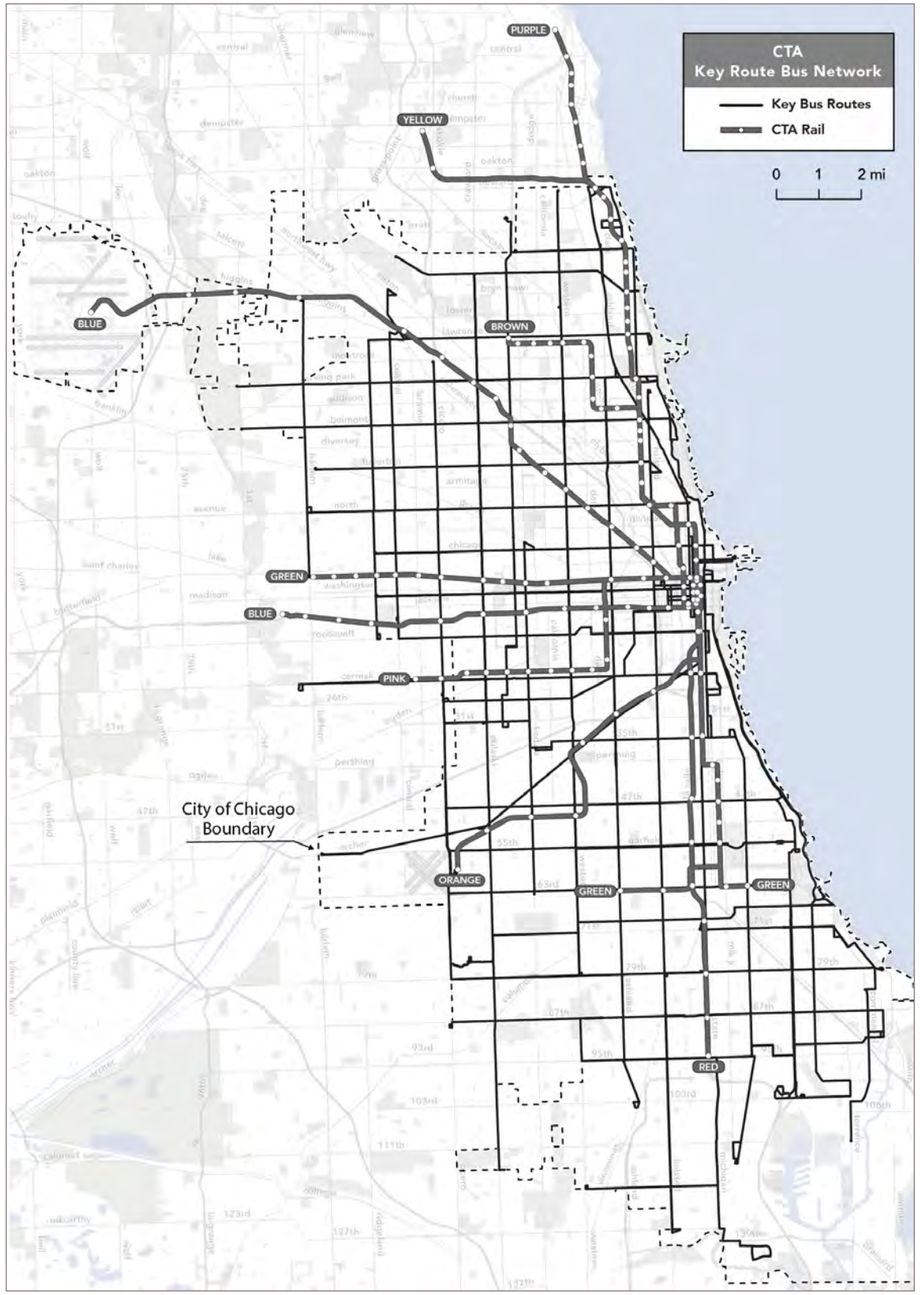


Figure 6: Map showing the location of buses included in the CTA's Key Route Bus Network.

The edges of the network are served by shorter local lines.

Neighborhoods that aren't on the main grid of bus lines aren't as well connected to the rest of the CTA service area.

The limits of the grid

Because of the distance from one end of Chicago to another (about 25 miles north to south), it is very difficult to run a reliable bus line that spans the whole length of CTA's service area.

Long lines are difficult to run reliably because:

- The longer a bus travels, the more likely it will encounter delays on the way. On any given trip, a bus can be delayed due to normal traffic congestion, construction, accidents, weather, or even unusually high ridership. So longer lines are inherently less reliable.
- There are natural limits to how long a driver can sit in their seat. Drivers need breaks to use the bathroom and stretch their muscles.

Recognizing these problems, most transit agencies try to keep bus lines shorter than 90 minutes one-way. CTA accepts up to 120 minutes on a few lines. But because most buses travel at speeds of 10 to 15 miles per hour, it's simply not possible for CTA to operate a single, well-functioning bus line from 130th St to Evanston.

Local feeder networks

CTA organizes services in outlying areas as networks of local feeder lines. These routes connect to the nearest CTA rail station or major bus transfer center.

As shown in the map in Figure 7[1], there are several distinct areas served by feeder lines:

- North of Foster Ave, where most bus lines are oriented to feed into the nearest station on the Red, Purple or Brown rail lines.
- The Far Northwest, where all bus lines lead to the Jefferson Park Transit Center.
- West of Midway, where bus lines lead to the Midway Station on the Orange line.
- South of 95th St, where most bus lines lead to 95th St Station on the Red line.

Connecting outlying areas to rail makes it possible for passengers to reach Downtown as quickly as possible. But **passengers traveling from these areas need to transfer twice to reach many other parts of the CTA service area.**

Reading the Map Frequencies

- **Dark red lines run every 12 mins or better.** Most frequent and convenient.
- **Pink lines run every 13 to 15 mins.** Somewhat frequent, but a few minutes delay can result in a 20 minute wait.
- **Light blue lines run every 16 to 30 mins.** Less frequent and less convenient. Many passengers time their trips to catch the bus, instead of leaving whenever they want.

1 Noon is typically when service levels are lowest in the daytime, so this illustrates a minimum frequency many riders learn to rely on.

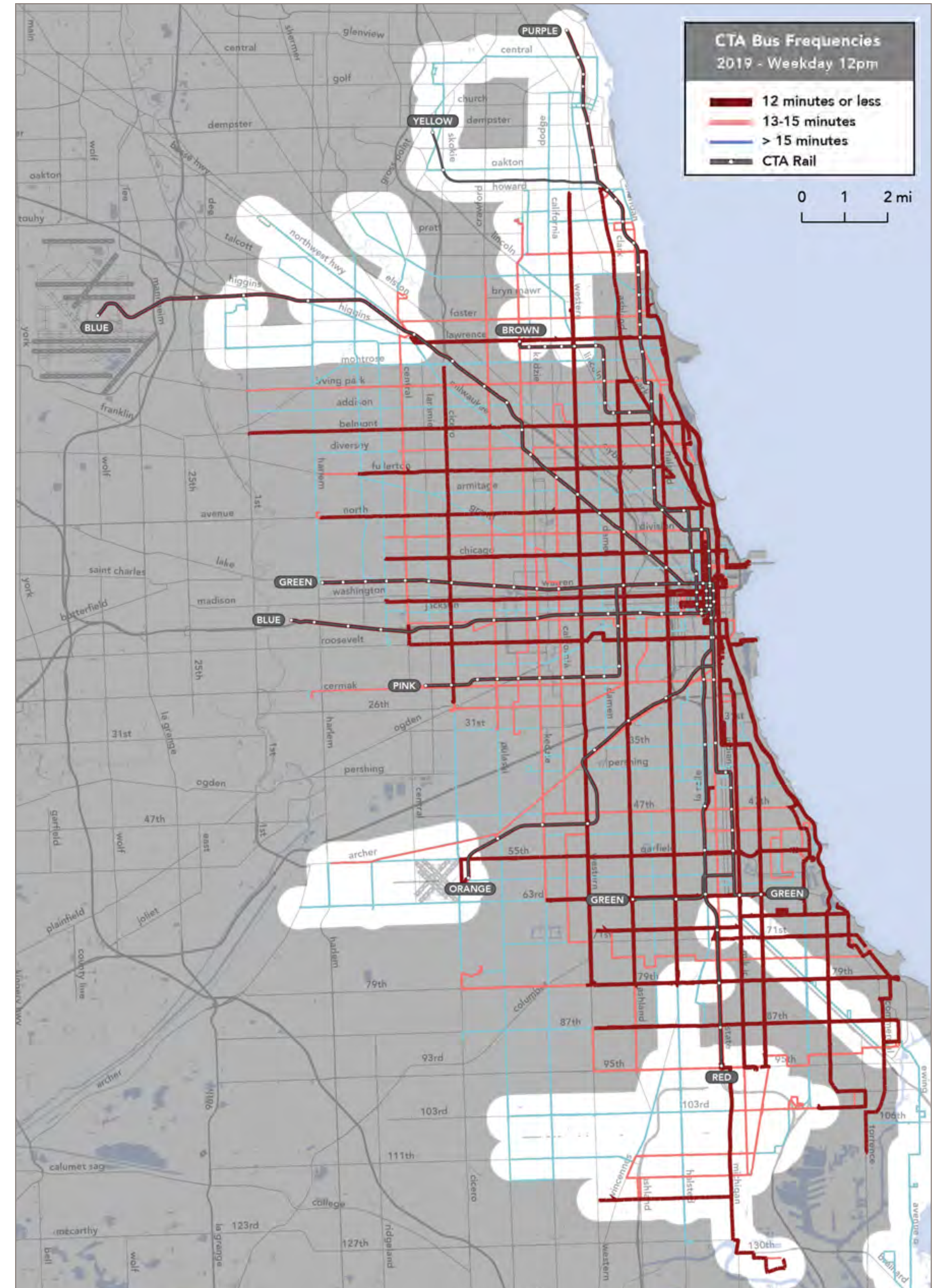
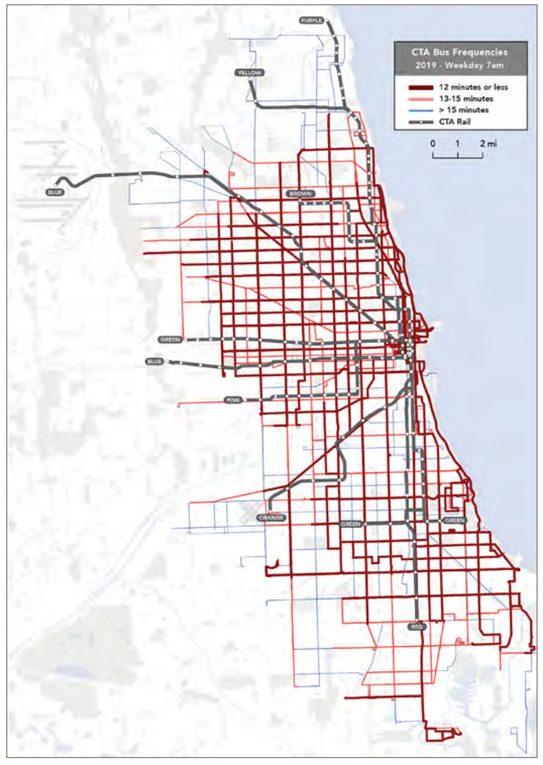


Figure 7: Map highlighting the location of local feeder lines within the CTA bus network, and their frequencies in 2019.

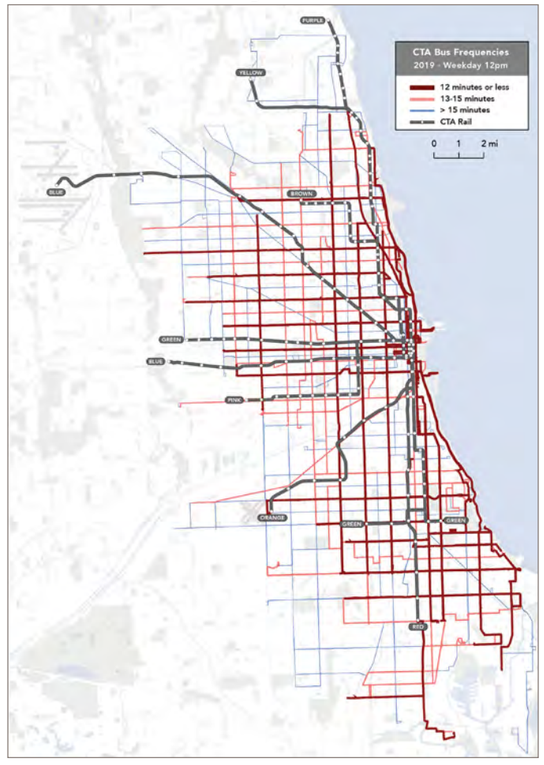
Service levels vary widely by time of the day and week.

CTA provides the most service on weekdays at peak hours, and much less frequent service in the evenings, at night, and on Sundays.

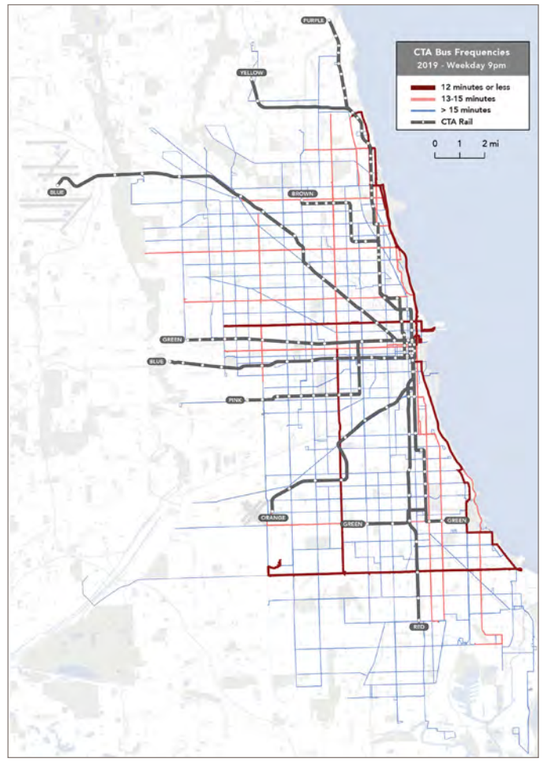
Weekdays at 7 AM



Weekdays at Noon



Weekdays at 9 PM



Sundays at Noon

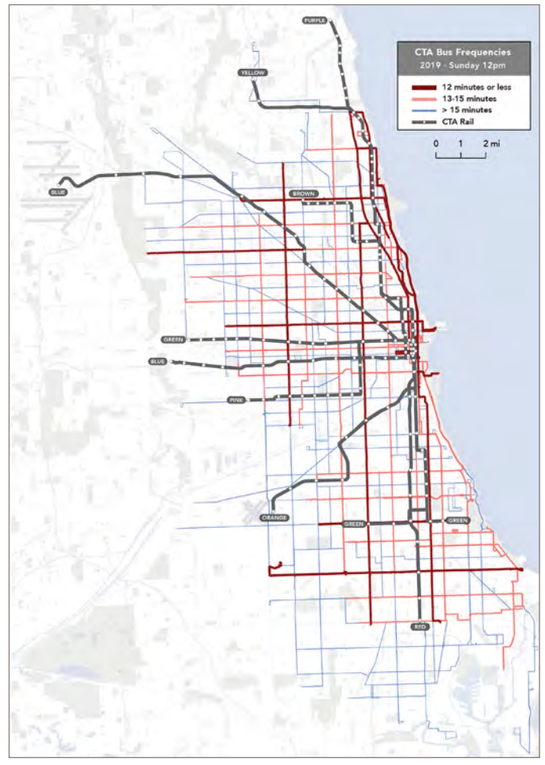


Figure 8: Maps of bus frequencies at different times of the day and week in 2019, including: weekdays at 7 AM (far left), weekdays at 12 PM (center left), weekdays at 9 PM (center right), and Sundays at 12 PM (far right). Since January 2023, frequencies have been temporarily reduced on many lines. However, the general shape of service change throughout the week (more at weekday peaks, less in the evening, less on Sundays) remains the same.

Bus frequencies are generally highest on weekdays at peak hours. In 2019, on weekdays at 7 AM, 71% of CTA service area residents and 69% of jobs were within a half-mile of service every 12 minutes or better.

Historically, CTA has also run a number of special bus lines at peak hours only. However, peak-only service has been reduced across the city during the pandemic.

CTA provides frequent service in most of Chicago throughout the weekday midday. In 2019, on weekdays at noon, 56% of CTA service area residents and 59% of jobs were located within a half-mile of service every 12 minutes or better.

But frequent service is less prevalent in the western half of the city in the midday. At least six North-South lines operate every 12 minutes or better east of Western Ave in 2019, but there was only one such line further west, on Cicero Ave.

In the evenings, only parts of the "L" and a small number of core bus lines retain very frequent service. After 8 PM, most bus lines run every 16 to 30 minutes until 11 PM or midnight.

Saturday midday frequencies are mostly similar to weekdays, but **service on Sundays is lower.** In 2019, on Sundays at noon, only 45% of CTA service area residents are within a half-mile of service every 12 minutes or better.

Less frequency on evenings and weekends means longer waits on emptier streets, especially for trips with transfers.

Service has mostly been funded by local sales taxes and fares.

Revenue structure

Figure 9 shows CTA's main operating revenue sources in 2019. At that time, over 90% of CTA's operating revenue came from two sources:

- **RTA Public Funding.** This is a mix of local and state revenues defined in state law and administered by the Regional Transportation Authority (RTA). Most funds come from local sales taxes, real estate transfer taxes, and matching funds from the State of Illinois.
- **Fare Revenue.** CTA collected nearly 40% of its revenues from passengers.

The remaining 7% came from a variety of sources, including advertising sales, a state subsidy on reduced fares, and many other smaller sources.

CTA Operating Revenue (2019)

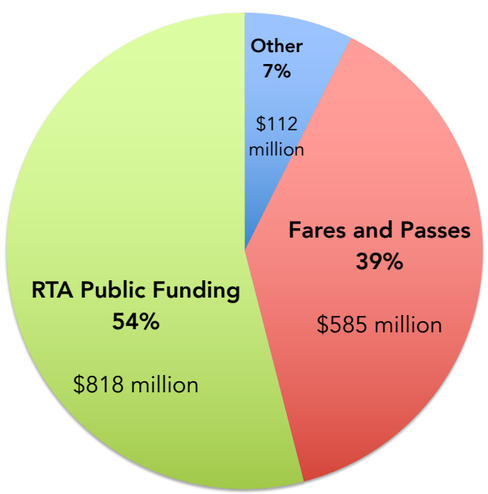


Figure 9: CTA's main revenue sources in 2019.

State law requires CTA to maximize fare revenue.

To be eligible for RTA public funding, CTA is required by law to recover at least 50% of its operating expenses each year as "system-generated revenue".

The actual percentage can change[1] and relies on a complex calculation that excludes certain expenses and considers some non-RTA subsidies as "system-generated." Nonetheless, a recovery ratio at or above 50% is very high by US transit industry standards.

As a result, **CTA must maximize the fare revenue generated by every hour of service** or risk losing the ability to operate most transit service. Routes that perform well get more investment, and routes that do not get less. CTA also invests more service at times of day when more people travel, and much less service at other times.

This continual optimization means service levels vary greatly based on location and time of day, impacting the usefulness and convenience of the network as a whole.

This funding structure can also push CTA to set fares in ways that meet short-term revenue targets but may damage ridership in the longer-term. For example, when CTA increased pass costs in 2013, many passengers switched to purchasing single-ride fares, which stabilized fare revenue for the two following years. But people who pay for individual rides tend to use the bus less often and have an incentive to find alternatives. The switch away from passes may be one of the reasons CTA ridership declined starting in 2014[2].

1 Due to temporary relief provided by the Illinois General Assembly, the recovery ratio is currently set at 42% through the end of 2023.

2 The CTA has since reversed direction. Pass costs were reduced significantly in 2021, and have not increased since.

CTA Revenues by Funding Source - 2007 to 2022

Adjusted (CPI) to constant 2020 dollars (millions).
Sources: CTA Budget Recommendations Reports, 2008 to 2023; BLS CPI-U for All Items

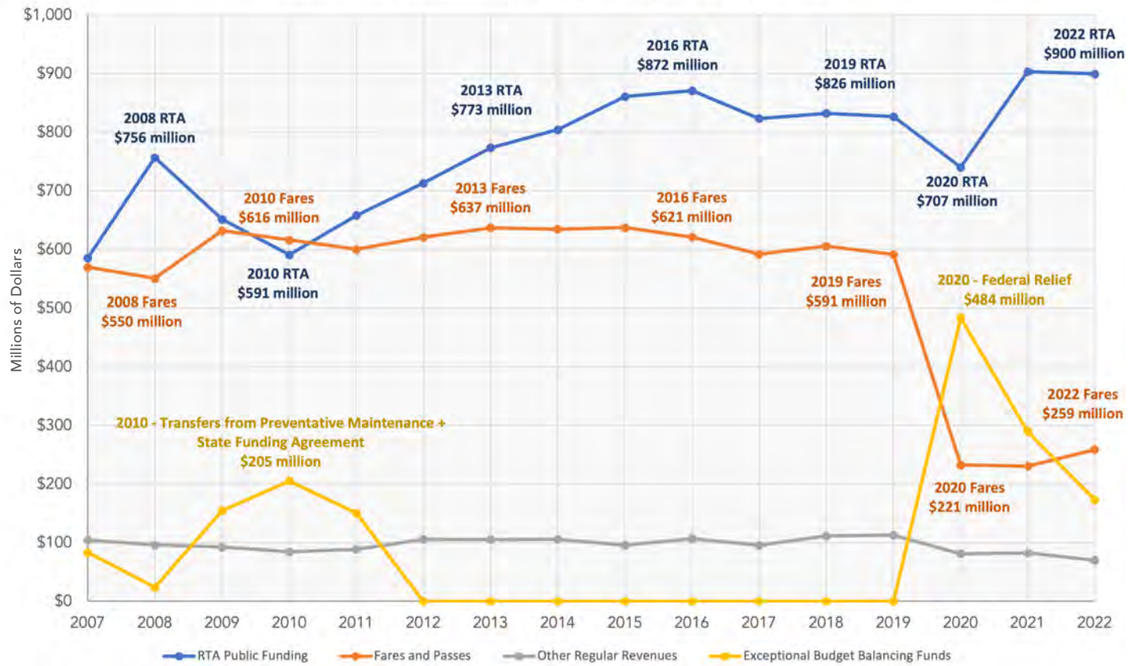


Figure 10: How CTA revenues evolved from 2007 to 2022.

How has COVID-19 affected CTA revenue?

Ridership decreased dramatically in 2019 and has been recovering gradually since. However, the corresponding recovery in fare revenue has been largely offset by inflation and reduced prices for one-day and multi-day passes. As a result, **CTA has lost over $1 billion in fare and pass revenue since 2020, compared to expected revenues** based on 2017 to 2019 trends (Figure 10).

That revenue gap has mostly been plugged by exceptional infusions of federal funds, which RTA is allowing CTA to classify as "system-generated revenue". In 2020, federal funds accounted for 31% of CTA's operating revenue. This declined to 19% in 2021 and 12% in 2022.

After an initial downturn in 2020, local and state tax revenues recovered in 2021, stabilizing RTA public funding at a slightly higher level than the pre-pandemic trend, even accounting for inflation.

This funding structure leaves little room for transit to improve.

In lean years, CTA's funding model makes it challenging to prioritize goals beyond maintaining ridership for immediate financial survival.

CTA's funding sources are vulnerable to crises.

Compared to other US transit systems, the CTA funding model ensures high service levels[1]. Nonetheless, both of CTA's main revenue sources are vulnerable to downturns.

In years when either RTA public funding or fares decrease significantly, CTA must enact dramatic service cuts, seek exceptional funding from the state or federal government, or both.

There is no room for long-term growth in this cyclical funding model, where (as mentioned in Chapter 1) operating revenues have remained essentially unchanged since 2009.

Some of the reasons why are made clear by CTA's experience in the last two major fiscal crises: the Great Recession and the ongoing COVID-19 pandemic.

Recessions cause declines in RTA public funding.

During the Great Recession of the late 2000s, local tax receipts collapsed. RTA Public Funding decreased by 22% from 2008 to 2010, as shown in Figure 10 (see previous page).

CTA was able to plug some of that funding gap through a special agreement that provided state funds for a few years, but decreased revenues led to major bus and rail service reductions, the impacts of which are still being felt today.

Reliance on fares was a liability during the pandemic.

High fare revenue is normally a strength for a transit network. However, in situations where the public is discouraged from using transit, that revenue can largely disappear.

From 2019 to 2020, CTA fare and pass revenue decreased by 60%.

The only reason CTA did not have to enact a "doomsday" service cut in 2020 or 2021 was the ability to use funds from the CARES Act and subsequent federal stimulus packages to balance its budget.

Reliance on fare and pass revenue can also be problematic during recessions, to the extent that ridership and fare revenue may decrease in times of employment loss.

A different approach is possible.

CTA relies on the unstable sales tax revenues that underlie RTA public funding. In years when these revenues are lower than expected, CTA has sometimes been forced to cut service. Such cuts tend to especially impact the usefulness of the transit network at times of the day and week when ridership is relatively low and service is already infrequent such as nights, evenings and Sundays.

This contrasts with the approach of the Toronto Transit Commission (TTC), the most comparable transit agency to CTA in North America. TTC and CTA serve areas with similar sizes, similar populations, and similar climates. Both Chicago and Toronto have regular grids of long streets, an important but non-dominant heavy rail network, and a network of key bus routes spaced out on a regular 1-mile (2 km in Toronto) grid.

Yet TTC provides much higher levels of evening and Sunday service on its Ten-Minute Network than CTA does on its Key Route Bus Network. TTC's Ten-Minute Network frequency standards require service every 10 minutes or better from 6 AM to 1 AM Monday to Saturday, and 8 AM to 1 AM on Sundays.

Even though ridership is lower on evenings and weekends, providing consistently high levels of service allows more people to rely on transit at all times. In 2018, TTC provided about 20% more bus service than CTA, but generated 80% more bus ridership[1]. This is part of the reason for TTC's higher fare revenues: TTC collected approximately 65% of its operating expenses through fares and passes in 2018[2], compared to about 42% for CTA[3].

This kind of approach is possible because TTC subsidies rely on direct allocations from the City of Toronto budget rather than specific taxes. Because the City views TTC as an essential service, TTC is much less likely to need to plan a significant service reduction than CTA due to a "lean" year.

Toronto's experience suggests that **if CTA's funding model were based on more stable subsidies, it might be possible to maintain and increase ridership by emphasizing consistently high levels of service throughout the day and week.**

1 Based on NTD data, in 2017, CTA operated 9.9 million revenue hours of service, or 3.2 hours per service area resident. The only agencies with higher per capita levels of service in the US were MTA/New York City Transit (3.7 rev hours/resident) and San Francisco's Muni (4.0 rev hours/resident).

1 Per TTC 2018: https://transittoronto.ca/archives/reports/Ridership_and_service_statistics_2018-A.pdf, TTC provided ~22,000 rev. hours and carried ~1.42 million riders per weekday on buses on weekdays in 2018, vs. ~18,000 rev. hours and ~780,000 boardings on CTA buses, as reported in NTD 2018.

2 Per TTC's 2018 Annual Report. Total operating revenue recovery listed as 68% on page 52, adjusted downward here to reflect fare and pass income only, reported as "passenger services" revenue on page 17. Report available at: https://www.ttc.ca/transparency-and-accountability/Annual-Reports

3 Per CTA Financial Statements for 2019 and 2018, based on fare and pass revenue and operating expenses before provisions, as reported on page 10. Report available at: https://www.transitchicago.com/finance

The 2010 service cuts had a major impact and frequency has not been restored.

Visualizing the impacts of the 2010 service cuts

In spring 2010, CTA implemented a 16% reduction in bus service and a 10% reduction in rail service. Frequencies were reduced on 119 bus lines, and hours of operation were reduced on 41 bus lines, by an average of 1.5 hours.

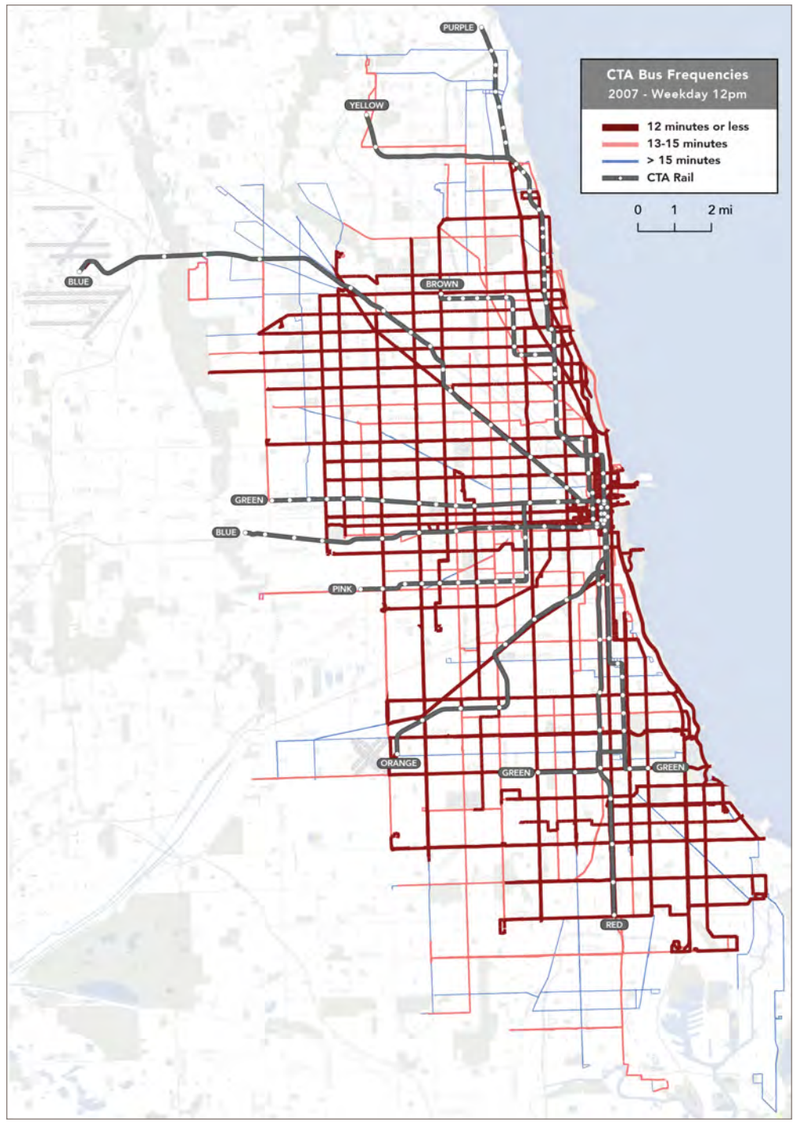
Figure 11 shows maps comparing 2007 and 2019 bus line frequencies on weekdays at noon[1]. These help illustrate the magnitude of bus service reduction since the late 2000s, and its impacts in terms of the loss of convenience for passengers. In particular, the maps illustrate that:

- **The share of residents near the most frequent service has declined considerably.** In 2007, 68% of service area residents lived within a half-mile of service every 12 minutes or better all day on weekdays. In 2019, this has declined to 56%.
- **Many areas used to have more frequent service than they do now.** The impacts of frequency reductions are particularly visible west of Kedzie Ave and north of Belmont Ave.

Reading the Map Frequencies

- **Dark red lines run every 12 mins or better**. Most frequent and convenient.
- **Pink lines run every 13 to 15 mins.** Somewhat frequent, but a few minutes delay can result in a 20 minute wait.
- **Light blue lines run every 16 to 30 mins.** Less frequent and less convenient. Many passengers time their trips to catch the bus, instead of leaving whenever they want.

2007 CTA Bus Line Frequencies
Weekdays at 12 PM



2019 CTA Bus Line Frequencies
Weekdays at 12 PM

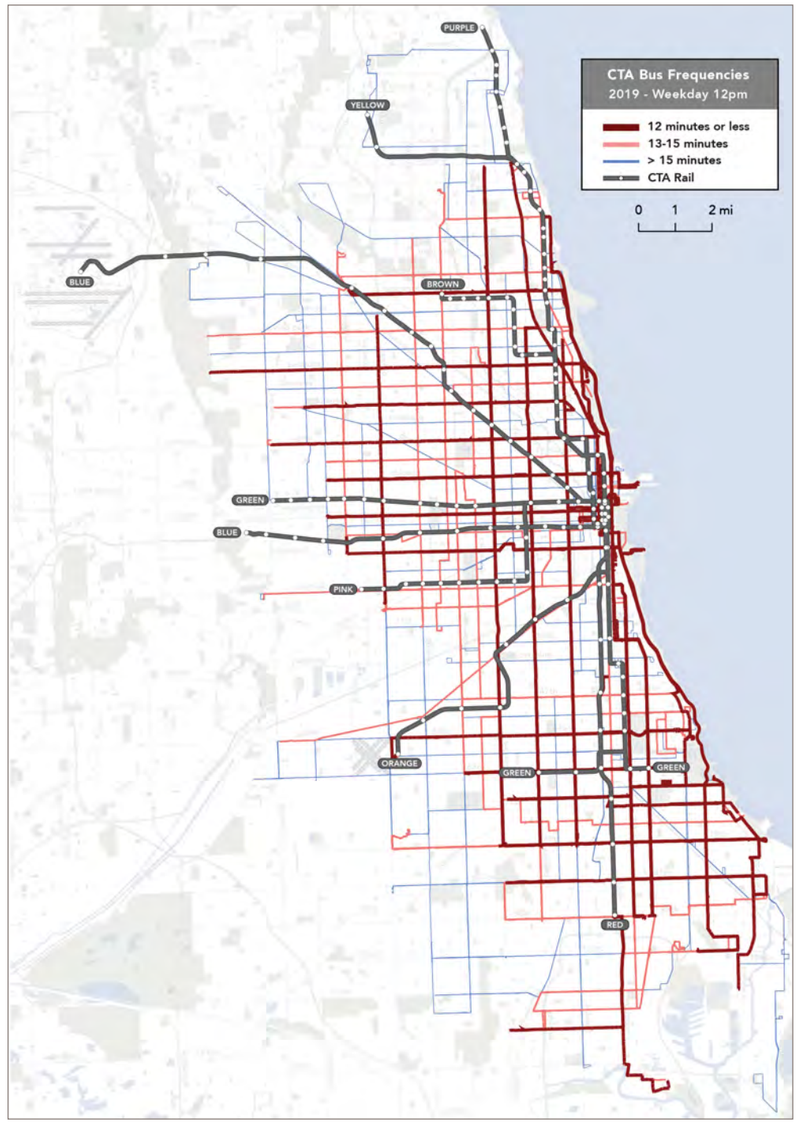


Figure 11: Maps of bus frequencies on weekday in the middle of the day, in 2007 vs. 2019. Frequencies depicted correspond to the 90th percentile of scheduled time between any two buses on each line between 11 AM and 1 PM in each year.

1 Noon is typically when service levels are lowest during the day, illustrating a minimum frequency many riders learn to rely on.

Bus ridership declined during the 2010s.

Service levels remained below pre-recession levels.

CTA has made many adjustments to service since 2010, and bus service did increase in the 2010s, from 5.68 million in-service hours in 2011 to 5.84 million hours in 2019 (+3%). Nonetheless:

- **CTA provided nearly 14% less bus service in 2019 than it did in 2007**, as illustrated in Figure 12.
- **Service reductions have impacted nearly all times of day**, as shown for weekdays in Figure 13. Similar patterns exist on weekends, although the percentage reduction is slightly less.
- **The impact of service cuts has been felt throughout Chicago**, as shown on the maps in Figure 11 on page 18.

Ridership decline

From 2012 to 2019, ridership on CTA buses declined by over 20%. Several factors likely contributed to ridership losses since 2012, including:

- **Shifts in population and jobs** increased travel demand to areas near rail stations, shifting some passengers from bus to rail.
- **Competition from Transportation Network Providers (TNPs)**, such as Uber and Lyft likely reduced the total number of transit riders.
- The relative **increase in pass costs in 2013** caused many riders to switch to individual fares, likely reducing their transit use.

However, the sheer scale of bus ridership decline and its distribution in space (as shown in the following pages) suggests it may also partly be due to the **reduced availability and convenience of bus service.**

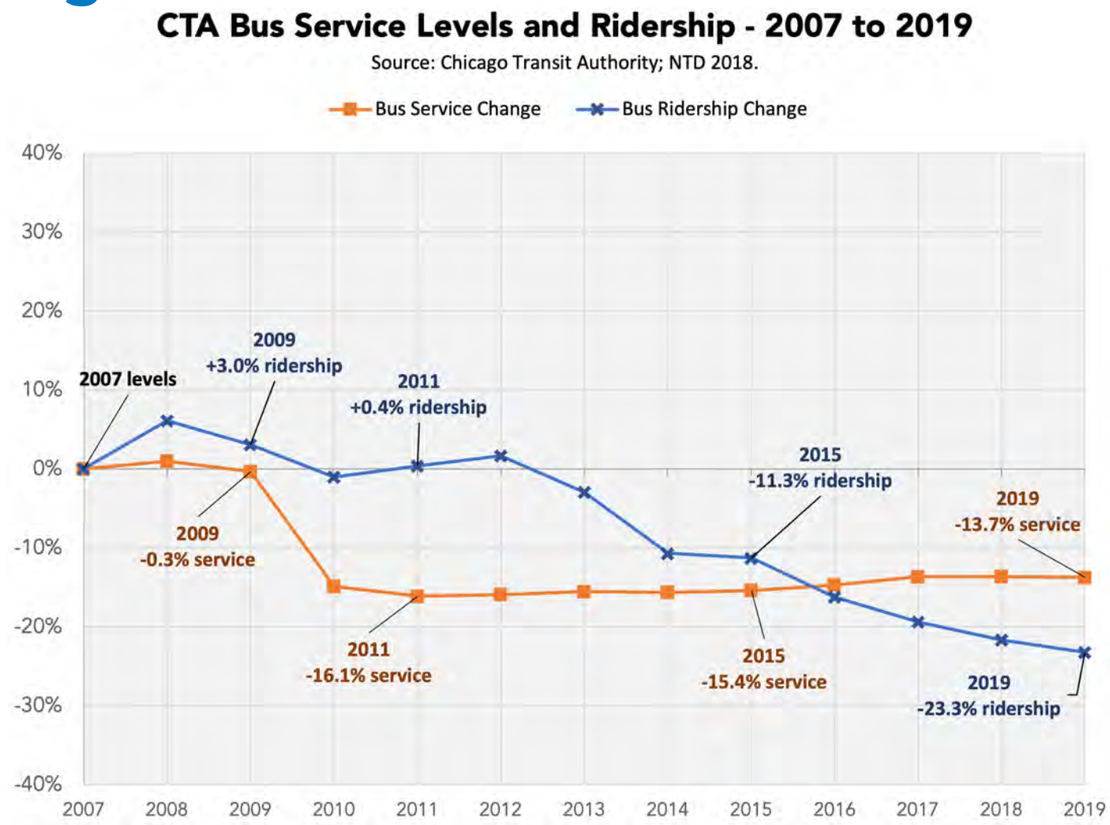


Figure 12: Comparing changes in the amount of CTA bus service to changes in ridership. Service is calculated as annualized in-service hours based on CTA weekly schedule data in each year. Ridership is calculated from Unlinked Passenger Trips reported in the National Transit Database (NTD).

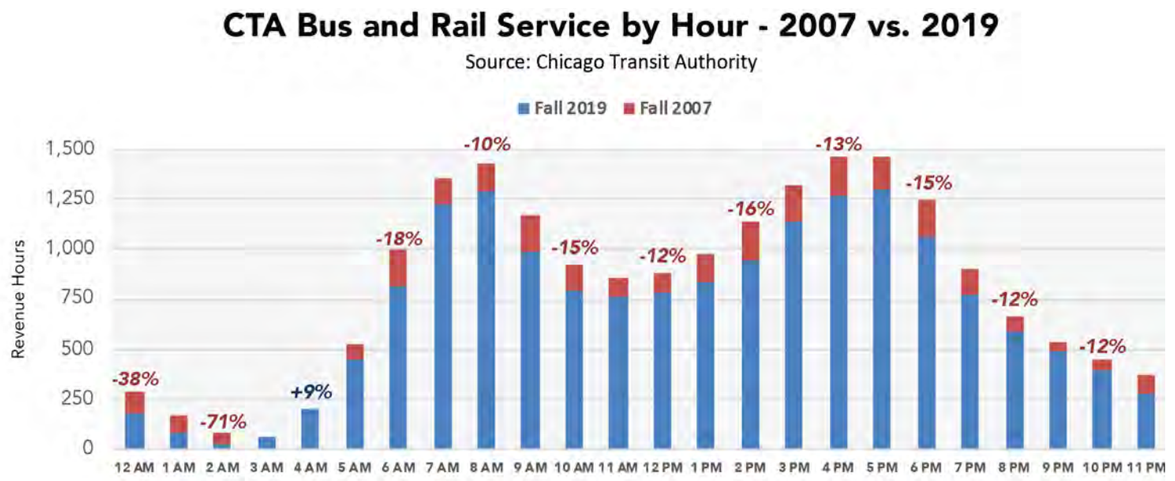


Figure 13: The total amount of CTA bus service available on weekdays, by hour of the day, in 2007 and 2019, based on published weekly schedules. The amount of bus service provided has declined at nearly all times of day and night. The only exception is between 3 and 5 AM, when service was very low to begin with.

Part of the decline in bus ridership reflects changes in where people live.

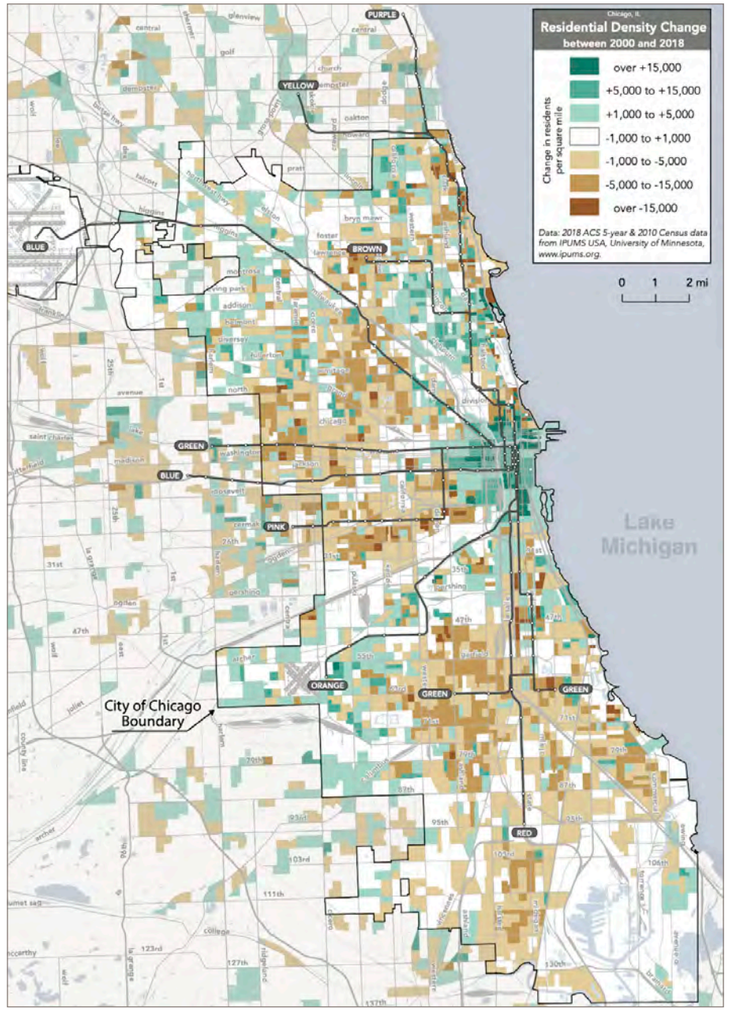
In Figure 14 on this page:

- The map on the left shows the change in population density[1] in different parts of Chicago from 2000 and 2018. Green represents an increase in the number of people living in an area and brown represents a decrease.
- The map on the right shows how much CTA ridership (bus and rail) has changed in different areas from 2008 to 2019. Blue represents increases; red/orange represents decreases.

These maps show that:

- **The largest area of population growth since 2000 has been within 2 miles of the Loop**. Despite this, transit ridership in the central Chicago has declined at similar rates to system wide ridership change.
- **Outside central Chicago, areas near rail have tended to grow more** (or decline less) in population than similar areas further out, **and have experienced much less transit ridership decline** than areas served only by the bus network.
- **Large parts of the South Side, West Side and some of the Far Northeast have experienced significant population loss.** Most of these areas have (or had) large Black majorities. All feature disproportionately low-income populations. Many are far from rail, and have long been core markets of the CTA bus network. On the South Side in particular, lower transit ridership appears to be linked to population decline.

Change in Residential Population Density (2000 vs. 2018)



Change in CTA Ridership (2008 vs. 2019)

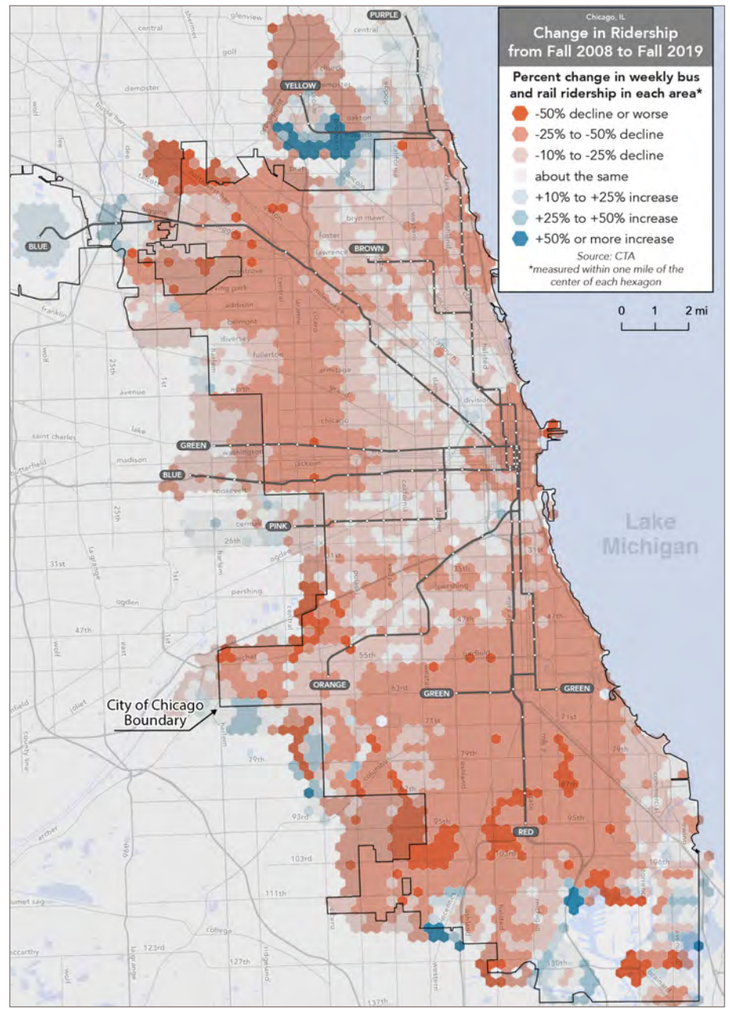


Figure 14: Maps of the CTA service area comparing change in population densities from 2000 to 2018 (left) to change in CTA ridership from 2008 to 2019 (right).

As growth concentrated Downtown and along a few rail corridors, the share of CTA ridership on buses went from 62% in 2007 to 52% in 2019.

1 How many people live in an area, per square mile of area.

And another part reflects changes in where people need to go.

In Figure 15 on this page:

- The map on the left shows the change in density of jobs[1] between the years 2002 and 2017. Green represents an increase in the number of jobs in an area and purple represents a decrease.
- The map on the right shows how much CTA ridership (bus and rail) has changed in different areas from 2008 to 2019. Blue represents increases; red/orange represents decreases.

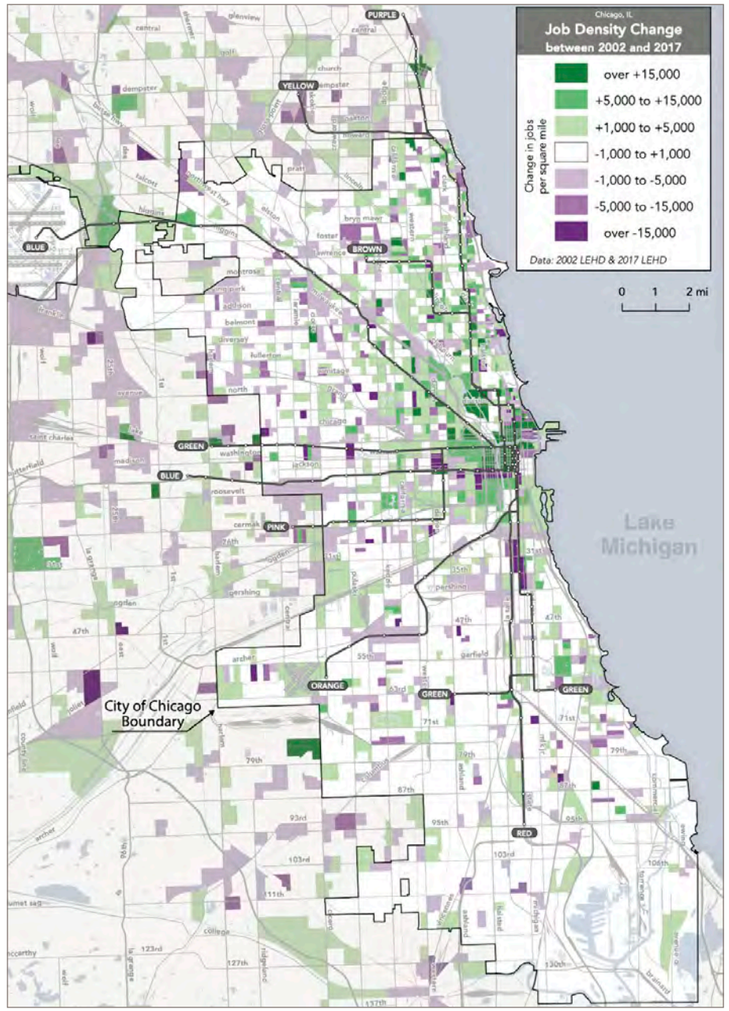
These maps show that:

- **As with population, the largest area of consistent growth in jobs since 2000 has been within 1 to 2 miles of the Loop.** In addition to Downtown and River North, there has also been significant job growth in the West Loop.
- **Job growth outside central Chicago has been concentrated on the North Side**, especially along the Red, Blue and Brown lines. Many of these areas have experienced much less transit ridership decline than average since 2008, or have experienced overall ridership growth.

The shifts illustrated in the last two pages show the complex interactions between transit service levels, ridership and the development of the city.

- When areas near rail grow faster, rail ridership tends to grow faster than bus ridership. In the 2010s, this drove relative increases in rail service[2].
- CTA service cuts did not cause the massive out-migration from the South and West sides, but part of this shift may have been exacerbated by long-term declines in bus service. As population in any area declines, transit ridership in that area tends to decline as well.

Change in Job Density
(2002 vs. 2017)



Change in CTA Ridership
(2008 vs. 2019)

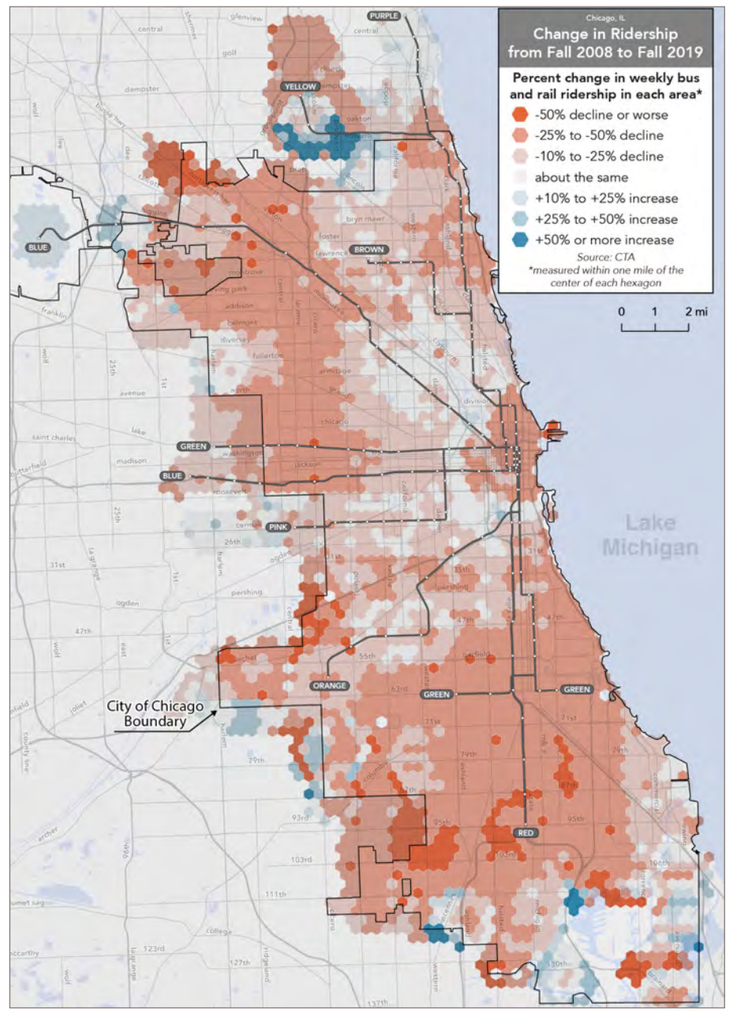


Figure 15: Maps of the CTA service area comparing change in job densities from 2002 to 2017 (left) vs. change in CTA ridership from 2008 to 2019 (right).

1 How many jobs are located in an area, per square mile of area.

2 According to the National Transit Database, CTA spent 38% of its operating expenses on rail in 2007, compared to 43% in 2019.

Ride-hail companies also have had a negative impact on bus ridership.

Total TNP Trips by Census Tract per Foot of Road, March 2018 – February 2019

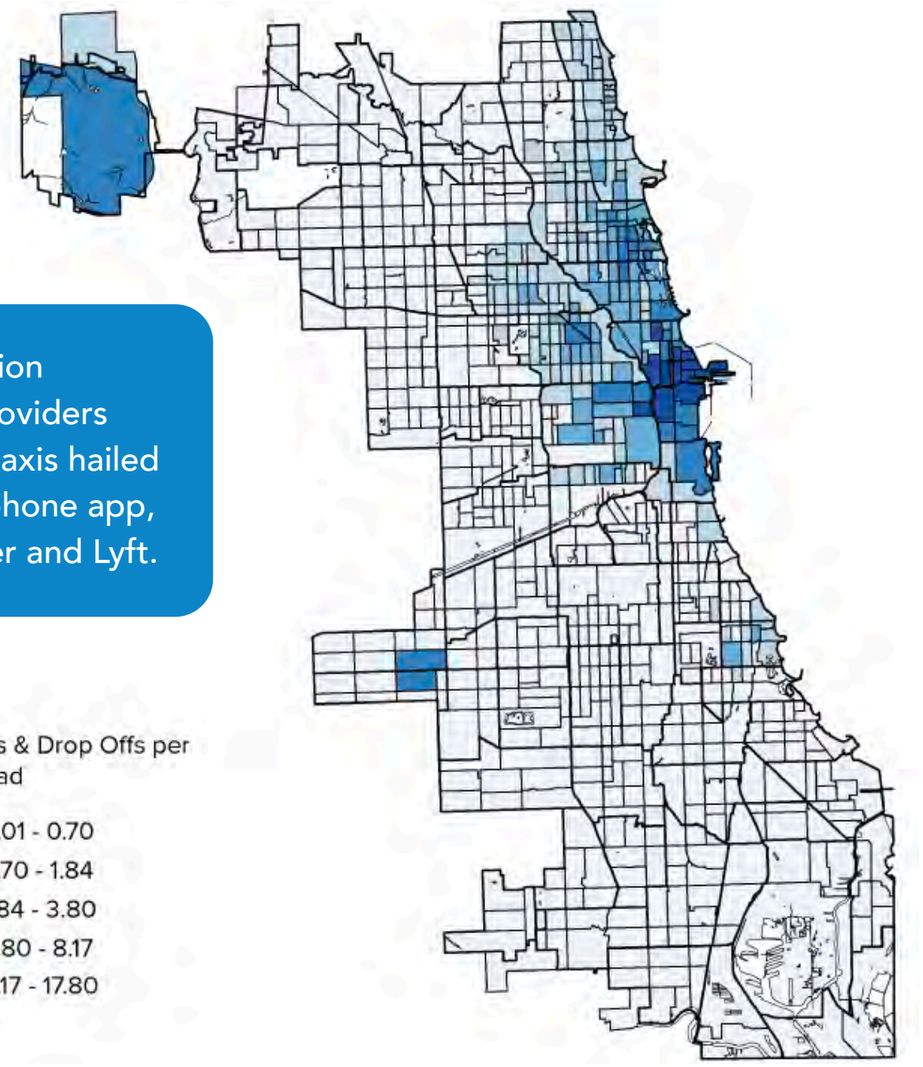


Figure 16: Map of the intensity of TNP use in different parts of Chicago in 2018-2019.
Source: City of Chicago, 2019. "Transportation Network Providers and Congestion in the City of Chicago".

Transportation Network Providers (TNPs) are taxis hailed by a smartphone app, such as Uber and Lyft.

Uber and Lyft compete with transit for riders.

Transportation Network Providers (TNPs)[1] offer taxi-like service dispatched through a smartphone app. TNPs have tended to offer high vehicle availability and discounted prices, subsidized by investor capital. As a result, TNP usage in Chicago grew quickly in the 2010s, from 28 million rides in 2015 to 103 million rides in 2018.

TNP drivers make the most money in areas where many people travel to many destinations over short distances, so TNPs and transit tend to compete for many of the same riders. Figure 16 (left) shows that TNP use in Chicago is heaviest in Downtown and the inner North Side. These are the densest areas in the city, where transit has the highest ridership potential, and CTA provides the most service per square mile.

Local and national studies have provided evidence that TNPs reduce transit ridership. **In a 2018 CTA rider survey, 48% of respondents who used TNPs said they would have used CTA for more trips if TNPs did not exist.** A nationwide study of transit ridership change suggests that the introduction of TNP-like services may have accounted for more than half of transit ridership declines in the 2010s[2].

TNPs increase congestion, impacting transit.

Rapid growth in TNP service has also caused a significant increase in vehicle miles travelled on city streets:

- TNP trips that replace transit trips require more vehicle miles per person, because fewer people share a vehicle.
- Every TNP trip requires more vehicle miles than the trip itself, because the driver must travel from their prior location to the place where their next ride begins.

According to the City of Chicago, **in 2018, TNP vehicles travelled 12 times more miles than CTA buses, but carried half as many passengers**[3]. In addition, half of TNP trips start or end in the Downtown area. This area is the most prone to congestion, and where the most buses converge. As such, TNPs have likely been a factor in worsening bus speed and reliability issues in the center of Chicago.

TNPs may be filling some of the gap left by lower evening frequencies.

CTA's ridership analyses show that evening ridership has been declining faster than ridership overall. In pre-pandemic conditions, TNP usage peaked significantly later and longer in the evening than transit.

- CTA ridership peaked in the 5 PM hour, and dropped below midday levels after 7 PM.
- TNP use peaked in the 6 PM hour, and remained above midday levels until 11 PM.

This may mean that people who would otherwise ride transit in the evenings are choosing to ride TNPs.

1 "TNP" is a Chicago-specific term. Other terms for this include "TNC", "ridehailing" or "ridesharing", although the majority of TNP rides are not shared.

2 TCRP 231 (2021), *Recent Decline in Public Transportation Ridership: Analysis, Causes, and Responses* . Available at: https://www.trb.org/Main/Blurbs/182505.aspx

3 City of Chicago (2019), *Transportation Network Providers and Congestion in the City of Chicago*. This report cites ~600 million TNP vehicle miles for approximately 100 million trips, compared to ~50 million vehicle miles and over 200 million annual boardings on CTA in 2018, per NTD. City report available at: https://www.chicago.gov/content/dam/city/depts/mayor/Press%20Room/Press%20Releases/2019/October/TNPCongestionReport.pdf.

But ridership also dropped most in the areas that lost the most service.

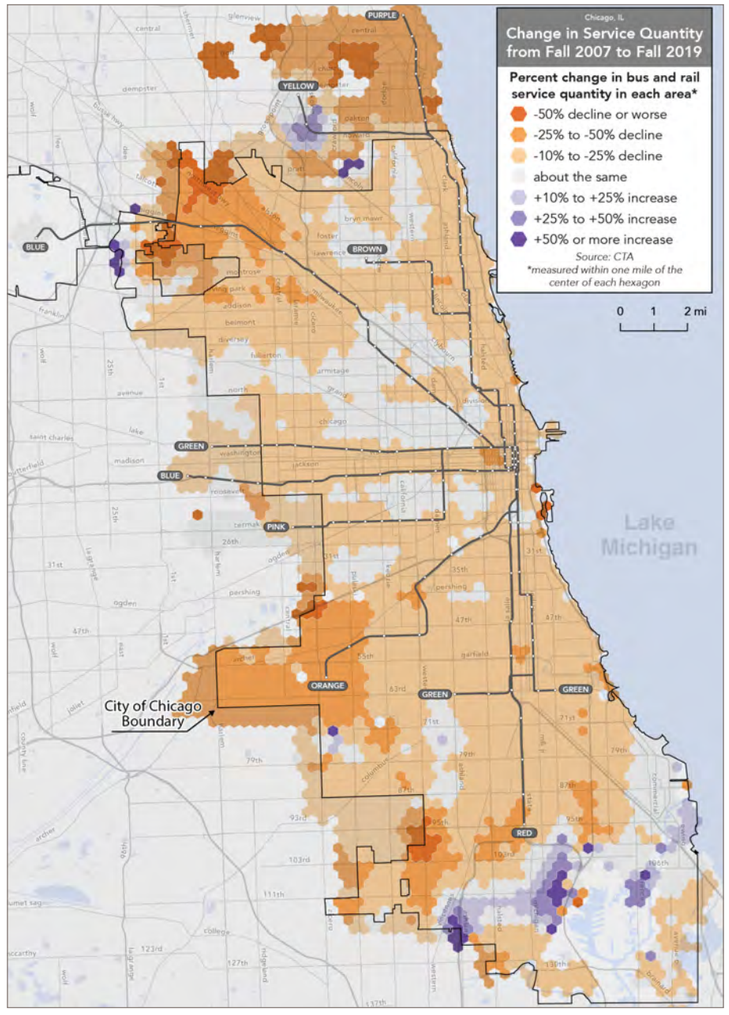
In Figure 17 on this page:

- The map on the left shows how much the total amount of CTA transit service (bus and rail) has changed in different areas from 2007 to 2019. Purple represents an increase in transit service nearby; orange represents a decrease. Because CTA operates many more bus trips than rail trips, this is mostly a map of bus service change.
- The map on the right shows how much CTA ridership (bus and rail) has changed in different areas from 2008 to 2019. Blue represents increases; red/orange represents decreases.

These maps show that, from 2008 to 2019:

- **Service levels and ridership declined almost everywhere.**
- **Areas that experienced the deepest service cuts tended to experience similarly deep declines in transit ridership.** This is especially visible in certain parts of the South Side; in areas north and west of Midway Airport beyond the reach of the Orange Line; and in parts of the Far Northwest.
- **On the West and Northwest sides, ridership decline mirrored losses of high frequency service.** Ridership declined more in areas west of Pulaski Ave. This reflects areas where many bus lines provide service every 12 minutes or better before 2010, but not after (see Figure 11 on page 18). The ridership decline in this part of Chicago was consistent across many neighborhoods, regardless of whether they grew or declined in population.
- Some areas at the edges of the network experienced ridership gains in percentage terms, but these tended to be places where overall ridership was low to begin with.

Change in the Amount of CTA Service Available (2007 vs. 2019)



Change in CTA Ridership (2008 vs. 2019)

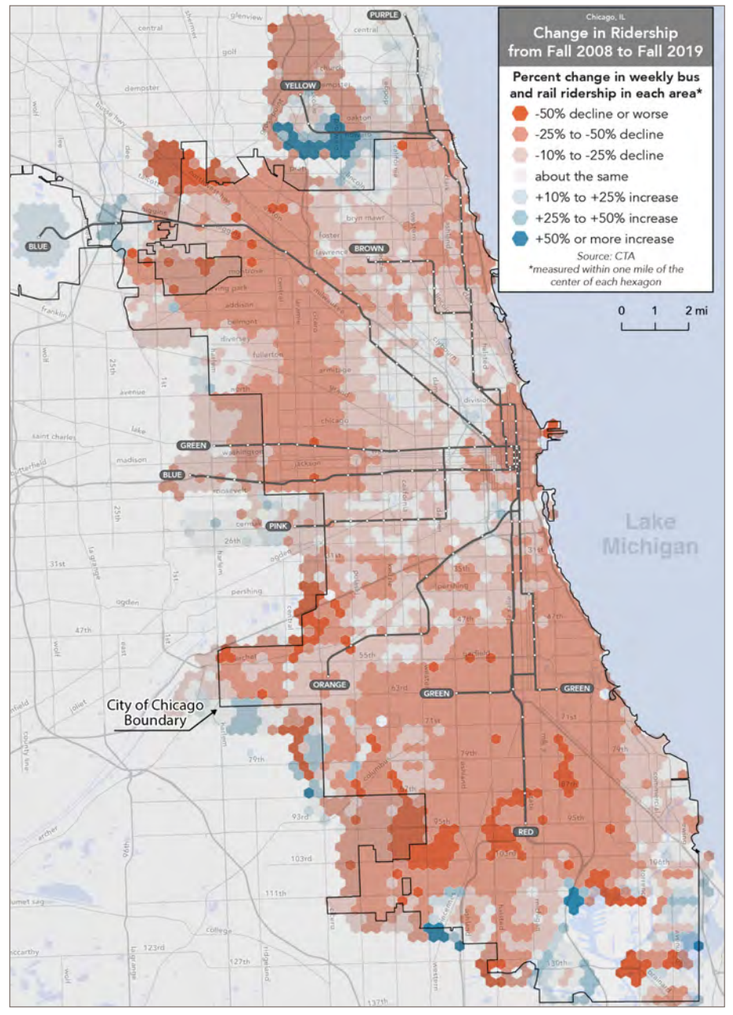


Figure 17: Maps of the CTA service area comparing change in the amount of transit service from 2007 to 2019 (left) vs. change in CTA ridership from 2008 vs. 2019 (right).

The COVID-19 pandemic had a major impact on ridership.

The pandemic presented CTA with significant operational challenges, such as changing public health regulations and high rates of driver absences and turnover, due to health concerns or changed home situations.

The conditions experienced during the pandemic have evolved over time. But ridership patterns observed in 2020 do lay bare the unequal level of need experienced by different types of riders.

Ridership collapsed in 2020, and has not fully recovered.

Figure 18 shows how CTA monthly ridership evolved from November 2019 to June 2023.

In the early pandemic with strict stay-at-home orders, bus and rail ridership collapsed. In April 2020, bus ridership declined by 71% and rail ridership declined by 88% compared to 2019.

As shown in Figure 19 (on the next page), a large part of this decline was concentrated in weekday morning and afternoon peak hours (7 AM to 9 AM; and 3 PM to 6 PM). This reflects school closures, the immediate loss of many jobs, and transitions to work from home for white collar workers.

As reopenings have proceeded, some riders have returned, but ridership remains far below pre-COVID levels. As of June 2023, ridership was still down by 33% on buses and 45% on rail compared to 2019.

There are many reasons for this slow recovery. One of the most impactful ones may be the slow recovery of Downtown activity. Cell phone activity in Spring 2023 remains at just 52% of pre-pandemic levels[1], suggesting far fewer people are travelling to the single largest destination for the CTA network.

In addition, similar to other transit agencies in the United States, CTA has faced challenges with workforce availability. This has impacted CTA's ability to deliver full intended levels of service throughout Chicago.

Peak hour ridership increased after schools started reopening in 2021, and has continued to grow since then. As of May 2023, about 47% of weekday CTA boardings happened at peak hours, similar to 2019.

Pandemic-era riders were essential and disadvantaged.

According to the results of CTA's 2020 Ridership Survey, pandemic-era transit riders:

- **Ride often.** 52% rode at least 4 days a week, 23% rode 6 or 7 days per week.
- **Lack alternatives.** 73% were from households with more drivers than vehicles. Only 7% of commuters said they could have driven a car for the last trip they took by transit.
- **Hold jobs that can't be done remotely.** 84% of commuters reported an occupation that requires being on site.
- **Have lower incomes.** Median respondent incomes were $40,000 per year, compared to $60,000 in a comparable 2018 survey.
- **Were more likely to be Black.** The share of Black respondents increased by nearly 70% since a comparable 2018 survey.

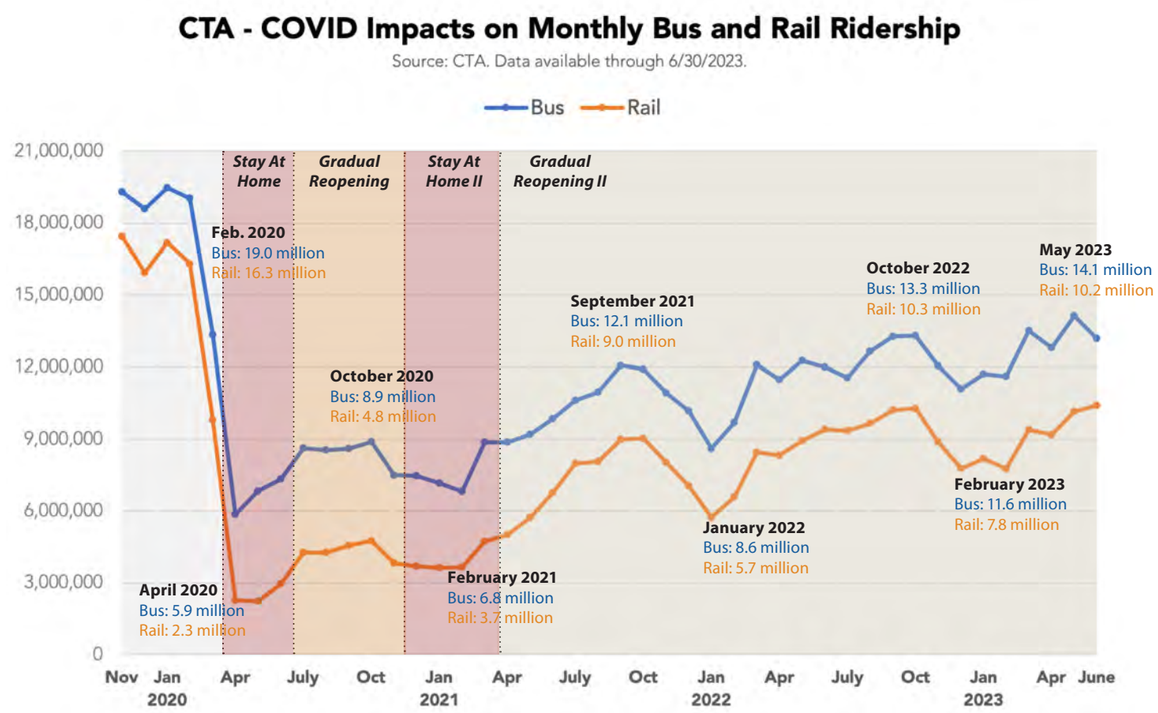


Figure 18: The change in monthly CTA bus and rail ridership from November 2019 to June 2023.

1 According to the University of Toronto's Downtown Recovery Index. Available at: https://downtownrecovery.com/charts/rankings

Early pandemic ridership impacts were very unequal across Chicago.

Figure 20 shows how CTA ridership shifted from April 2019 to April 2020. On this map, blue dots are bus stops where ridership declined less than average, and red dots are bus stops where ridership declined more than average. In the deepest part of the pandemic, when only the most essential trips were being made:

- **Ridership declined least in low-income, majority Black areas.** This was clearest in the early days of lockdown. In April 2020, ridership was down about 90% along the North Lake Shore, but only down about 55% on many South Side bus lines.
- **Ridership declined less on weekends.** Sunday bus and rail ridership in April 2020 was 61% lower than in April 2019, compared to 76% lower on weekdays. This pattern persisted through part of 2021, and began changing as weekday peak-hour ridership returned.
- **Rail ridership declined more than bus ridership.** This was likely a function of who was riding in 2020, compared to 2019. Pre-pandemic rail ridership tended to be more peaked, more weekday-focused and more Downtown-focused than bus ridership.

These findings provide insight into who may benefit the most from transit in Chicago: people with low incomes and few alternatives, who may need to travel at any time of the day, and aren't necessarily going Downtown.

However, some of these trends have changed since 2021. For example, as of May 2023, ridership on some major South Side lines[1] remained about 45% below 2019 levels. In contrast, on comparable North Side lines[2], ridership is only about 35% below 2019 levels.

1 Such as Lines 63-63rd (-42%), 79-79th (-44%), and 87-87th (-47%)

2 Such as Lines 77-Belmont (-38%), 80-Irving Park (-33%) and 81-Lawrence (-28%)

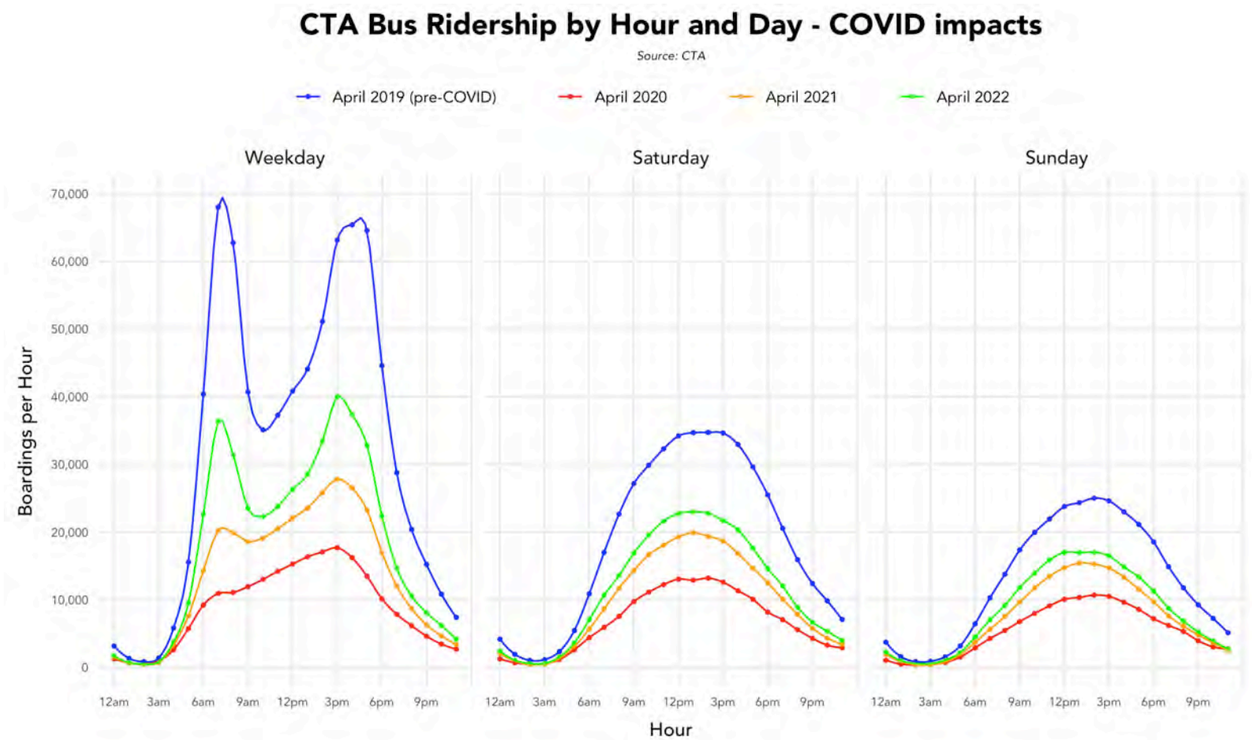


Figure 19: CTA bus ridership by day and hour, April 2019 (pre-COVID) vs. April 2020, April 2021 and April 2022.

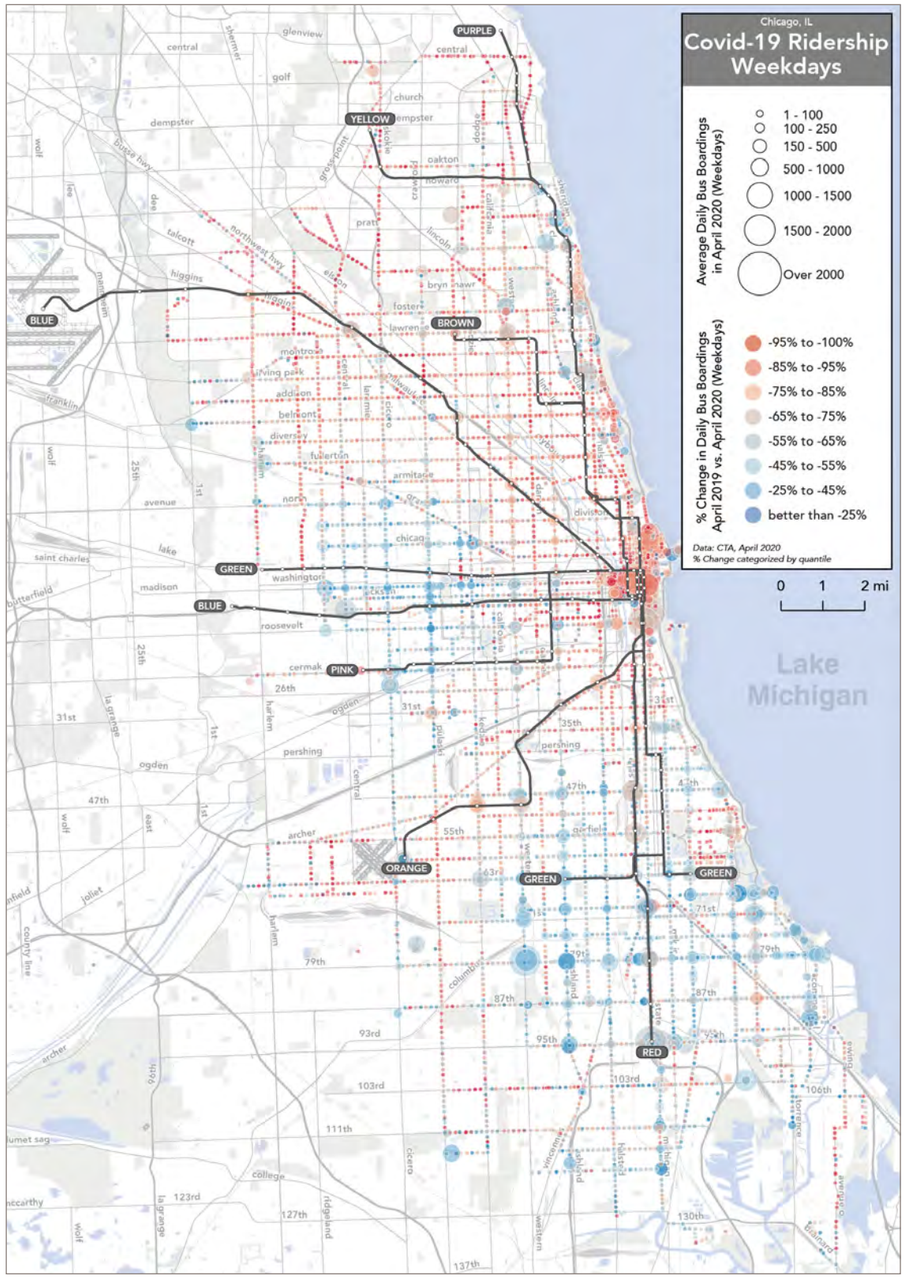


Figure 20: Map of change in weekday ridership by bus stop in Chicago, comparing April 2019 (pre-pandemic) to April 2020 (early lockdown).

3 What makes the bus network useful?

This chapter helps explain how transit works, what makes transit useful, and how transit can serve the goals described in Chapter 1.

This is essential to understand how some of the challenges to the CTA bus network identified in Chapter 2 might be addressed.

What's in a transit network?

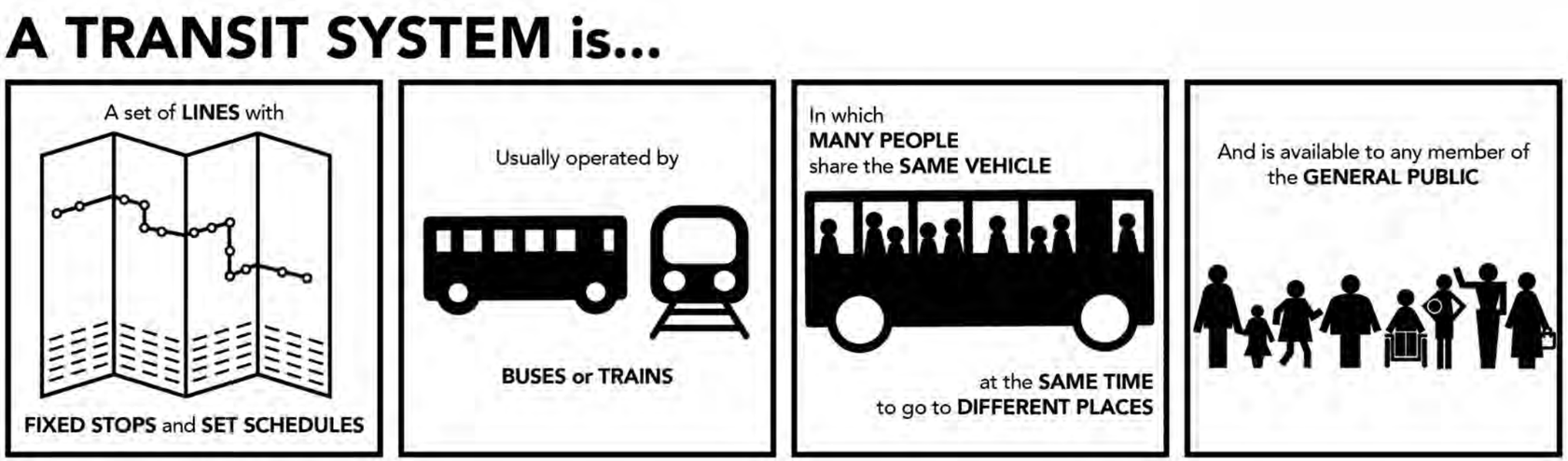


Figure 21: A transit network enables people to travel to many places throughout a city or region.

In a city like Chicago, there isn't enough space for everyone to travel by car. Many people also can't or don't want to drive (or bike), but need to go further than their feet will take them. Even many people who do drive (or use a bicycle or scooter) may not want to for all their trips, depending on where and when they need to go.

Transit is essential in meeting these needs, by providing a way for people to move around the city and access the places they need to go. Figure 21 illustrates what defines transit, as distinct from other forms of transportation. This includes:

- A set of lines, operating with fixed stops and schedules, usually operated by buses or trains.
- Many people sharing the same vehicle at the same time, even though they are going different places.
- Service available to any member of the public.

When many transit lines exist in the same general area, they can form a transit network that enables people to travel to many places.

For the purposes of this report, transit does not include:

- Microtransit services, where routes and stops vary according to ride requests, and relatively few people share a vehicle at the same time.
- Taxis and Transportation Network Providers (TNPs), like Uber or Lyft, which do not have set routes or schedules.
- Shared bicycle or scooter systems like Divvy, where each vehicle is intended to be used by one person at a time.
- Private buses, which are not available to the general public and often charge higher fares.

COVERAGE: To be useful, transit needs to be near many people and places.

How much coverage does the CTA network provide?

The first thing most people notice about a transit line is where it goes. So it's useful to consider how many people and places the CTA network serves.

Figure 22 shows that in 2019, **86% of residents and 79% of jobs in the CTA service area are located within a half-mile walk of a CTA rail or bus stop**. These percentages increase to 93% of residents and 86% of jobs when including Pace bus lines.

Most residents (64%) and many jobs (32%) are both within a half-mile walk of a CTA bus stop, but farther from rail. These numbers reflect that the bus network provides the bulk of the transit system's coverage in Chicago's neighborhoods.

Since the January 2023 service optimization, the total number of people and jobs near service has not changed, but the number of people who live near high frequency service is temporarily lower, until CTA returns to full staffing levels.

What goals are served with extensive coverage?

By extending the reach of transit to the vast majority of residents of Chicago and its inner suburbs, the CTA bus network serves some of the goals detailed in Chapter 1, including:

Social Safety Net. Providing a basic level of insurance against insolation to people wherever they may be.

Health. Enabling basic access to a variety of health and social services.

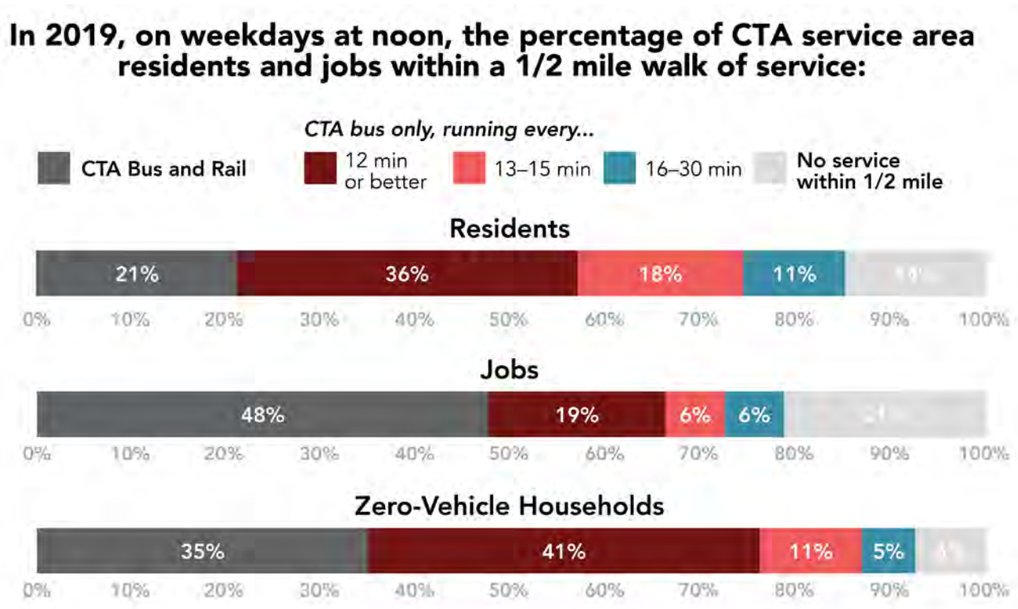


Figure 22: Proximity to the CTA bus and rail transit system in 2019. Overall network coverage is similar since the January 2023 service optimization, but fewer people and jobs are near high frequency service.

The limits of coverage

More broadly, **a high degree of coverage does not necessarily mean that the transit service is useful to most people.**

A bus stop near your house is no guarantee of useful service. The following factors are also key to determining whether service is useful:

- **Frequency.** A bus that can be relied on to come by often is useful for more trips.
- **Span.** Bus lines are useful for more trips when they have longer hours of service and operate seven days a week.
- **Access to Places**. A bus line is only likely to be useful if it takes people on a relatively direct path to the places you are going.

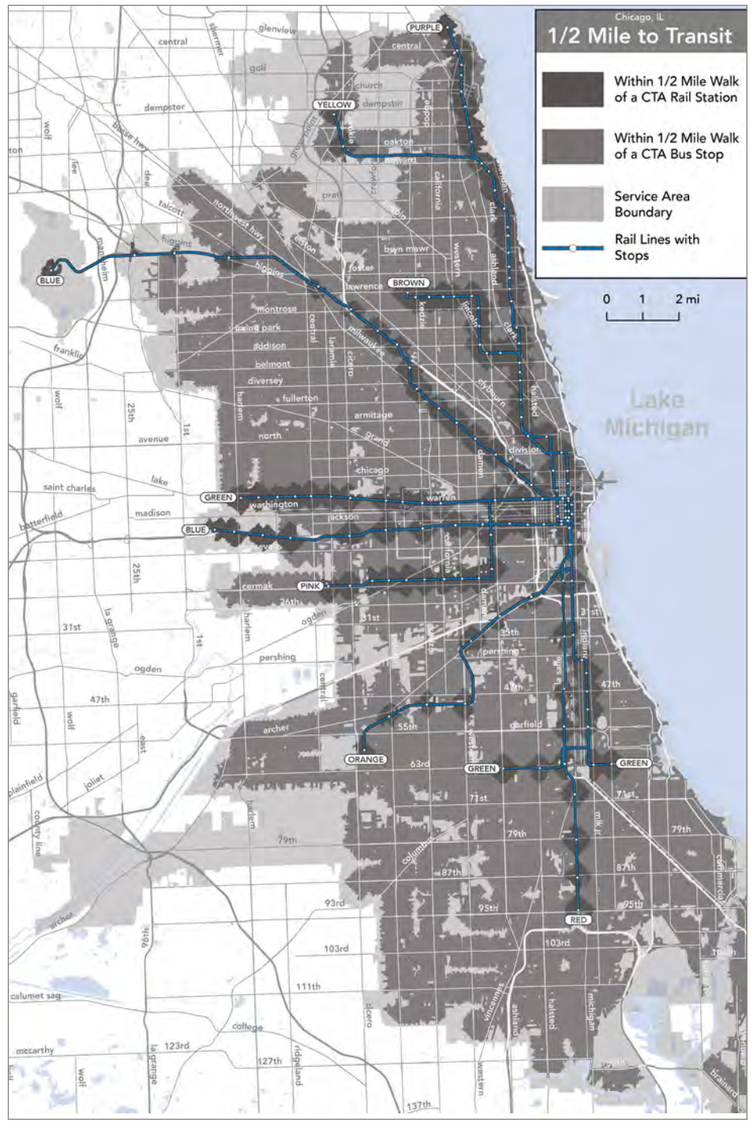


Figure 23: Map showing the 1/2 mile walk buffer for daytime bus and rail with the CTA's 2019 service area. Areas near bus and rail have not changed.

FREQUENCY: A bus that comes often is useful to more people, for more trips.

Frequency is how often the bus or train comes. Frequency is usually expressed as **"the bus or train comes every X minutes"**.[1]

Frequency can be invisible to people who do not use a bus or train regularly. But how often the bus comes is critical to any rider: it tells you whether or not you can count on the bus to get you places soon.

Frequency is freedom

High frequency provides several linked benefits:

- **Shorter Waits.** Unless you plan your life around a bus schedule, the average wait for transit is half the frequency. If a bus line comes every 30 minutes, the average wait will be 15 minutes. But if it comes every 10 minutes, the average wait will be 5 minutes.
- **Faster Transfers.** Many bus trips require connecting to a second line. Frequent service makes this connection easy, because the next bus is always coming soon. Infrequent service means you might have to wait a long time, in conditions that might feel uncomfortable or unsafe.
- **Easier Recovery from Disruption.** Frequent service is more reliable, because if a bus breaks down you don't have to wait as long until the next one shows up.
- **Spontaneity and Freedom.** When transit comes every few minutes, there's no need to build your day around a bus schedule. You can turn up at the stop and go, whenever you want.

1 Among transit planners and schedulers, the typical time between two buses or trains on the same line is also known as the "headway". High frequencies correspond to short headways.

Frequency and ridership

Figure 24 is a plot of all CTA bus lines in September 2019, based on their frequency[2] and productivity. Each line is represented by a dot. The location of this dot on the chart reflects the bus line's frequency (horizontal axis) and productivity (vertical axis) at that time.

"Productivity" means the number of people who board the bus for each hour it's operating. The plot shows that more frequent lines tend to be more productive, despite operating more service hours. In other words, **higher frequency services have much higher ridership.** This reflects a two-way effect:

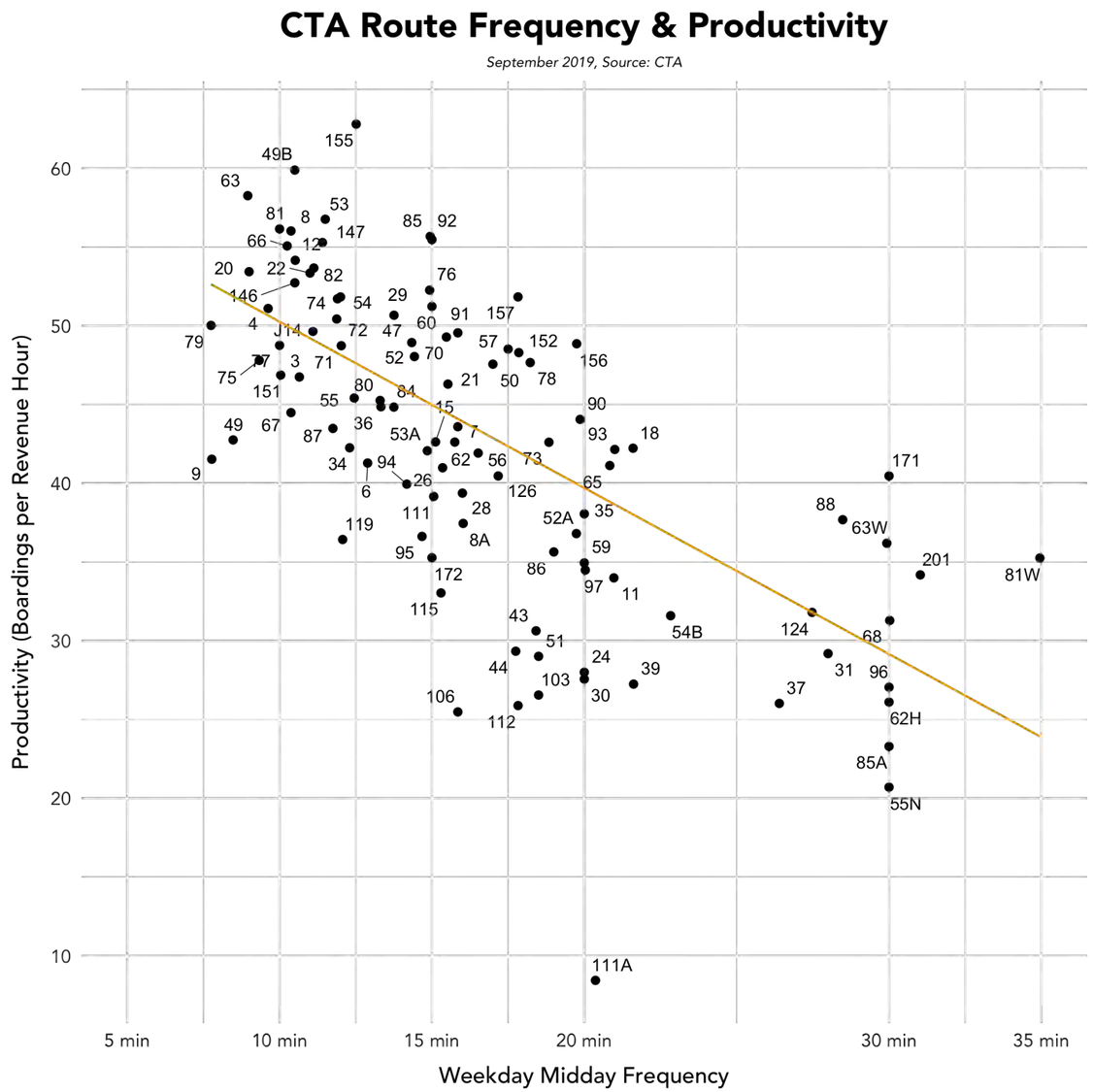
- Frequency is expensive to provide, so CTA generally provides higher frequency on lines where they expect higher ridership.
- Frequency makes service more convenient, so frequent bus lines attract more riders.

Coverage and frequency

Reflecting the importance of frequency, the chart in Figure 22 on page 28 distinguishes between service coverage at different frequencies. **The 57% of service area residents who lived near CTA service every 12 minutes or better are likely to find transit more useful on average than the 29% who lived near less frequent service.**

2 The exact measure used here (and on maps of midday frequency throughout this report) is the 90th percentile scheduled interval between two buses between 11 AM and 1 PM, in late 2019. In other words, the frequency we are showing approaches the worst-case scenario in the schedule for how long someone might have had to wait for the bus during the daytime.

Figure 24: How often the bus came on each CTA bus line (frequency - horizontal axis), to the average number of boardings per hour of service provided on that line (productivity - vertical axis), in 2019. A "revenue hour" means an hour that a bus is either operating on this line, or on break between two trips on this line.



ACCESS to all the city has to offer is the most important product of transit.

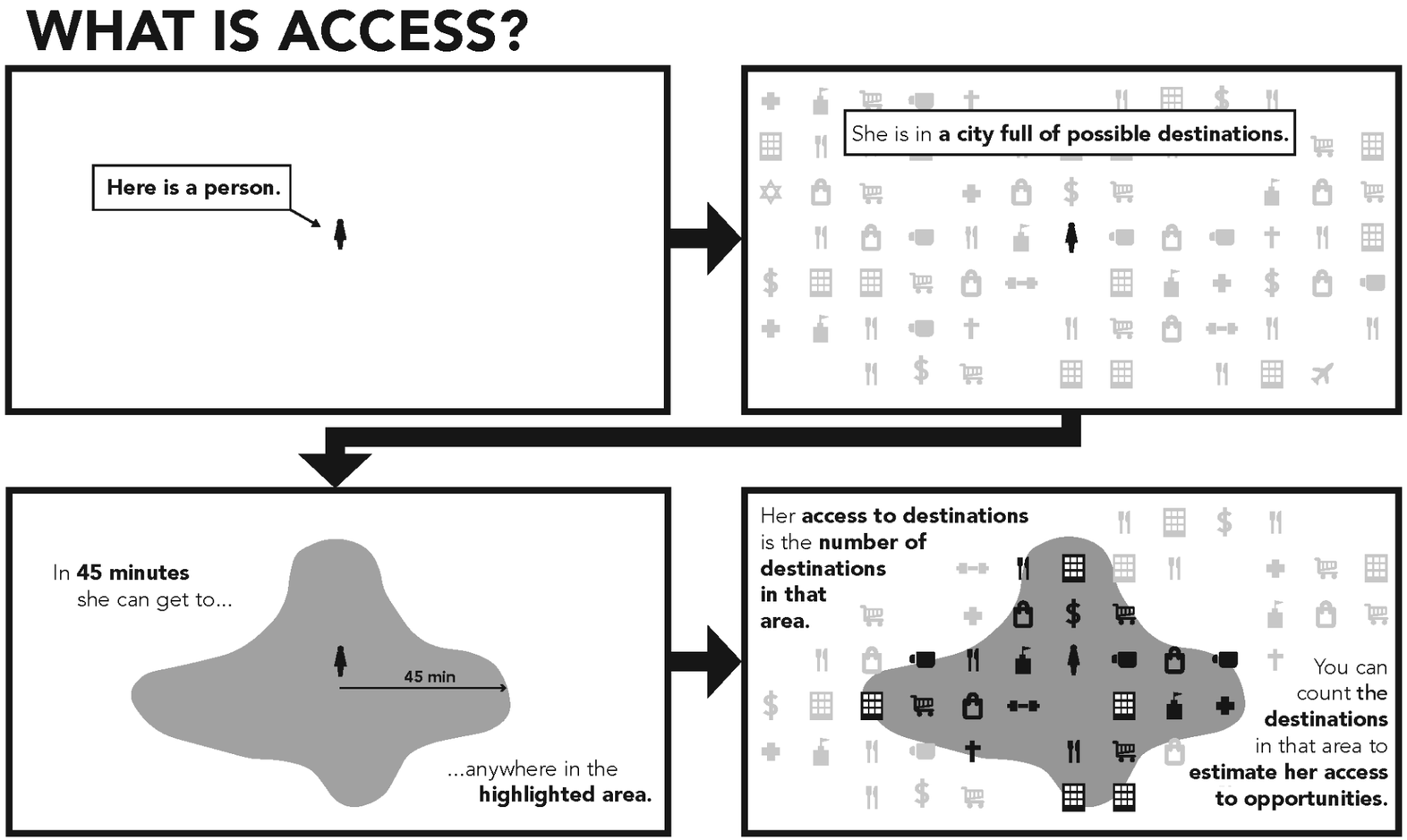


Figure 25: A person's access to opportunity can be pictured as an area on a map. Depending on what's in the area, someone may have more or less access.

The best thing CTA can do to make a person more likely to use transit is to increase the number of places they can reach quickly.

Access to opportunity is the **ability to reliably reach useful places** in a **reasonable amount of time.**

High frequency and broad coverage are necessary for an effective transit network, but they are only interesting because they reflect something more important: the ability to reach many places in a reasonable amount of time.

Whoever you are, and wherever you are, you have a limited amount of time available to travel for any particular trip. That amount of time defines how far you can go, and how many places you can reach.

You can think of all the places you are able to reach as an area on a map, as shown in the illustration in Figure 25. Within this area are all the things you can do. Outside this area are opportunities you usually can't access.

Fundamentally, transit makes it possible for people to access more places, without requiring a car.

Why does measuring access matter?

the point of living in a city is to

LIVE NEAR OPPORTUNITY

Cities are expensive places to live. And yet, people choose to live in them, because they want to live near opportunity. Cities provide more opportunities for jobs, education, services, shopping, arts and culture, and even simply meeting other people. Measuring access shows how much people can take advantage of these opportunities.

access to opportunity makes transit

USEFUL & LIBERATING

People want to be free. They want more choices of all kinds so that they can choose what's best for themselves. Access measures how we deliver those options so that everybody is more free to do whatever they want, and be whoever they are. Transit is a relatively low-cost way for everyone to access more options, without needing to own a vehicle or being able to drive one.

the degree of access indicates

RIDERSHIP POTENTIAL

If a transit network can enable a person to reach more of the places they want to access in a reasonable amount of time, it's more likely that they will use transit to get around. As a result, when transit creates access, it produces ridership. Measuring the amount of access to opportunities that a transit system provides gives a sense of how likely it is that people will use the system.

What goals does increasing access to the city by transit serve?

In addition to increasing ridership potential, expanding access for many people achieves the following important outcomes related to the transit goals outlined in Chapter 1.

Social Safety Net. Limiting impacts of economic disadvantage by allowing people who need transit most to reach the places they need to go.

Economic opportunity. Connecting people with jobs and services, and connecting businesses with workers and customers.

Climate & Environment. Reducing air pollution and greenhouse gas emissions, by giving more people a viable alternative to driving.

Congestion Mitigation. Limiting traffic and vehicle-related hazards, by reducing the number of people who need to drive to get around.

Health. Improving public health by increasing everyday physical activity, as people who ride transit are more likely to walk regularly.

Personal Liberty. Making it possible for people to use transit to reach a wider variety of places on a regular basis.

Measuring access requires understanding TRAVEL TIME.

Figure 26 explains the three elements of travel time: **walking**, **waiting**, and **riding**. If a trip requires **transfers** (changing buses or trains) the steps may be repeated.

There are limits to how much time people have.

Most people have a maximum amount of time they can reasonably spend going somewhere. This might depend on the importance of the trip or how often they have to make it.

CTA can't know anyone's exact limit, but it's easy to imagine that someone might consider where they can get to in 30, 45 or 60 minutes.

How this report measures access.

In this report, "access" means **all the places you could go in 30, 45 or 60 minutes after you:**

- **Walk** for the time it takes a typical adult to walk at the start, middle and end of a trip, and in the course of any transfers.
- **Wait** for half of the frequency of each bus or rail line that a person might be using, at the time they are travelling.
- **Ride** for the amount of time spent on the bus(es) or train(s), based on typical speeds in the areas the trip goes through.

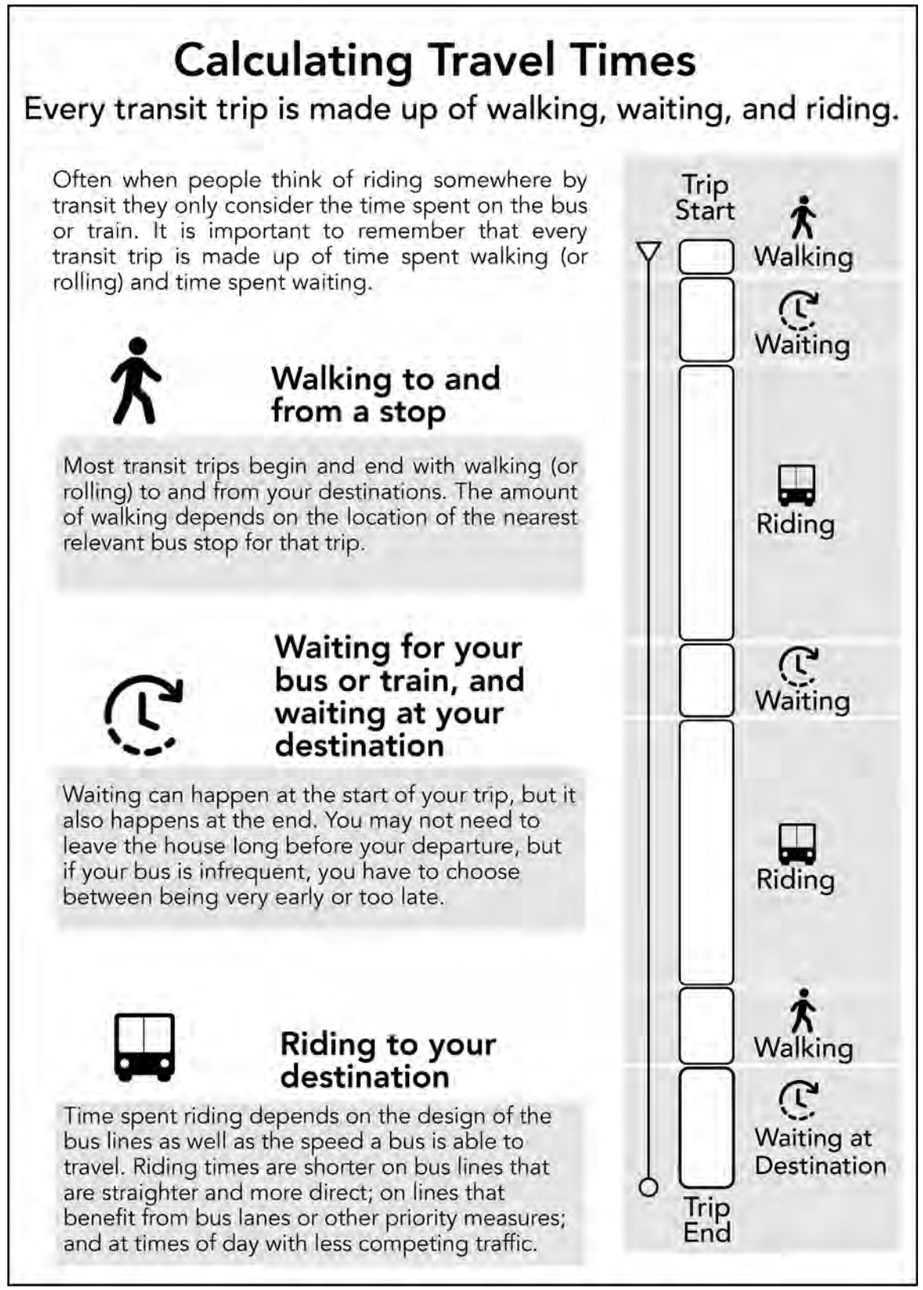


Figure 26: Travel time for a transit trip is made up of walking, waiting, and riding.

Important: waiting time counts!

Waiting time includes any time that you spend not being where you want to be. This describes the constraint that most people feel when they are expected to arrive somewhere at a specified time.

Waiting, in this sense, begins when you want to leave, not when the bus goes. Waiting can also occur at the destination. If you need to be at work at 8:00 and your bus gets there at 7:35 or 8:05, you will have to wait 25 minutes at your destination, or be late. Perhaps you can make some use of this time, but you'd probably rather have been in bed.

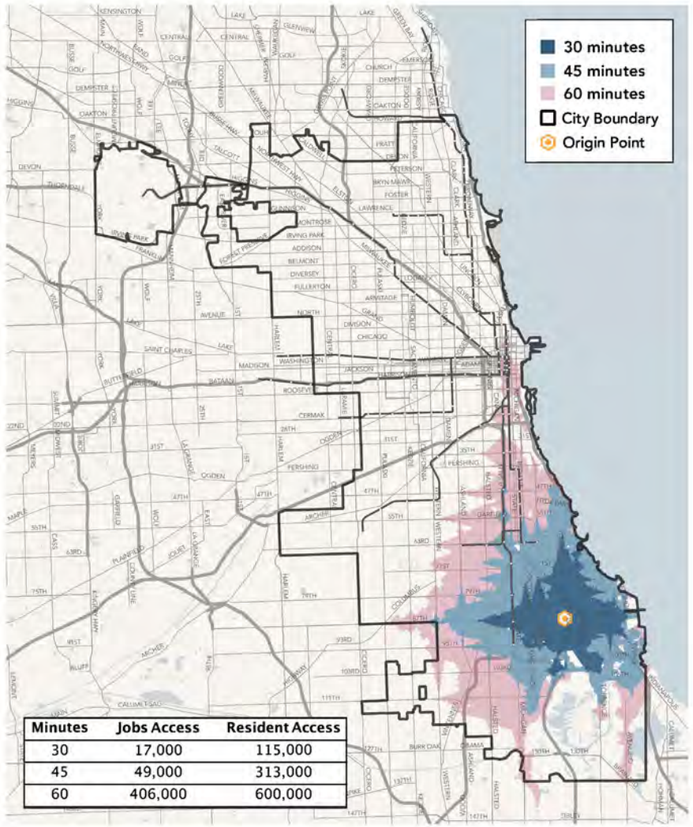
In the access maps and analyses shown in this report, average waiting time is calculated as half the frequency of each bus and rail line you would need to use. This reflects the fact that, if you might arrive at a bus stop at any time, your average wait will be half the time between two buses.

Examples of access by transit in 30, 45 and 60 minutes in Chicago.

The maps on this page show how far someone could travel at 12 PM on a weekday in 2019, by walking and transit.

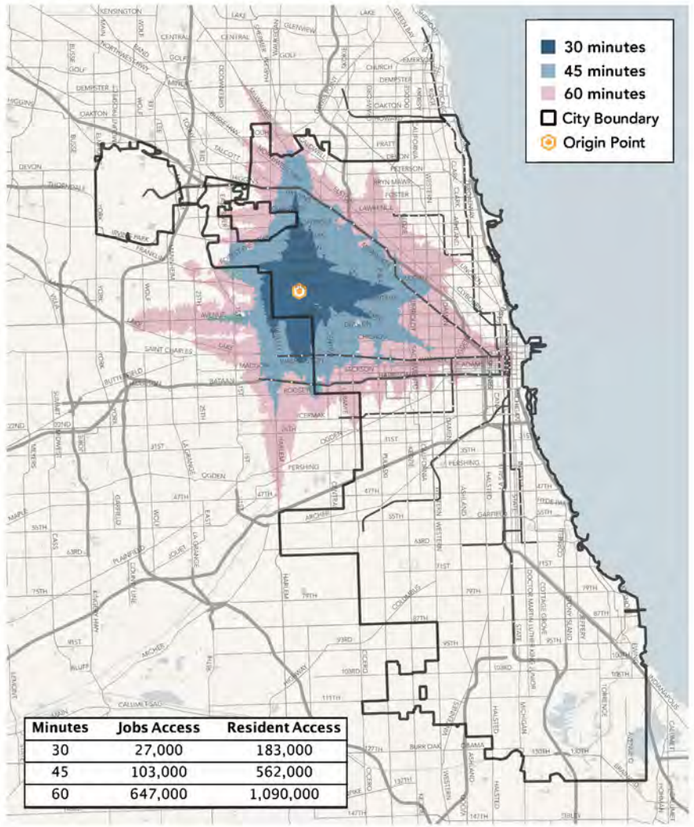
- **Areas in dark blue** are how far a person would reach in **30 minutes.**
- **Areas in light blue** are where the person would get to in **45 minutes.**
- **Areas in pink** are the additional distances a person would reach in **60 minutes.**

How far can I travel in 30, 45, and 60 minutes from
87th & Stony Island
at 12pm on a weekday?



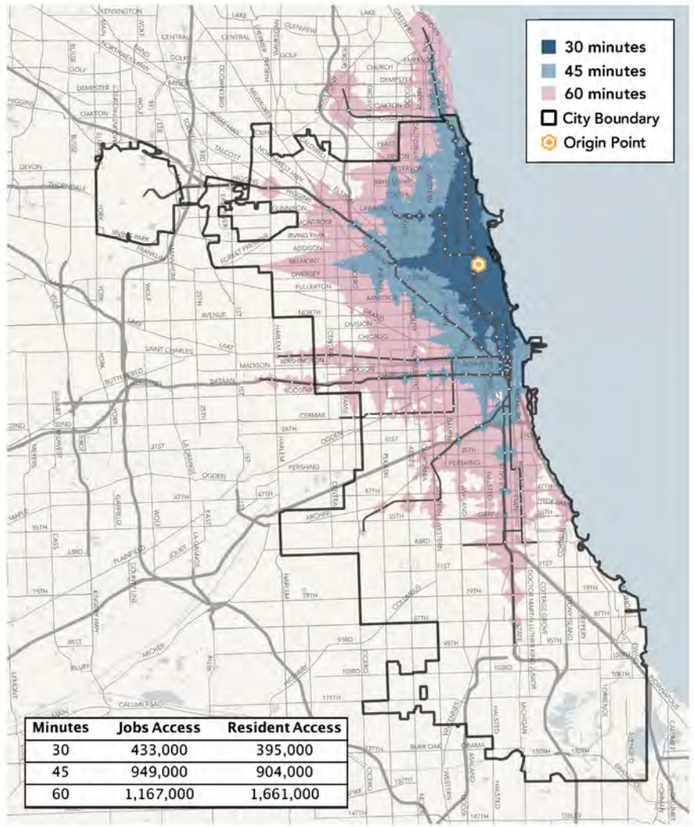
Minutes	Jobs Access	Resident Access
30	17,000	115,000
45	49,000	313,000
60	406,000	600,000

How far can I travel in 30, 45, and 60 minutes from
Narragansett & Diversey
at 12pm on a weekday?



Minutes	Jobs Access	Resident Access
30	27,000	183,000
45	103,000	562,000
60	647,000	1,090,000

How far can I travel in 30, 45, and 60 minutes from
Clark & Belmont
at 12pm on a weekday?



Minutes	Jobs Access	Resident Access
30	433,000	395,000
45	949,000	904,000
60	1,167,000	1,661,000

Figure 27: The maps above show the areas a person could access by transit in 30, 45 and 60 minutes in 2019, starting from three different locations: 87th and Stony Island on the South Side; Narragansett and Diversey on the Northwest Side; and Clark and Belmont on the inner North Side. The differences between maps show that the amount of access afforded by transit depends on where someone is located.

Chicago's transit system creates access with a FREQUENT GRID.

Frequent grids combine high frequencies with long and straight routes.

As was explained in Chapter 2 (see page 13), Chicago's extremely regular street grid naturally leads to a regular grid of straight bus lines, spaced every half-mile in both the North-South and East-West directions.

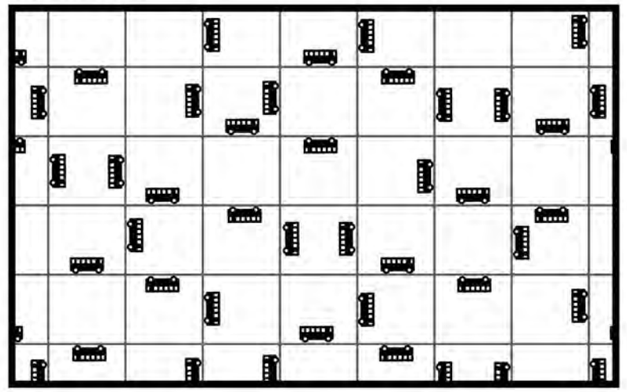
Frequent grids are able to minimize transit travel times in two important ways:

- **Less time waiting. High frequencies allow people to travel from anywhere to anywhere with a single fast transfer**. If you do need to transfer, you have to wait twice. So grids work much better when they connect frequent routes to other frequent routes, cutting down the total waiting time.
- **Less time riding. The straight lines of the grid, without deviations, are the shortest possible path.** In fact, the L-shaped trip, made by using two buses in the grid, often follows exactly the same path that you would use if driving.

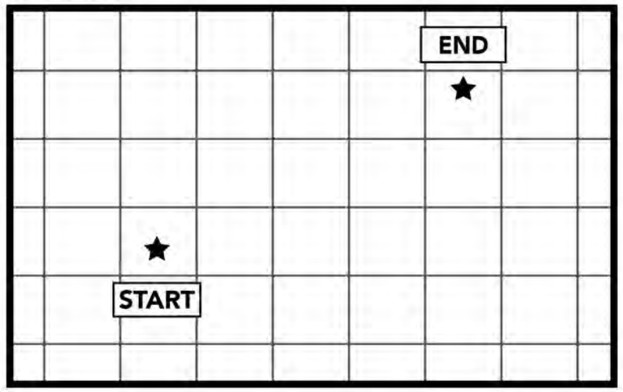
The effectiveness of the grid at providing access to the city at large is illustrated by the access examples in Figure 27 on page 33. In all three cases, the places people can reach in 45 and 60 minutes go far beyond the areas along the bus lines available at the start locations.

The Power of the Frequent Grid

A frequent grid consists of perpendicular lines all running **FREQUENTLY.**

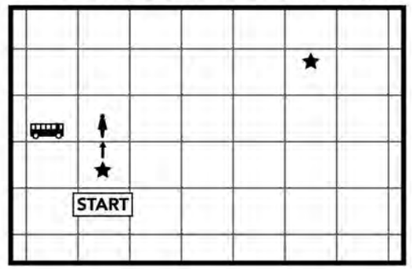


A grid serves trips from **ANYWHERE** to **ANYWHERE.** For example:

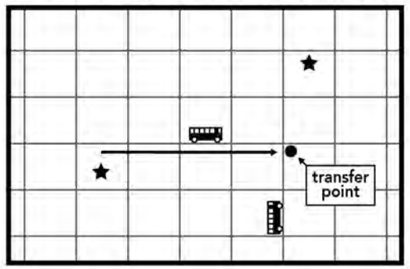


For ANY trip...

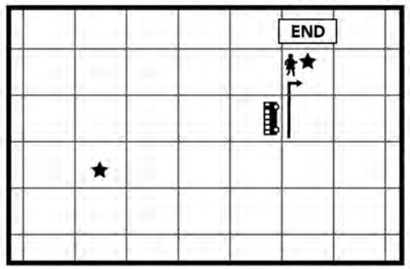
1. WALK and **WAIT*** for the first bus.
*The wait is **SHORT** because service is **FREQUENT.**



2. RIDE and **WAIT*** for the second bus.
*The wait is **SHORT** because service is **FREQUENT.**



3. RIDE and **WALK** to the destination.
You've arrived!



THE HIGH FREQUENCY IS CRITICAL.
It makes the **transfer fast**, so that the **whole travel time is reasonable.**

Figure 28: How frequent grids work.

The combination of grid routes with high frequencies is what has allowed CTA service to provide high levels of access to opportunity in most of the service area.

Transit's ability to provide access depends on its SPEED and RELIABILITY.

Maintaining reliable bus speeds is difficult.

Even if a transit line is frequent and direct, the amount of access it provides depends on how fast the bus can go. A slow bus means longer travel times and less access. CTA bus lines face multiple challenges in maintaining their speed:

- They usually **operate in mixed traffic**, and are impacted by general traffic congestion.
- They make **many stops**. Most CTA bus lines have about eight stops per mile. Rail station spacing is variable in Chicago, but most "L" lines make one to three stops per mile.
- They can experience **long passenger loading times**, particularly in areas and at times where many people get on and off.

Bus speeds vary by location and time of day.

Bus speeds vary by time of day. As shown in Figure 29 below, **buses tend to run slowest in the afternoon**, which is also when they experience the highest levels of ridership.

Figure 30 is a map of bus speeds in the CTA service area, on weekdays in the middle of the day in September 2019. Each 1x1 mile zone is shaded by the median scheduled speed of all CTA bus trips as they pass through that zone. This map shows that **buses run slowest in the busiest parts of Chicago,** and faster where population and job densities tend to be lower.

Figure 29 and Figure 30 reflect pre-COVID conditions. Speeds have changed as pandemic conditions have evolved. However, the general facts (slower buses in the afternoon and in busier areas) remain true.

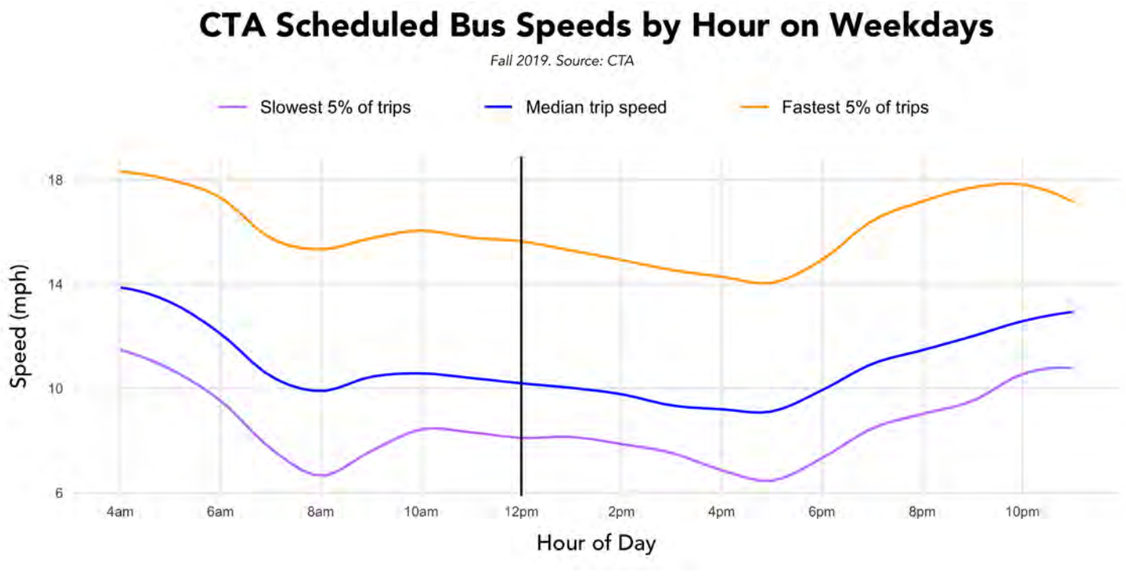


Figure 29: CTA Median, 5th and 95th percentile scheduled trip speeds by hour, Weekdays, Fall 2019

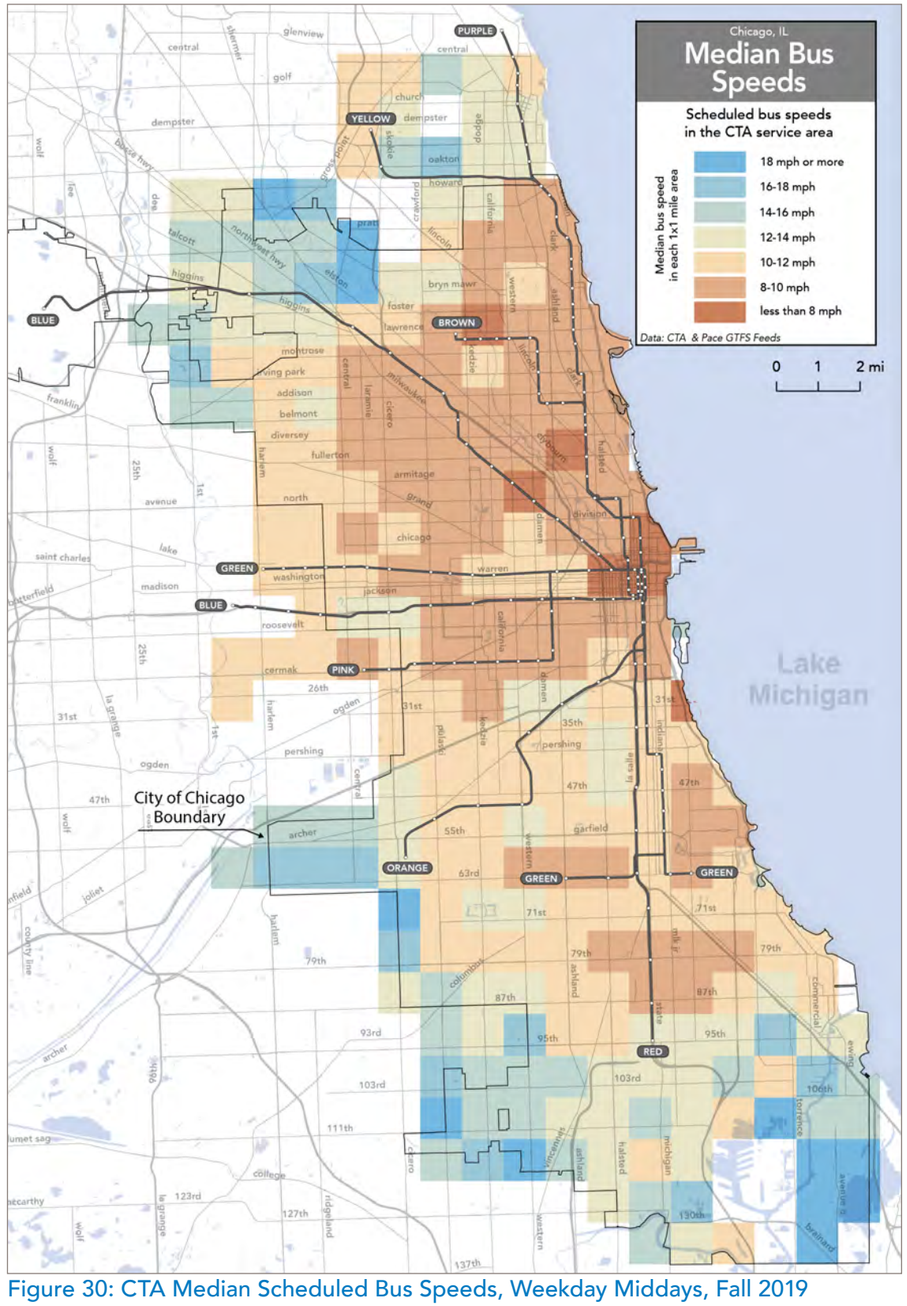


Figure 30: CTA Median Scheduled Bus Speeds, Weekday Middays, Fall 2019

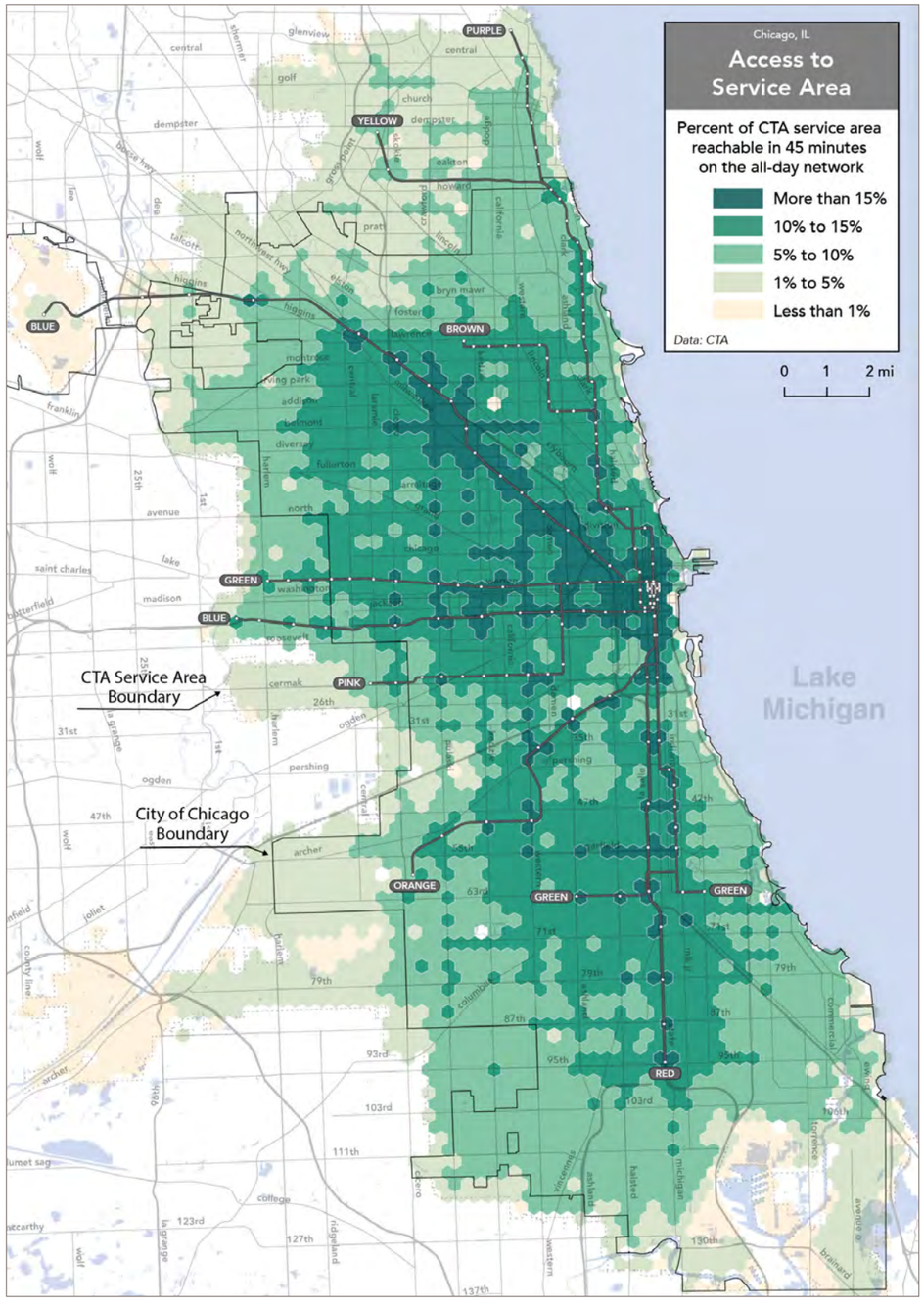
ACCESS MAP: How much access transit provides depends on where you are.

The maps on page 33 show examples of the areas accessible within 30, 45 and 60 minutes from three specific locations. It's possible to run the same analysis from any location, and to see the size of the area reachable from anywhere.

The map in Figure 31 combines the 45-minute access analysis from every location in the CTA service area. This provides a picture of just how useful transit might be from anywhere in Chicago and its immediate surroundings, based on 2019 frequencies.

Specifically, the map shows the percentage of the CTA service area someone could access in 45 minutes or less on weekdays, between 11 AM and 1 PM. This map reveals two key facts about transit and access in the Chicago region:

- **Transit provides the most access for trips that begin in central areas of Chicago.** Access tends to decline as distance from the Loop increases. This makes sense, because the Loop includes the center of both the bus and rail networks.
- **Being near a rail line tends to lead to access to more places** compared to other locations. This is most visible on the O'Hare branch of the Blue Line.
- **Overall, transit provides slightly less access from the South Side**. This is mostly related to longer distances to the Loop, compared to the North and West sides. Other factors at play include fewer CTA rail stations, and relatively thin East-West bus service between 47th St and Cermak Rd due to crossing the former stockyards site and the Chicago Sanitary and Ship Canal.



Reading the Access Maps

The color of each hexagon represents how much access is available from that area. The darker the area, the more access the transit network provides in a set amount of time.

Why show access at noon on a weekday?

The **"all-day network"** is the baseline level of service that a regular transit rider would learn to use for understanding how soon the next bus will come.

Weekday noon-time service is a useful proxy for the all-day network because service levels tend to be at this level or higher from 6 AM to 8 PM on weekdays, and 11 AM to 6 PM on Saturdays. In other words, **service would either be the same or better most of the time**.

Why focus on 45 minutes?

Many people accept travel times up to 45 minutes for a typical daily trip. Once a regular commute or other daily trip becomes longer than that, it is often perceived as a hardship.

Why base this on 2019 frequencies?

These maps and analyses use 2019 frequencies, reflecting CTA's intention to return to a full level of service as soon as possible. Access has been temporarily reduced by the 2023 service optimization, but the relative differences between different parts of Chicago have only marginally changed.

Figure 31: Map of access to the CTA service area, in 45 minutes or less on transit (including time spent walking, riding, waiting and transferring), in 2019. Darker green indicates a person starting from this location could reach a larger percentage of the whole service area.

Maximizing ACCESS maximizes RIDERSHIP potential.

Transit ridership is notoriously difficult to predict. From one month to another, ridership can be impacted by fares, gasoline prices, interest rates for car loans, employment rates, and the weather.

A transit agency like CTA can't control for these external factors. But CTA can focus on providing the most useful service possible, and evidence shows that when transit is more useful, more people use it.

This is demonstrated in part by the maps on this page.

Figure 32 (center) is the same map as on the prior page. It shows how much of the CTA service area was reachable within 45 minutes from each location in the service area in 2019. The darker the green on this map, the more access the transit network provides.

Figure 33 (right) is a map showing the relative productivity of CTA bus and rail service in different areas in 2019. Productivity compares ridership to the amount of service provided. **More productive service means that more people are finding transit to be useful.** More productive areas show up in shades of yellow, orange and red. Less productive areas show up in white.

Comparing these maps shows that **areas where transit provides more access to the city tend to experience higher ridership**, compared to the amount of service CTA provides.

It is notable that this correlation seems weaker south of 79th St. As will be seen in Chapter 4, this is likely due to a combination of lower densities (fewer people near each stop), and longer distances to reach major destinations.

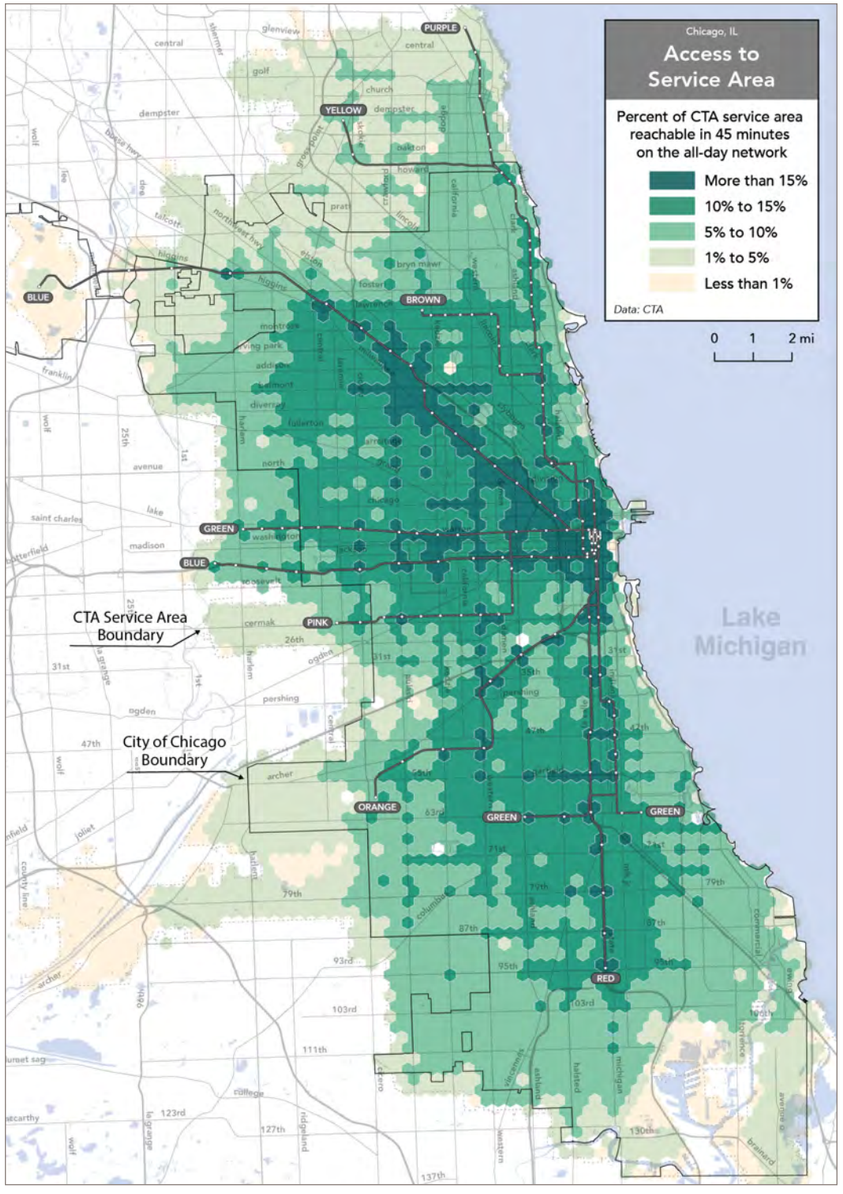


Figure 32: Map of access to the CTA service area, in 45 minutes or less on transit (including time spent walking, riding, waiting and transferring) in 2019. Darker green indicates a person starting from this location could reach a larger percentage of the whole service area.

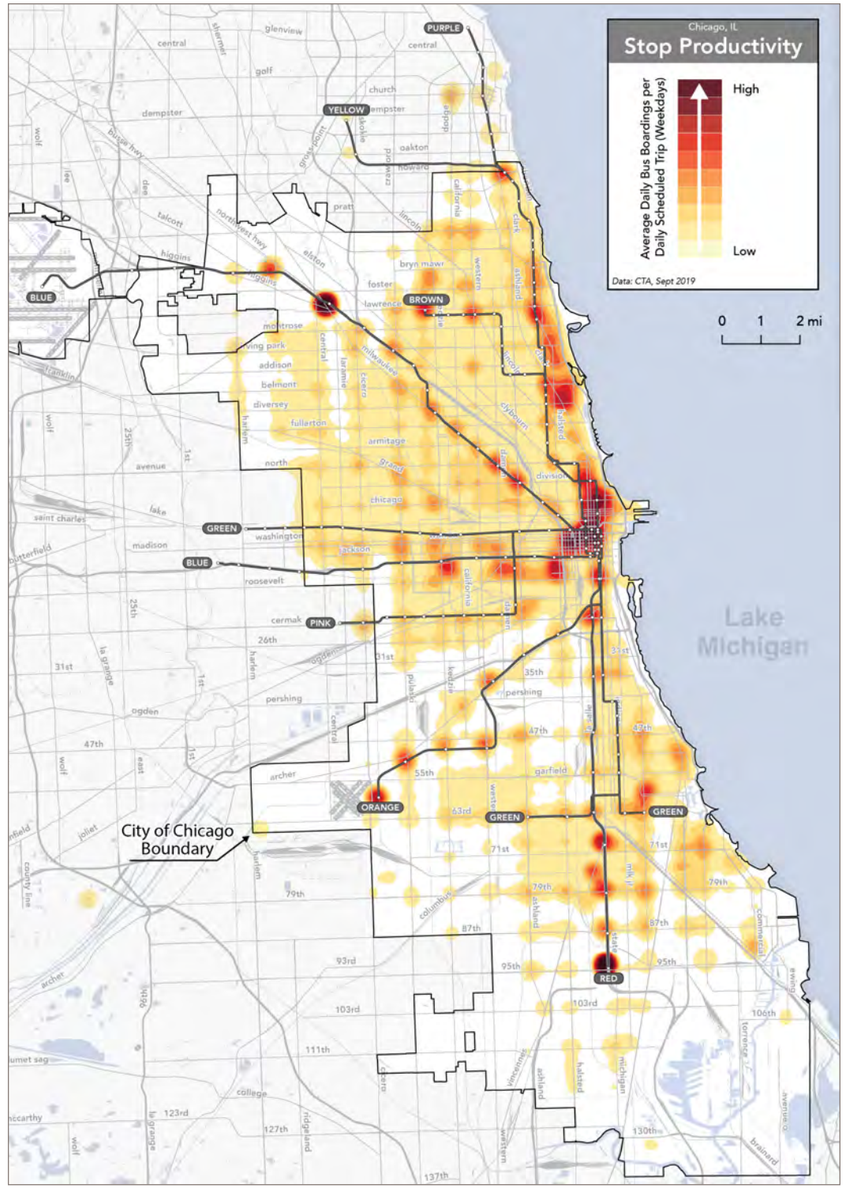


Figure 33: Map showing the relative productivity of CTA service in Fall 2019, i.e. the number of boardings on buses and trains in each area, compared to the total number of weekday bus and train trips at nearby stops. Areas that experience high access tend to have more productive service.

EQUITY: How are the benefits of access distributed?

CTA must consider not just how much value the bus network provides in total, but whether people in marginalized communities are getting a fair share.

Transit may be more critical for some people than others.

It is relevant to ask whether the access benefits of transit are equally useful to different people. This includes:

- **People who don't own cars** are more likely to need transit. For those who can't afford a car, this is an equity issue.
- **People with low incomes** are less likely to be able to afford reliable cars and their maintenance.
- **People with disabilities** are in some cases less able to drive.

Some people are more at risk of discrimination.

In Chicago, people of color have historically been discriminated against, including with respect to what neighborhoods they can live in.

The impacts of this history are still evident in Chicago's built environment. As will be shown in Chapter 4, demographic data shows that patterns of racial segregation persist in Chicago.

CTA's equity commitment

CTA is committed to improving equity in its service area. As a baseline, it meets the requirements of **Title VI** of the 1964 Civil Rights Act, and of the **Americans with Disabilities Act (ADA).** Among other requirements, CTA must:

- Develop standards[1] for vehicle loading, frequency, on-time performance, service availability, and vehicle assignments.
- Demonstrate that these standards are being met equally on bus lines predominantly used by minorities vs. other bus lines.
- Ensure service changes do not disproportionately impact low-income and minority populations.
- Make buses accessible to those with disabilities, such as by ensuring they can accommodate wheelchairs and by announcing bus stops, among other measures.

Since 2016, CTA has also taken many steps that go beyond legal requirements, including:

- Increasing service on some South Side bus lines, particularly in the midday and evening.
- Creating and extending new bus lines to low-income communities.
- Since late 2021, reducing the prices of transit passes and eliminating transfer fees.

1 CTA's service standards were adopted in 2014 and are available online at: https://www.transitchicago.com/assets/1/6/Chicago_Transit_Authority_Service_Standards.pdf

Many equity issues in transit in Chicago come back to race and location.

Figure 34 (below) shows that CTA service allows people across lines of income and race to access a similar area. In other words, they can travel similar distances in the same amount of time. However, the number of useful destinations within those areas is very different for members of different racial and ethnic groups.

White and Asian residents tend to live in more central and rail-adjacent locations where transit provides access to many people and jobs. Conversely, Black and Latino residents tend to live in areas where there are fewer destinations nearby. Travelling the same number of miles or the same amount of time simply doesn't yield the same benefit.

The sources of these patterns, and how they play out in different parts of Chicago, will be explored in more detail in Chapter 4.

How far can people reach within 45 minutes by transit if they are...	Area Reachable (sq. miles)	Average Distance (miles)	No. of Residents Accessible	No. of Jobs Accessible
"Average" Resident (for comparison)	30.7	3.9	426,000	136,000
Low Income (below 150% federal poverty)	32	4	427,000	151,000
White (non-Hispanic)	28.9	3.8	501,000	265,000
Asian	29.6	3.8	483,000	445,000
Hispanic or Latino	31.7	4	435,000	130,000
Black or African-American	31.7	4	369,000	91,000

Figure 34: How the access provided by the transit network in 45 minutes varies depending on people's income and race, based on 2019 service frequencies.

4 The Geography of Chicago's Transit Challenge

Chapter 3 explained how transit's usefulness relates to how many places it can take you in a reasonable amount of time. This is called access to opportunity.

This chapter examines how the geography of the CTA service area impacts how much access to opportunity the transit network can provide.

Land use determines how useful transit can become.

Chicago's uneven density and development pose a difficult challenge for CTA.

Many factors outside the control of CTA – such as land use, development, urban design, and street networks – affect transit's usefulness, as shown in Figure 35. The key factors at play are:

- **Density**. Where there are more people near each stop, there are more people who might ride.
- **Walkability.** For transit to be useful, it must be possible to walk to and from the stop.
- **Linearity.** Areas where all the important places someone would need to go are on a straight line along a main road are easier to serve well.
- **Proximity.** Areas with continuous development are more cost-effective to serve than areas with big gaps.
- **Mix of Uses.** Where housing, jobs, and destinations are mixed along a corridor, the bus is equally busy in both directions at the same time, which uses capacity more efficiently.

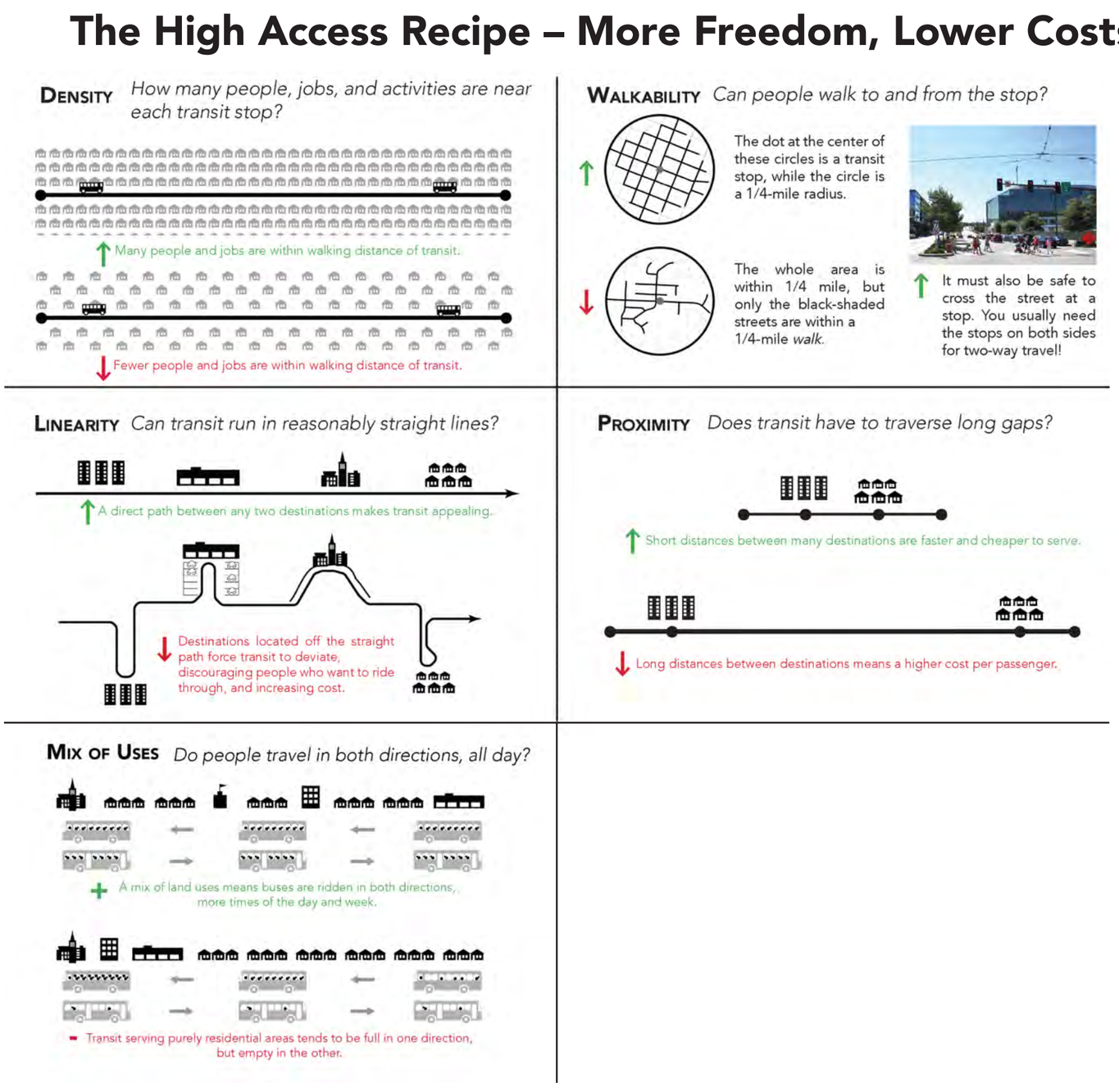


Figure 35: Five key built environment factors that determine how useful a transit network can be.

Where do people live, in general?

Density means more people can benefit from each transit stop.

Understanding where many people live close together can help us see where there is a greater market for transit. Most people make trips that start or end at home everyday. Places where many people live also serve as destinations for other people, whether for visiting, caring for family, or home-based work.

Most of CTA's service area has residential densities higher than 5,000 people per square mile. In most cities in the United States, densities this high would all be considered "urban" or "good transit territory." However, **there is a lot of variation in density within the CTA service area.**

South Side

The South Side generally has lower residential densities than other parts of the service area.

This is mostly not an issue of built form: many near and mid-South Side neighborhoods were built with similar housing types to other places at comparable distances from the Loop. However, many of these neighborhoods have lost large populations in the last 20 years. Abandoned housing and empty lots are more common than in other parts of Chicago.

This is different south of 95th St. These areas have a more suburban built form, with more single-story houses and individual driveways than in other parts of Chicago.

West Side

Residential densities on the West Side tend to be highest north of Chicago Ave and south of Cermak Rd approaching densities on most of the North Side.

This is in part due to larger household sizes, rather than building types. These neighborhoods tend to be dominated by more houses and fewer apartment buildings. Their higher densities continue into parts of neighboring Cicero and Oak Park.

The "middle" part of the West side, between Roosevelt Rd and Chicago Ave, is less dense than the southwest or the northwest, largely due to population decline in the last 20 years.

North Side

In general, residential density tends to be highest on the North Side. The North Lake Shore has by far the highest residential densities in the CTA service area, reflecting the large number of apartment buildings and residential towers.

Most of the rest of the North Side is built as a mix of apartment buildings and attached or closely-spaced houses that resemble older areas of many U.S. cities.

Residential densities decline quickly beyond the city line, as Skokie, Lincolnwood and much of Evanston are dominated by suburban houses on larger lots.

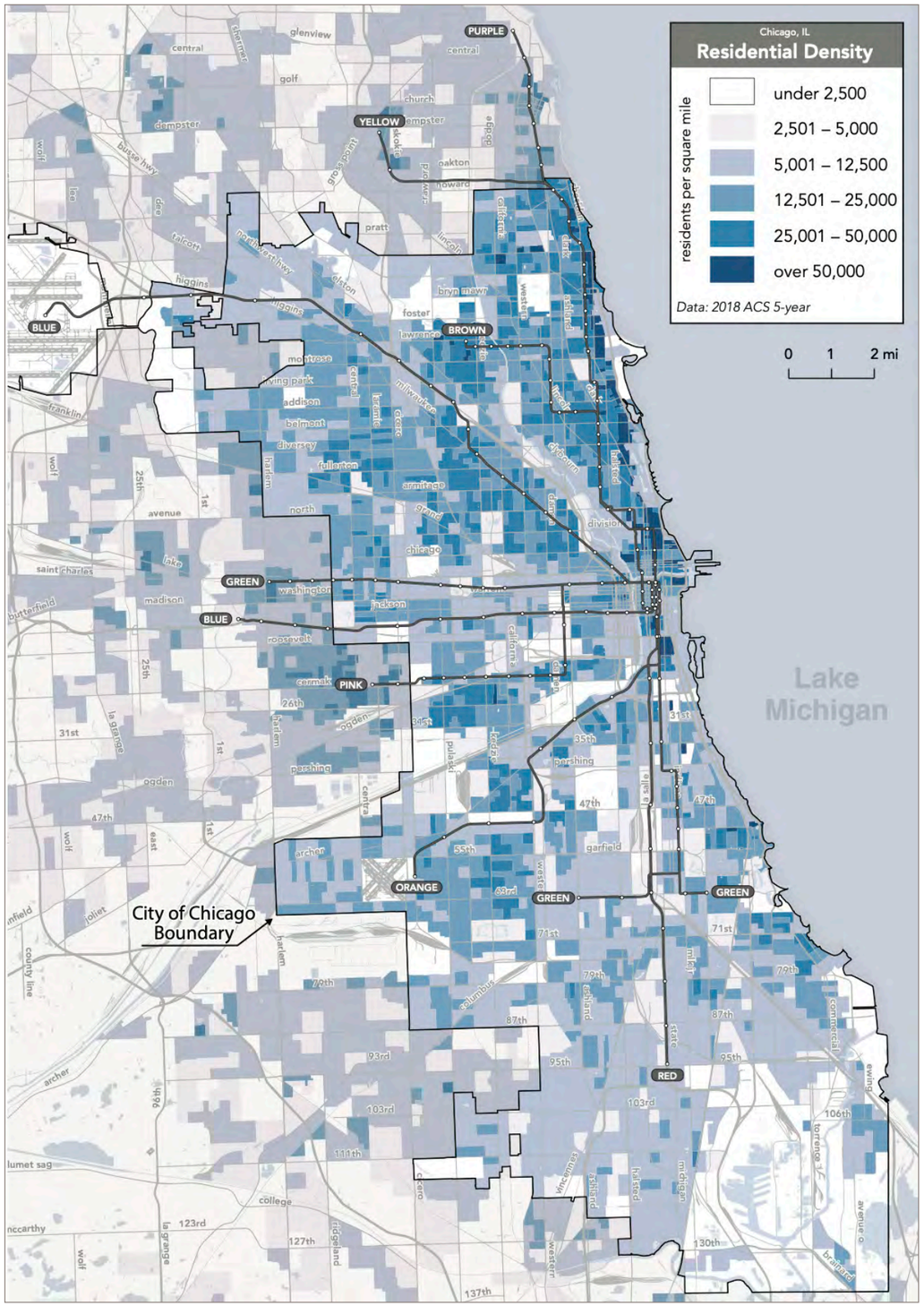


Figure 36: Map of residential density in Chicago and environs.

Where do people live, by race?

The densest and most close-in neighborhoods in Chicago are majority White. Peripheral neighborhoods tend to have lower densities, and to be majority Black or Latino.

Ensuring equitable access to transit across racial lines is a key civil rights concern.

In Chicago, Black, Latino, and White residents each represent about 30% of the total population. The remaining 10% reflects many distinct groups. Taken together, Asians account for about 7%.

There is a high degree of separation by race, rooted in historic segregation and urban renewal. With a few exceptions (especially in the Far North), race divides the service area into "pie slices" emanating outward from the Loop.

Black residents live largely on the West and South sides. On the West side, Black residents tend to live in the lower-density areas between Cermak Rd and Chicago Ave. On the South Side, there is a distinct edge between mostly Latino areas near the Orange Line in the Southwest vs. mostly Black areas almost everywhere else. Many of the predominantly Black areas of the South Side correspond to lower-density neighborhoods that have experienced significant population decline.

Latino residents live largely in two "slices". The larger slice is in the **Southwest** of Chicago extending to Cicero, extending on both sides of the Sanitary and Ship Canal. The smaller slice is in the **Northwest**, mostly west of Kedzie Ave. This reflects the parts of the West Side that are dominated by modest single-family homes with larger average household sizes.

Other minority groups are smaller and more dispersed, although there is a notable concentration of East Asian population in the Armor Square and Bridgeport areas (inner Southwest) that include Chinatown, and South Asian population in the West Ridge area (Far North).

White residents are heavily concentrated in high-density neighborhoods on the inner North Side. In other words, most White residents tend to live in the densest part of the CTA service area. They are also dispersed at lower densities in the Far Northwest of Chicago, and in most surrounding suburbs.

Why does this matter?

Chicago's population distribution by race highlights a trade-off between **maximizing ridership** and **promoting equity** in planning the bus network.

Black people are most likely to live in lower-density areas far from the Loop where investments in useful service are more expensive per rider served, and provide less access to the city as whole.

Latinos are most likely to live in areas far from CTA rail service, and are thus more likely to need high-quality bus service to access the city as a whole.

White people are most likely to live in the dense, inner areas where it's easiest for CTA to maximize ridership in a cost effective way.

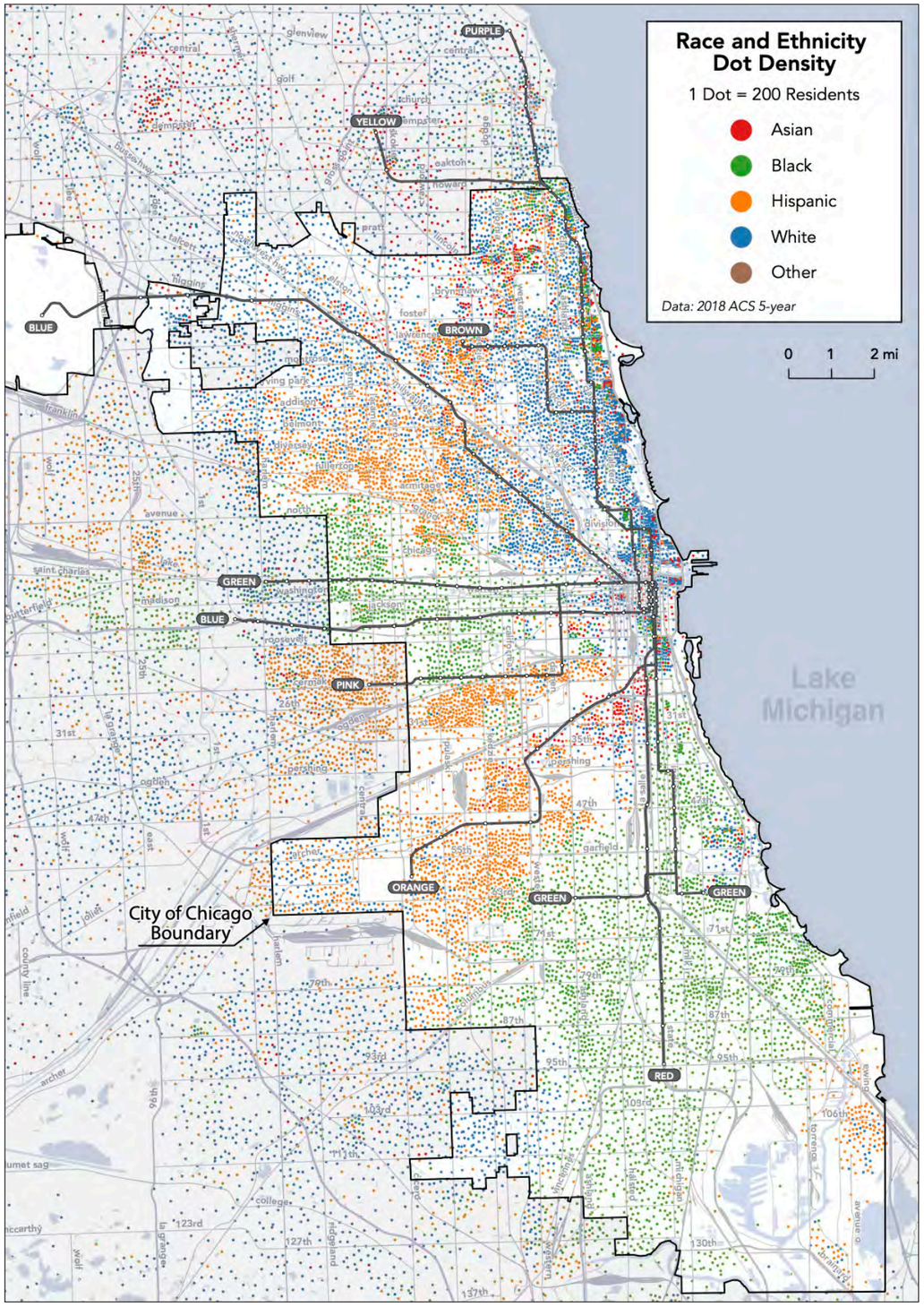


Figure 37: Map of population distribution by race and ethnicity in Chicago and environs.

Where do low-income people live?

Most people in poverty live in a ring of neighborhoods located 5 to 10 miles from the Loop, on all sides.

The more carefully a person must manage their money, the more attractive transit's value proposition may be. Lower-income people are also more likely to live in households that don't own cars, or have more adults than cars. So when many people live on low incomes in a given area, this can suggest a relatively strong market for transit.

However, low income people are still sensitive to travel time. If transit can't meet their needs in an amount of time that they have in their day, they will seek other options. This may include occasional taxi rides, buying a used car or getting rides from friends and family, even if those may cause financial or social stress.

In Chicago, the concentration of people in poverty appears to be related to distance from Downtown. The map in Figure 38 shows that areas with higher densities of people in poverty tend to be 5 to 10 miles from the Loop on all sides. They also include areas closer in on the South and West sides.

In addition, **many high-poverty areas are one mile or further from CTA rail service**, suggesting a relatively higher specific need for CTA bus service among low-income populations in Chicago.

Why does this matter?

Transit can only take you so far in a given amount of time.

If you live near CTA rail, you can go further, accessing more jobs and opportunities, because rail is generally faster and more reliable. But many low-income people live far from rail.

As a result, **increasing bus frequency and speed** is the most efficient way to expand the range of places many low-income people can reach. This would serve both **ridership** and **equity** goals.

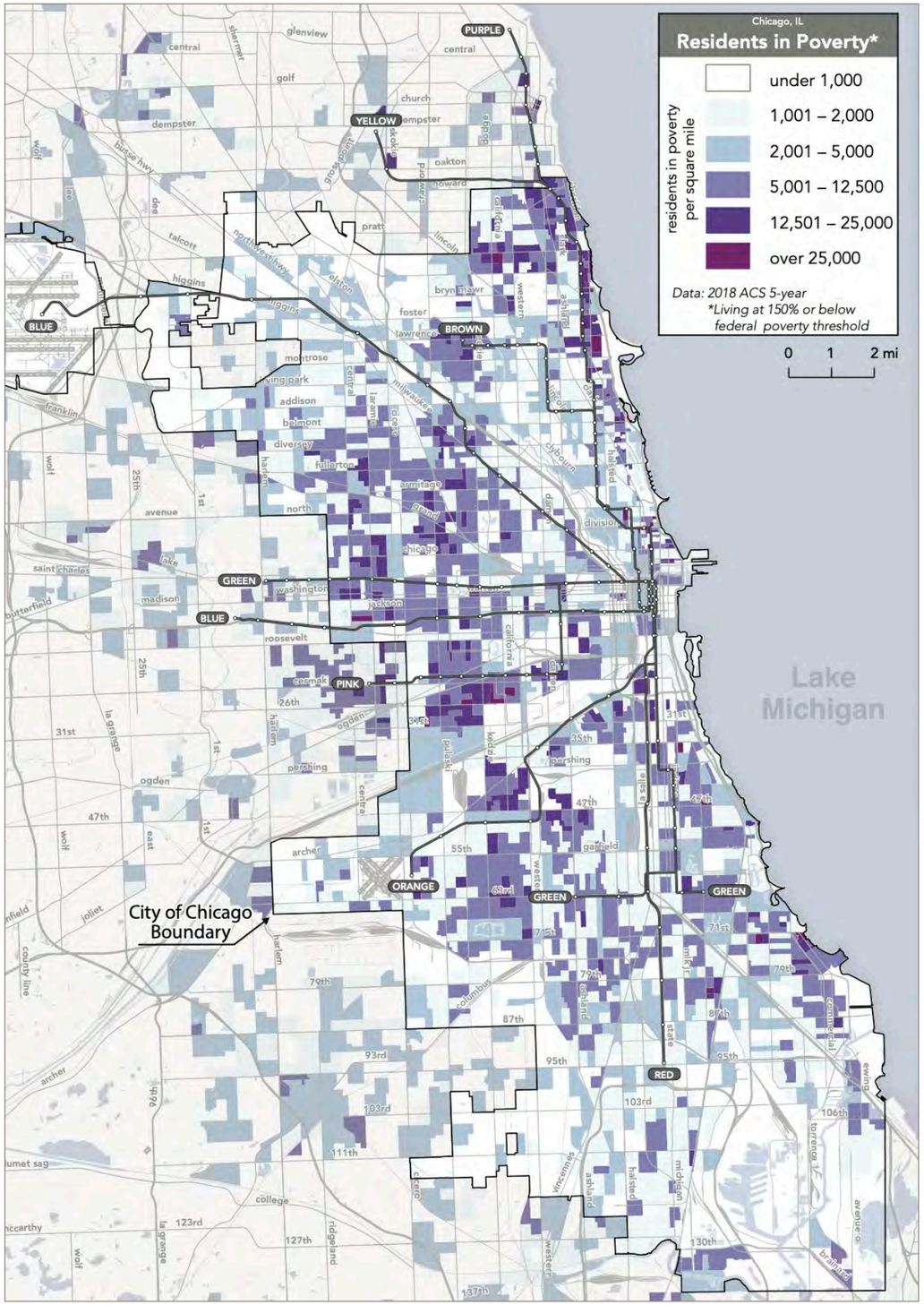


Figure 38: Map of the density of low income residents in Chicago and environs.

Where do people with no cars live?

The highest densities of households with no cars are on the North Lake Shore, but the places where most people don't own cars are largely on the West and South sides.

Some people prefer not to own a car, and are able to locate themselves in places where they don't need one. Other people simply do not have a choice. Their income or other circumstances prevent them from owning a car.

Both types of zero-car households exist in large numbers in Chicago, and significant densities are found up to 10 miles out from the Loop. But some areas stand out:

- The North Lake Shore has the highest densities of zero-car households. This is a logical place to live car-free, because the high overall density means that many useful things are in walking distance.
- Parts of the West and South Sides have relatively low densities, but very high percentages of carless households. In these very low-income areas, it's very likely that many people simply can't afford a car.

Density of Zero Vehicle Households

Percent of Zero Vehicle Households

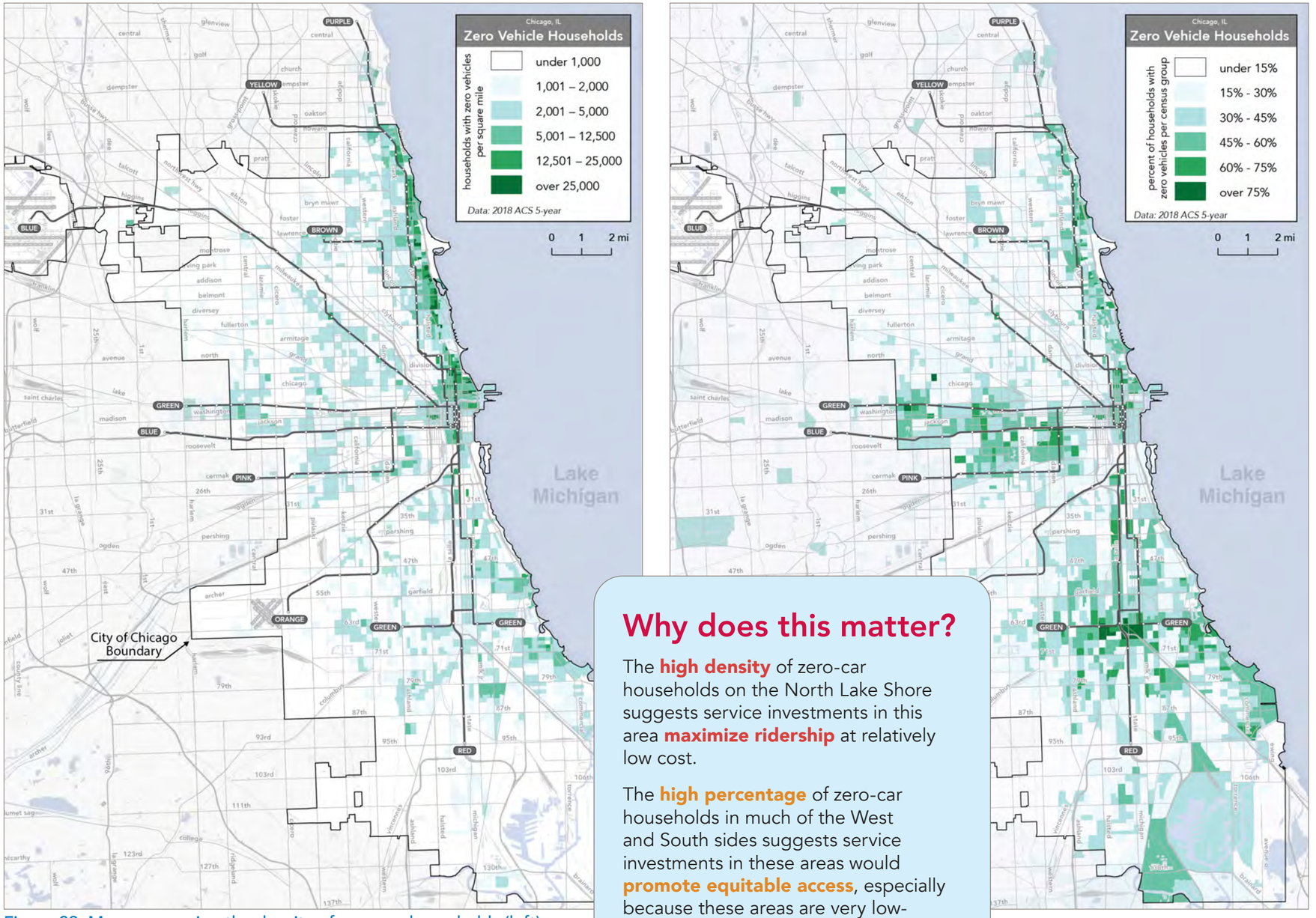


Figure 39: Maps comparing the density of zero-car households (left) vs. the percentage of zero-car households (right) in Chicago and environs.

Why does this matter?

The **high density** of zero-car households on the North Lake Shore suggests service investments in this area **maximize ridership** at relatively low cost.

The **high percentage** of zero-car households in much of the West and South sides suggests service investments in these areas would **promote equitable access**, especially because these areas are very low-income and majority Black.

Where are the jobs?

Jobs are overwhelmingly concentrated near the Loop and in the inner North Side. In contrast, there are very few jobs on the South Side.

Despite the changes brought about by the COVID-19 pandemic, jobs remain a central destination in most people's lives. Although remote work remains more prevalent than it did in 2019, as of August 2023 only 13% of full-time employees in the US reported working remotely full-time[1].

Therefore, the location and concentration of jobs is a key factor in understanding the places where people need to go on a daily basis. This is also true for many reasons that go beyond commuting.

Most places people visit regularly (retail, services, schools, medical establishments etc.) are places where jobs are located. So **being near many jobs usually means being near many other useful destinations.** Conversely, being near very few jobs often means being farther from other destinations.

The map in Figure 40 shows that job densities are:

- **Highest in the two miles around the Loop**, particularly in the Loop itself, River North, and the West Loop.
- **Medium in most areas north of Cermak Rd, and east of Cicero Ave.** Nevertheless, job densities do tend to increase as one gets closer to Lake Michigan and to the Loop.
- **Very low in other parts of Chicago, especially the South Side**. The only large and dense concentration of jobs within city limits south of 47th St is around the University of Chicago.

There is also **significant employment just outside city limits, in areas primarily served by Pace Suburban Bus.** The contrast is especially notable along the Southwest and Northwest edges of the city, such as 95th St west of Western Ave, Bedford Park, and the vicinity of O'Hare Airport.

Why does this matter?

The extremely lopsided job distribution shown in Figure 40 means that:

- People who live in areas within 5 miles of many useful places (i.e. where service investments will **maximize ridership** per dollar invested), are more likely to be White and higher-income.
- Unless operating speeds improve, many people on the South and Far West sides (where service investments are more likely to **promote equitable access**) live too far from centers of activity for transit to take them to all the places they need to go without taking more time than they have.

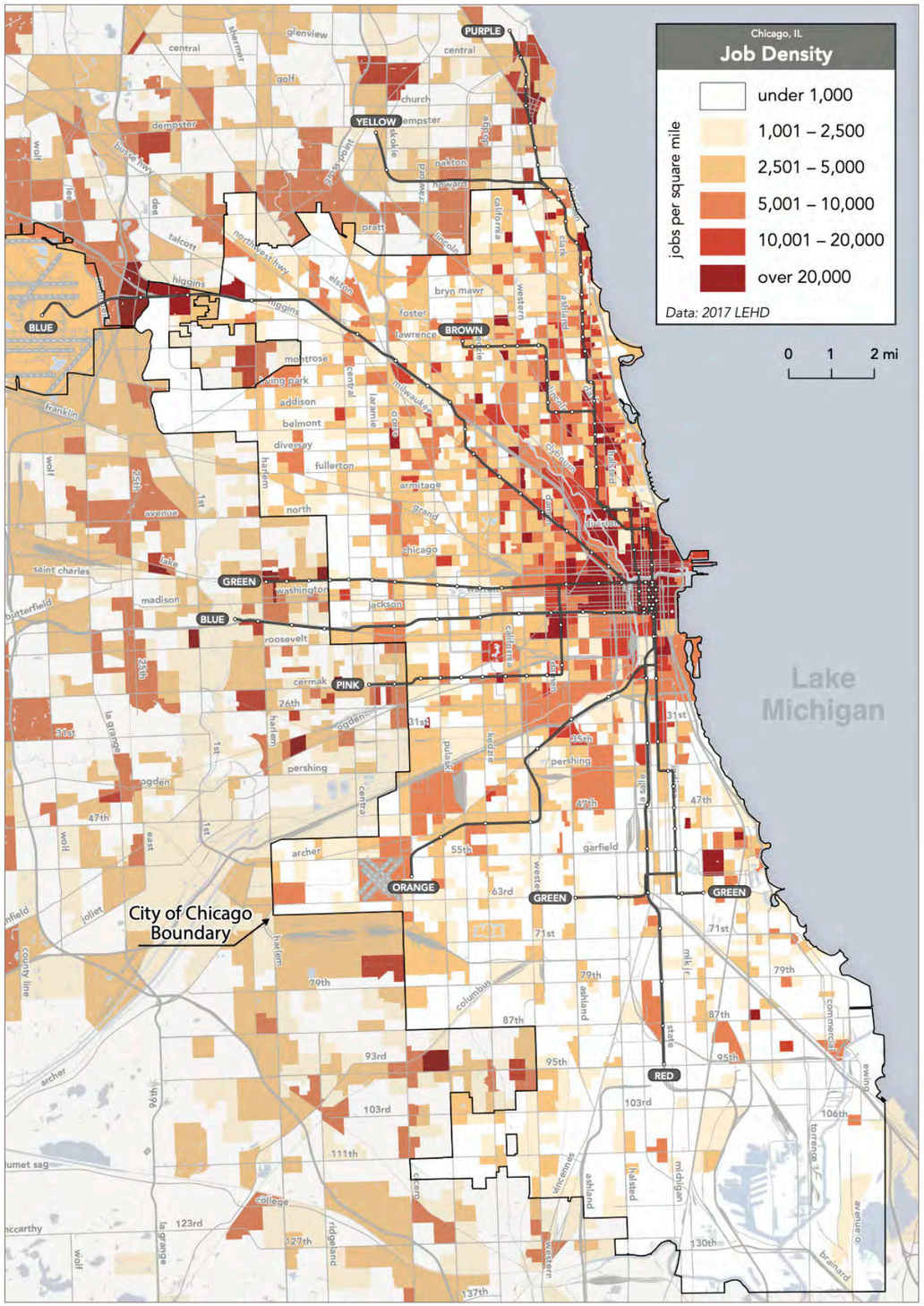


Figure 40: Job density in the Chicago region.

1 According to a WFH Research of 200,000 full-time employees. A further 30% reported being in a hybrid work from home situation, coming in to a work site at least 1 day per week, while 57% reported going to a work site every day they worked. Accessed at: https://wfhresearch.com/wp-content/uploads/2023/09/WFHResearch_updates_September2023.pdf

Where else do people often go?

Retail businesses

Like jobs in general, retail is concentrated in Downtown and in the Inner North Side. The West Side has less, and the South Side has the least retail.

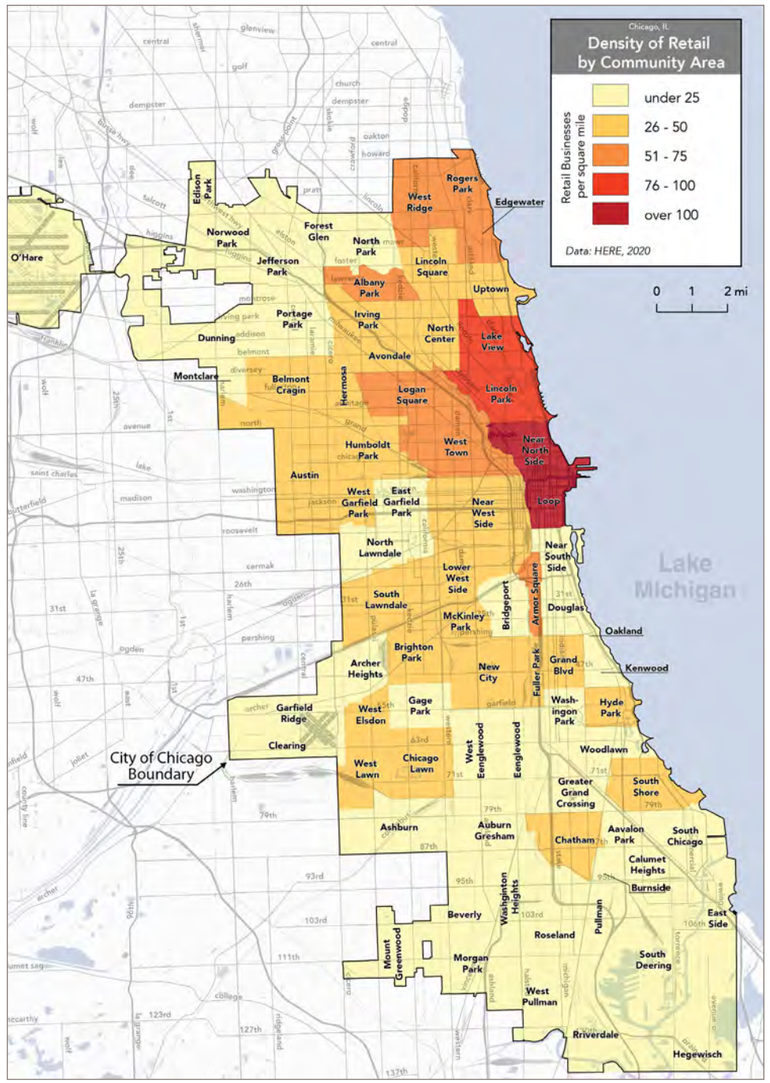


Figure 41: Density of retail businesses in the City of Chicago.

Medical services

Medical offices exist throughout Chicago, but larger facilities cluster in certain areas. The Southwest stands out as a low-amenity area, with only one hospital in the area west of the Red Line and south of the Orange Line.

Figure 42: Location of hospitals and medical centers in the Chicago region.

Schools & colleges

Schools are widely distributed, but many students choose to travel to other areas for better schools. Community colleges are mostly located in the eastern half of the city.

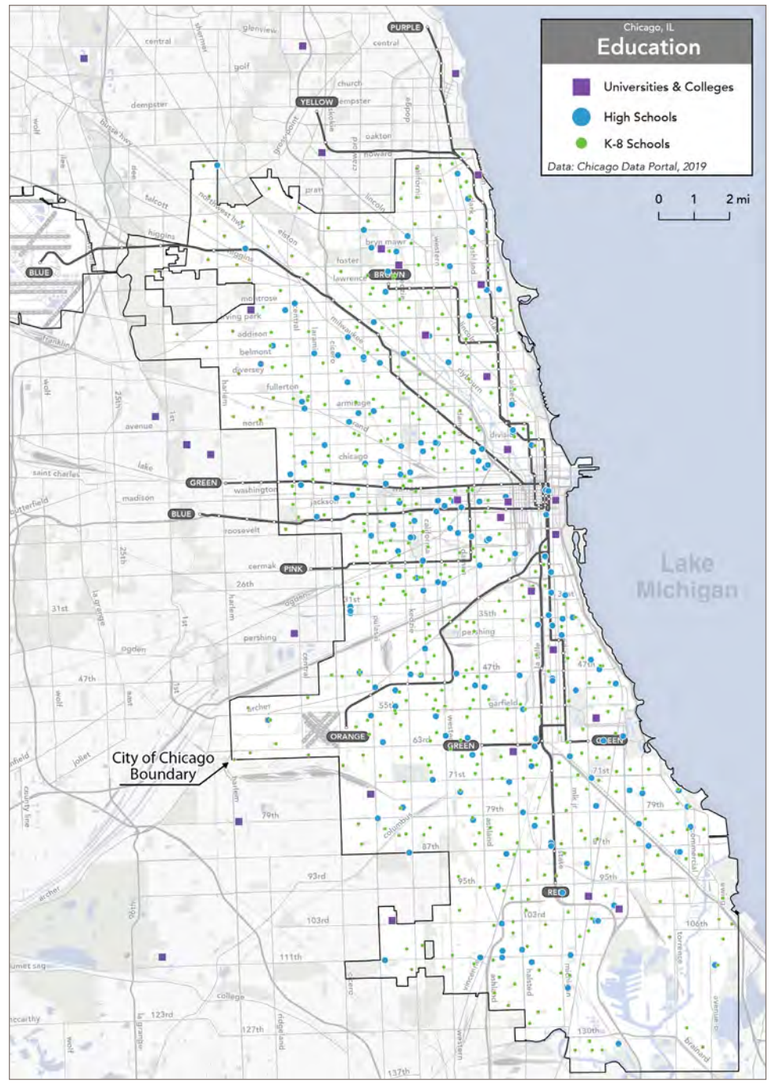


Figure 43: Location of schools and colleges in the Chicago region.

Low-income residents tend to be located farther from jobs and services.

Low-income people are less likely to own cars, but are more likely to need to travel far from their neighborhood.

On this page:

- Figure 44 (center) shows the number of jobs reachable within two miles, from all locations in Chicago. This is a rough estimate of the number of jobs that a person could reach by walking, biking, or taking a scooter.
- Figure 45 (right) estimates the average income per person in each Census block group, based on median household income divided by household size.

These maps show that:

- **Average incomes are much lower on the West and South sides** than on the North Side. In Chicago, low income areas have higher rates of zero-car households, especially in Black neighborhoods. This can be seen by comparing the maps on this page to the maps on page 42 and page 44.
- **Residents of the West and South sides have fewer jobs available nearby**. This is true even when comparing to North Side locations at similar distances to the Loop. As a result, they are likely to travel farther on average to meet everyday needs.
- **The areas farthest from job clusters are on the far South Side**. This is in part because the South Side extends so much farther from the main job concentrations near the Loop and on the inner North Side.

Jobs Available Nearby

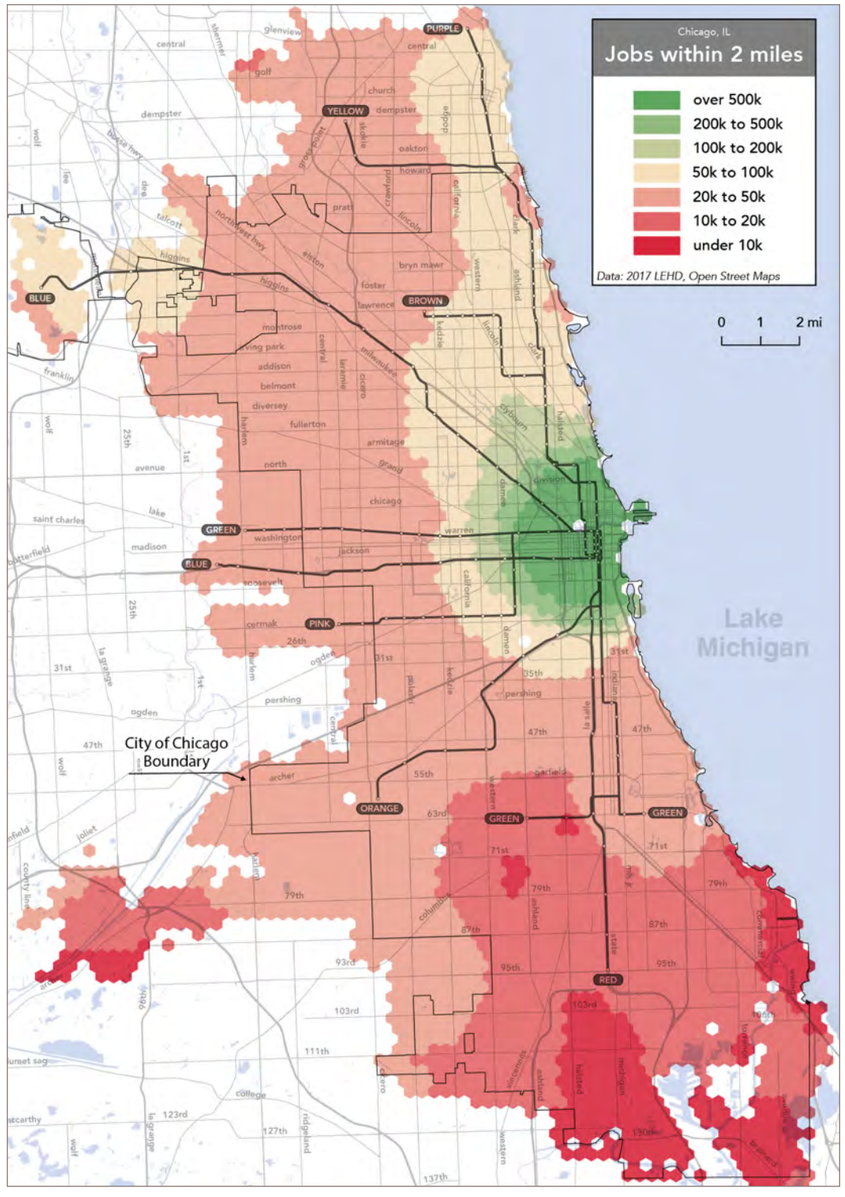


Figure 44: Map of jobs reachable within 2 miles, from anywhere in the City of Chicago.

Average Income Per Person

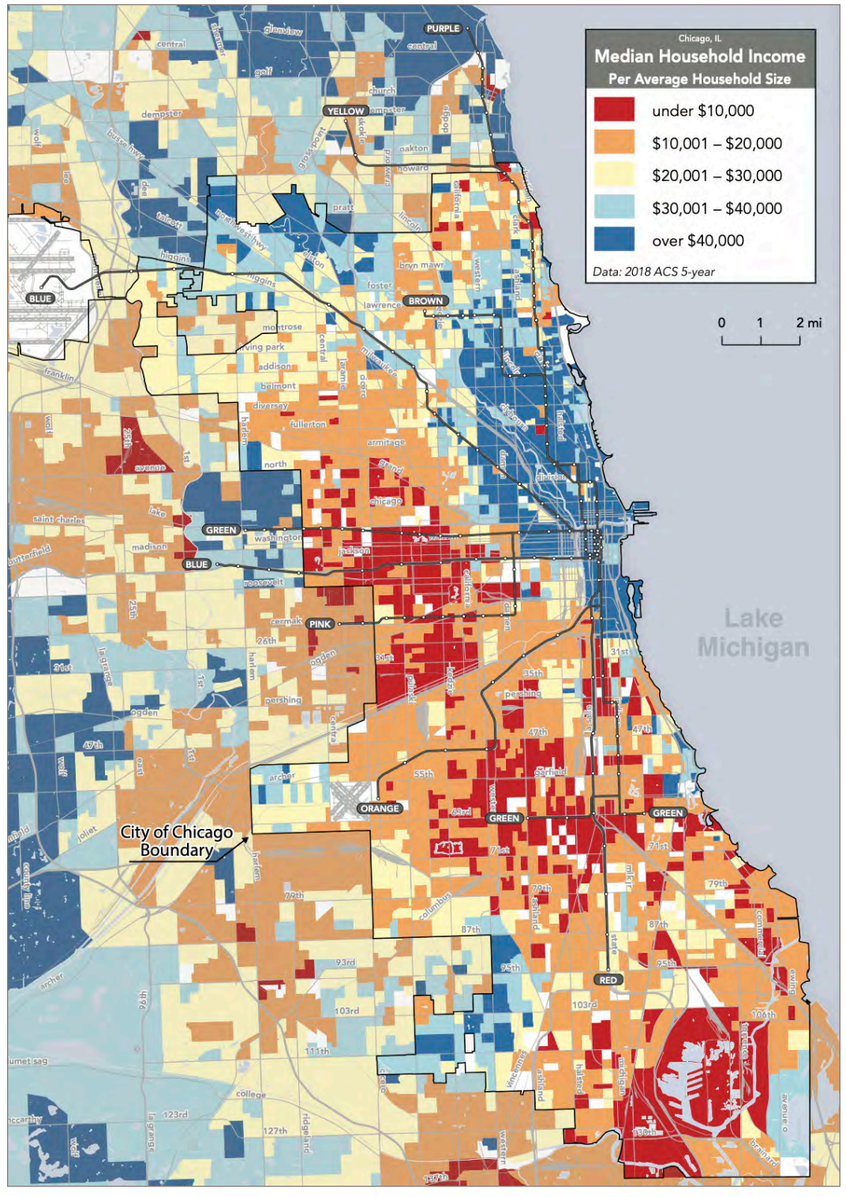


Figure 45: Map of median household income, divided by household size, in Chicago and environs.

The areas farthest from jobs are almost all majority-Black neighborhoods.

Low-income Black people in the Far South and Southwest sides face the greatest transportation challenges.

On this page:

- Figure 46 (center) is the same map of jobs within two miles as on page 47.
- Figure 47 (right) is a map of residential location by race, rather than income. This is the same map shown on page 42.

The vast majority of people living in areas with fewer than 20,000 jobs within two miles are Black. This includes most areas south of 71st St, and many areas between 55th St/Garfield Blvd and 71st St, west of the Red line.

At the same time, the majority of Latinos also live in areas with relatively low numbers of jobs within two miles (20,000 to 50,000 jobs).

Jobs Available Nearby

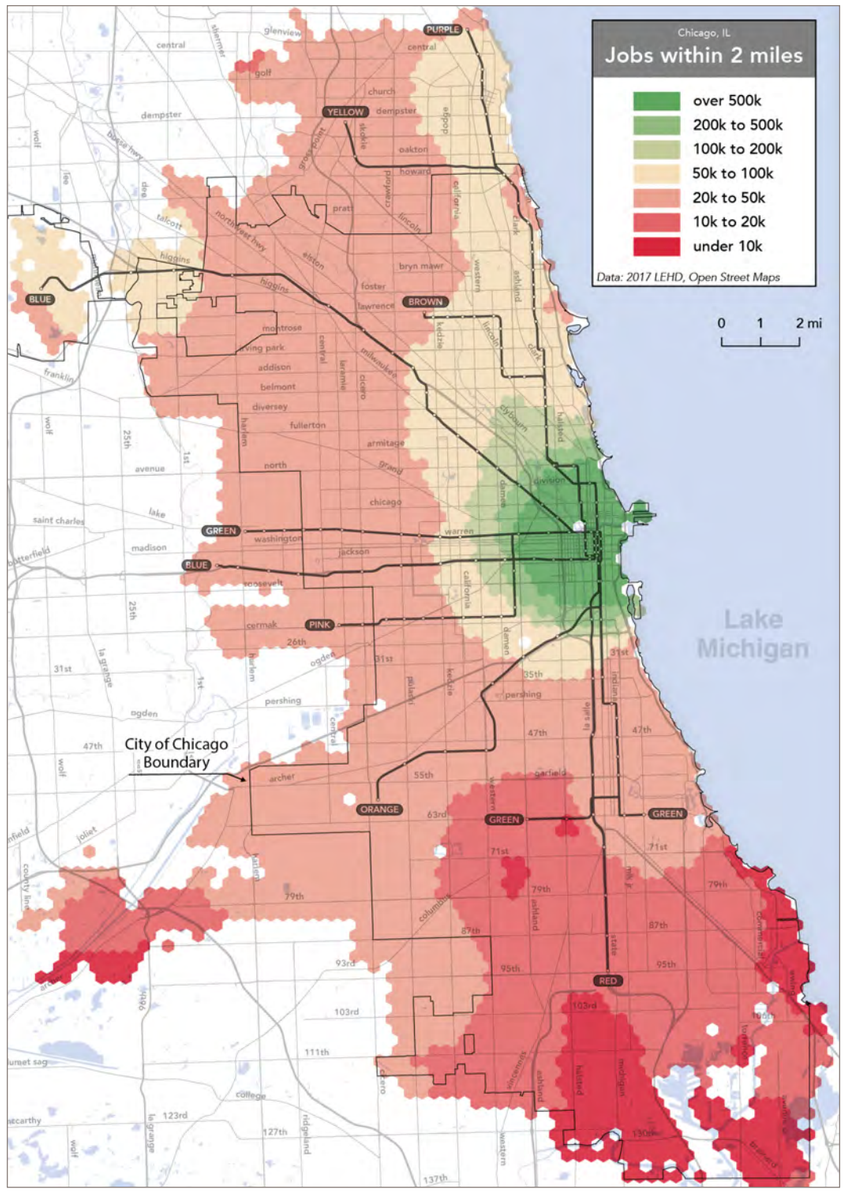


Figure 46: Map of jobs reachable within 2 miles, from anywhere in the CTA service area.

Residential Location by Race and Ethnicity

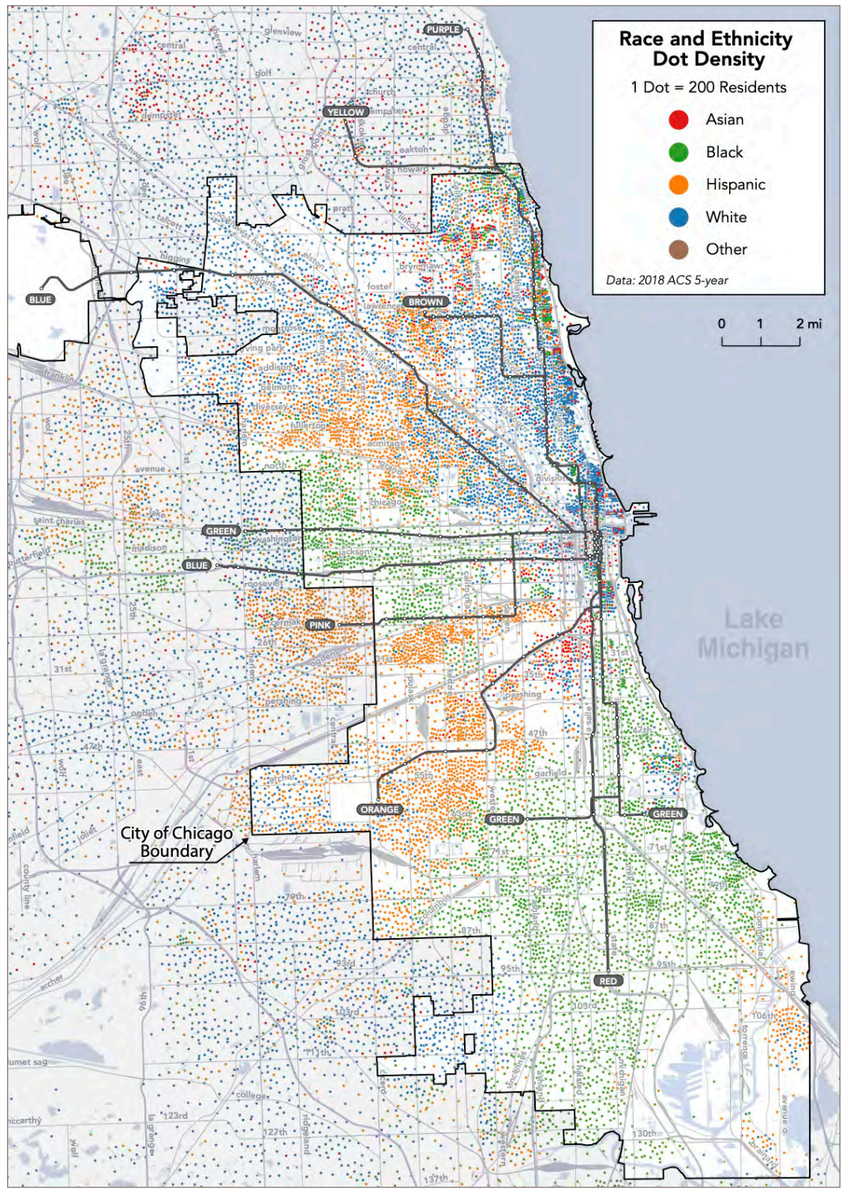


Figure 47: Map of population distribution by race and ethnicity in Chicago and environs.

This makes it difficult for transit to provide equitable access to jobs.

No level of CTA bus service can overcome the deep inequality built into Chicago's geography.

On this page:

- Figure 48 (center) shows how much of the CTA service area could be reached within 45 minutes by transit and walking in the middle of the day on weekdays in 2019, from all locations in the city.
- Figure 49 (right) shows the number of jobs reachable within 45 minutes by transit and walking, from the same areas and at the same time.

Taken together, these maps show that **taking people the same distance doesn't have the same value on the North and South sides.** This is due to the lopsided distribution of jobs and useful destinations shown previously.

This reflects an underlying reality of Chicago, not a problem that CTA can fix just by redistributing service. In 2019, Black residents were already most likely to live near service every 12 minutes or better, and Latinos were more likely than average to live near service every 15 minutes or better[1].

Even if service could be improved from every 15 minutes to every 5 minutes, this would on average either save 5 minutes per trip or allow up to one more mile of travel in the same amount of time. While helpful, that would not result in an equal distribution of access to amenities that are 10 miles away.

1 In 2019, 66% of Black residents lived near service every 12 minutes or better on weekdays in the middle of the day, compared to 56% of all residents. 84% of Black residents and 77% of Latino residents lived near service every 15 minutes or better, compared to 73% of all residents.

JARRETT WALKER + ASSOCIATES

Area Accessible by Transit within 45 Minutes

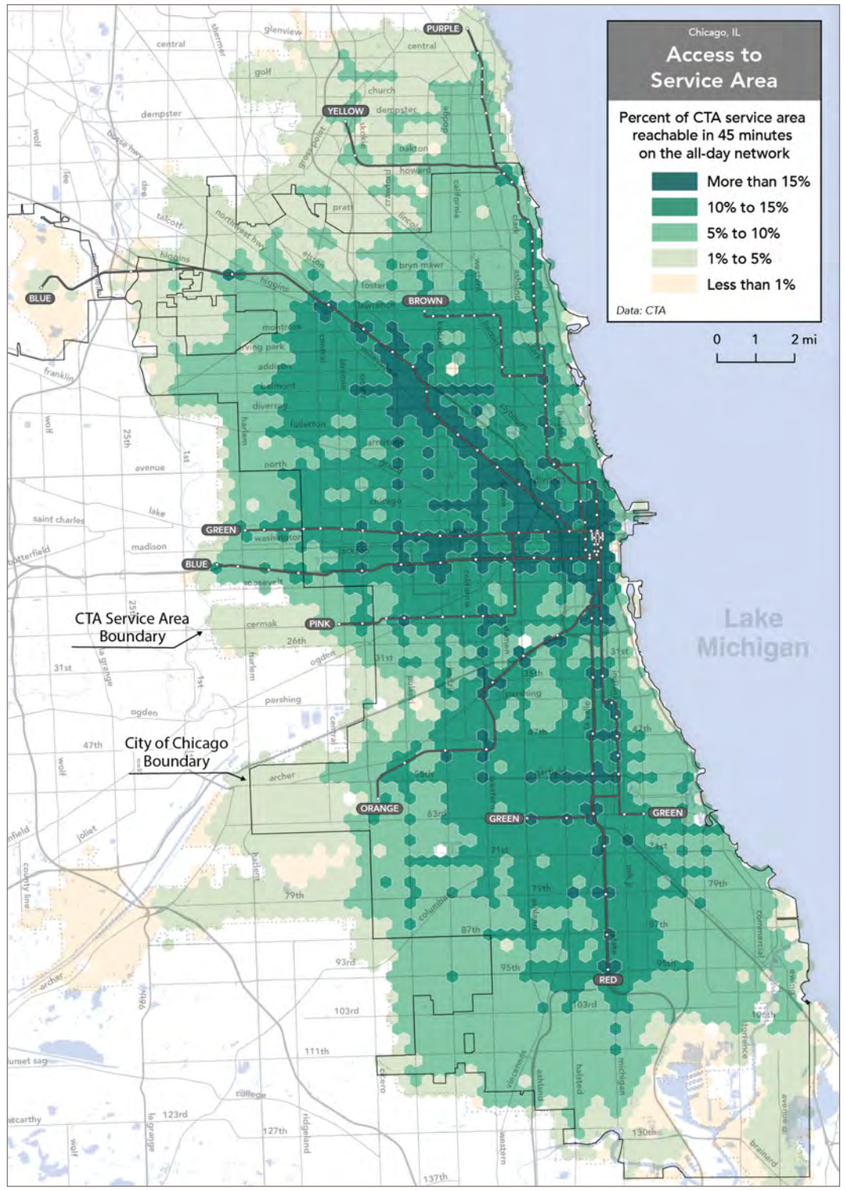


Figure 48: Map of access to the CTA service area, in 45 minutes or less on transit (including time spent walking, riding, waiting and transferring) in 2019.

Jobs Accessible by Transit within 45 Minutes

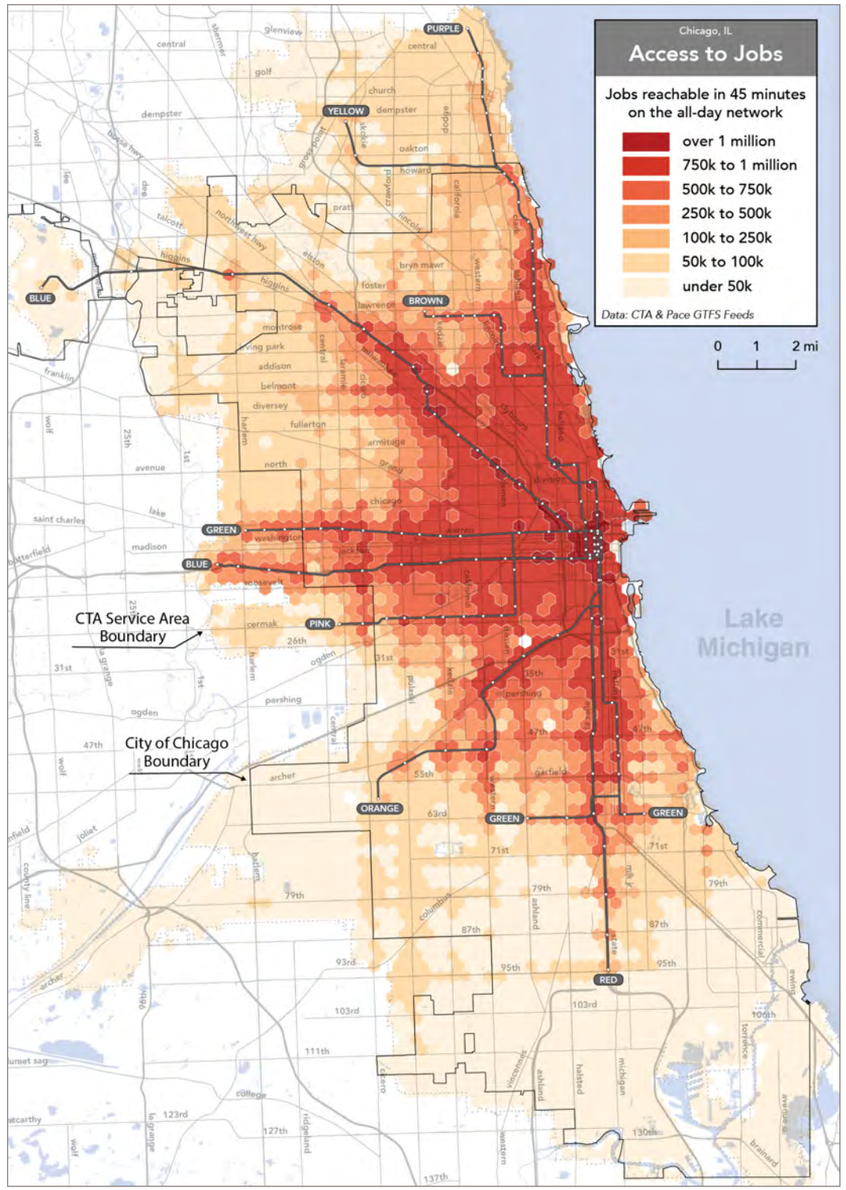


Figure 49: Map of access to jobs, in 45 minutes or less on transit (including time spent walking, riding, waiting and transferring) in 2019.

Access to residents favors people and businesses in the North and Near West.

Lower residential densities and longer travel distances make South Side locations accessible to fewer people.

On this page:

- Figure 50 (center) shows how much of the CTA service area can be reached within 45 minutes by transit and walking in the middle of the day on weekdays in 2019, from all locations in the city.
- Figure 51 (right) shows the number of residents reachable within 45 minutes by transit and walking, from the same areas and at the same time.

Access to residents shows how many people might find a given location convenient to reach. This is important for the location decisions of businesses and public services, which tend to locate in places accessible to many people. High access to residents also indicates locations where residents have the most potential social opportunities.

Figure 51 shows that access to residents is disproportionately weighted in favor of the North Side.

This inequality results from the lower population densities on the South Side, and **reflects cycles of disinvestment that CTA cannot fix with better service alone.** A history of relative underinvestment in real estate and public services, the decline of industrial employment, and out-migration have all contributed to the hollowing-out of the South Side.

Area Accessible by Transit within 45 Minutes

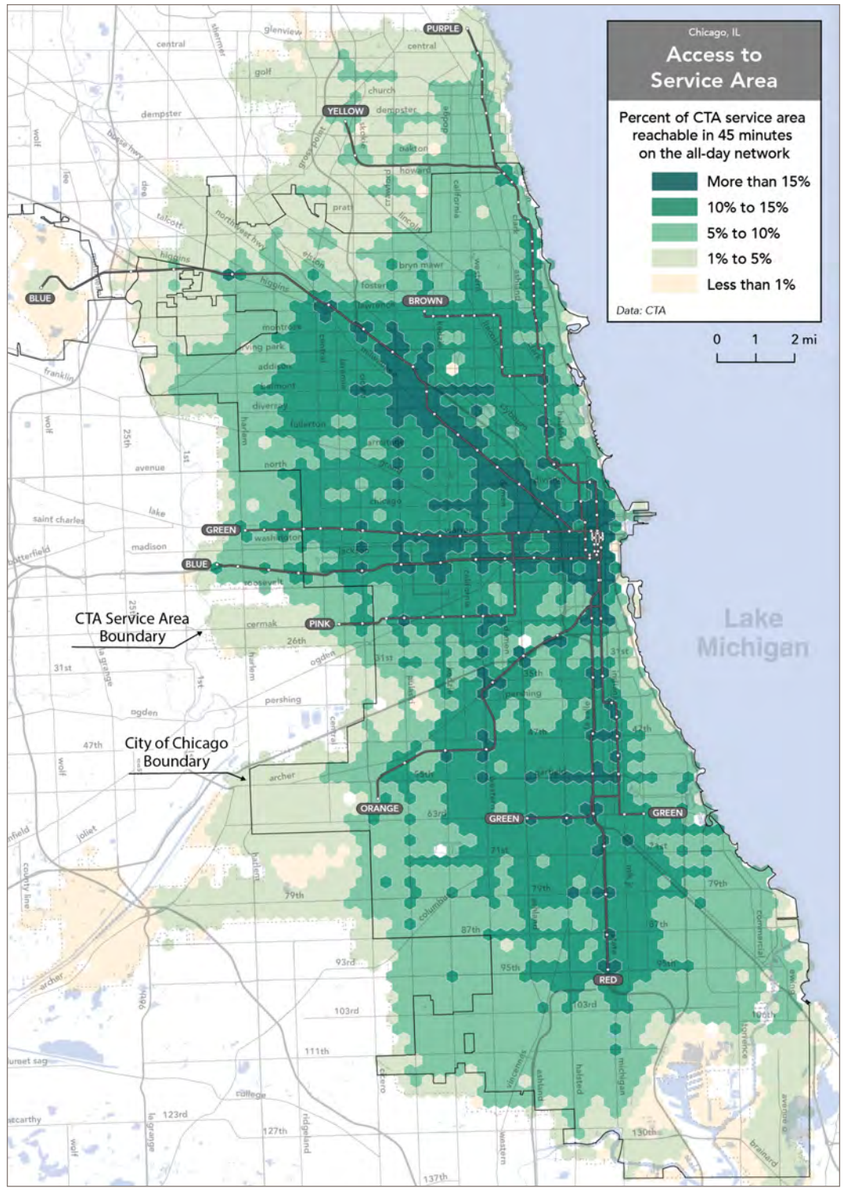


Figure 50: Map of access to the CTA service area, in 45 minutes or less on transit (including time spent walking, riding, waiting and transferring) in 2019.

Residents Accessible by Transit within 45 Minutes

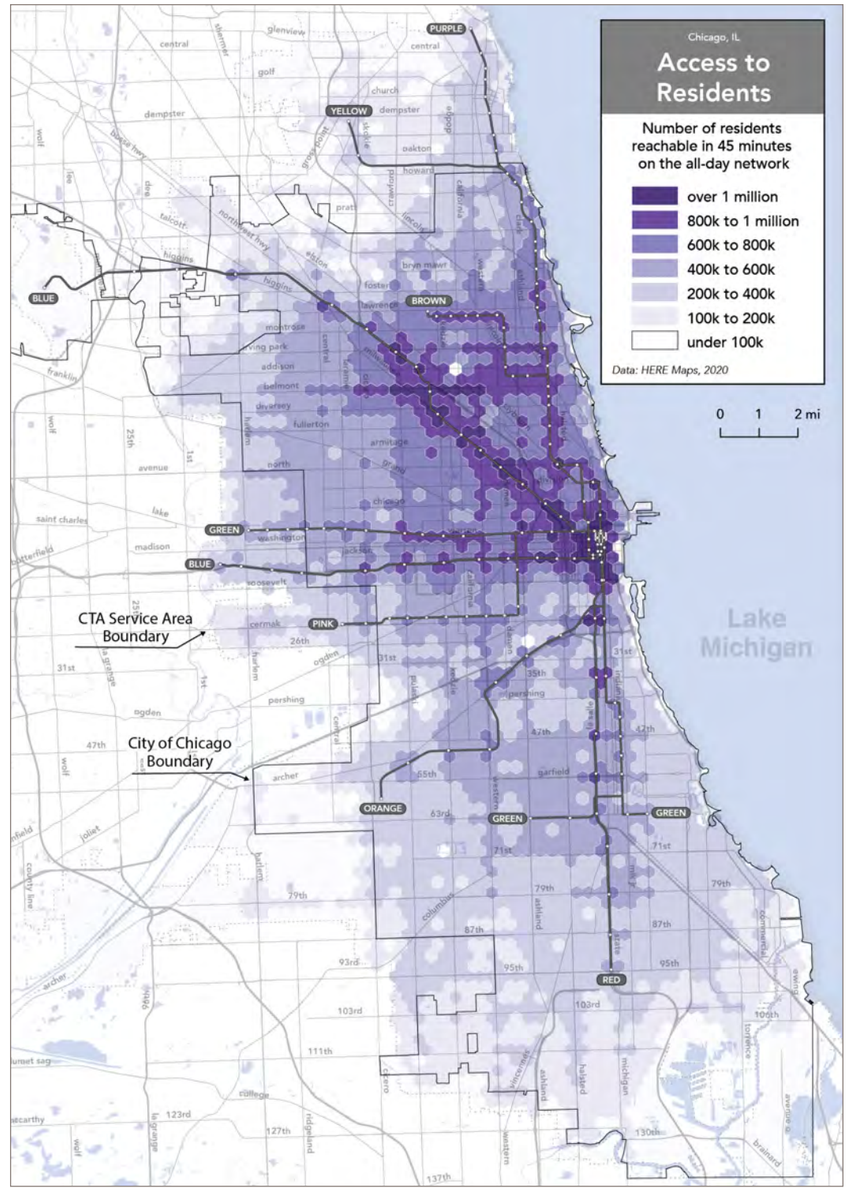


Figure 51: Map of access to jobs, in 45 minutes or less on transit (including time spent walking, riding, waiting and transferring) in 2019.

Similar inequalities impact access to many destinations.

The maps on this page show how access by transit in 2019 varied throughout the CTA service area for some other important places people need to go: schools, grocery stores, and medical care.

Like jobs, these specific destinations are unequally distributed, leading to unequal access outcomes that often favor the inner North Side, disfavor the South side, and leave parts of the West Side with good access to some destinations but not others.

All maps on this page depict access by transit and walking on weekdays in the middle of the day.

Why show access within 30 minutes for grocery stores and hospitals?

Although many people tolerate a longer trip for a long-term commitment, like a job or higher education, people usually need quicker access to other kinds of services.

Grocery Stores

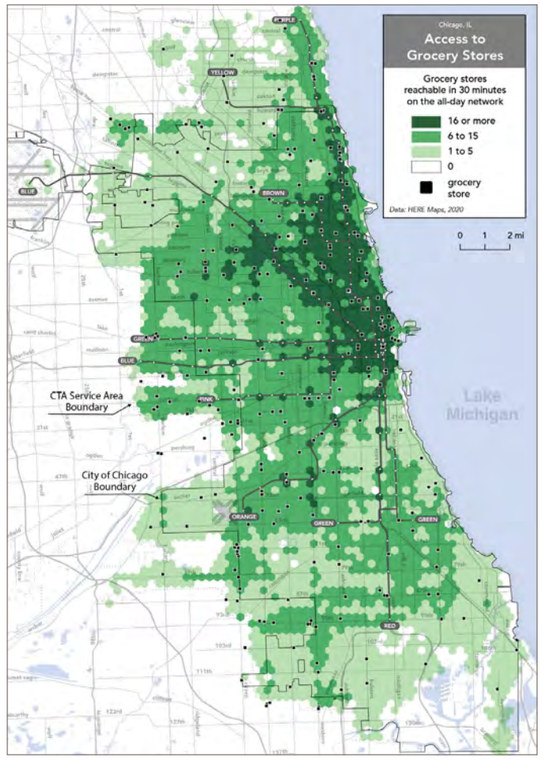


Figure 52: Map depicting access to full-service grocery stores, which is a way to measure how much access people have to fresh and nutritious food. Darker green areas are places where people generally have more choices. Lighter green and white areas are places where people have far fewer (or no) choices within 30 minutes on transit.

High Schools

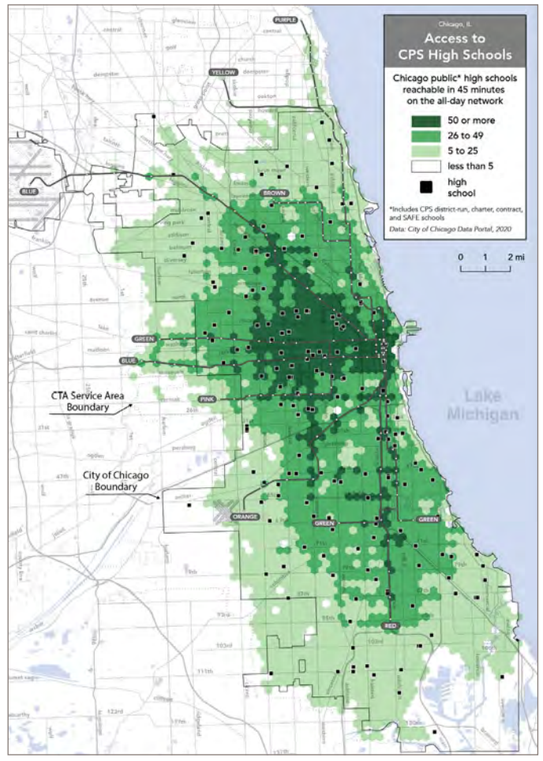


Figure 53: Map depicting access to Chicago high schools within 45 minutes. Students in the darker areas can reach the most schools, meaning they can exercise the most school choice without enduring very long commutes.

Community Colleges

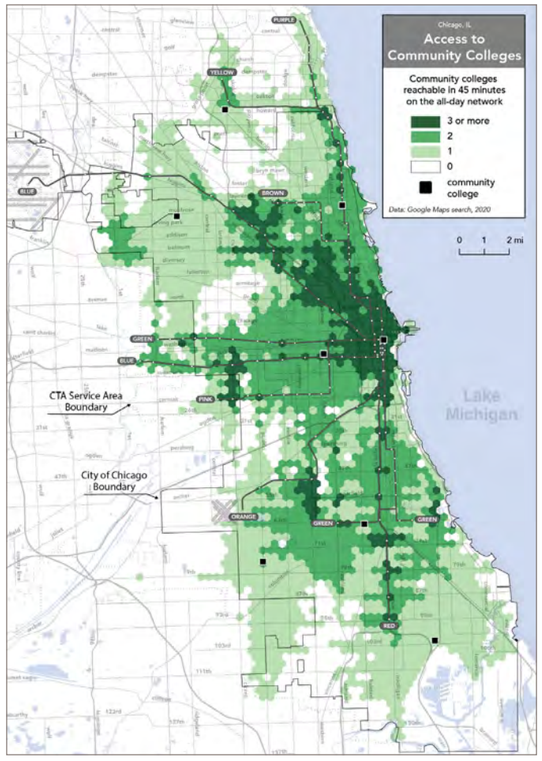


Figure 54: Map depicting access to community colleges within 45 minutes. People on the inner North Side typically have convenient access to multiple community colleges. This contrasts with many areas in the West and far South of the City where people can typically reach only one campus in 45 minutes or less (or none from some areas).

Hospitals and Medical Centers

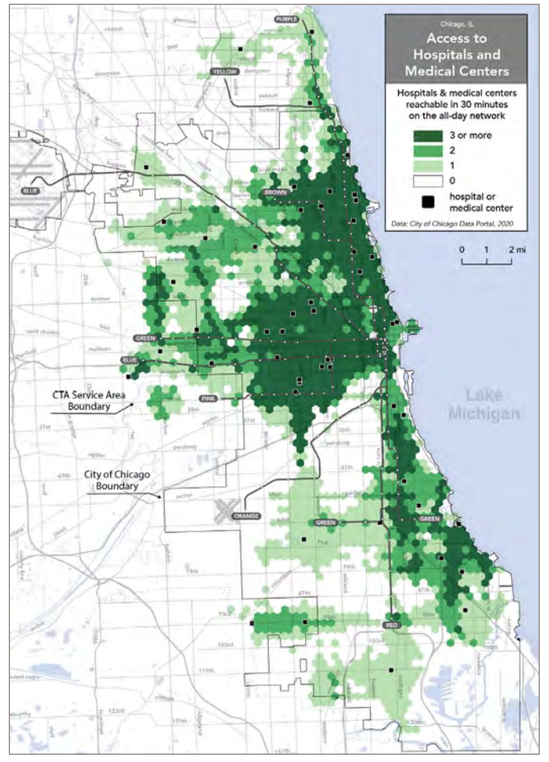


Figure 55: Map depicting the number of hospitals and medical centers that can be reached within 30 minutes. Access to hospitals is highest on the North and Inner West sides, middling in the Northwest and Southeast, and lowest on the Southwest Side.

Transit does a lot to counter unequal opportunity in Chicago.

Transit expands many people's freedom by allowing them to reach places they otherwise couldn't. The positive impacts are clearest in areas where people have the lowest incomes.

The map in Figure 56 (center) represents how transit expands people's economic opportunities from all locations in Chicago by showing the difference between:

- How many jobs could be reached by transit and walking in 45 minutes in 2019.
- How many jobs are available within two miles.

In other words, **Figure 56 provides an estimate of how transit increases access to jobs beyond typical walking and biking distances.**

Comparing this to the map in Figure 57 (right) shows that transit multiplies the number of jobs low-income people in Chicago can access many times over.

Specifically, we can see that in 2019 transit typically multiplied job access in 45 minutes by a factor of 10 to 50 in areas where the most low-income people live, compared to places that people might walk or bike to.

Expanded Access to Jobs within 45 Minutes

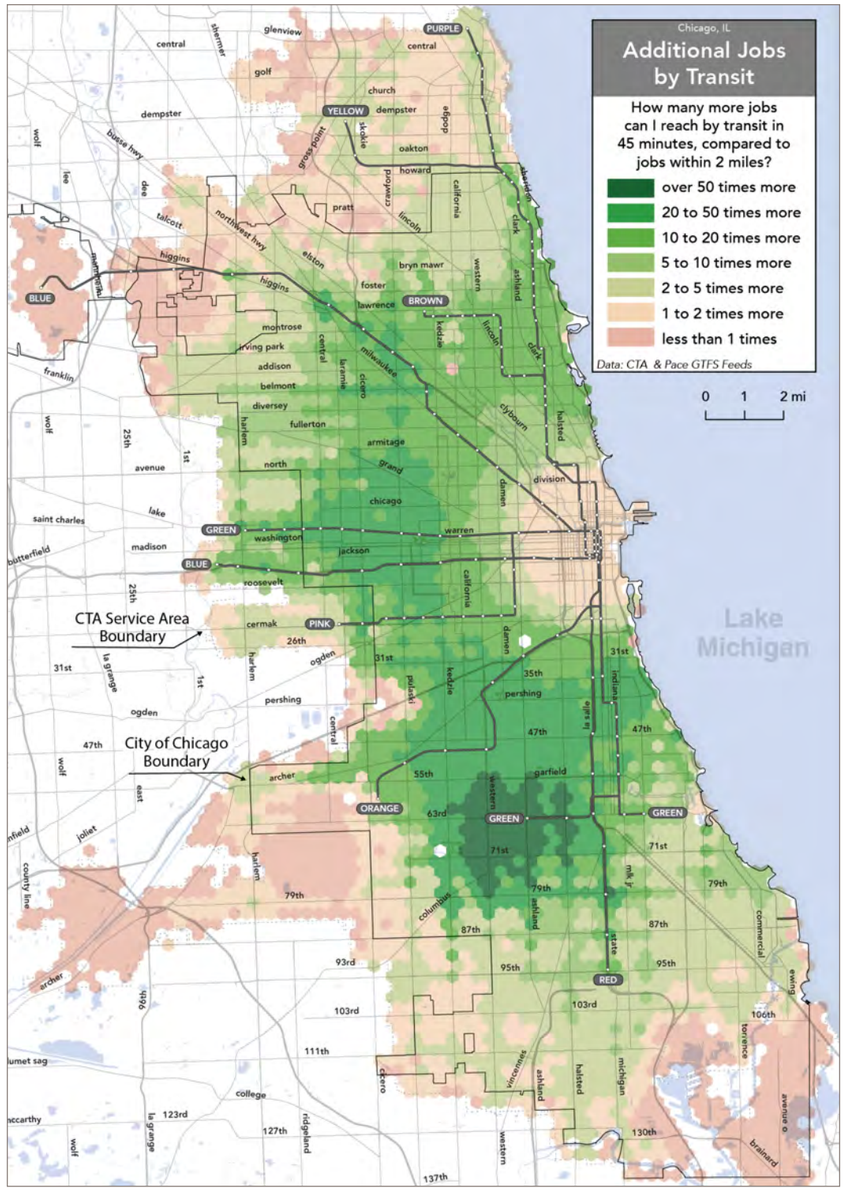


Figure 56: Map showing how many more jobs were reachable by transit within 45 minutes in 2019, compared to the number of jobs available within 2 miles, from anywhere in the CTA service area.

Average Income Per Person

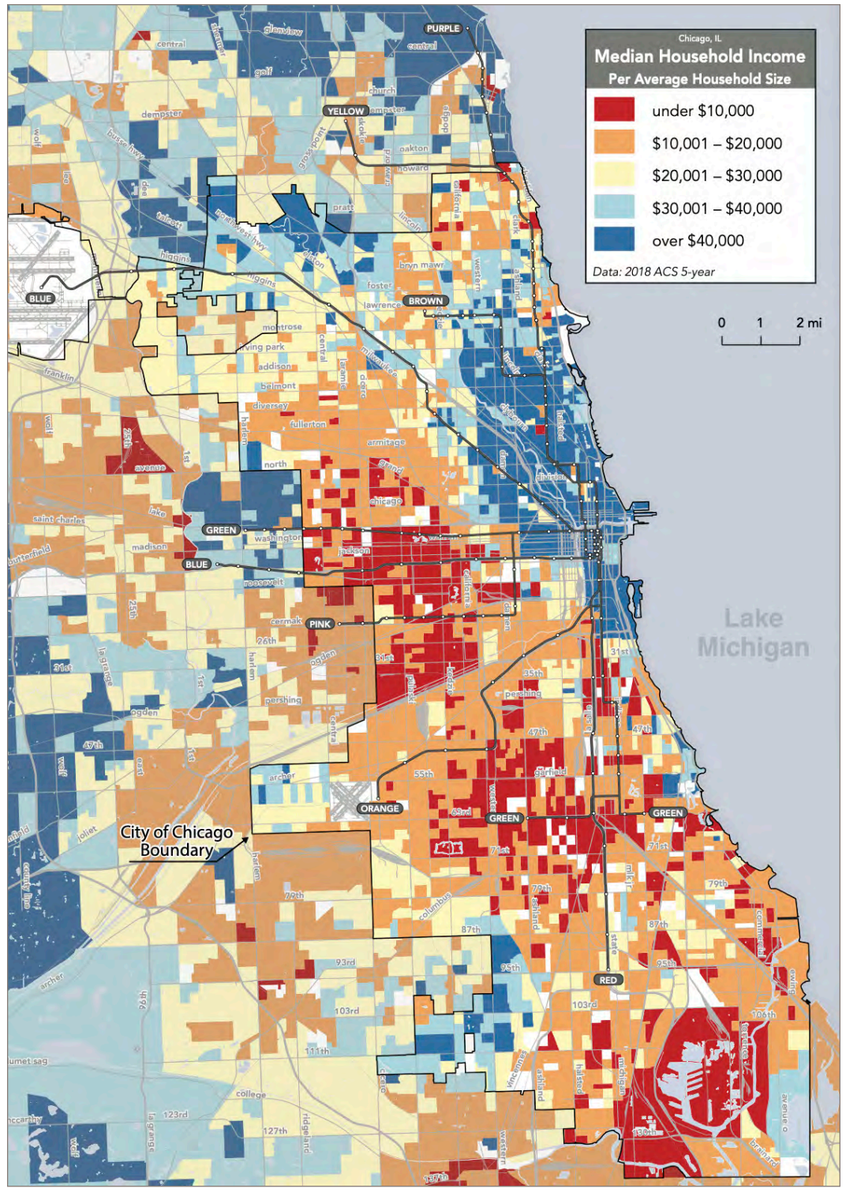


Figure 57: Map of median household income, divided by household size, in Chicago and environs.

5 The Structure and Limitations of the CTA Bus Network

Chapters 3 and 4 explained how transit provides access to opportunity, and how inequality in Chicago limits who benefits and how much.

This chapter examines the bus network's structure, how that structure creates (or limits) access to opportunity, and barriers to its improvement.

Most of CTA's bus network is a frequent grid.

The bus grid reflects the street grid.

As discussed in Chapter 2, Chicago's extremely regular street grid naturally encourages bus lines to be organized as a grid of long and straight lines, spaced every half-mile.

Some lines operate East-to-West, others North-to-South, and each bus line crosses many others. This allows riders to go from anywhere to anywhere else with a single transfer.

CTA has also made the choice of designating Key Routes with higher frequencies every mile (see page 13). CTA Rail service adds to the grid by allowing connections to faster service for certain destinations.

Frequency makes the grid work.

A gridded network relies on passengers' willingness to transfer from one bus to another. This means it's essential to minimize the amount of time passengers spend waiting for both buses.

Making a grid network convenient requires very frequent service on as many lines as possible, so no matter where you are, the next bus (or train) is always coming soon.

The map in Figure 59 (see next page) depicts the extent of the frequent grid in Chicago. Specifically, it highlights the areas within a half-mile walk of stops on bus and rail lines that are frequent (every 15 mins or better), long (at least 6 miles) and connect to many other lines.

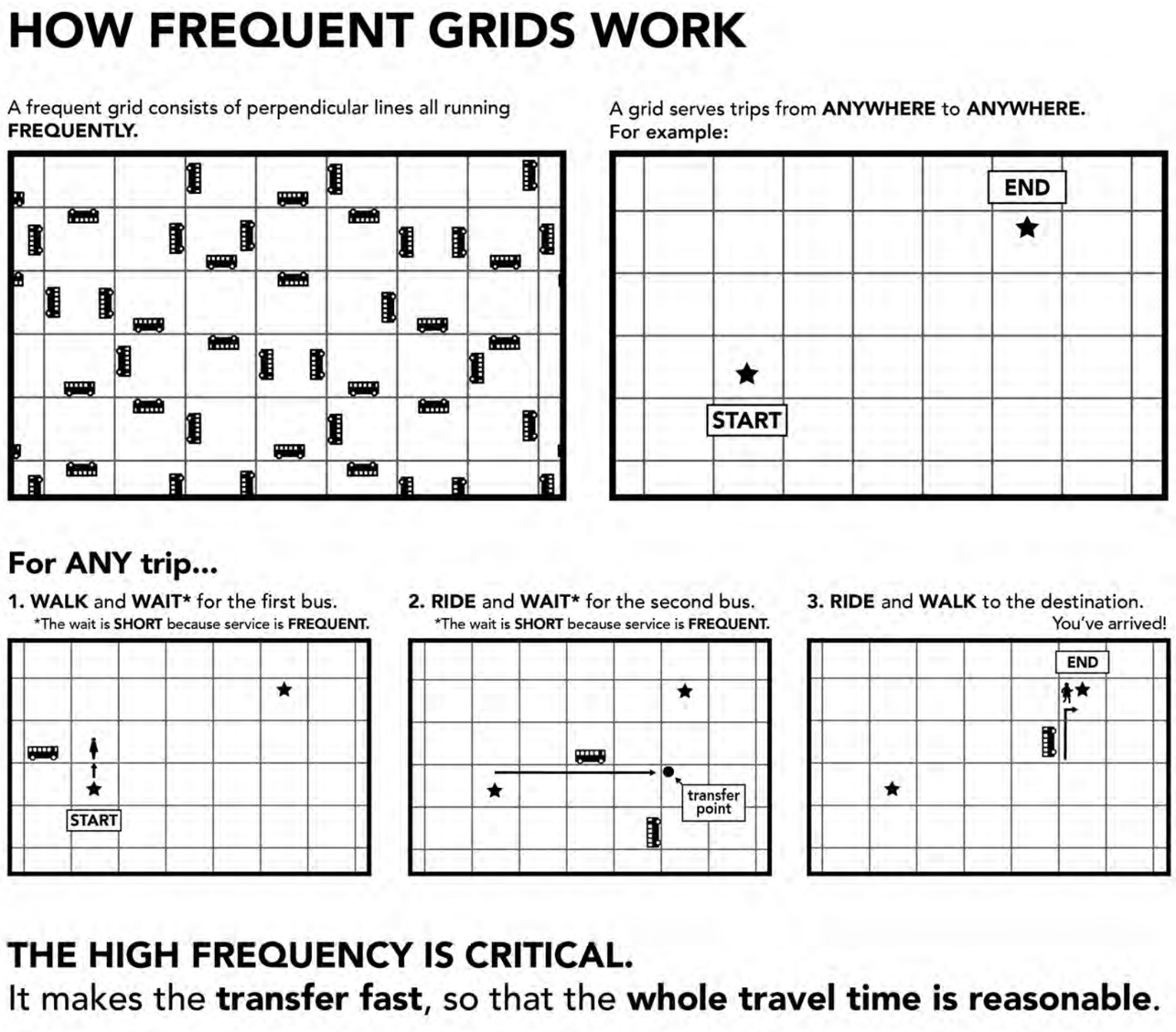


Figure 58: How frequent grids work.

The frequent grid enables people to use CTA to access a broad area.

On this page:

- Figure 59 (center) is a map that shows the extent of CTA's frequent grid, based on weekday midday service frequencies in 2019[1].
- Figure 60 (right) is a map that shows the percentage of the CTA service area reachable within 45 minutes by transit and walking in the middle of the day on weekdays, from anywhere in the CTA service area.

Comparing these maps suggests that **access is directly related to how extensive and frequent the grid is.**

Almost anyone located within a half-mile walk of both a North-South and East-West frequent grid line could reach over 30 square miles (or 10% of the service area) within 45 minutes[2]. In contrast, transit provides less access in areas where:

- Frequent grid service was only available in one direction, such as west of Austin Ave in the Northwest, and parts of the Far North Side.
- All transit service was on shorter, local, or less frequent lines, such as south of 95th St, west of Kedzie Ave in the Southwest, and the Evanston/Skokie/Lincolnwood area.

1 As explained on page 36, weekday midday frequency is relevant as a measure of frequency in general, because it represents a minimum frequency that can be relied on throughout the daytime, up to 6 days a week on most bus lines. 2019 frequencies are used to reflect CTA's intention to return to a full level of service as soon as possible.

2 The main exception to this are areas located near the shores of Lake Michigan. This is because there is simply less land area potentially accessible, given that so much of the vicinity of these areas is water. The issue is more pronounced on the South Side, mostly due to greater distances from CTA rail service.

Areas on the Frequent Grid

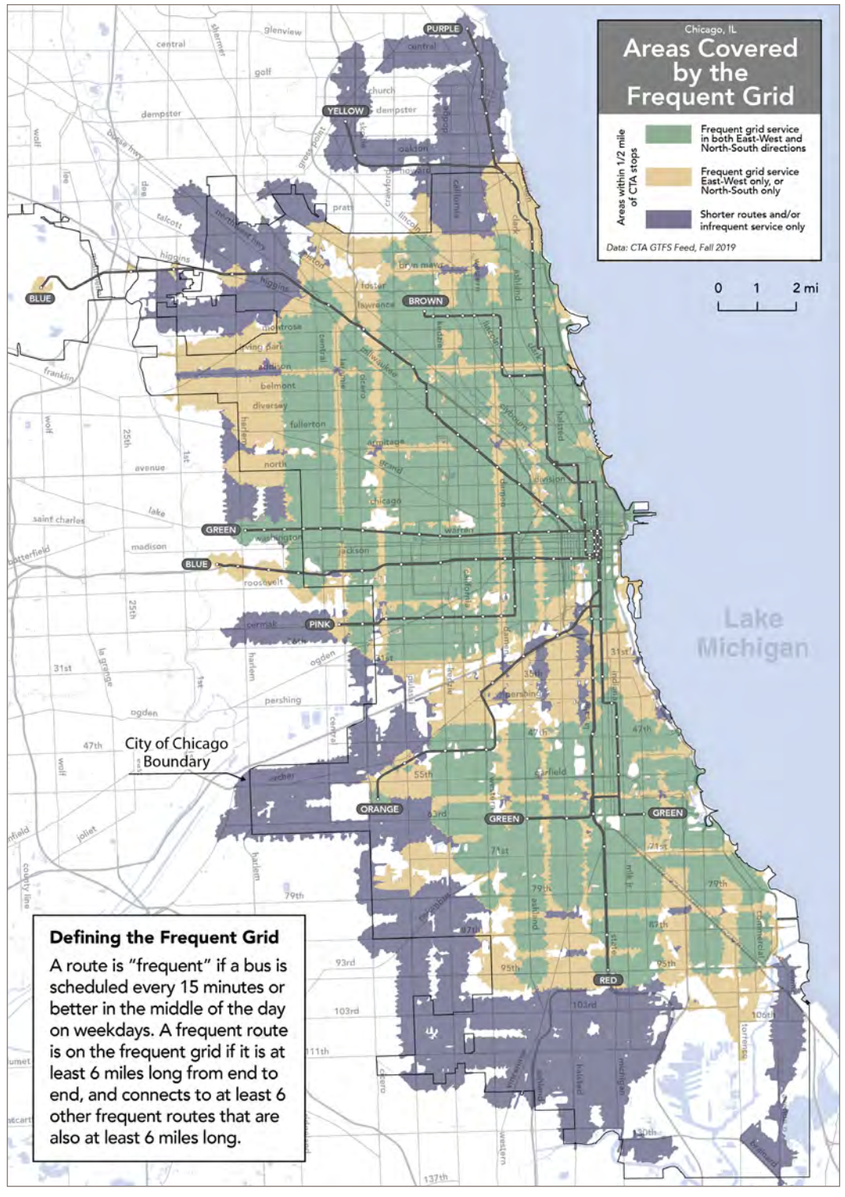


Figure 59: Map of areas that are within a half-mile walk of stops on bus and rail lines that form the frequent grid in 2019.

Area Accessible by Transit within 45 Minutes

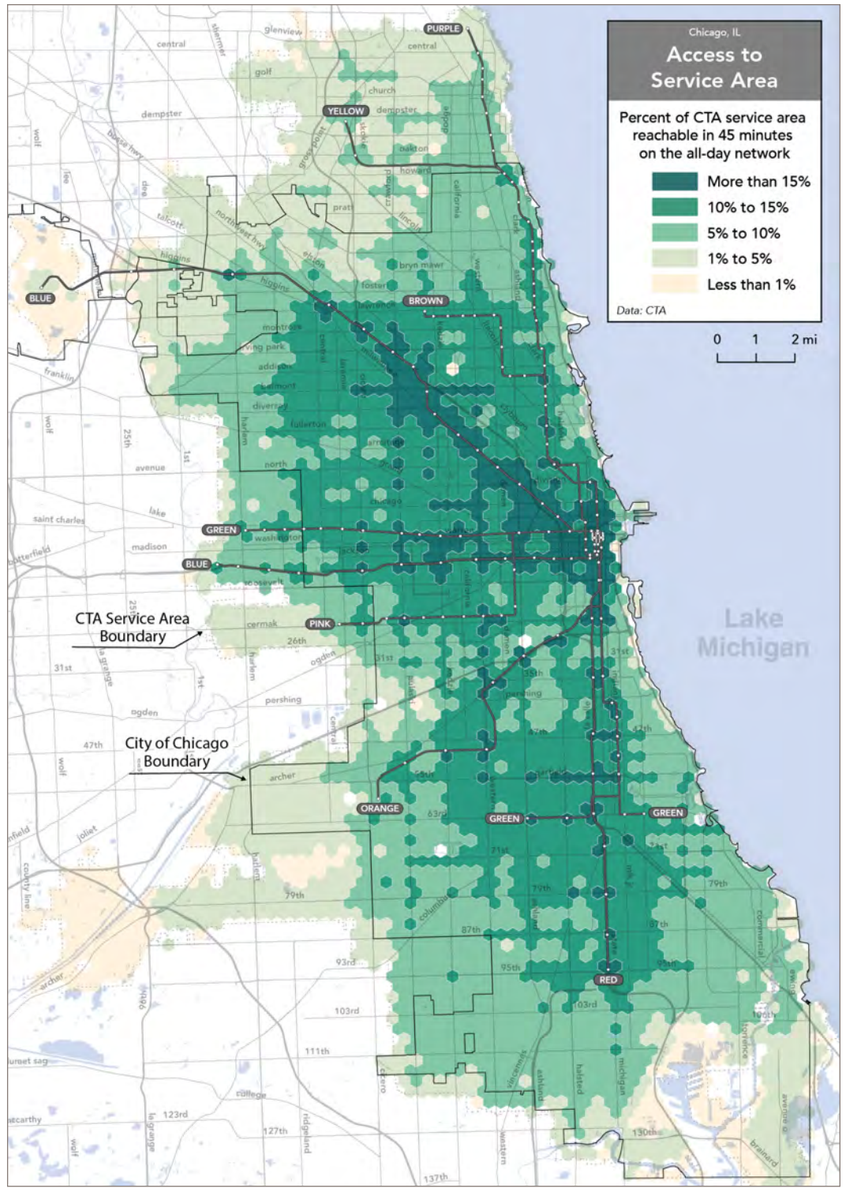


Figure 60: Map of access to the CTA service area, in 45 minutes or less on transit (including time spent walking, riding, waiting and transferring).in 2019.

Frequent buses make most jobs in Chicago accessible within 60 minutes.

On this page:

- Figure 61 (center) is a map of weekday midday frequencies on CTA buses in Fall 2019.
- Figure 62 (right) is a map of the number of jobs accessible by transit and walking in 60 minutes or less throughout the CTA service area, based on 2019 weekday midday frequencies.

As discussed on page 45, access to jobs provides a partial window into access to many other useful places, including retail, medical services, education and other everyday needs.

At a 60 minute time scale, the impact of the bus network in producing access to opportunity throughout Chicago is clear:

- In close-in areas that are relatively far (a half-mile or more) from rail, buses provided comparable access benefits to rail. This is visible in Figure 62 as the continuous dark red area between Lake Michigan and Pulaski Ave, north of Cermak Rd and south of Lawrence Ave.
- **CTA's high-frequency bus lines have helped extend access to opportunity far beyond the reach of rail, especially on lines that connect areas with few opportunities to places with more**. Examples include:
  - North-South lines on the South Side like the J14-Jeffery Jump, 9-Ashland, 49-Western and 53A-South Pulaski.
  - North-South lines on the Far North Side like the 49B-North Western and 82-Kimball.
  - East-West lines in the Northwest like the 74-Fullerton, 76-Diversey, 77-Belmont and 80-Irving Park.

CTA Bus Network Midday Frequencies in 2019

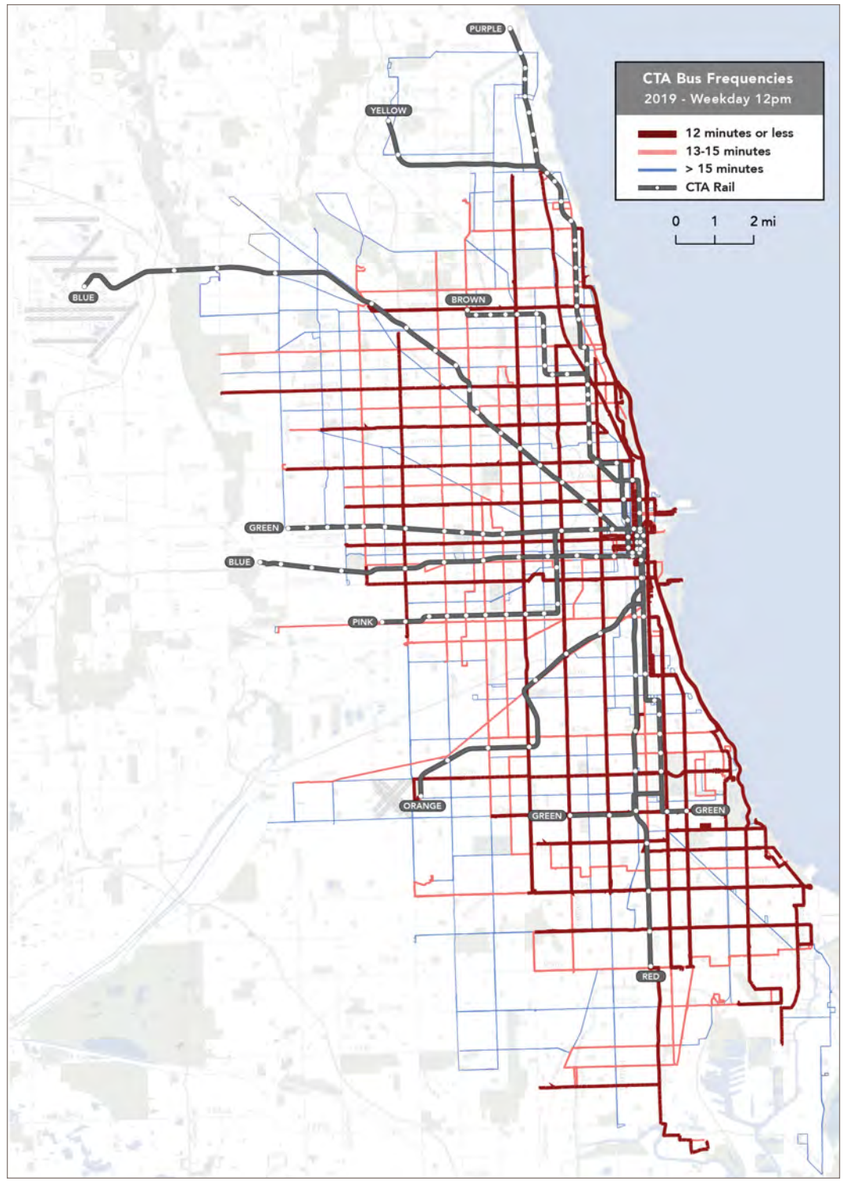


Figure 61: Map showing frequency of bus service throughout Chicago on weekdays in the middle of the day in 2019.

Jobs Accessible by Transit within 60 Minutes

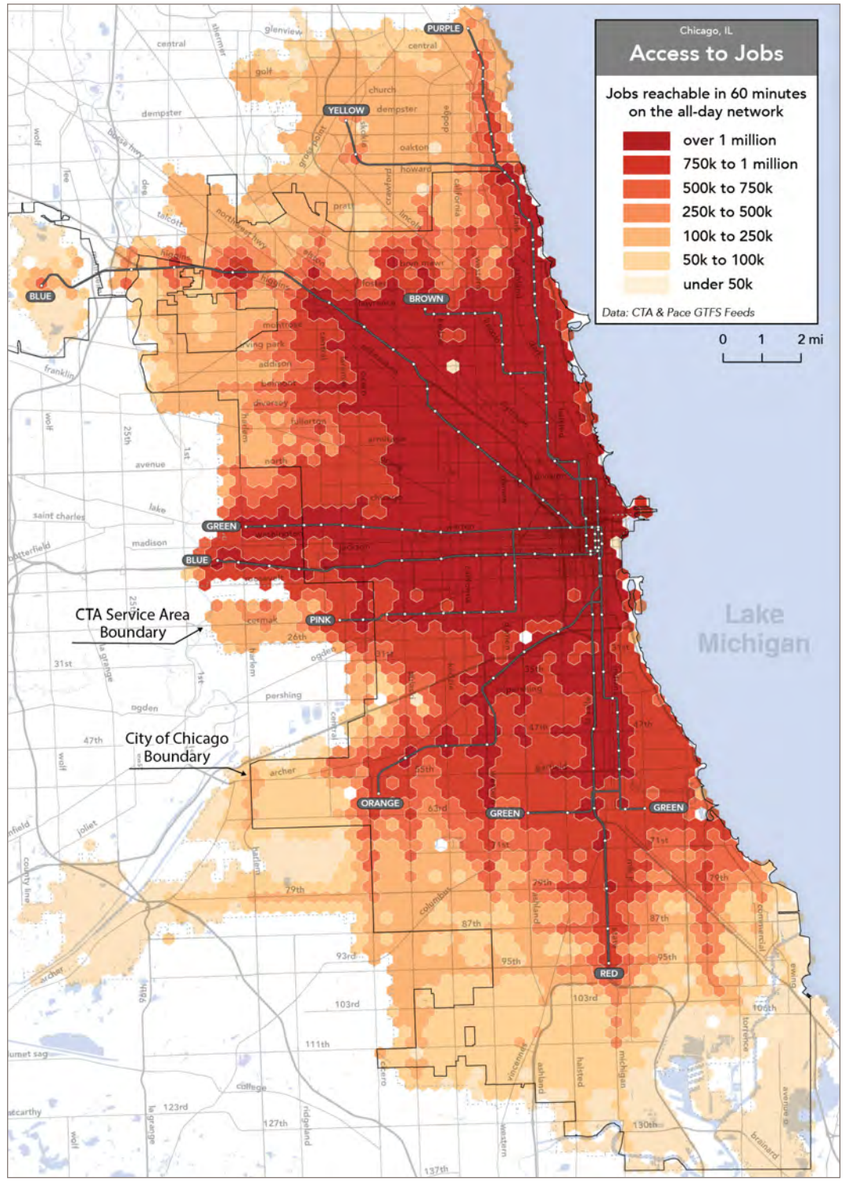


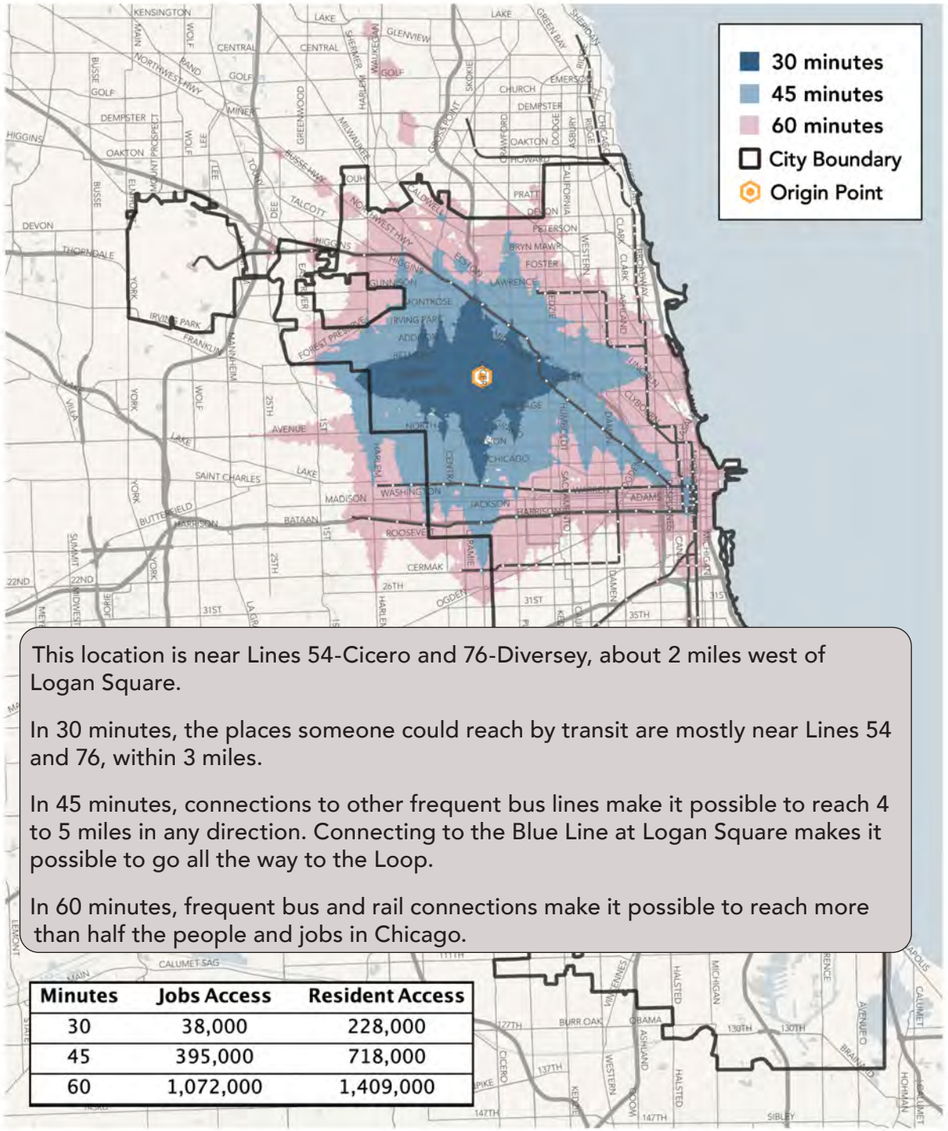
Figure 62: Map of access to jobs, in 60 minutes or less on transit (including time spent walking, riding, waiting and transferring) in 2019.

Examples of access enabled by the frequent grid in 2019.

How far can I travel in 30, 45, and 60 minutes from

Diversey & Cicero

at 12pm on a weekday?



This location is near Lines 54-Cicero and 76-Diversey, about 2 miles west of Logan Square.

In 30 minutes, the places someone could reach by transit are mostly near Lines 54 and 76, within 3 miles.

In 45 minutes, connections to other frequent bus lines make it possible to reach 4 to 5 miles in any direction. Connecting to the Blue Line at Logan Square makes it possible to go all the way to the Loop.

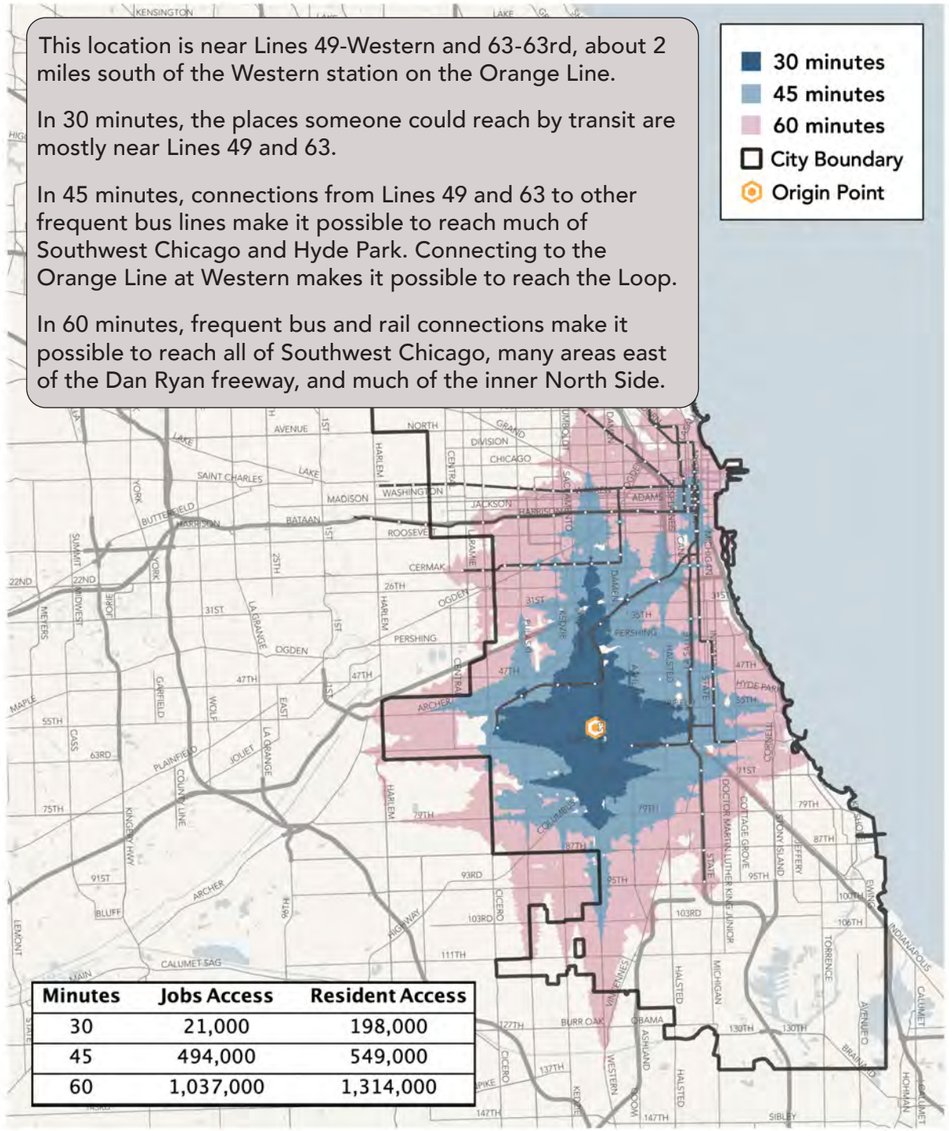
In 60 minutes, frequent bus and rail connections make it possible to reach more than half the people and jobs in Chicago.

Minutes	Jobs Access	Resident Access
30	38,000	228,000
45	395,000	718,000
60	1,072,000	1,409,000

How far can I travel in 30, 45, and 60 minutes from

63rd & Western

at 12pm on a weekday?



This location is near Lines 49-Western and 63-63rd, about 2 miles south of the Western station on the Orange Line.

In 30 minutes, the places someone could reach by transit are mostly near Lines 49 and 63.

In 45 minutes, connections from Lines 49 and 63 to other frequent bus lines make it possible to reach much of Southwest Chicago and Hyde Park. Connecting to the Orange Line at Western makes it possible to reach the Loop.

In 60 minutes, frequent bus and rail connections make it possible to reach all of Southwest Chicago, many areas east of the Dan Ryan freeway, and much of the inner North Side.

Minutes	Jobs Access	Resident Access
30	21,000	198,000
45	494,000	549,000
60	1,037,000	1,314,000

CTA provides more service in places where it expects higher ridership.

CTA's revenue model requires high ridership, so CTA provides more service in areas where there are many jobs and people, especially if those people don't have cars.

As explained in Chapter 2, the public funding CTA receives is established in state law. This limits how much service CTA can provide.

In addition, state law makes public funding dependent on meeting strict requirements for "system-generated revenue".

This means CTA needs to maximize fare revenues. Because fare revenues are related to ridership, CTA has historically provided more service in places where it expects higher ridership, and less service in other parts of its service area.

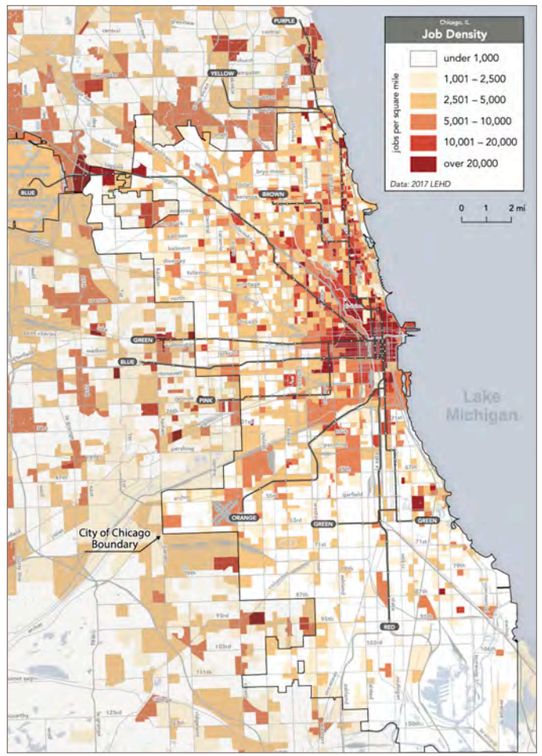
As shown in Chapter 4, the strongest predictors of transit ridership are:

- Job density, because it is directly correlated to the places people need to go on a regular basis.
- Residential density, because it indicates where people start and end their day.
- Zero-car household density, because it indicates where the largest numbers of people are likely to rely on transit.

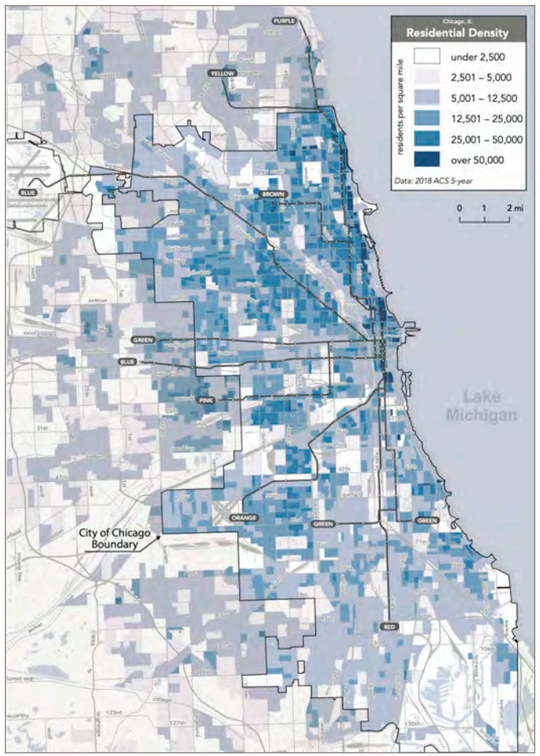
Figure 63 compares these factors to relative service quantities in the CTA service area in 2019. These maps show that CTA service levels:

- Are highest in the two miles around the Loop, and North Lake Shore, where job, zero-car and residential densities are highest.
- Are otherwise mostly proportional to residential density.
- Are relatively high in parts of the West and South sides where zero-car household densities are significant, even if overall residential densities are middling.

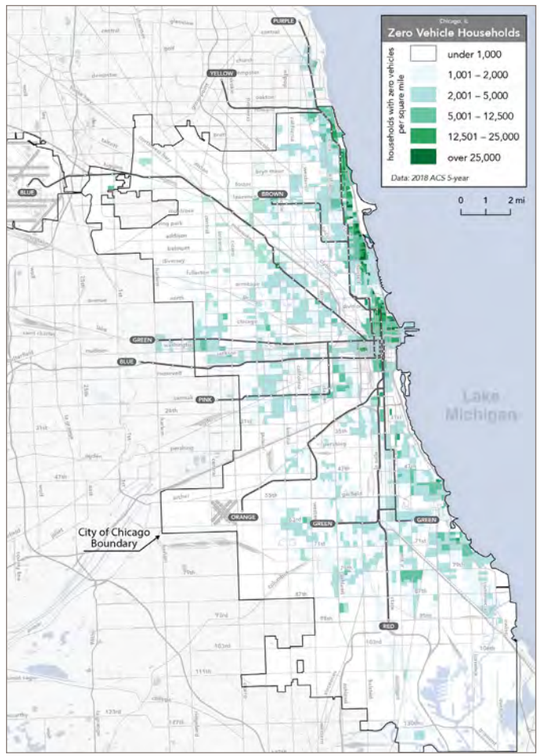
Job Density



Residential Density



Zero-Car Household Density



CTA Service Quantity

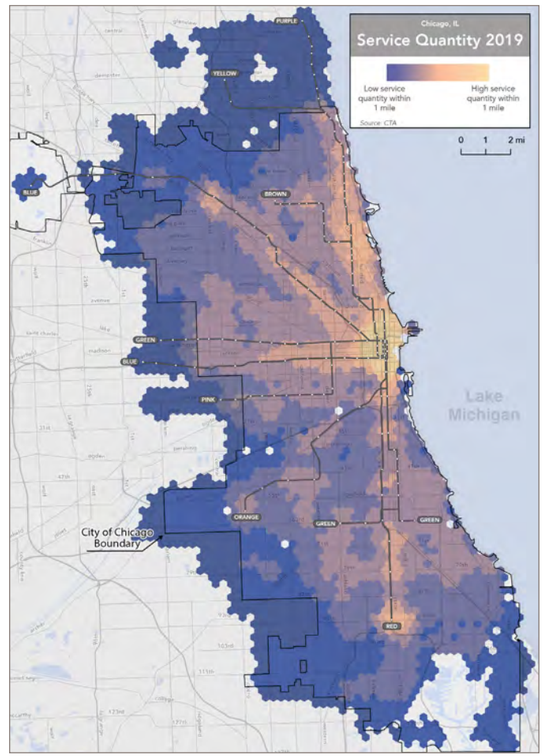


Figure 63: These four maps compare job density, overall residential density, and the specific density of zero-car households, to the amount of transit service provided in different areas by CTA in 2019. The service quantity map shows the relative amount of weekly bus and rail trips provided in each area, with brighter, yellow areas indicating that a lot of service is being provided and darker, bluer areas indicating less service.

More productive lines have higher frequency.

CTA balances the needs of different lines within available resources. This results in higher frequency on lines with more riders, and lower frequency on less productive lines.

The chart in Figure 64 shows one dot for every CTA bus line that operates through the middle of the day. The position of each dot depends on the bus line's:

- **Frequency** on weekdays in the middle of the day in 2019, represented on the horizontal axis[1]. More frequent lines are located to the left, less frequent lines to the right.
- **Productivity**, the average number of people who got on a bus, for every hour that bus was in service in September 2019. Productivity is on the vertical axis, so more productive lines show up higher on the chart.

Matching frequency to productivity is efficient.

Providing higher frequency on bus lines with the most riders has multiple benefits, including:

- **Maximizes access to opportunity for the most people.** As transit become more frequent, it becomes more convenient. So providing higher frequency tends to increase ridership, even on an already productive bus line. Over time, high frequency and high ridership converge, so CTA tends to provide the most convenient service possible to the most people possible.
- **Maximizes net revenue per hour of bus service.** Higher frequency means running more buses, which is expensive. But bus lines that are more productive produce more fare revenue per hour of service, at a lower operating cost per rider.
- **Limits overcrowding.** CTA service standards[2] include maximum passenger loads. When those loads are regularly exceeded on a given bus line, CTA needs to increase service. High productivity can be correlated with higher loads. Increased frequency can reduce loads by spreading passengers out among more buses.

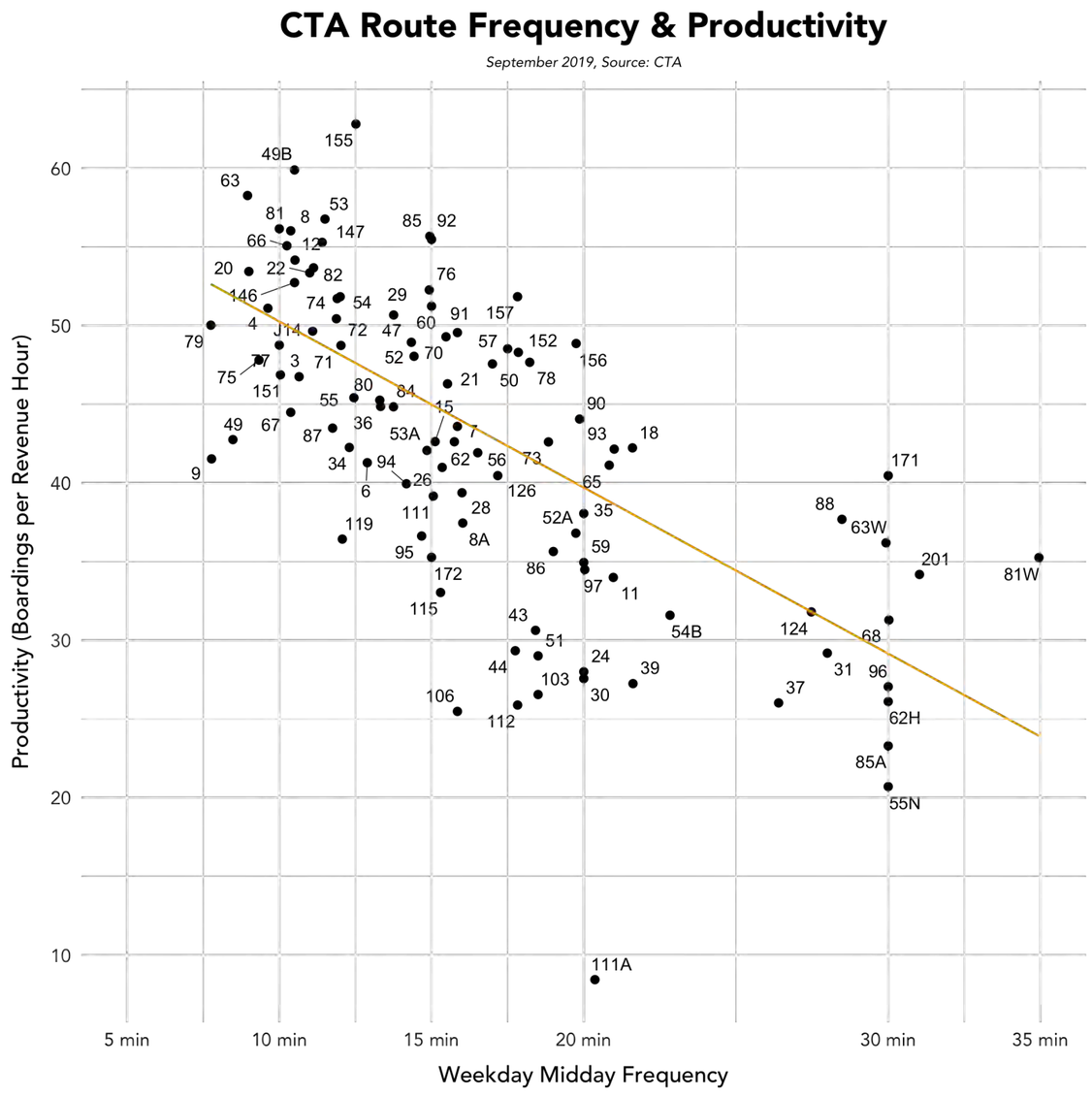
This serves broader goals.

Personal freedom. Providing the best service to the most riders maximizes the number of people who benefit from transit.

Climate & Environmental. Making the most efficient services the most attractive minimizes average emissions per rider.

Congestion Mitigation. When frequencies are high enough for transit to compete with cars, more people on a bus means fewer people are travelling on the same road in a car.

Figure 64: How often the bus came on each CTA bus line (frequency - horizontal axis), to the average number of boardings per hour of service provided on that line (productivity - vertical axis), in 2019. A "revenue hour" means an hour that a bus is either operating on this line, or on break between two trips on this line.



1 The exact measure used is the 90th percentile interval between two buses between 11 AM and 1 PM.

2 Available online at: https://www.transitchicago.com/assets/1/6/Chicago_Transit_Authority_Service_Standards.pdf

Service levels are higher during the peak periods.

Ridership has historically been very peaked.

The chart in Figure 65 shows how bus ridership and service levels varied by time of day on weekdays in September 2019. On this chart:

- The **red line** shows the percentage of daily ridership that occurred in each hour.
- The **blue line** shows the percentage of daily bus service provided in each hour.

For example, in the 7 AM hour, CTA provided about 8% of weekday bus service, and experienced about 10% of weekday ridership.

Following the red and blue lines, we can see that, pre-COVID:

- Weekday ridership was extremely peaked in the morning and afternoon.
- CTA service increased and decreased with ridership over the course of the day.
- CTA service did not peak as strongly as ridership. This is visible because the red line reaches much higher than the blue line.

Providing peaked service used to match demand.

This is called service peaking. Peaking serves to meet two important goals. It:

- **Maximizes ridership by providing capacity to meet higher demand.** In pre-COVID times, far more people traveled in the morning and late afternoon than at other hours. CTA simply would not have been able to carry the number of people who wanted to travel in the peak with midday service levels.
- **Minimizes overcrowding and pass-ups.** Some CTA bus lines handled thousands of passengers per hour during the morning and afternoon peak. If the bus didn't come often enough, bus crowding could become hazardous, and some people may not have been able to get on at all.

This also serves broader goals.

Economic opportunity. Peak-hour ridership is strongly tied to school and work commutes. Ensuring sufficient capacity on peak-hour buses helps connect people to opportunities.

Congestion Mitigation. Traffic tends to be worse at peak hours. Ensuring additional capacity on transit helps prevent even more people from needing to drive.

Climate & Environmental. Lowering the amount of drivers on the roads in peak hours reduces air pollution and greenhouse gas emissions.

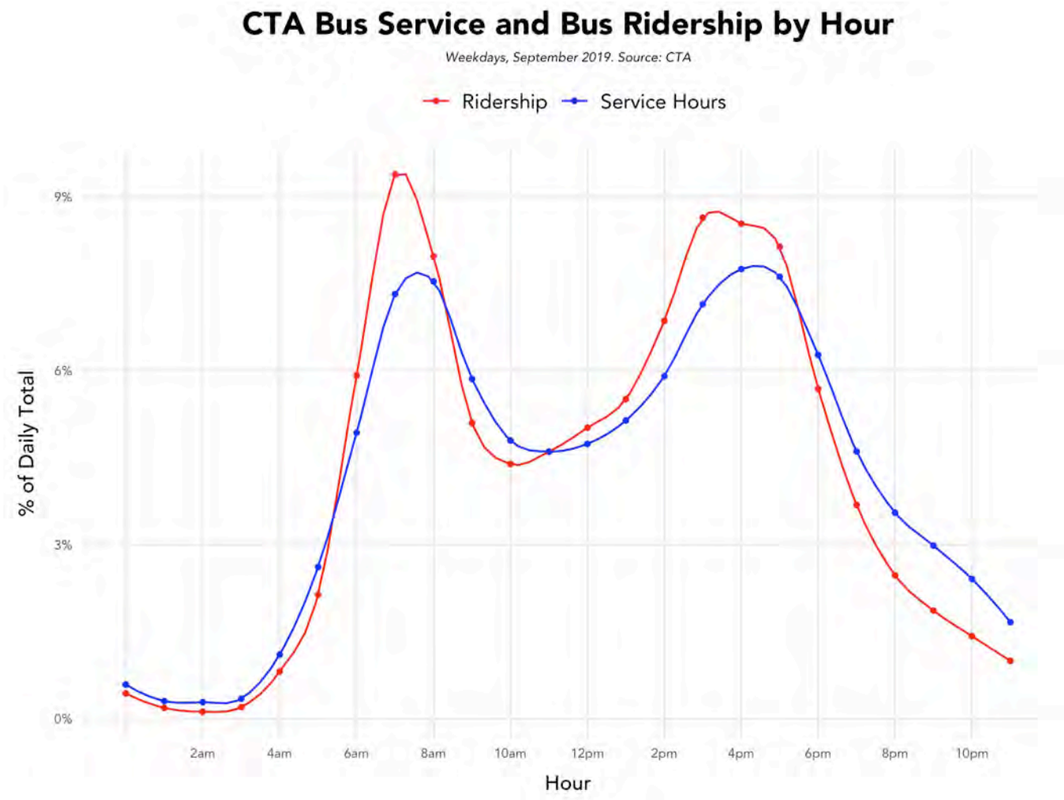


Figure 65: The relative levels of bus ridership (in red) and CTA bus service (in blue) by hour on weekdays, in September 2019.

But peaked service comes at a cost.

Adding extra service at peak means operating some buses for just a few hours at a time. This has several costs for CTA, including:

- **Owning and maintaining more vehicles** and the space to store them.
- **Running empty buses to and from garages** at the start and end of each peak.
- **Less desirable working conditions for drivers.** Providing extra service for just a few hours a day requires either using part-time drivers for short shifts, or requiring full-time drivers to accept split shifts[1]. Over-reliance on either option can cause hiring and retention issues.

1 A split shift is a workday that includes two work periods separated by an amount of time longer than a meal break. For example, a driver might be scheduled to work from 6 AM to 10 AM, and 2 PM to 6 PM.

Peaked service increases access to jobs at the busiest times of day.

On this page:

- Figure 66 shows CTA bus frequencies during the morning peak hour, in September 2019.
- Figure 67 shows how higher frequencies at peak increased the number of jobs accessible within 60 minutes by transit from anywhere in the CTA service area.

CTA operates additional service throughout the network at peak hours, in the form of:

- **Higher frequencies on all or part of a regular bus or rail line.** This is the case throughout the network.
- **Special peak-only patterns on all-day routes.** For example, at peak hours:
  - Line 28-Stony Island from the South Side continues to Downtown Chicago, instead of terminating at Lake Park & 47th Street.
  - The Purple Line rail service from Evanston continues to Downtown Chicago, instead of terminating at Howard Station.
- **Special peak-only routes**, such as:
  - The express services like the X9 on Ashland, the X49 on Western, and the new X4 on Cottage Grove.
  - Several Lake Shore express routes.
  - Less prominent services like the 54A – North Cicero and 48 – South Damen.

The additional frequencies and express services available at peak increase job access by transit, especially in areas far from rail.

This additional access is useful for people who have work and school commutes in the peak hours. However, people whose jobs start or end outside those hours experience lower service and less access.

CTA Morning Peak Frequencies in 2019

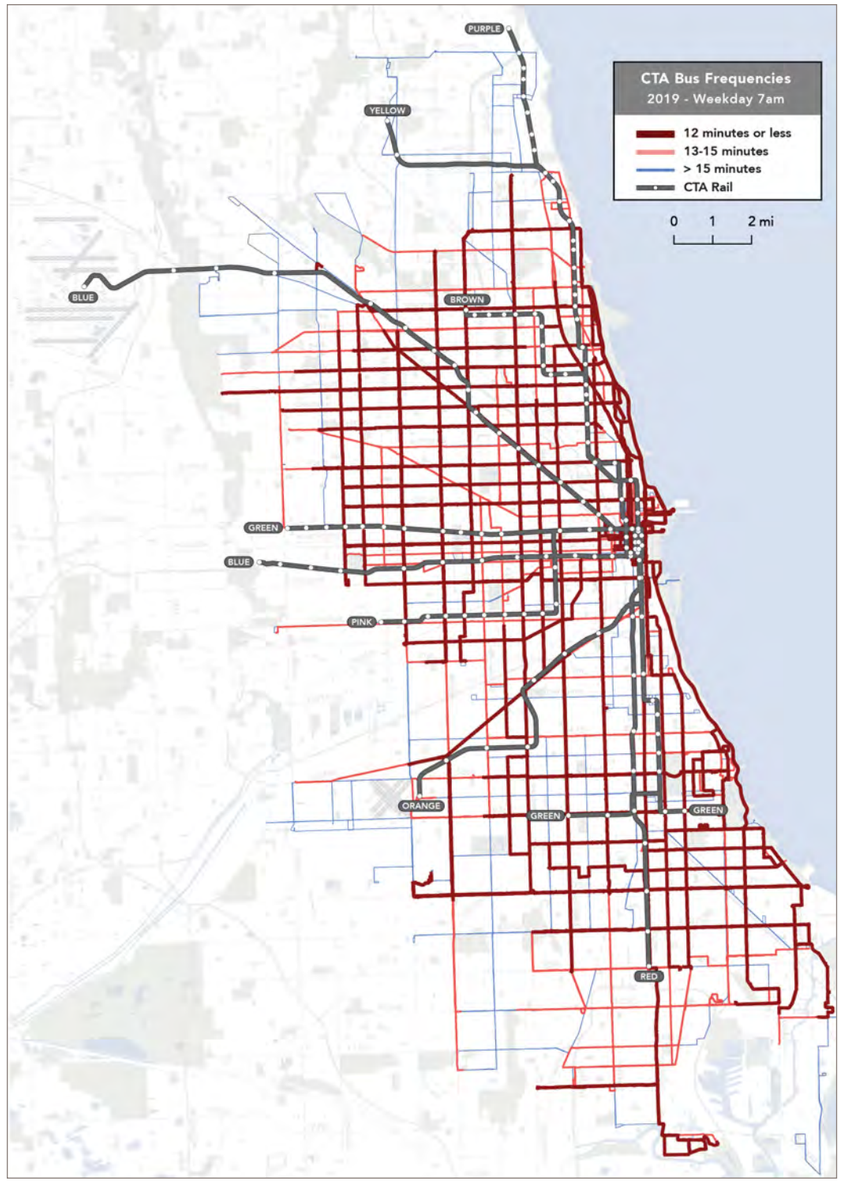


Figure 66: Map of CTA bus frequencies at 7 AM on weekdays, in September 2019.

Additional Jobs accessible within 60 Mins at Peak Hours

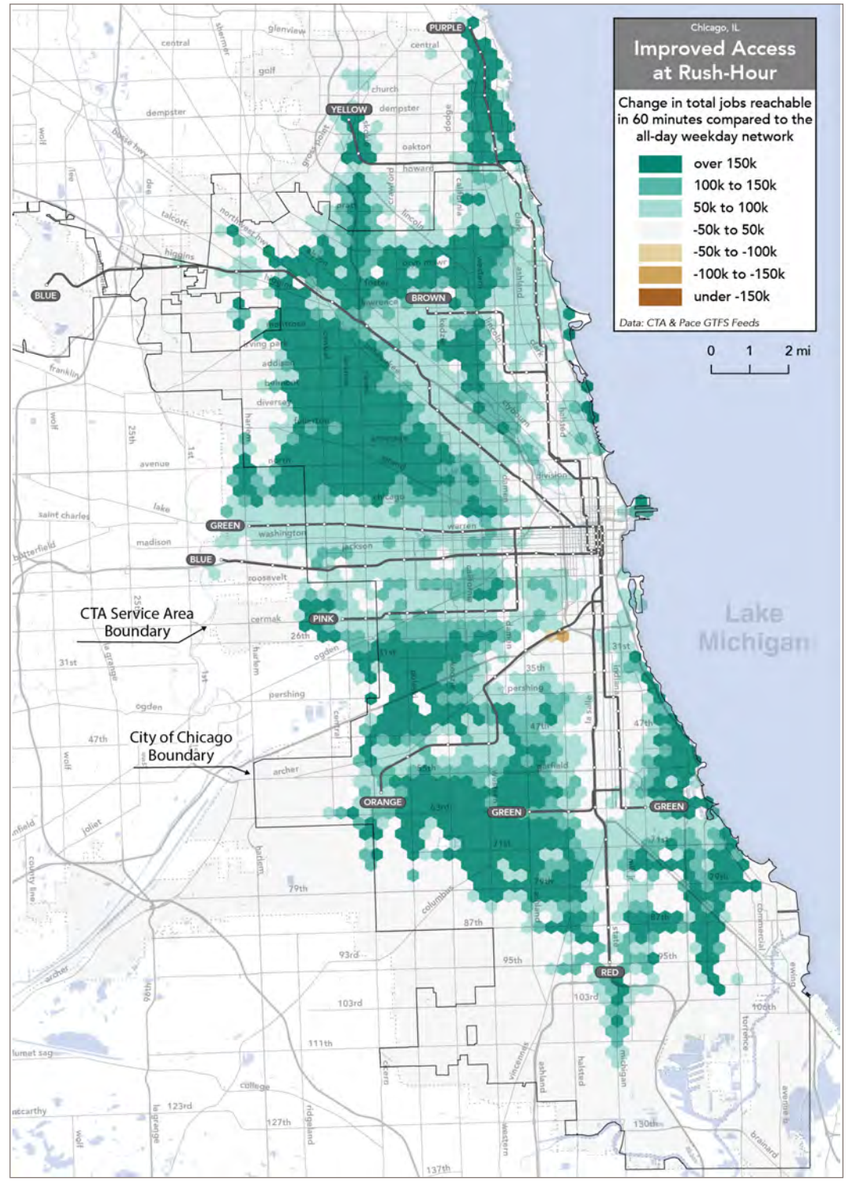


Figure 67: Map showing how many more jobs were accessible by transit within 60 minutes (including time spent walking, riding, waiting and transferring) at peak hours, compared to the middle of the day, in 2019.

Peak ridership fell sharply in 2020, but the peaks have since returned.

The morning and afternoon peaks remain the most productive times of day for CTA bus service. But peak ridership levels remain much lower than in 2019. As a result, there's less need to manage overcrowding.

Peak ridership has returned gradually.

The chart in Figure 68 (top right) shows how ridership levels varied throughout the day on weekdays, as of April 2022, compared to April in 2019, 2020 and 2021. This chart shows that:

- Ridership demand flattened out across the day at the start of the pandemic, with little additional demand in the peak periods. In 2020, the peak hours accounted for only 37% of weekday boardings on CTA buses.
- Since 2020, peak hour ridership has reemerged. As of May 2023, the peak hours account for 47% of weekday boardings - nearly as much as in May 2019 (48%).
- Ridership remains lower than in 2019 at all time periods.

As of April 2022, weekday ridership was highest between 3 and 4 PM, suggesting that the types of trips being made in peak hours may have changed since 2019.

People making essential trips are often riding at off-peak times.

As shown in Figure 69, off-peak ridership retention was much stronger in the early (2020) and middle (2021) stages of the pandemic. This highlights the importance of midday, evening and weekend service in providing for:

- People who are totally reliant on transit for trips that are essential to their lives.
- People who use transit to travel to essential jobs that cannot be done remotely and kept the region functioning during the pandemic.

Transit has always been essential for these purposes, but **the pandemic highlighted the importance of service at off-peak times to ensuring the basic functioning of essential services.**

Proportions of peak and off-peak service are similar to 2019.

The January 2023 service optimization made changes to both peak and off-peak service, but did not fundamentally rebalance service by time of day. 42% of weekday CTA service is still provided in peak hours, compared to 43% in 2019.

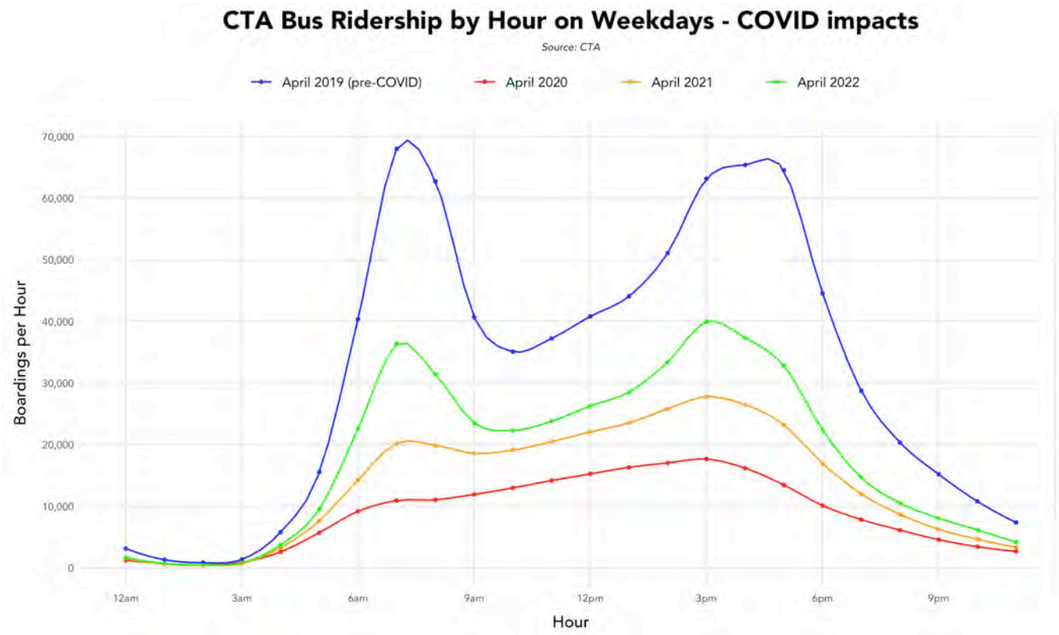


Figure 68: CTA weekday bus ridership by hour, April 2019 (pre-COVID) vs. April 2020, April 2021, and April 2022

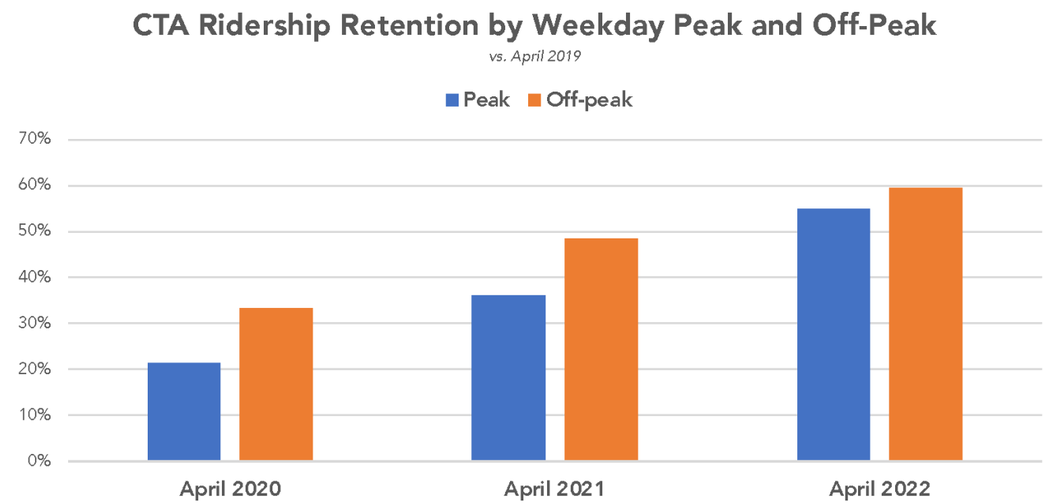


Figure 69: Comparing peak and off-peak ridership in April 2020, April 2021 and April 2022, to peak and off-peak ridership in April 2019 (percentages on the y-axis).

Service is less useful on evenings and Sundays.

Less frequency = less access

The maps in Figure 70 show what every CTA rider knows: you have to wait longer to get on the bus in the evenings and on weekends.

The table in Figure 71 shows how the difference between weekday and Sunday midday service impacts access to jobs and residents. It shows that in 2019 **the average CTA service area resident using transit could access 10% fewer places and 20% fewer job locations on Sundays than on weekdays in 45 minutes or less.**

Low frequencies undermine ridership and equity goals.

Low evening and weekend frequencies may seem efficient, because fewer people travel at off-hours. CTA is minimizing operating cost per rider by responding to lower demand with lower service.

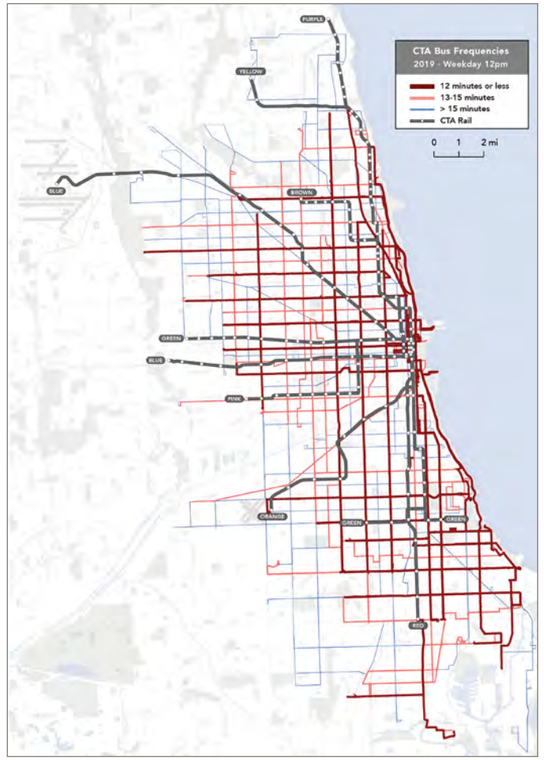
However, longer evening and weekend waits also mean that some people won't use transit, because they learn the bus is not reliable for their needs.

It's difficult to know exactly how many people are in this situation, but it's easy to see why many people would want to avoid waiting 20 minutes alone for a bus on a cold night. People who buy a car to avoid this will tend to ride less in general, or not at all.

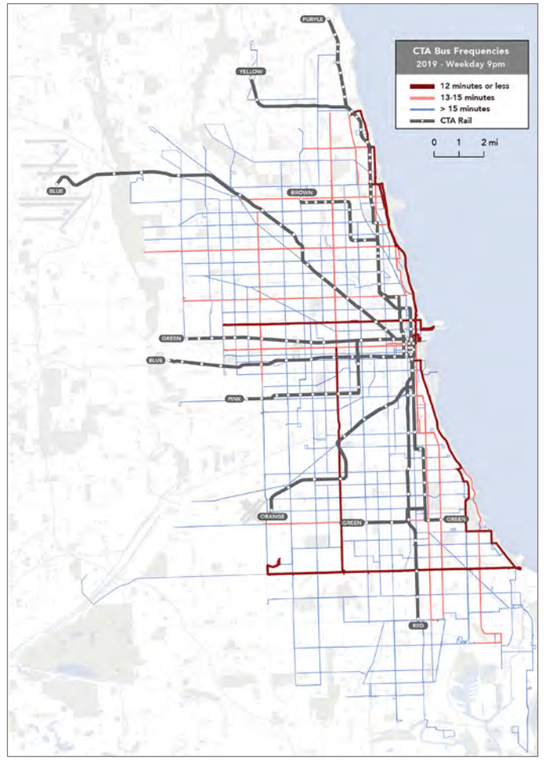
This is also an equity issue. Low-income people are more likely to hold jobs with evening and weekend shifts. For people in high-crime areas, the bus will take the longest when streets are emptiest and waiting at the bus stop feels least safe.

Low evening and weekend frequencies send a message to the public: transit isn't a service you can rely on all the time.

Weekdays at Noon



Weekdays at 9 PM



Sundays at Noon

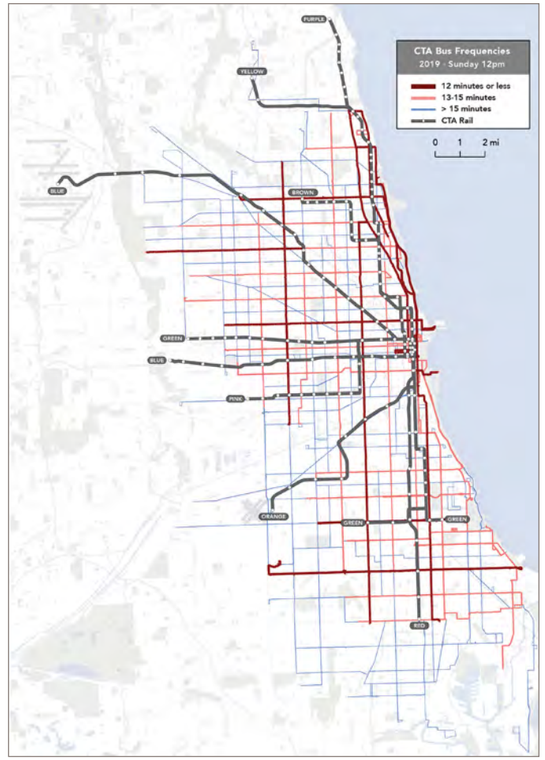


Figure 70: Maps of CTA bus frequencies in 2019, comparing weekday middays (left), weekday evenings (middle), and Sunday middays (right). Since January 2023, frequencies have been temporarily reduced on many lines. However, the general pattern of lower service levels on evenings and weekends remains the same.

How far can people reach within 45 minutes if they are...	Area Reachable (sq. miles) Weekdays	Area Reachable (sq. miles) Sundays	% Difference	No. of Jobs Accessible Weekdays	No. of Jobs Accessible Sundays	% Difference
"Average" Resident (for comparison)	30.7	27.7	**-10%**	136,000	108,000	**-20%**
Low Income (below 150% federal poverty)	32.0	29.1	**-9%**	151,000	116,000	**-23%**
Hispanic or Latino	31.7	28.6	**-10%**	130,000	104,000	**-20%**
Black or African-American	31.7	29.2	**-8%**	91,000	71,000	**-22%**

Figure 71: Impacts of lower Sunday frequencies on access within 45 minutes by transit.

Access to opportunity by transit declined during the 2010s.

Less service since 2010

As discussed in Chapter 2, CTA made a 16% bus service cut in 2010. There was only a small increase in bus service over the rest of that decade. As a result, fewer bus lines operated at high frequency in 2019 than in 2007, especially in the western half of the city.

The edges of the network have been more impacted.

The maps in Figure 72 show how far someone could travel by transit within 60 minutes, on weekdays in the middle of the day, in 2007 and 2019.

- Job access shrank by 27% from Addison & Central and 26% from 83rd & Kedzie.
- Access to other people (residents) shrank by 42% from Addison & Central and 24% from 83rd & Kedzie.

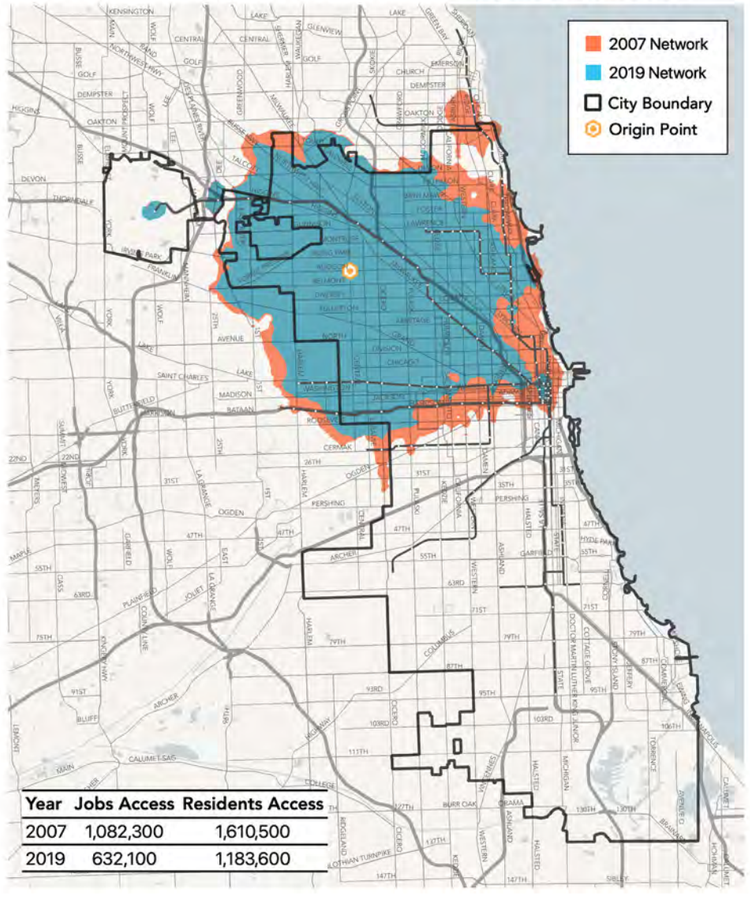
These locations illustrate an above average impact. In both places, service was about 22% lower in 2019 than in 2007, compared to an average 14% change systemwide.

Nevertheless, they illustrate a key problem with frequency cuts in a grid system. **The grid relies on transfers. For many passengers, reducing frequencies systemwide means increasing the length of two separate waits**.

Lower speeds have also reduced access.

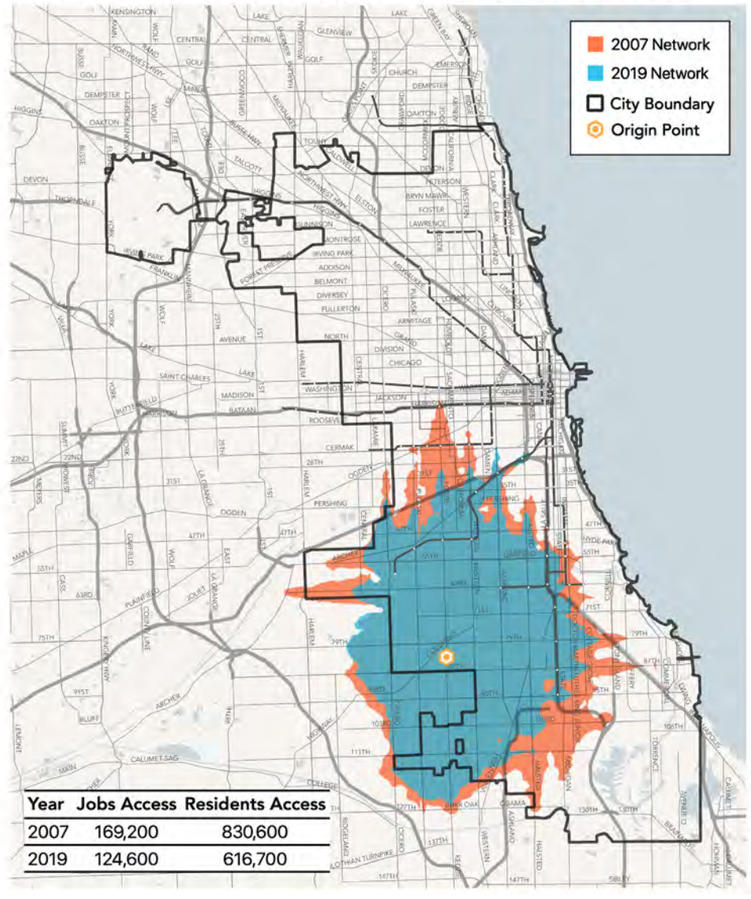
As we will see in the following pages, long-term declines in bus speeds have caused longer travel times and are likely contributing to lower frequencies in some areas.

How far can I travel in 60 minutes from
Addison & Central
at 12pm on a weekday, in 2019 compared to 2007?



Year	Jobs Access	Residents Access
2007	1,082,300	1,610,500
2019	632,100	1,183,600

How far can I travel in 60 minutes from
83rd & Kedzie
at 12pm on a weekday, in 2019 compared to 2007?



Year	Jobs Access	Residents Access
2007	169,200	830,600
2019	124,600	616,700

Figure 72: These maps compare how far someone could travel within 60 minutes on weekdays in the middle of the day in 2007 (in red), to how far they could travel from those same locations at the same time of week in 2019 (in blue). The "red halo" represents the area someone could have reached in 2007, but not in 2019.

Slower speeds have increased travel times.

Slower and less reliable speeds have the same effect as service reductions.

Speeds have declined since the mid-2000s.

CTA buses gradually got slower from 2008 to early 2020. For example, Figure 73 shows how average daytime operating speeds on CTA's Key Route Bus Network[1] changed in this time.

From 2008 through 2012, the average daytime operating speed on CTA's Key Routes declined from 10 mph to 9.3 mph. This trend stabilized somewhat after 2012, but **as of early 2020, CTA's key routes were running about 8% slower on average than they were in 2008, at 9.2 mph.**

This is consistent with systemwide historical data from the National Transit Database (NTD). NTD data suggests that CTA speeds have been declining since 2003, and declined by 7% from 2008 to 2019[2].

Over the same period of time, NTD data suggests that average CTA rail speeds did not change significantly, going from 17.7 mph in 2008 to 18.1 mph in 2019.

Declining speeds increase in-vehicle time.

The most direct impact of lower bus speeds is that riders spend longer on the bus. On average, **a trip that required 30 minutes on the bus in 2008, would have required 32.5 minutes on the bus in early 2020.**

This impact increases as trips become longer. A trip that required 60 minutes on the bus in 2008 would have required 65 minutes in 2020.

Declining speeds lead to longer waits.

Slower service also means more buses are needed to maintain service. For example:

- If a bus trip takes 120 minutes from start to end to return (including end-of line breaks) and the bus line runs every 10 minutes, the line requires 12 buses.
- But if that trip now takes 130 minutes, it will require 13 buses. If CTA can't afford the extra bus, scheduled frequency will be reduced to every 11 minutes.

CTA's operating budget does not grow as speeds go down. Therefore, as speeds decline, CTA has to choose which lines will maintain their frequencies, and which ones will experience longer waits.

Longer waits and slower rides have reduced how much access to opportunity transit can provide in a reasonable amount of time.

Average Key Route Bus Speeds, 2008 to 2019

Weekdays,6 AM to 8 PM. Monthly and 12-month rolling average. Source: CTA.

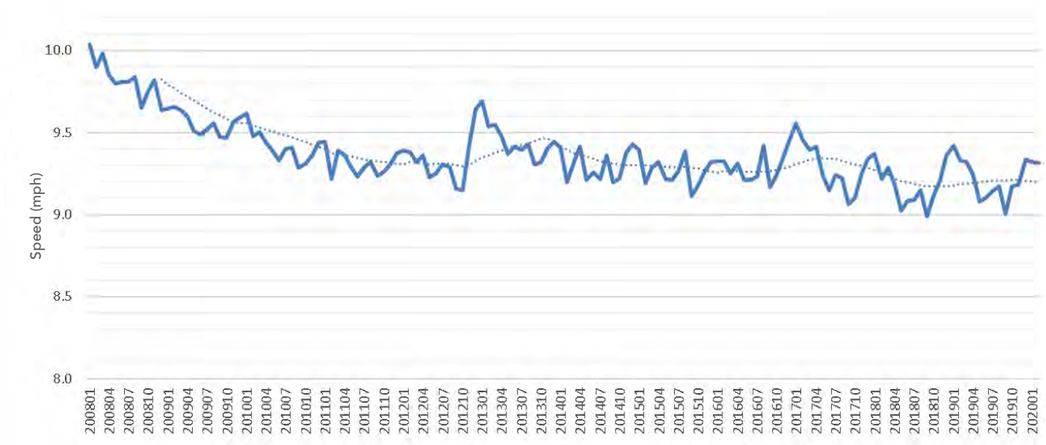


Figure 73: The evolution of average daytime speeds (6 AM to 8 PM) on the CTA Key Route Bus Network, from January 2008 to January 2020. Speeds shown are actual speeds, not scheduled.

How Declining Speeds Cause Longer Waits and Added Costs

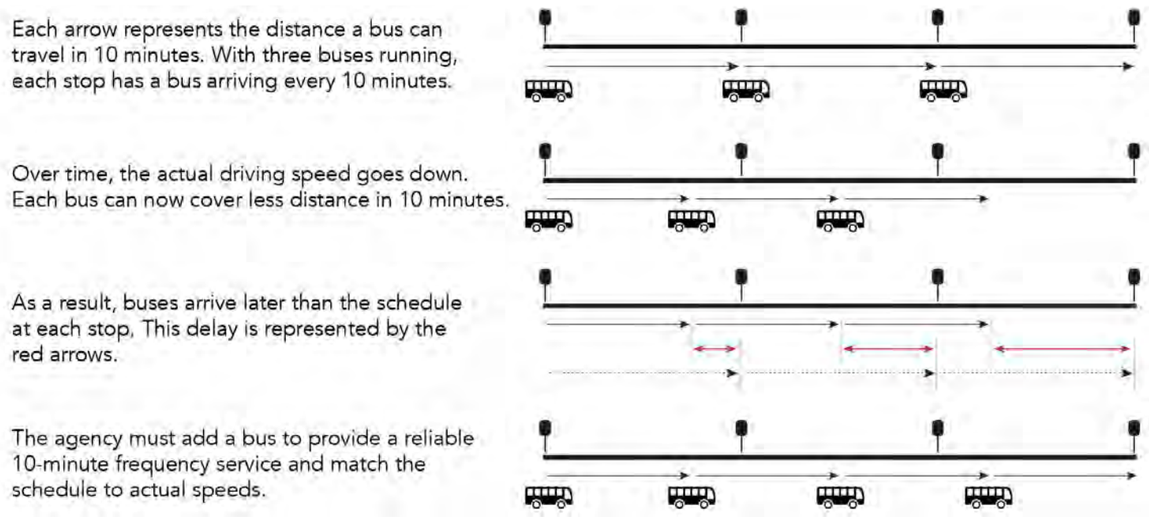


Figure 74: How reduced speeds require transit agencies to spend more on service to maintain frequencies. If it's not possible to spend more on service, the only alternative is to reduce frequency.

1 See page 13 for the definition of the Key Route Bus Network.

2 Based on NTD 2020 data, systemwide average bus revenue speed (annual revenue miles divided by annual revenue hours) was 10.03 mph in 2003, 9.77 mph in 2008, and 9.08 mph in 2019. Revenue speeds are slower than operating speeds, because revenue hours include time when buses are on break, but revenue and operating speed trends are correlated. NTD table TS 2.1 available here: https://www.transit.dot.gov/ntd/data-product/ts21-service-data-and-operating-expenses-time-series-mode-2

Speeds have also become more variable.

Runtimes have become more variable.

Reduced speeds express themselves in bus schedules as longer round-trip runtimes. From 2008 to 2019, worst-case runtimes have increased faster than average runtimes, based on data from CTA's Automatic Vehicle Location (AVL) system[1]. From 2008 to 2019:

- The median round-trip runtime for a CTA bus line in the midday went from 124 minutes to 134 minutes, an 8% increase.
- The 90th percentile runtime for a round-trip run in the midday went from 16.1 minutes longer than the median, to 19.2 minutes longer than the median, a 19% increase.

This means most passengers have been spending a longer amount of time on the bus. At the same time, CTA has been required to pay more and more to maintain service frequencies.

This adds up to higher costs to maintain service.

To ensure consistent delivery of service, CTA typically writes schedules **so that 90% of buses can complete each trip with enough spare time to start the next trip on time.**

In other words, as CTA observes slower speeds, it adjusts schedules to maintain service delivery. As CTA observes more variability (longer 90th-percentile runtimes), it is required to allocate more and more end-of-line recovery time in the schedule. This in turn means allocating more buses and drivers to maintain the same levels of service.

The chart in Figure 75 shows examples of CTA bus lines following the general trend of increasing runtimes. These lines have been selected to best illustrate the issue of worsening runtimes.

The 90th-percentile runtimes have increased on five of the six lines portrayed. The impact of these worsening runtimes on service costs is reflected in Figure 76.

These two figures also include one notable counterexample: Line 49-Western. Lines 9-Ashland and 49-Western are unique among CTA bus lines, because both the Ashland and Western corridors were significantly modified in 2015.

These changes reduced the average number of bus stops per mile from eight to five on Lines 9 and 49 (and about half as many on Lines X9 and X49). On Line 49, this appears to have prevented escalations in runtime.

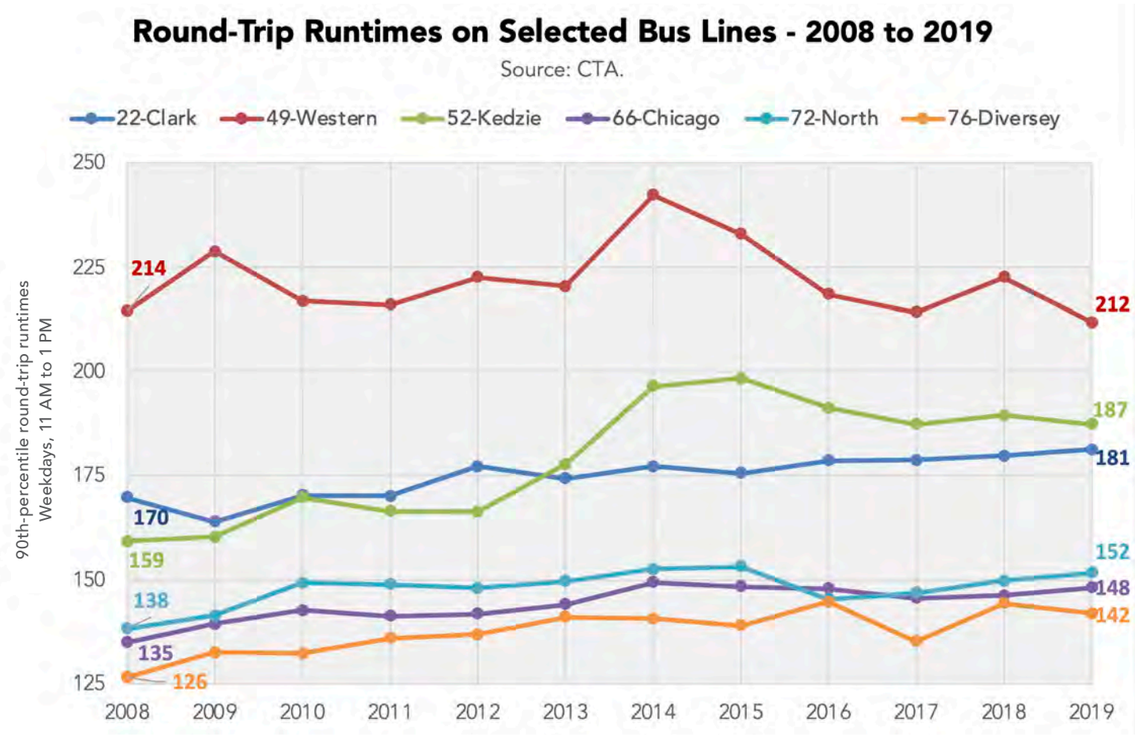


Figure 75: Changes in weekday midday runtimes on selected CTA bus lines, 2008-2019. The round-trip run time does not include layover.

Bus Line	2019 PM Peak Frequency	2008 90th Percentile Runtime	Vehicles Required for 2019 Frequency at 2008 Speeds	2019 90th Percentile Runtime	Vehicles Required for 2019 Frequency at 2019 Speeds
22-Clark	11	170	16	181	17 (+1)
49-Western	9	214	24	212	24 (=)
52-Kedzie	14	159	12	187	14 (+2)
66-Chicago	10	126	13	142	15 (+2)
72-North	12	138	12	152	13 (+1)
76-Diversey	15	126	9	142	10 (+1)

Figure 76: 90th Percentile PM Peak Runtime 2008-2019 and minimum vehicle requirements on selected CTA bus lines.*

**Simplified example - actual number of buses required is likely to vary.*

1 Figures for weekday runtimes, between 11 AM and 1 PM, in September. Runtimes have also increased at peak times.

Slow speeds restrict expansion of the frequent grid.

Bus lines operate unreliably when they are too long.

The longer a bus line becomes, the more delays a bus is likely to encounter along the way. In addition, bus drivers need to take occasional breaks to stretch and to use the restroom.

Many transit agencies adhere to an unofficial standard that a bus line should not require more than 90 minutes to operate in each direction. Agencies that operate in especially large areas sometimes tolerate up to 120 minutes, if there are compelling reasons to do so.

The length and speed of CTA's North-South bus lines creates reliability challenges.

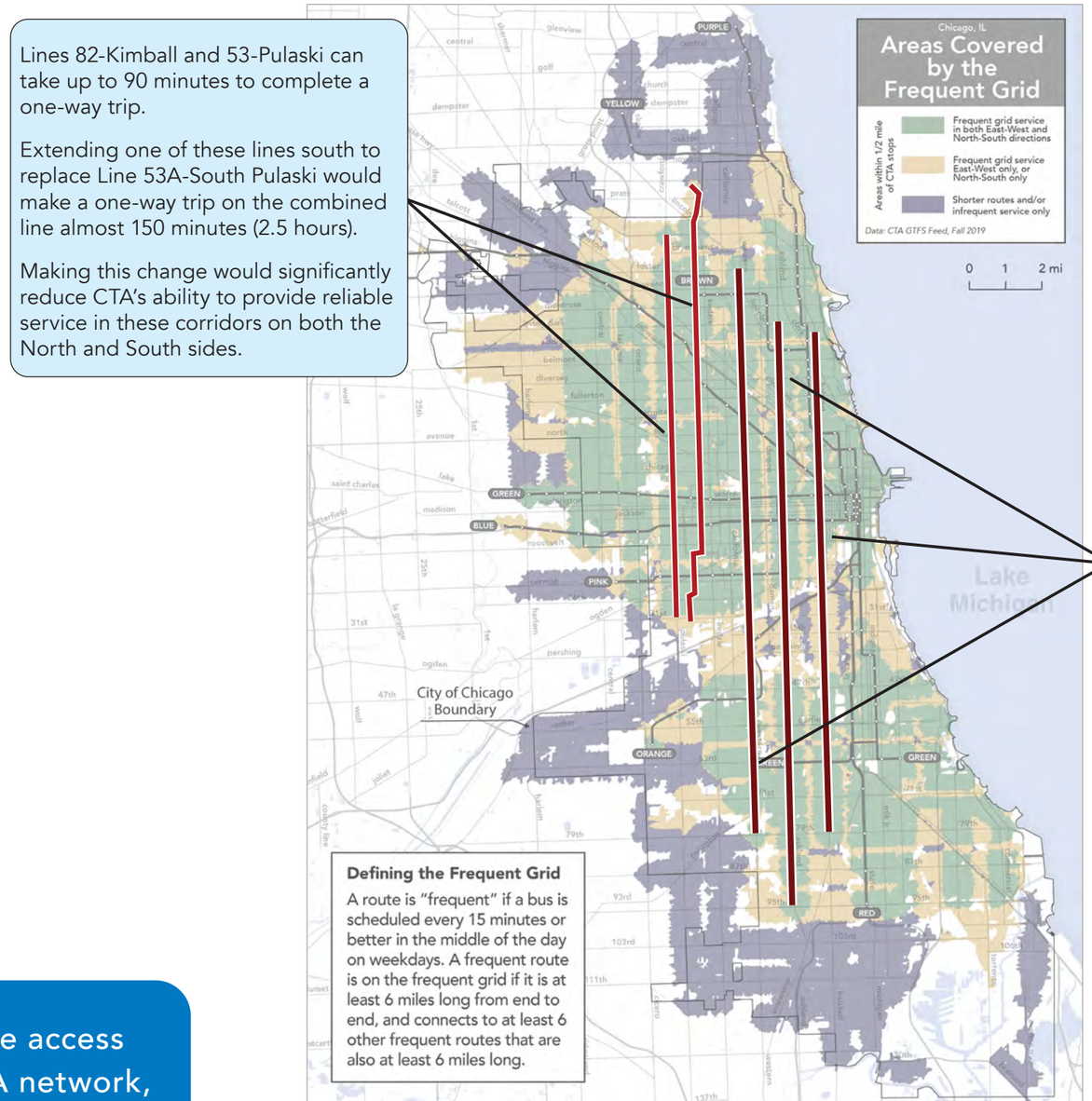
CTA faces precisely this dilemma with regards to all its major North-South lines, which are all approaching or exceeding 90 minutes.

The principle of the frequent grid is that you can go from anywhere to anywhere else with a single transfer. This goal would be better achieved if all the bus lines discussed in Figure 77 were extended to operate from the north to the south end of the CTA service area.

But until speeds can improve, CTA cannot contemplate this type of change without significantly reducing the reliability of service on those routes.

Extending the grid further out would increase access to opportunity at the outer edges of the CTA network, but slow speeds make this expansion difficult.

Areas on the Frequent Grid



Lines 82-Kimball and 53-Pulaski can take up to 90 minutes to complete a one-way trip.

Extending one of these lines south to replace Line 53A-South Pulaski would make a one-way trip on the combined line almost 150 minutes (2.5 hours).

Making this change would significantly reduce CTA's ability to provide reliable service in these corridors on both the North and South sides.

Due to unreliable speeds, Lines 8-Halsted, 9-Ashland, and 49-Western can take up to two hours to complete a one-way trip.

Extending these lines farther south would help connect many low-income people on the far South Side with opportunities in the North. But making that kind of service operate reliably would require major changes to operating conditions.

For example, to operate reliably in 90 minutes in each direction, a hypothetical complete Western Ave line (from Howard to 119th) would need its 90th-percentile lowest speed to be nearly 17 miles per hour, compared to about 9 miles per hour on Line 49 in 2019.

Figure 77: Map showing areas that are within a half-mile walk of stops on bus and rail lines that form the frequent grid.

How buses could run faster.

Buses can run faster and more reliably if streets and stops are designed to minimize situations where buses are delayed.

Slow operating speeds mean slower overall trips.

Buses are often slow and experience unpredictable delays because they share streets with cars, trucks and delivery vehicles making curbside stops along the way.

Slow bus speeds mean slow bus trips, making bus service less useful for current CTA riders, and less attractive for potential riders. There are ways to speed up buses, but the potential solutions often involve difficult trade-offs, and require collaboration between CTA, CDOT, city policy-makers and other stakeholders.

There are a number of ways to address this, including:

- **Establishing bus priority on city streets.**
- **Speeding up boarding.**
- **Reducing the number of bus stops.**

Establishing bus priority

Across much of Chicago, car and truck traffic interferes with bus operations in ways that make bus service slower and less reliable. This is because almost all streets are designed so that every vehicle in a traffic lane gets equal priority. But equal priority for all vehicle types means that a car serving one person may frequently delay a bus serving 30 people.

Shifting this dynamic to better prioritize buses means changing the way streets and signals are designed, to reduce the impacts of car and truck traffic on buses. Bus priority elements can include bus lanes, bus stop bump-outs, transit signal priority, and other measures to help buses go faster and stay on schedule.

To date, Chicago has seen two bus priority projects involving stretches of dedicated bus lane and other bus priority elements: Jeffery Jump on the South Side and Loop Link downtown.

There have also been smaller scale projects including the Bus Priority Zone projects to address specific pinch points, primarily on Chicago Ave and 79th St, and transit signal priority (or TSP) installed on stretches of Ashland and Western Avenues.

Bus priority measures are popular with bus riders, but they can impact and generate concerns from other street users, especially when designs repurpose space used for parking or general traffic travel lanes, or where turns are restricted.

CTA can't make changes to streets on its own. In Chicago, the Chicago Department of Transportation (CDOT) controls street space. The Illinois Department of Transportation (IDOT) also has jurisdiction on some streets.

CTA and CDOT have recently developed the Better Streets for Buses Plan, a citywide framework plan to improve street infrastructure for public bus service. The Better Streets for Buses plan lays the groundwork for ongoing bus infrastructure improvements by establishing a network of priority corridors and a toolbox of bus priority street treatments to consider as solutions. More information about this plan can be found at www.betterstreetsforbuses.com.

Figure 78: Example of a bus priority lane in use along Chicago Ave & Wabash as traffic is backed up beside it.
Source: CTA Bus Priority Zones web page

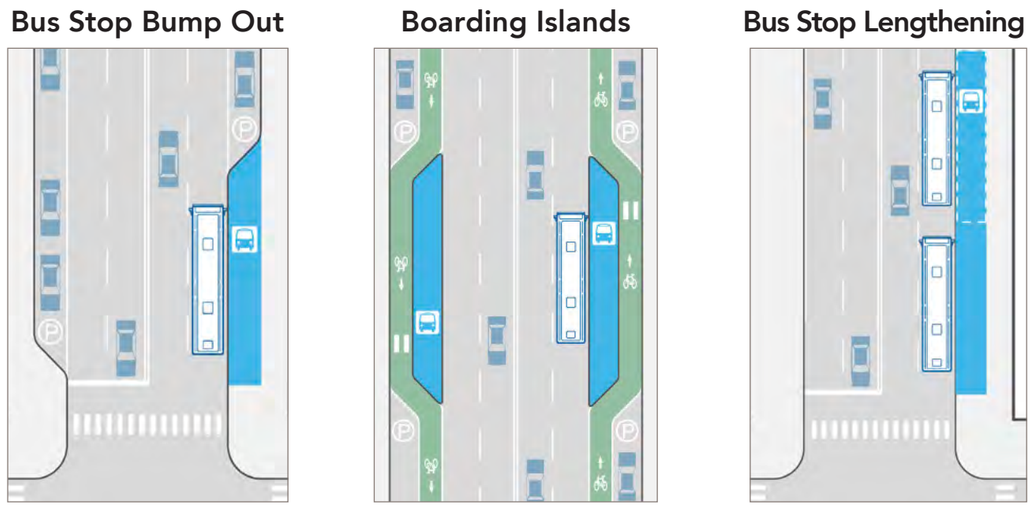


Figure 79: Conceptual illustrations of bus stop configurations that eliminate or minimize the hassle of pulling out of traffic.
Source: Better Streets for Buses Toolbox.

How buses could run faster. (cont'd)

Speeding up boarding

Making it easier and faster for people to board the bus, and enabling people to pay their fares off-board can also help buses keep moving faster.

Prepaid boarding, level and near-level boarding, and multi-door boarding are all ways to do this. These strategies have the most benefit at high-volume stops, where buses are delayed due to the high number of people getting on and off.

CTA has piloted prepaid boarding in several locations during rush hour by sending staff to collect payment at busy stops. Loop Link bus stops on Washington St and Madison St have near-level boarding, with raised platforms that bring the height of the stop closer to the bus floor. These strategies generally require some combination of changes to either bus and fare operations and policy, street infrastructure, and vehicle infrastructure.

CTA intends to continue piloting different methods to speed up boarding. Because of the size of CTA's bus system, which includes over 1,800 buses and over 10,000 bus stops, wholesale change cannot be achieved overnight, and the risks and trade-offs need to be considered carefully before deploying at scale.

Figure 80: The CTA bus stop at Washington & State combines multiple strategies to minimize bus delay. This stop is located on an island adjacent to a curbside bus lane on the far side of a signalized intersection. A ramp provides access to its raised platform, which allows for near-level boarding.

Respacing bus stops

The fewer times a bus needs to stop the faster it can go. But eliminating some stops means the people near them will need to walk further to catch a bus, which makes transit less convenient and can offset any time savings from the faster bus.

CTA's target standard for bus stop spacing is between 1/8 and 1/4 mile, which is between 660 and 1,320 feet. Most bus lines in Chicago have regularly spaced stops that are closer to 1/8 mile apart, or about every block or two. Along some corridors, CTA has experimented with stop spacing closer to 1/4 mile.

On Ashland and Western Avenues, stops were consolidated in 2015. Run times improved with approximately 5% of the end-to-end travel time shaved off. This provided a small amount of travel time savings to some customers and allowed CTA to make modest improvements in frequency without adding cost. Ridership did not drop significantly but it also did not rise as a result.

The risk with widening stop spacing is that it reduces convenience in accessing transit, especially for short trips. More closely spaced stops mean that the bus is always nearby-so transit can provide something closer to door-to-door service. This is especially important for seniors, people with physical disabilities, people travelling with small children, anyone in inclement weather, and anyone using a bus for trips such as grocery shopping.

Stop spacing can also be a factor in considering personal safety, if longer walks to a bus stop are potentially unsafe. Any potential changes to stop spacing standards should be considered carefully and be vetted publicly, grounded in public discussion of the trade-offs.

Another way to address the trade-offs of wider stop spacing is by instituting more X-routes. CTA has several X-routes, and had more previous to the 2010 service cuts. These routes stop about every ½ mile and run as an overlay to the local routes that continue to serve local stops along the same corridor. Access at local stops is maintained while service that makes far fewer stops is also provided. Riders can opt for one or the other, or transfer between the two, depending on their specific needs and the length of the trip they're taking.

The main disadvantage to X-routes is that they incur additional costs, mainly operating expense for labor. This means implementing X-routes on a larger scale requires either additional funding, or reducing existing services.

CTA could make some changes to bus service with no new money.

Even with no new funding to expand operations, CTA could increase service in some places and times. This would require reducing service in other places and times. Would the benefits be worth more than the negative impacts?

Peak vs. evening and weekend service.

As more in-person activities have resumed in 2022 and 2023, CTA is once again experiencing its highest ridership at weekday peak hours. While ridership remains below 2019 levels, the traditional peak periods are still the times of day when there is the most demand for transit service. This reflects a broad diversity of people and trip types, and suggests that extra service at peak hours continues to provide an important service to the regional transportation system.

At the same time, ridership patterns in 2020 and 2021 highlighted the importance of off-peak service for:

- People who are reliant on transit for trips that are essential to their lives.
- People who use transit to reach essential jobs that cannot be done remotely and kept the region functioning during the pandemic.

During the height of the pandemic – when many people were able to work from home and drive when needed to avoid contact with others – people in these groups were still riding transit. Improving evening and weekend service in particular would benefit these riders, who are often lower-income, or commuting to lower wage jobs.

Given the significant resources devoted to peak service, frequency levels in the peaks should be evaluated closely as ridership trends evolve. A public conversation about bus service could therefore ask: **should CTA reduce some peak hour service to pay for improvements to evening and Sunday service?**

There are significant potential risks and rewards to this strategy. On the one hand, CTA could operate a weekday-midday level of service daily from 6 AM to 9 PM by reducing peak service by 25%, and still allow for some elevated level of peak period service.

On the other hand, reducing service at the time when the most people travel is likely to discourage further use by existing peak hour riders, since they may experience less frequent and more crowded buses. The associated loss in convenience for these riders might cause a downward spiral of ridership loss.

Duplication

The frequent grid design of the CTA bus network limits route overlap. However, there are still instances where it's worth examining how much unique value each bus line is providing. For example:

- To what extent should overlapping bus lines be combined into fewer, more frequent lines?
- To what extent should bus lines overlap with rail lines?

In cases where duplication is not providing a high level of useful service for different trip patterns, CTA must ask if resources could be better spent elsewhere.

Service decisions should reflect public goals.

A public conversation about re-evaluating service distribution should focus on what goals CTA is trying to meet. For example:

- Are equity goals better served by:
  - providing more service in peak periods when the highest numbers and broadest cross-section of people are riding, or
  - improving service on evenings and weekends when a higher share of riders have low incomes, hold essential jobs, and rely exclusively on transit?
- How do decisions about equity and service duplications align or conflict with climate, environment, congestion mitigation and other goals?
- How much (if any) disruption to existing customers is acceptable in service of these broader goals?

6 Looking Ahead

Given what this report has shown about Chicago and the CTA network, what actions should the CTA and its partners take to improve the bus system?

Making the most out of the frequent grid.

The frequent grid is a sound base to build on.

CTA's grid network of frequent routes is a sound service structure that maximizes access to opportunity for area residents. The combination of high-frequency service and long, straight bus lines following Chicago's main streets and connecting to the L means that customers can access most of the service area as quickly as possible and with minimal transfers.

However, the grid network faces pressure from slower bus speeds, and funding limitations hinder its effectiveness. Sound decisions about prioritizing street space, service design and regional transit funding levels will be needed going forward to ensure the bus network is helping CTA meet regional equity, environmental, congestion mitigation and economic goals among others.

Increasing bus speeds to improve the grid.

Slow speeds reduce the grid's effectiveness. They increase the time it takes for a bus to get from one end of the line to the other. This results in longer travel times for riders, and puts pressure on CTA to lower frequencies to avoid increasing operating costs. This runs counter to customer feedback, which places faster travel times and improved frequency at the top of the list of needed service improvements.

Because long routes are difficult to operate reliably, longer runtimes also restrict the expansion of the frequent grid. This limits CTA's ability to improve access to the city for the often lower-income, Black, and Latino areas in outlying parts of the city, especially on the far South Side.

To speed up service, CTA will need to continue to collaborate with CDOT, city policy-makers and other stakeholders to implement the Better Streets for Buses Plan and establish better bus priority treatments on city streets. Treatments such as bus lanes, bus stop bump-outs, transit signal priority and other measures all help buses go faster and stay on schedule.

CTA can also continue to take measures within its own control, at bus stops and on the bus itself. Policies such as prepaid and multi-door boarding can speed the boarding process. Changes to stop spacing can speed up customer travel times but could also have negative impacts on overall access and convenience, while adding more express services would require CTA to incur additional costs.

Rethinking service allocation and design.

Shifts in ridership patterns at the height of the pandemic highlighted the importance of off-peak and weekend service in maintaining the essential services that everyone in Chicago relies on.

This is also an important consideration in evaluating equity goals, because the transit riders who made this possible in 2020 tend not to have access to a car; tend to earn lower incomes; and are disproportionately likely to be Black.

However, CTA is once again experiencing its highest ridership during weekday peak hours, which reflects the broad diversity of people and trip types taking place at the busiest times of day. Additional service at peak hours continues to provide an important service to the regional transportation system, with economic, environmental, climate and traffic benefits.

Given these considerations, how much additional service should CTA continue to allocate at peak? How much should CTA instead re-allocate peak service to improve evening and Sunday service?

Decisions about where, when and how much service to provide would benefit from a public conversation about these competing priorities.

To make the most out of the outcomes of this conversation, CTA should minimize any unnecessary service duplication. While CTA's frequent grid network is effective in limiting duplication and waste, some exceptions should be examined closely.

Integration with the future Red Line extension.

CTA's proposed Red Line Extension project will extend the Red Line on the Far South Side, more than five miles, from the existing terminal to 130th St. This project will have a transformative effect, addressing the lack of access to opportunity identified in this report for people living in and traveling to the Far South Side.

The extension is anticipated to reduce travel times by up to 30 minutes for those traveling from 130th St to the Loop and is also key to connecting the Far South Side to the frequent grid of CTA services for customers traveling to areas outside of downtown.

Once operational, the Red Line Extension will be accompanied by bus service adjustments to directly connect existing CTA and Pace bus lines to the new rail stations. These adjustments will expand CTA's intuitive grid network of routes and bus-rail connections and ensure the project's benefits, including reduced travel time and improved transit access, are experienced by those living well beyond the new station areas, across the Far South Side.

CTA and Pace look forward to continued coordination with the public on bus service changes as this transformative project progresses.

A new vision for CTA bus requires addressing regional funding.

State law limits CTA's ability to address equity issues or plan for growth.

CTA's operational budget, which determines how much service can be provided, depends largely on regional sales tax revenue for funding, which can fluctuate and leave **CTA service vulnerable to economic downturns.**

Overall funding levels and **state law requiring CTA to fund at least 50% of its operational expenses from fares or other system-generated revenue further limit CTA's ability to provide additional service.**

As an example of how this requirement shapes service decisions, any shift in service away from peak periods to other times of day could mean lower overall system ridership and fare revenue. In turn, this could cause a reduction to the size of CTA's overall operational budget.

Evidence from peer cities points to the benefits of an all-week, all-times of day high frequency network, and the broad, long-term ridership growth that could potentially result from such a network, but limited funding and the requirement to meet the 50% threshold every year makes it difficult to wait for longer term results.

What would help reduce CTA's funding challenges?

Pandemic related changes to ridership levels have impacted fare revenue greatly. Federal COVID relief funding has been allowed to help fill that gap. However, this funding is expected to run out in the coming years.

While post-pandemic ridership trends are still emerging, **fare and pass revenues are not anticipated to return to pre-COVID levels by the time federal relief funds run out.** If this is the case, and no further changes have been made to the regional transit funding mechanism, it will most likely cause a severe budget shortfall.

All of this suggests that CTA, working together with regional partners such as CMAP, RTA, Pace and Metra, should advocate for changes in state law that would:

- Remove the implicit threat of defunding if fare revenue targets are not met;
- Establish funding mechanisms that are less vulnerable to year-to-year fluctuations; and
- Establish new sources of funding.

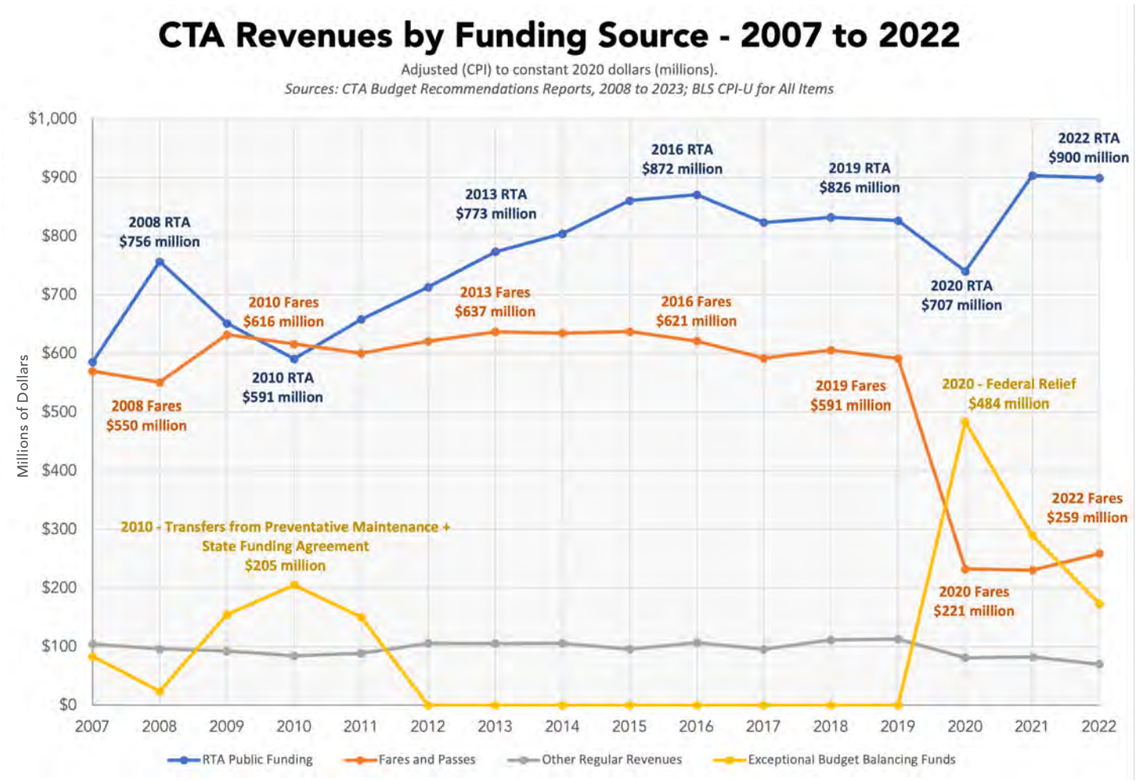


Figure 82: How CTA revenues evolved from 2007 to 2022, as shown on page 16.

Chicago Transit Authority

JARRETT WALKER + ASSOCIATES