Mobility Justice in Focus: A Report on Route 82 in North Lawndale

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Cover photo: FannerofTransit, YouTube

Executive Summary

This report examines Route 82, also known as the Kimball-Homan bus line, in North Lawndale on Chicago's West Side through the lens of mobility justice to determine whether or not it is serving its ridership adequately and equitably. Mobility justice is defined by the Untokening collective as when communities are "given space and resources to envision and implement planning models and political advocacy on streets and mobility that actively work to address historical and current injustices."[1] There are a multitude of sociodemographic factors that make North Lawndale a good candidate for this study. First, the supermajority of Black residents and concentration of people with disabilities necessitates quality transit service that helps to address current and historical injustices—namely, systemic disinvestment and environmental racism.

Researchers conducted a spatial analysis of key locations and businesses in North Lawndale and their proximity to bus stops along Route 82. This analysis provided insight into the impacts of disinvestment in the study area and highlighted the crucial role Route 82 plays as a lifeline for those accessing these essential locations. Additionally, spatial analysis revealed the neighborhood's disproportionate exposure to, and lack of protection from, environmental hazards such as nearby brownfields and excessive heat. Each of these factors underscores the need for high quality transit service.

To evaluate the current quality of service on Route 82 in North Lawndale, the project team conducted a frequency and reliability study, as well as a bus stop audit. The frequency and reliability study consists of two components: an evaluation of Route 82 performance within the Chicago Transit Authority (CTA) system and a comparison of CTA performance to that of peer agencies. Route 82, specifically when traveling through North Lawndale, performs worse in each reliability metric than the system overall. In September 2024, Route 82 had a 71.4 percent higher bunching rate, a 46 percent higher rate of large gaps between buses, and in North Lawndale, a 23.8 percent higher additional wait time than the system overall.[2] The second section compares the CTA against peer agencies' service standards. The CTA deems a route compliant to reliability standards if 65 percent of trips are delivered on-time, which is low relative to peer agencies. The project team used available data and geospatial analysis to determine that only nine percent of all routes were in compliance with the agency's own service standards for on-time performance in 2022. In other words, only nine percent of all CTA bus routes delivered at least 65 percent of passenger trips on time, which is low relative to peer agencies.[3]

1 "Untokening 1.0 — Principles of Mobility Justice." Untokening. November 11, 2017. https://www.untokening.org/updates/2017/11/11/untokening-10-principles-of-mobility-justice.
2 Chicago Transit Authority, "CTA Performance Metrics & Reports," transitchicago.com, September 2024, https://www.transitchicago.com/performance/.
3 "Title VI Program Triennial Report," Chicago Transit Authority, 2022, https://www.transitchicago.com/assets/1/28/Title_VI_Program_Triennial_Report.pdf.

The project team used available data and geospatial analysis to determine that only nine percent of all routes were in compliance with the agency's own service standards for on-time performance in 2022. In other words, only nine percent of all CTA bus routes delivered at least 65 percent of passenger trips on time. The project team found that the CTA has relatively high standards for bus service frequency, especially for Key Routes, which have headway standards of 10 minutes during peak service hours.[4] However, according to the agency's own on-time performance data, only 54 percent of passenger trips were delivered on time systemwide in 2022.[5] This measure of reliability is the lowest of all researched agencies.

Frequency and reliability are important components of service quality and accessibility; however, the presence of amenities at bus stops can lighten the burdens of excess wait times and even shift riders' perceptions of those wait times. The second component of this report, a bus stop audit, examines all 22 bus stops in North Lawndale along Route 82 to determine if the route meets Americans with Disabilities Act (ADA) compliance and provides adequate shelter, safety, and quality. Only two of the 22 stops audited met all the projects' criteria for an ideal bus stop. A signal, a shelter structure, benches, tree covers/shade, or a trash can were each present at less than 50 percent of stops. However, all bus stops had curb cuts, sidewalks, and traffic ramps. Overall, bus stops were physically accessible but did not have the health and safety amenities that would bolster the bus riding experience. North Lawndale bus stops on Route 82 are equipped with the bare minimum to allow them to be accessible, but the project team found that much more could be done to ensure North Lawndale riders feel safe and comfortable waiting for the bus, especially given the findings of the previous section.

The purpose of this report is to establish current conditions along Route 82. The results show that Route 82 in North Lawndale is an important service for residents, but lacks adequate service delivery and bus stop amenities. Further study is needed on riders' and bus drivers' experiences on the route, especially relating to factors impacting reliability. While this report does not offer specific recommendations, it should serve as a guide and call to action to transit agencies, professionals, and activists with recognition of funding constraints and infrastructure ownership issues.

4 "Service Standards and Policies," Chicago Transit Authority, May 2023, https://www.transitchicago.com/assets/1/6/Chicago_Transit_Authority_Service_Standards.pdf.
5 Ibid.

Introduction

The CTA Kimball-Homan bus line, also known as Route 82, is a North/South line spanning from Little Village to Lincolnwood. The line has 200 maximum stops on its run and serves nine of Chicago's unique community areas.[6] North Lawndale, a West Side neighborhood grappling with both historic and current economic disinvestment, is one of these community areas.

This report examines the equitability of service along Route 82 through a mobility justice lens. According to Untokening, mobility justice determines that "when people live at the intersection of multiple vectors of oppression, unfettered access to mobility and public space are not guaranteed."[7] North Lawndale is a majority Black and Hispanic/Latino community with a significantly higher proportion of low-income, disabled, and environmentally vulnerable residents than the city of Chicago average. A bus route that does not provide enhanced service to a marginalized community such as North Lawndale does not meet the criteria for mobility justice set by Untokening. Conversely, enhanced bus service that increases the bus's reliability could mitigate spatial inequities that currently exist. This report posits that enhanced service, rather than equal service, promotes racial and economic justice and should be a priority for transit agencies. Mobility justice demands that impacted communities are "given space and resources to envision and implement planning models and political advocacy on streets and mobility that actively work to address historical and current injustices."[8]

The demographic makeup of North Lawndale directed the project team to study local transportation networks—specifically, Route 82— using Untokening's mobility justice criteria. Access to equitable transportation, especially in historically underserved communities like North Lawndale, helps individual residents to live safe and healthy lives while working toward community-wide restorative justice. Public transit is an inherent right for all, regardless of race, income, age, location, or ability. However, North Lawndale's unique history makes it crucial to ensure equitable, safe, frequent, and reliable bus service.

This document begins by summarizing existing conditions to contextualize and justify further study along Route 82 in North Lawndale. Second, the report examines the frequency and reliability of Route 82 in two parts: (1) a regional comparison to CTA service standards at the city level and (2) a national comparison to peer agencies across the United States. Next, the report audits North Lawndale's 22 Route 82 bus stops for quality and accessibility. To conclude, the report provides recommendations for future areas of study and action.

Background and Context

A History of North Lawndale and Route 82

North Lawndale's land use includes two-flat apartments, shoebox houses, railroads, and massive industrial sites. It is home to K-Town Historic District, a pristine sixteen-block stretch of historic Graystones built between 1901 and 1931.[9] North Lawndale is surrounded by rail on the West, South, and East, and the Eisenhower Expressway to the North. [10]The neighborhood was annexed by Chicago from Cicero in 1869 and became an enclave for Jewish immigrants over the next 50 years. However, between the 1930 and 1960 Censuses, white flight shifted the population from almost entirely White to over 90 percent Black residents.[11] In 1966, Martin Luther King Jr.'s visit to North Lawndale amplified the neighborhood's burgeoning culture of community activism. After Dr. King's assassination in 1968, uprisings ensued across the nation in an angry outpouring of grief.[12] Fearing they could lose their insurance, anchor businesses like Sears-Roebuck shifted their headquarters or retreated from North Lawndale completely.[13] This ushered in an era of continued unjust and systemic disinvestment in the community.

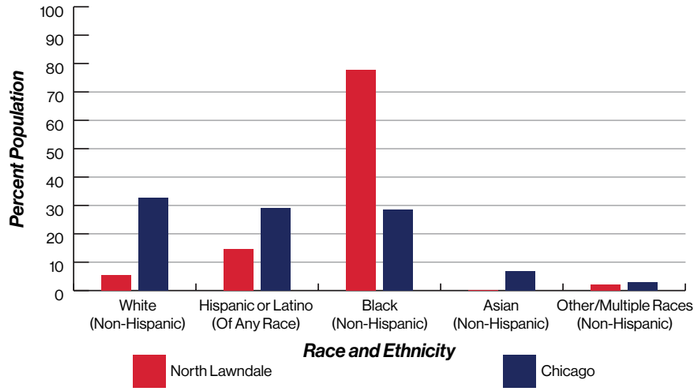
Black homebuyers in North Lawndale were limited by "contract selling," a widespread and federally endorsed discriminatory mortgage lending practice in which a buyer pays a monthly fee to a contracted firm in lieu of a traditional mortgage payment to a bank, denying them the same chance to build equity.[14] A lack of access to credit and equity-building tools often reinforced cycles of generational poverty.[15] Redlining compounded contract selling by designating neighborhoods as too "undesirable" or "risky" for investment because of their racial makeup. The effects of these discriminatory practices and systemic disinvestment are still apparent in North Lawndale today. A disproportionate share of North Lawndale's current land use inventory consists of vacant lots (15 percent, compared to five percent for the city of Chicago).[16] Empty storefronts line the streets and essential businesses, including a busy Walgreens, have recently closed down.[17] While disinvestment is prominent, community advocacy and reinvestment have contributed to important amenities in North Lawndale, detailed later in this report.

The Route 82 bus is a vital asset, connecting community members to essential services in and around North Lawndale. Route 82 has run in one form or another since 1931. It began as a streetcar service and was replaced by motor buses in 1937.[18] While the route and service have changed over the last century, today Route 82 runs from its Southern terminus at 31st Street and Pulaski Road north to Lincolnwood Town Center Mall. The bus stops at the Central Park Pink Line, Kedzie/Homan Blue Line, Belmont Blue Line, and Kimball Brown Line stations. The route cuts through the heart of North Lawndale along Central Park Avenue, Douglas Boulevard, and Homan Avenue.[19] It is an important artery for North Lawndale residents, serving schools, grocery stores, and other amenities.

Demographics

North Lawndale is made up primarily of Black and low-income residents. The median age is 34.3, similar to 35.3 for all of Chicago.[20] While 28.4 percent of all Chicagoans identify as Black, North Lawndale's residents are 77.7 percent Black (see Figure 1).[21] Residential density is highest in the community's center, where Route 82 runs along Homan and Central Park avenues (see Figure 2).[22] Only 20.3 percent of Chicago households make less than $25,000 a year, compared to the 42.3 percent of North Lawndale households that make this same amount (see Figure 3).[23]

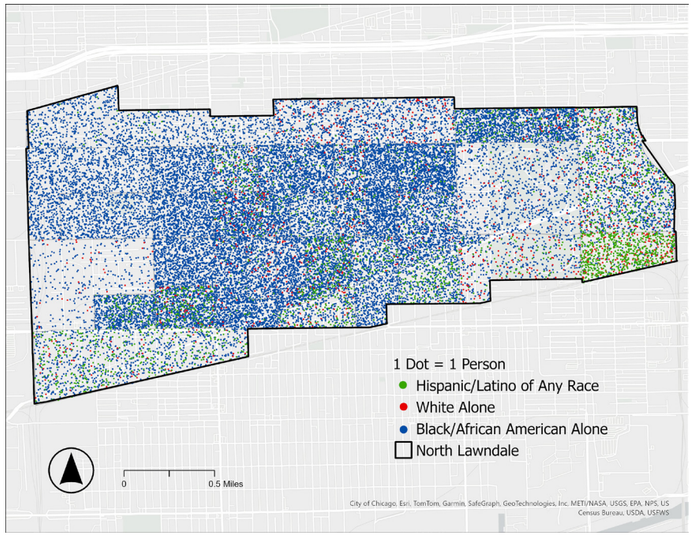
Figure 1: Racial distribution in North Lawndale and Chicago, 2022



Source: "Community Data Snapshots." Chicago Metropolitan Agency for Planning, August 29, 2024. https://cmap.illinois.gov/data/community-data-snapshots/.

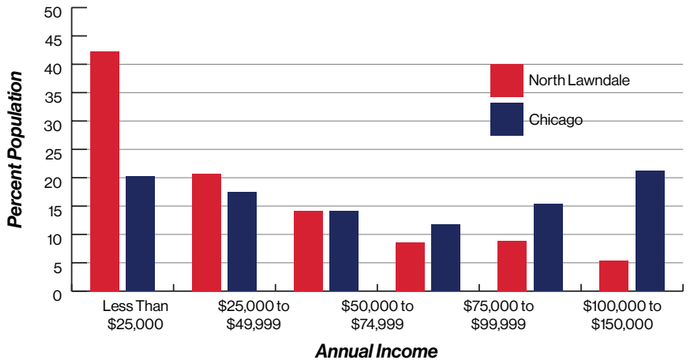
6 "82 - Kimball-Homan." Chicagoland Transit. Accessed November 12, 2024. https://chicagoIndtransit.org/cta/route/82-kimball-homan.
7 "Untokening 1.0 — Principles of Mobility Justice." Untokening. November 11, 2017. https://www.untokening.org/updates/2017/11/11/untokening-10-principles-of-mobility-justice.
8 Ibid.
9 Phoebe Tollefson, K-Town: Greystones, Block Clubs and a presidential library bid, Medill Reports Chicago, May 7 2015, https://news.medill.northwestern.edu/chicago/preserving-k-town-history/.
10 "North Lawndale." Encyclopedia of Chicago, 2005, http://www.encyclopedia.chicagohistory.org/pages/901.html.
11 "82 - Kimball-Homan." Chicagoland Transit. Accessed November 12, 2024. https://chicagoIndtransit.org/cta/route/82-kimball-homan.
12 "Remembering the 1968 Riots on Chicago's West Side." WTTW Chicago. Accessed November 18, 2024. https://interactive.wttw.com/chicago-stories/when-the-west-side-burned/remembering-the-1968-riots.
13 Ibid.
14 Burns, Rebecca, "The infamous practice of contract selling is back in Chicago." The Chicago Reader, March 1, 2017. https://chicagoreader.com/news-politics/the-infamous-practice-of-contract-selling-is-back-in-chicago/.
15 Samuel George et al, The plunder of black wealth in Chicago: New Findings on the Lasting Toll of Predatory Housing Contracts, May 2019, https://socialequity.duke.edu/wp-content/uploads/2019/10/Plunder-of-Black-Wealth-in-Chicago.pdf
16 "Community Data Snapshots | North Lawndale" Chicago Metropolitan Agency for Planning, August 29, 2024,. https://cmap.illinois.gov/data/community-data-snapshots/.
17 Corli Jay, (2024, September 27). "Walgreens in North Lawndale is closing; some residents hadn't even heard about it." The TRiiBE, September 27, 2024, https://thetriibe.com/2024/09/walgreens-in-north-lawndale-is-closing-some-residents-hadnt-even-heard-about-it/.
18 "#82-Kimball-Homan Route History." Illinois Railway Museum. Accessed November 10, 2024. http://irm-cta.org/RouteDescriptions/RouteHistories/081-100/082-Kimball-Homan.pdf.
19 "82 Kimball-Homan." Chicago Transit Authority. Accessed November 10, 2024. https://www.transitchicago.com/bus/82/.
20 "Community Data Snapshots." Chicago Metropolitan Agency for Planning, August 29, 2024. https://cmap.illinois.gov/data/community-data-snapshots/.
21 Ibid.
22 United States Census Bureau. 2021 Planning Database. https://www.census.gov/topics/research/guidance/planning-databases.html.
23 "Community Data Snapshots." Chicago Metropolitan Agency for Planning, August 29, 2024. https://cmap.illinois.gov/data/community-data-snapshots/.

Figure 2: Population density by race in North Lawndale, 2022



Source: "Community Data Snapshots." Chicago Metropolitan Agency for Planning, August 29, 2024. https://cmap.illinois.gov/data/community-data-snapshots/.

Figure 3: Annual household income in North Lawndale and Chicago, 2022



Source: "Community Data Snapshots." Chicago Metropolitan Agency for Planning, August 29, 2024. https://cmap.illinois.gov/data/community-data-snapshots/.

A significant 19.5 percent of North Lawndale residents live with a disability, compared to 11.3 percent of all Chicagoans (see Figure 4). This difference is important because over 20 percent of non-workers and 12 percent of workers aged 18 to 64 with disabilities live in households without vehicles.[24] 100 percent of CTA buses are compliant with the ADA, with features such as ramps, wheelchair securement areas, visual displays, and auditory announcements, making bus travel the most accessible mode of public transportation in Chicago. However, accessibility goes beyond what happens inside the bus. Features like curb cuts, ADA-compliant sidewalks, and tactile ramps are crucial for riders with disabilities. Later in this report, a bus stop audit assesses these features' presence at North Lawndale bus stops. Without accessibility assets outside of the bus, Route 82 fails to serve the North Lawndale community equitably.

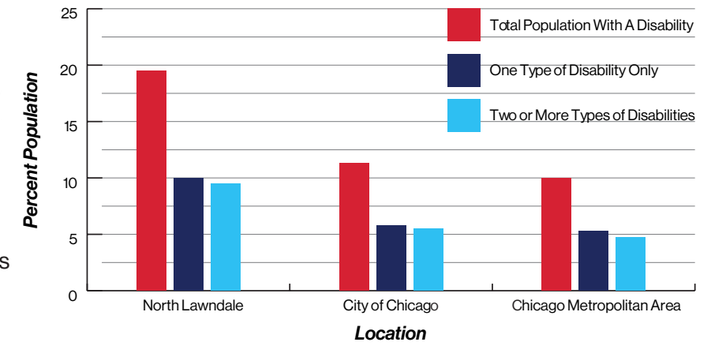
Route 82 is essential to North Lawndale's economy, providing daily transport to and from employment centers. In 2022, 60 percent of North Lawndale residents were employed outside of the community area (see Figure 5). Approximately 23 percent of residents commuted to work via public transit, higher than the City of Chicago's

24 U.S. Department of Transportation | Office of the Secretary of Transportation | Bureau of Transportation Statistics. (2018, September). Travel Patterns of American Adults with Disabilities.

21 percent. However, North Lawndale residents also commute by car at a higher rate (57 percent) than the Chicago average.[25] This indicates that, although North Lawndale residents are more reliant on transit to get to work, they also may only have the option to drive due to unreliable or unavailable transit options.

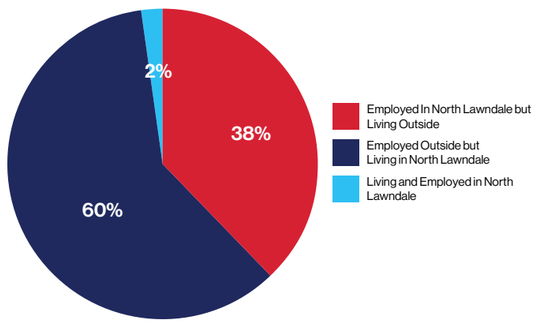
North Lawndale is currently classified as a jobs desert, with nearly half the population working outside the neighborhood in places like the Loop and Near North Side (see Figure 26 in the Appendix). Healthcare is the largest employment sector, with many residents employed as essential healthcare workers.[26] From 2001 to 2020, the neighborhood lost nearly 25 percent of local jobs.[27] Additionally, many of the 3,000 jobs created in North Lawndale over a similar period are held by non-local White workers commuting from outside the neighborhood. As a result, more North Lawndale residents are forced to find employment outside their neighborhood.[28] Additionally, only 6.7 percent of North Lawndale residents worked from home in 2022, compared to 15.6 percent of all Chicagoans (see Figure 6).[29] Together, these factors underscore the need for reliable, frequent, and equitable transportation.

Figure 4: Population living with disabilities in North Lawndale, Chicago, and the Chicago Metropolitan Area, 2022



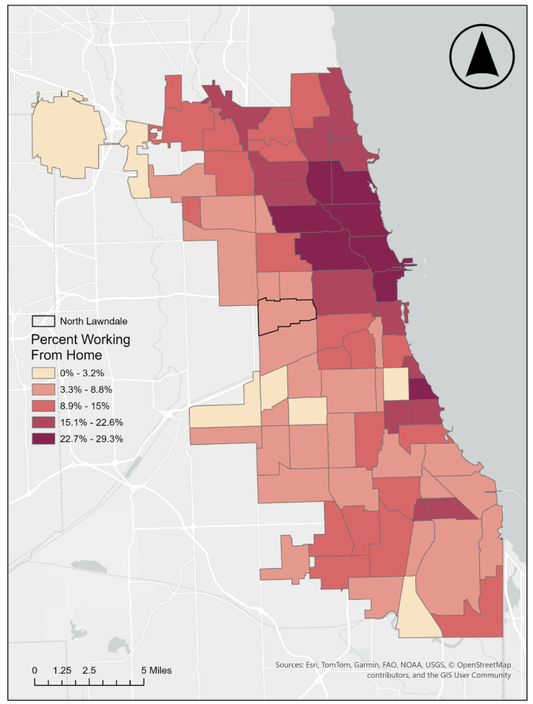
Source: "Community Data Snapshots." Chicago Metropolitan Agency for Planning, August 29, 2024. https://cmap.illinois.gov/data/community-data-snapshots/.

Figure 5: North Lawndale employment origin and destination, 2022



Source: U.S. Census, OnTheMap Application. (2022). https://onthemap.ces.census.gov/.

Figure 6: Percentage of people working from home



Source: U.S. Census Bureau, "Commuting Characteristics by Sex," 2022. American Community Survey, ACS 5-Year Estimates Subject Tables, Table S0801.

25 "North Lawndale: A neighborhood plan." Chicago Metropolitan Agency for Planning. Chicago Metropolitan Agency for Planning. https://www.cmap.illinois.gov/documents/10180/126764/North+Lawndale.pdf\.
26 Ibid.
27 Alby Gallun, Bringing a Jobs Desert Back to Life. Crain's Chicago Business, December 16 2021, https://www.chicagobusiness.com/crains-forum-jobs/what-will-it-take-increase-employment-south-and-west-sides.
28 Pascal Sabino, "Lawndale Has Been Robbed of Equitable Investment for Generations, New Study Finds," Block Club Chicago, April 26 2022, https://block-clubchicago.org/2022/04/26/lawndale-has-been-robbed-of-equitable-investment-for-generations-new-study-finds/.
29 "North Lawndale: A neighborhood plan." Chicago Metropolitan Agency for Planning. (n.d.). North Lawndale: A neighborhood plan. Chicago Metropolitan Agency for Planning. https://www.cmap.illinois.gov/documents/10180/126764/North+Lawndale.pdf.

Mobility Justice for Route 82

While there are important amenities along Route 82, the impacts of systemic disinvestment manifest in a relatively low density of businesses in North Lawndale. This means residents must leave the community to access amenities that fully meet their needs. Frequent and reliable transit service is one piece of the mobility justice puzzle; however, equitable access to places of employment, worship, communal gatherings, and other essential services within a reasonable travel time is equally important. For example, a fifteen-minute bus ride in an affluent, White neighborhood like Lincoln Park should grant residents access to the same number of amenities as a fifteen-minute bus ride in North Lawndale. The significant disparity in access to amenities in North Lawndale means the criteria for transportation justice have not been met. Unfortunately, a direct quantitative comparison of amenities between community areas is beyond this report's scope. However, the project team used existing data to assess access within the frequency and reliability analysis and bus stop audit.

"Transportation justice describes a normative condition in which no person or group is disadvantaged by a lack of access to the opportunities they need to lead a meaningful and dignified life."

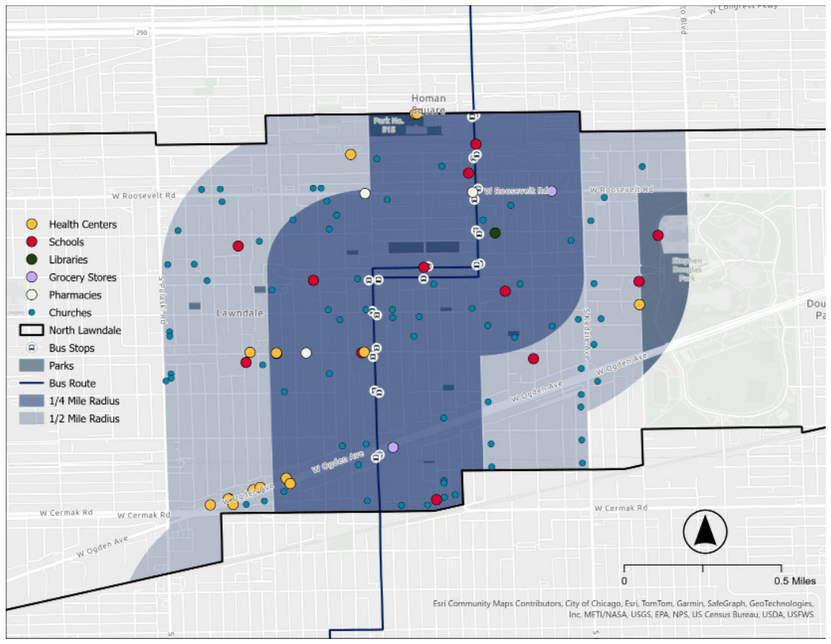
(Karner et al., 2020)

Beyond amenities, reliable transit service offers a space for transit affinities, conversations that "help Black passengers pass the time, but also provide them with helpful information, an outlet for voicing their frustrations with racism, freedom to express their own racially insensitive ideas, and the space to voice political discontent."[30] As a majority Black community, North Lawndale benefits from a place for these valuable relationships—a sort of mobile "quasi-community"—to form, especially when traveling north on Route 82 and away from predominantly Black neighborhoods.[31]

Amenities

Route 82 serves as a vital connector to gathering spaces, fostering social cohesion both outside and inside the bus. From Douglass Park's natural spaces and recreation opportunities to spiritual congregation in places of worship, Route 82 presents residents with opportunities for interpersonal connection (see Figure 7). Furthermore, goods and services that foster community development and health are close to the route. Important health centers such as the Lawndale Christian Health Center are within a half-mile radius of Route 82 (see Figure 7). Access to fresh, nutritious foods and groceries is critical for residents' health and well-being. Route 82 serves full-service grocery store Leamington Foods, as well as the Farm on Ogden. This community farm houses an organic vegetable garden, aquaponics facility, commercial kitchen, a small market selling fresh produce, and community educational programming.[32] Two pharmacies are easily accessible from bus stops along the route. Several educational institutions and a public library also follow the route (see Figure 7). These amenities transform Route 82 from a typical transportation artery to a lifeline for North Lawndale residents.

Figure 7: North Lawndale amenities within ½ and ¼ mile of Route 82



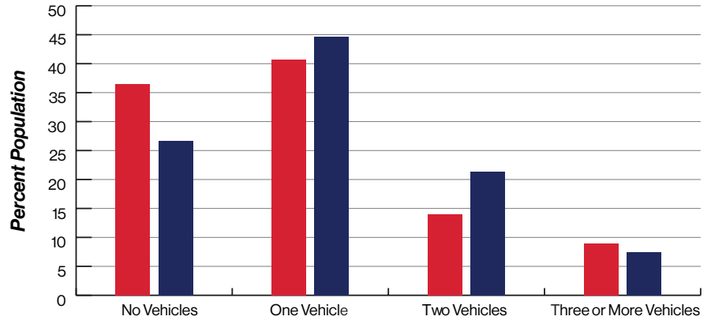
Source: City of Chicago. (2024). City of Chicago data portal. Retrieved November 19, 2024, from https://data.cityofchicago.org/ (See Appendix for specific sources).

Transportation

The number of existing amenities along Route 82 makes it essential to the community. The route serves grocery stores, healthcare, education, and civic centers, easing the pressures of disinvestment and marginalization on community members. On average, North Lawndale residents have less access to personal vehicles than other communities (see Figure 8). Furthermore, the higher rate of residents who are elderly and have a disability compounds mobility and socioeconomic vulnerability.[33] Delays or uncomfortable bus stops present compounding barriers to amenity access.[34] These frequently overlooked barriers perpetuate cyclical disinvestment. Mobility justice envisions a Route 82 that enables all residents, regardless of income or ability, equitable access to local goods and services.

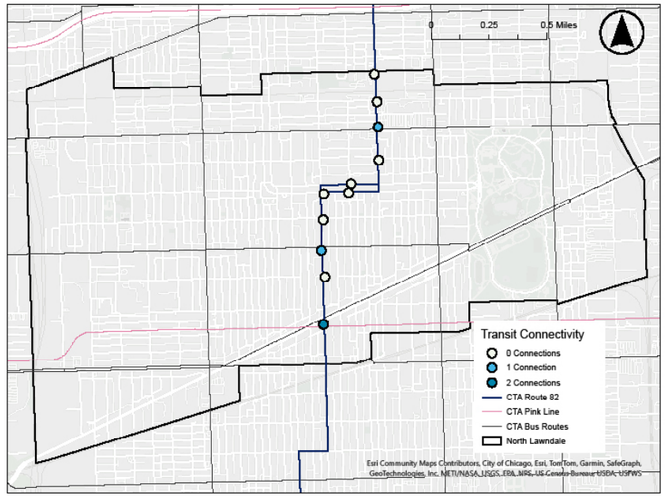
Route 82 also provides vital connections to other transit routes, including bus routes 12-Roosevelt, 18-16th/18th, 157-Streeterville/Taylor, and 21-Cermak (see Figure 9). The route offers transfers to the Pink Line at Central Park and to the Blue Line at Kedzie-Homan just outside of North Lawndale (see Figure 10). Connections between different routes enable riders to have more flexibility in their travel by allowing them to access destinations that are not on bus routes. This flexibility does come at a cost, as each transfer adds an average of 8:25 minutes to each trip within Chicago when controlling for distance and transit mode.[35]

Figure 8: Vehicle ownership in North Lawndale and Chicago, 2022



Source: "Community Data Snapshots." Chicago Metropolitan Agency for Planning, August 29, 2024. https://cmap.illinois.gov/data/community-data-snapshots/.

Figure 9: Transit connectivity in North Lawndale



Source: City of Chicago. (2024). City of Chicago data portal. Retrieved November 19, 2024, from https://data.cityofchicago.org/ (See Appendix for specific sources).

30 Gwendolyn Y. Purifoye. "Transit affinities: The distinctiveness of Black social interactions on public transportation," Du Bois Review: Social Science Research on Race, 17(2), 389-410, 2020.
31 "North Lawndale: A neighborhood plan." Chicago Metropolitan Agency for Planning. Chicago Metropolitan Agency for Planning. https://www.cmap.illinois.gov/documents/10180/126764/North+Lawndale.pdf
32 "Farm on Ogden", Farm On Ogden | Chicago Botanic Garden, https://www.chicagobotanic.org/urbanagriculture/farm_on_ogden
33 Aimi Hamraie, "Crip Mobility Justice: Ableism and Active Transportation Debates." International Journal of Urban and Regional Research, 2020. https://www.ijurr.org/spotlight-on/disabling-city/crip-mobility-justice/.
34 Kate Lowe, Juan Barajas, and Crystal Coren. "'It's Annoying, Confusing, and It's Irritating': Lived Expertise for Epistemic Justice and Understanding Inequitable Accessibility." Journal of Transport Geography 106 (2023).
35 "Measuring how people get around northeastern Illinois", Chicago Metropolitan Agency For Planning, Accessed October 18, 2024, https://cmap.illinois.gov/data/transportation/travel-survey/.

Compared to other community areas along Route 82, North Lawndale has more transit connections than the CTA average of 3.33 (see Table 1). The transit connectivity of Route 82 in North Lawndale provides additional flexibility and accessibility to riders, highlighting the local importance of Route 82.

Education

Route 82 also serves North Lawndale's school-age residents, who made up 22.9 percent of the community's population in 2022.[36] Notably, high school students are more likely than younger students to take transit to school on their own without the help of parents. Chicago's school system is still reeling from the 2013 closure of 50 schools—mostly in Black and Hispanic/Latino communities on the city's South and West sides.[37] These closures included two schools within North Lawndale.[38] Many shuttered schools were classified as "neighborhood" schools, serving all students from the local enrollment district. Today, students without neighborhood high schools often opt to attend a magnet, private, or charter school across the city through a competitive enrollment system.[39] In the US, enrollment in non-local schools is higher among minority students than white students, "highlighting the importance of accessing educational opportunities for historically disadvantaged communities" such as North Lawndale. [40]

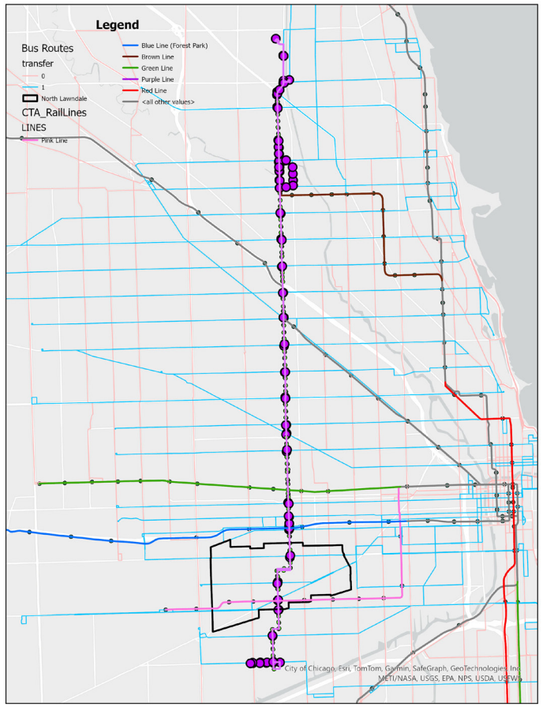
Table 1: Transit connections along Route 82

Community Area	Bus-To-Bus	Bus-To-Train	Total Connections
South Lawndale*	3	0	3
North Lawndale	3	1	4
East Garfield Park	3	2	5
Humboldt Park	4	0	4
Logan Square	3	0	4
Avondale	2	0	2
Irving Park	2	0	2
Albany Park	1	1	2
North Park	4	0	4
Route Average	2.78	0.563	.33

* While officially named "South Lawndale," the community area directly to the south of North Lawndale is locally known as "Little Village" or "La Villita" because of its high proportion of Mexican residents.
Source: City of Chicago. (2024). City of Chicago data portal. Retrieved November 19, 2024, from https://data.cityofchicago.org/ (See Appendix for specific sources).

36 "Community Data Snapshots." Chicago Metropolitan Agency for Planning, August 29, 2024, https://cmap.illinois.gov/data/community-data-snapshots/.
37 Sarah Karp, Nader Issa, Lauren FitzPatrick and Alden Loury. "After 10 years, Chicago school closings have left big holes, and promises unkept.", NPR Chicago, WBEZ, June 1, 2023, https://www.npr.org/2023/06/01/1178727834/after-10-years-chicago-school-closings-have-left-big-holes-and-promises-unkept
38 Nader Issa, "Proposal to close 3 North Lawndale schools and open a new one put on hold, CPS says," Chicago Sun-Times, December 1 2020, https://chicago.suntimes.com/education/2020/12/1/21768292/cps-school-closure-north-lawndale-sumner-lawndale-community-academy-crown-academy-fine-arts
39 "Apply and Enroll," Chicago Public Schools, Accessed November 3, 2024, https://www.cps.edu/schools/apply-enroll/.
40 Matthew Palm & Steven Farber, "The role of public transit in school choice and after-school activity participation among Toronto high school students," Travel Behavior and Society 19, April 2020: 219, https://doi.org/10.1016/j.tbs.2020.01.007.

Figure 10: Transit connectivity along Route 82

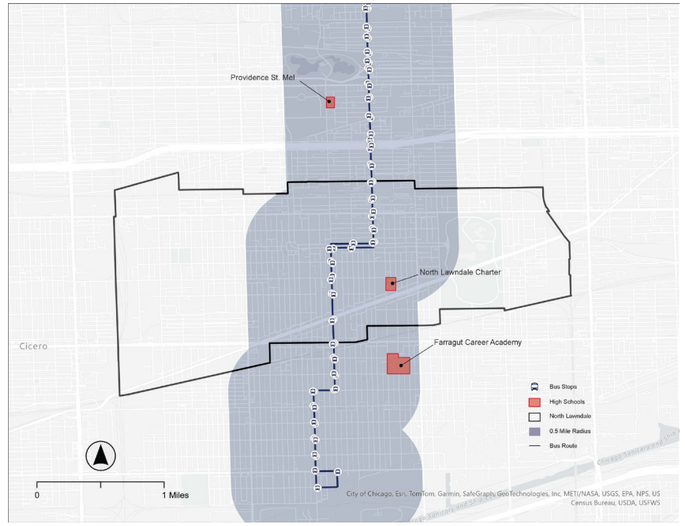


Source: "CTA - Bus Stops - Shapefile", Chicago Open Data Portal, Accessed October 3, 2024, from https://data.cityofchicago.org/Transportation/CTA-Bus-Stops-Shapefile/pxug-u72f/about_data.

For students with limited transportation options—including working parents and/or one or fewer cars in their household—public transit significantly increases a student's likelihood of attending an impactful after-school program.[41] Only three high schools are within a half-mile of a Route 82 bus stop in North Lawndale, Little Village, or East Garfield Park (see Figure 11).

Of these high schools, only one is a neighborhood high school—Farragut Career Academy, located in Little Village. Today, North Lawndale lacks a neighborhood high school that is open to any student. This report does not focus on schools students may be traveling to more than a few miles outside of North Lawndale, as this is outside of the project's neighborhood-focused scope. However, these three schools are important amenities of Route 82, and community partner observation confirmed that students make up a high percentage of Route 82 riders during weekday commute hours.

Figure 11: Schools in or near North Lawndale served by Route 82

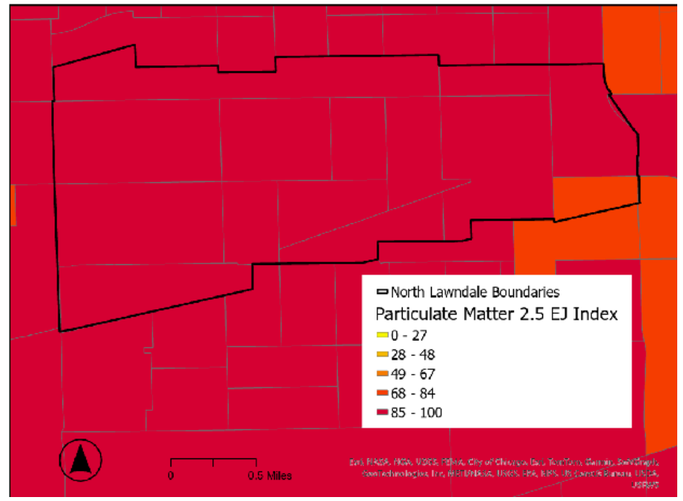


Source: City of Chicago. "Cook County Private Schools." City of Chicago Data Portal. Accessed November 13, 2024. https://data.cityofchicago.org/Education/Cook-County-Private-Schools/7rj8-26fg/about_data.

Environmental Justice

Environmental Justice (EJ) is an important component of mobility justice. The U.S. Environmental Protection Agency (EPA) defines EJ as "providing an environment where all people enjoy the same degree of protection from environmental and health hazards and equal access to the decision-making process to maintain a healthy environment in which to live, learn, and work."[42] Communities experiencing disproportionate environmental hazards and climate change vulnerability require safe, accessible, and frequent public transportation. North Lawndale is almost completely within the 85-100th percentile in Illinois for exposure to particulate matter 2.5 according to the EPA's EJ Screening and Mapping Tool, as shown in Figure 12. Across traffic proximity, air pollution metrics, and health metrics, North Lawndale is also in the 85-100th percentile.

Figure 12: Particulate matter 2.5 EJ percentiles in North Lawndale



Source: "EJ Screen." United States Environmental Protection Agency. https://www.epa.gov/ejscreen.

The urban heat island is already a significant concern in Chicago, but it will worsen with climate change. Days over 95°F will increase from two days annually to 18 days by mid-century.[43] While this is an alarming projection, trees can help mitigate the urban heat island effect by providing shade and reducing the air temperature.[44] United States

41 Ibid.
42 "Learn about Environmental Justice," U.S. Environmental Protection Agency, Accessed November 12, 2024, https://www.epa.gov/environmentaljustice/learn-about-environmental-justice.
43 "Risk-Based Vulnerability Assessment," Chicago Metropolitan Agency for Planning, Chicago IL: Chicago Metropolitan Agency for Planning, 2024.
44 "Community Tree Canopy Summaries," Chicago Region Tree Initiative, Chicago, IL: Openlands, 2020, https://mortonarb.org/plant-and-protect/chicago-re-

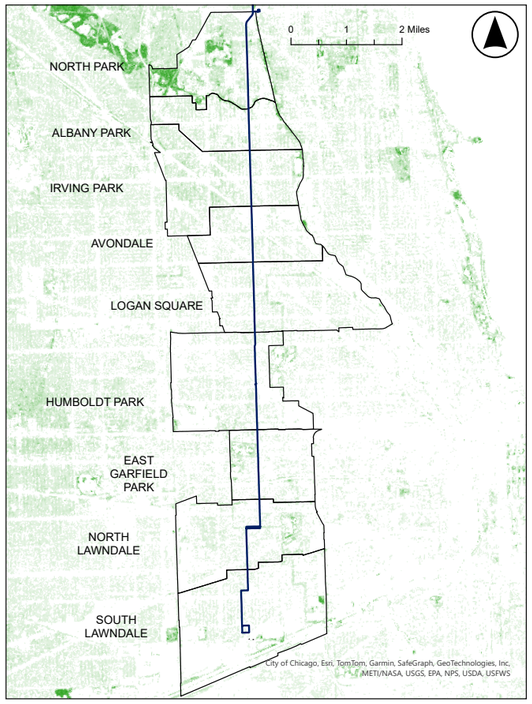
Department of Agriculture (USDA) Forestry Service data visualizes the existing percentage of tree canopy cover along Route 82.

North Lawndale's percentage of tree canopy coverage is currently 18 percent, just below Chicago's citywide tree canopy coverage of 20 percent. While there is denser canopy coverage in Douglass Park and on Douglass Boulevard, North Lawndale's other streets are sparsely populated with vegetation (see Figure 13). North Lawndale is most similar to its northern neighbor, East Garfield Park, while Little Village has even less tree canopy coverage at just 15 percent.[45] The average tree canopy coverage by community area is 20.76 percent, placing North Lawndale below average. Tree canopy coverage rates south of Addison Street tend to be lower, aligning with North Lawndale. As Route 82 travels north, tree canopy coverage rates generally increase. North Park, at the city's northern boundary, has the highest tree canopy coverage by far at 33 percent. Notably, the LaBagh Woods are partially located in this community area. Table 2 contains tree canopy coverage data for each of the Chicago community areas along Route 82.

The Chicago Metropolitan Agency for Planning (CMAP) published a Transit Rider Vulnerability Analysis as part of its multi-part Transportation Resilience Improvement Plan. Refer to the Appendix for an explanation of each component in CMAP's Transit Rider Vulnerability methodology. The assessment relies on the social and health vulnerability of where people live, not who is riding transit. This means the results are specific to Route 82 riders who live in North Lawndale.

Of the 22 Route 82 bus stops in North Lawndale, all are scored as having "very high" vulnerability. This score is a factor of social vulnerability, health vulnerability, and the projected number of days over 95°F in North Lawndale by mid-century.

Figure 13: Tree canopy cover in Chicago



Source: USDA Forestry Service Tree Canopy Cover Datasets. United States Department of Agriculture (USDA), "Tree Canopy Cover Dataset," 2023, accessed November 12, 2024, https://data.fs.usda.gov/geodata/rastergateway/treecanopycover/.

Table 2: Tree canopy coverage along Route 82

Community Area	Tree Canopy Coverage (Percent)
South Lawndale	15
North Lawndale	18
East Garfield Park	18
Humboldt Park	17
Logan Square	20
Avondale	16
Irving Park	25
Albany Park	24
North Park	33
Route Average	20.76

Source: "Community Tree Canopy Summaries," Chicago Region Tree Initiative, Chicago, IL: Openlands, 2020, https://mortonarb.org/plant-and-protect/chicago-region-trees-initiative/community-tree-canopy-summaries/.

gion-trees-initiative/community-tree-canopy-summaries/.

45 "Community Tree Canopy Summaries," Chicago Region Tree Initiative.

Transit riders in North Lawndale are more vulnerable to extreme heat than other community areas on Route 82. Most bus stops along the route have a "high" vulnerability score—48 percent of all bus stops. Only 26 percent of all bus stops on Route 82 have "very high" vulnerability, including all stops in North Lawndale. While 46 percent of all "very high" scoring bus stops along the route are located in North Lawndale, there are also stops in Little Village and East Garfield Park. Table 3 contains transit rider vulnerability data for each Chicago community area along Route 82.

As climate change intensifies, existing issues like heat inequality will only worsen. The environment's disproportionate impact on transit provides justification for this report's bus stop audit. If North Lawndale residents relying on Route 82 do not have access to shaded structures while waiting, or if their wait times are extraordinarily long, they will be more susceptible to the adverse health effects of extreme heat. Without frequent and reliable service along Route 82, residents waiting at stops may also experience prolonged, extreme exposure to airborne pollutants.

Table 3: Transit rider vulnerability along Route 82

Community Area	Bus Stop Scores (Percent)			
	Very High	High	Medium	Low
South Lawndale	100.00	0.00	0.00	0.00
North Lawndale	**100.00**	0.00	0.00	0.00
East Garfield Park	22.73	77.27	0.00	0.00
Humboldt Park	0.00	100.00	0.00	0.00
Logan Square	0.00	11.11	88.89	0.00
Avondale	0.00	77.78	22.22	0.00
Irving Park	0.00	40.00	60.00	0.00
Albany Park	0.00	100.0	0.00	0.00
North Park	0.00	33.33	66.67	0.00
Route Average	26.09	48.37	25.54	0

Source: "Risk-Based Vulnerability Assessment," Chicago Metropolitan Agency for Planning, Chicago IL: Chicago Metropolitan Agency for Planning, 2024.

Justification for Study

Given the unique history and characteristics of North Lawndale, a mobility justice study of one of its most important bus routes is not only justifiable, but necessary. According to the Federal Transit Administration, the governing body in charge of enforcing Title VI of the Civil Rights Act of 1964, Title VI "protects people from discrimination based on race, color, and national origin in programs and activities receiving federal financial assistance."[46] The CTA receives federal funding and therefore must abide by Title VI standards to ensure equitable service. The project team completed a study on frequency and reliability relative to the CTA's service standards. This study also compares CTA frequency and reliability standards to peer transit agencies to determine the efficacy of the CTA's standards in enforcing equitable service.

Bus stop quality along Route 82 is another important aspect of service. Factors like shade, seating, and accessibility features affect riders' comfort and safety while waiting at bus stops. To determine the equitability of Route 82 bus stops in North Lawndale, the report team conducted a bus stop audit. Comparing bus stop assets along the route to industry standards through the lens of mobility justice holds accountable the public and private agencies that have historically disinvested in majority Black, low-income neighborhoods like North Lawndale.

An equitable transportation network, including buses and bus stop infrastructure, are crucial in supporting reinvestment in the community by serving places like Farm on Ogden and Lawndale Christian Health Center. The frequency and reliability study and bus stop audit presented in this report aim to help support a continued focus on these efforts.

46 "Title VI of the Civil Rights Act of 1964," Federal Transit Administration, Accessed November 19, 2024, https://www.transit.dot.gov/title6.

Frequency and Reliability

Methods

Route 82's quality of service can be broken down into two parts: (1) the scheduled frequency of service and (2) the actual reliability of service. Standards and definitions vary by agency and are located in the Appendix. Here, the term "frequency" will refer to the scheduled frequency of bus service. Route 82 data was collected from CTA schedules and Global Transit Feed Specification (GTFS) data published by the CTA. For other agencies, frequency standards are from various Title VI reports and service standard publications. Reliability metrics are derived from official agency reports, interactive dashboards, and publications. There is no third party data used in this report. The term reliability refers to the actual service delivered, measured by a variety of metrics listed in the Appendix. Using these metrics, the authors determined that just 9 percent of CTA bus routes are in compliance with agency reliability standards.[47]

Results

Service Frequency Standards

The service standards for scheduled frequency of service per route provide important context for Route 82 and overall system service. The CTA designates select routes with more "stringent frequency standards" as Key Routes, while all other routes will be referred to as non-key routes. The designation system for Key Routes is described in the Appendix. Key Route bus service has a much higher headway standard than non-key route bus service, as demonstrated by Table 4.

Table 4: CTA headways for key routes and non-key routes

CTA Frequency Standards	Weekday Peak	Weekday Midday	Weekday Evening	Saturday/Sunday Afternoon
Key Route headways (minutes)	10	15	20	15
Non-key route headways (minutes)	30	30	30	30

Source: Chicago Transit Authority, "Service Standards and Policies," May 2023, https://www.transitchicago.com/assets/1/6/Chicago_Transit_Authority_Service_Standards.pdf. 1412.5161010Time

Route 82 is a Key Route, meaning its frequency service standards are much higher than non-key routes. Non-key Routes, which make up about 65 percent of the system's total routes, have a service standard of 30-minute headways, even during peak service hours.

Route 82 Frequency of Service in North Lawndale

Using GTFS data, the project team calculated average headways for Route 82 at specific stops in North Lawndale. For example, Table 5 shows average headways for Route 82 at the 15th and Central Park stop.

Table 5: Headways for Route 82

Route 82 Frequency	Weekday Peak	Weekday Midday	Weekday Evening	Saturday Afternoon	Sunday Afternoon
Time (Minutes)	10	10	16	12.5	14

Source: Chicago Transit Authority, "CTA GTFS Repository," transitchicago.com, 2024, https://www.transitchicago.com/downloads/sch_data/.

47 Complete analysis process located in the Appendix.

According to CTA data, Route 82 meets frequency of service standards for all time periods and has more frequent scheduled service for certain time slots than the standard. However, bus service does not always operate as scheduled.

Reliability Standards

Although reliability has various measures, the CTA only offers one standard for reliability of service: Route Compliance Standard. This standard determines whether a route's reliability is considered compliant for the purposes of Title VI equity analysis. Table 6 is an example of the Title VI equity analysis reported by CTA in 2022.

Table 6: CTA bus on-time performance per year 2019-2022

BUS ON-TIME PERFORMANCE MONITORING					
YEAR	MINORITY		NON-MINORITY		DISPARATE IMPACT EXISTS IF PERCENTAGE IS 15% OR HIGHER[1]
	MEETS STANDARD	DOES NOT MEET STANDARD	MEETS STANDARD	DOES NOT MEET STANDARD	
FALL 2019	15.1%	84.9%	9.6%	90.4%	-5.4%
FALL 2020	10.6%	89.4%	5.6%	94.4%	-5.0%
FALL 2021	4.9%	95.1%	5.6%	94.4%	0.7%
FALL 2022	9.3%	90.7%	8.0%	92.0%	-1.3%

Table 24: Bus On-Time Performance Monitoring
[1] A negative percentage (%) indicates service standards are met at a higher rate for customers on minority classified routes than customers on non-minority classified routes.

Source: Chicago Transit Authority, "Title VI Program Triennial Report," 2022, https://www.transitchicago.com/assets/1/28/Title_VI_Program_Triennial_Report.pdf.

Per the Title VI report, CTA determines that a route is compliant with the agency's on-time performance standards if "65 percent of trips on a given bus route are on-time."[48] In other words, up to 35 percent of bus trips on a route can arrive either more than one minute early or five minutes late and the route can still be considered compliant. There is no public, published data available on whether the Route 82 bus is considered compliant with the 65 percent reliability threshold.

Actual Reliability

According to On-Time Performance (Table 6), CTA definitions for minority and non-minority routes, and spatial analysis at the census tract level, nine percent of routes citywide are compliant with the CTA's own 65 percent threshold.[49] CTA does provide a statistic to demonstrate "the percent of customers boarding on-time service systemwide," which in 2022 was 54 percent.[50]

Aside from statistics which the CTA details in the Title VI Triennial Report, CTA also releases different, more detailed statistics on the CTA Performance Dashboard. The relevant statistics for the purposes of this report include additional wait time on average per passenger, per route, and optionally per stop, the percentage of buses which have "big gaps" between them, and the percentage of buses which are bunched. Table 7 details these statistics.

Table 7: CTA and Route 82 bunching percentages

September 2024	CTA Overall	Route 82	Percentage Increase
% Bunched Intervals	3.9%	6.7%	71.4%
% Big Gap Intervals	5.0%	7.3%	46.0%

Source: Chicago Transit Authority, "CTA Performance Metrics & Reports," transitchicago.com, September 2024, https://www.transitchicago.com/performance/.

As demonstrated by Table 7, Route 82 in September 2024 performed worse than the CTA bus system overall for both metrics. This resulted in a 71.4 percent increase in bunched intervals compared to the system overall, and a 46 percent increase in big gaps intervals compared to the system overall. September 2024 was picked because it represents

48 "Title VI Program Triennial Report," Chicago Transit Authority, 2022, https://www.transitchicago.com/assets/1/28/Title_VI_Program_Triennial_Report.pdf.
49 This percentage was determined by analyzing the length of bus routes (gathered from the Chicago Data Portal 2024 bus routes map) within CTA-defined minority tracts (2020 decennial census data used for race, 2020 Topologically Integrated Geographic Encoding and Referencing system (TIGER) shapefile used for census tracts) in ArcGIS Pro in conjunction with the percentages in the table located on page 47 of CTA's 2022 Title VI Triennial Report. Complete process detailed in the Appendix.
50 "Title VI Program Triennial Report," Chicago Transit Authority, 2022, https://www.transitchicago.com/assets/1/28/Title_VI_Program_Triennial_Report.pdf.

the most recent data, but the full dataset available on the dashboard (September 2023-2024) shows a similar picture, suggesting this trend is not isolated to one month (Table 8).

Table 8: CTA and Route 82 bus bunching, September 2023-2024

September 2023-September 2024	CTA Overall	Route 82	Percentage Increase
% Bunched Intervals	2.8%	4.7%	67.8%
% Big Gap Intervals	4.4%	6.3%	43.1%

Source: Chicago Transit Authority, "CTA Performance Metrics & Reports," transitchicago.com, September 2024, https://www.transitchicago.com/performance/.

The final statistic collected shows the excess wait time that an average passenger endures. This data can be disaggregated to a specific "time point" on a route. Table 9 represents the overall excess wait time for the month of September 2024 compared to Route 82's overall excess wait time, in addition to Route 82's excess wait time at the Central Park and Cermak Stop (chosen because it is in proximity to North Lawndale).

Table 9: CTA and Route 82 bus excess wait time, September 2024

September 2024	CTA Overall	Route 82 Overall	% Increase from CTA Overall	Route 82 at Central Park/Cermak	% Increase from CTA Overall
Bus Excess Wait time (minutes)	1.93	2.41	24.8	2.39	23.8%

Source: Chicago Transit Authority, "CTA Performance Metrics & Reports," transitchicago.com, September 2024, https://www.transitchicago.com/performance/.

As demonstrated by the table above (Table 9), Route 82 has a higher average wait time endured by passengers than the system overall, yet another statistic demonstrating that the bus is underperforming. This average wait time can be further disaggregated by direction, and the results of this disaggregation demonstrate another interesting trend, shown in Table 10.

Table 10: Route 82 northbound and southbound average excess wait time at Central Park/Cermak, September 2024

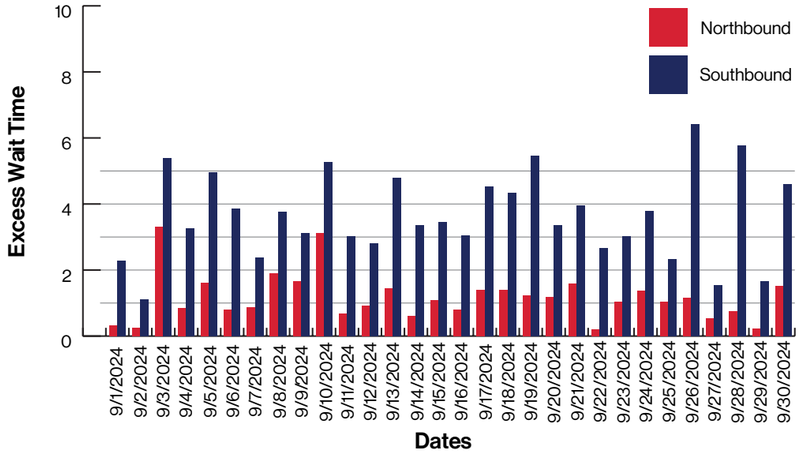
82 Kimball at Central Park/Cermak	Northbound	Southbound	Percentage Increase
Bus Average Excess Wait Time (minutes)	1.16	3.65	214.6%

Source: Chicago Transit Authority, "CTA Performance Metrics & Reports," transitchicago.com, September 2024, https://www.transitchicago.com/performance/.

Southbound excess wait times at the Route 82 Central Park/Cermak stop are on average 214 percent higher than Northbound wait times, which is not surprising considering the stop is near the southern terminus, but this statistic combined with the previous statistics indicate a potential bunching issue. Figure 14 visualizes Table 10 disaggregated by day.

Ultimately, while Route 82 scheduled service frequency meets CTA Key Route standards, it falls behind in reliability metrics compared to the system as a whole. This low reliability results in longer excess wait time for passengers. As demonstrated later in this report, the discomfort of this excess wait can be amplified by lack of shelter, lack of seating, or lack of safety from vehicles.

Figure 14: Excess Route 82 wait time at Central/Cermak, September 2024



Source: Chicago Transit Authority, "CTA Performance Metrics & Reports," transitchicago.com, September 2024, https://www.transitchicago.com/performance/.

CTA in the Context of Peer Agencies

The Regional Transportation Authority designates nine peer regions for inter-agency comparison in its Regional Peer Review.[51] Unfortunately, the peer review does not compare Chicago's transportation system to that of peer regions in the context of frequency or reliability. The next section attempts to answer the question: How is CTA performing in relation to other agencies in peer regions, and what does this reflect about Route 82's service in North Lawndale? Researching this question raised concerns about the lack of standardization of metrics, accessible data, and equity analyses across transit agencies.

Frequency Standards

Most peer agencies provide frequency standards. The first issue which arose was standardization; agencies had different definitions for peak and off-peak services, and some agencies, including CTA, divided off-peak into specific days and times of the week. The authors consolidated agency definitions into binary peak and off-peak categories. Peak and off-peak definitions per agency are located in the Appendix. Table 11 details peak and off-peak service standards per agency.

Table 11: Agency scheduled service standards

	Peak Headways (Minutes)	Off-Peak Headways (Minutes)
CTA	30	30
CTA Key Routes (Route 82 Included)	10	15-20
MARTA (Atlanta)	45	75
MBTA (Boston)	30	60
DART (Dallas)	30	60
LACMTA (Los Angeles)	30	60
MDT (Miami)	60	60
MTA (New York)	30	60
SEPTA (Philadelphia)	20	30
WMATA (Washington, D.C.)	15	15

Source: CTA, MARTA, MBTA, DART, LACMTA, MDT, MTA, SEPTA, WMATA (See Appendix for specific sources).

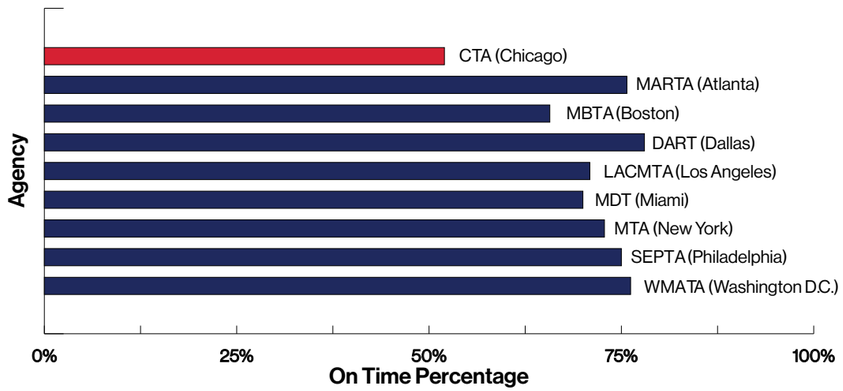
51 "Regional Peer Review: Report Year 2022," Regional Transportation Authority, 2022, https://rtams.org/sites/default/files/documents/2024-02/RTA_RegionalPeerReview_2022_0.pdf.

CTA Key Routes had the best standards of the peer agencies where there was available data. Some agencies had extremely low peak frequency standards. Even New York City, a city with 1.4 million daily bus trips in 2022,[52] over two times that of Chicago,[53] has an off-peak service standard of 60 minutes. Of course, these are just standards, and they do not reflect actual scheduled route headways.

Reliability Analysis

Figure 15 shows bus on-time percentage per agency.[54]

Figure 15: Peer agency on-time performance, latest available data



Source: CTA, MARTA, MBTA, DART, LACMTA, MDT, MTA, SEPTA, WMATA (See Appendix for specific sources).

As demonstrated by Figure 15 above, CTA is far behind its peers in reliability, as most agencies are within a range of 70-80 percent. CTA's on-time performance for the most recently available year (2022) was 54 percent. This low metric does not demonstrate the potential depths of this metric for a route like Route 82. Bus-bunching and wait time metrics suggest that Route 82 would have an even lower reliability percentage than the overall system, potentially pushing the Route 82 below 50 percent, meaning the bus would be on time as often as it was late.

The CTA also has lower standards than peer agencies for route on-time performance compliance, which is the metric used in its Title VI Triennial Report. Of the peer agencies that publicly provide data on on-time performance by route type, CTA has the lowest standard that a route needs to be considered compliant: 65 percent. This means that if 65 percent of passenger trips on a route are on-time, the route is considered compliant. Table 12 compares this to peer agencies with available data.

Table 12: CTA and peer agencies percentage of routes in compliance

	Route Compliance Standard	% Of routes in compliance
CTA (Chicago)	65%	8.97%
MBTA (Boston)	75%	33.80%
LACMTA (Los Angeles)	80%	9.34%

Source: CTA, MBTA, LACMTA (See Appendix for specific sources)

Of the three agencies with easily accessible published data, CTA has the lowest standard for a route to be considered compliant with on-time performance standards. Even with the lowest compliance standard, CTA still had the lowest compliance rate at 9 percent. Ultimately, while CTA has very good standards for service frequency, it falls far behind its peer agencies in delivering that standard of service, and thus has a lower reliability.

52 "Subway and Bus Ridership for 2022," Metropolitan Transportation Authority, MTA, 2022, https://new.mta.info/agency/new-york-city-transit/subway-bus-ridership-2022.
53 "Annual Ridership Report Calendar Year 2022," Chicago Transit Authority, 2022, https://www.transitchicago.com/assets/1/6/2022_Annual_Report_-_FINAL.pdf.
54 Definitions for on-time vary by agency, and are located in the Glossary of Terms in the Appendix.

Bus Stop Audit

Methods

Frequency and reliability only capture part of rider experience on CTA Route 82 in North Lawndale. The presence (or lack thereof) of factors like shade, seating, and sidewalks are critical for both accessibility and comfort. These factors are commonly referred to as bus stop assets. Research shows that the presence of basic assets like bus shelters and benches decreases transit riders' perception of wait time.[55] This is especially true for women, who were more likely to report feeling insecure at stops with low assets.[56] Additionally, adding new assets correlates to an increase in overall bus ridership.[57] The project team performed audits of Route 82 bus stops in North Lawndale to capture the current conditions and assets.

Bus stop audits capture the accessibility and quality of bus stops. Table 13 describes the process of selecting factors that measure accessibility and quality. Low accessibility and quality pose barriers to riders and degrade the experience of using public transit.

Table 13: Accessibility and quality in bus audits

	Accessibility	Quality
Guiding Questions	Is it easy for riders of all ages and abilities to reach this bus stop? Once riders arrive at the stop, can they wait for the next 82 bus and board without issue?	Are there features and assets at this bus stop that make waiting a pleasant experience? Are these features and assets in a state of good repair?

The study area audit was conducted through in-person observations of North Lawndale's 22 Route 82 bus stops. The project team selected assets based on ADA Public Right-of-Way Accessibility Guidelines (PROWAG)[58] and Active Living's Microscale Audit of Pedestrian Streetscapes (MAPS-Mini) tool.[59] In total, the audit investigated the presence of 11 basic assets. A copy of the bus stop audit raw data is included in the Appendix. The project team also used this opportunity in the field to collect photos and qualitative observational data on trip hazards, state of good repair, and surrounding buildings.

Results

Each bus stop was scored based on the number of assets. The presence of an asset, such as a bench, resulted in an award of 1 point for that asset category. The exception is the presence of a trash can, where an overflowing trash can results in a score of 0.5 rather than 1. The total points were then divided by the maximum possible number of points (11). Bus stop scores closer to 1 have more assets and therefore higher accessibility and quality. Conversely, bus stops closer to 0 have fewer assets and lower overall accessibility and quality. These scores do not function as a direct comparison. For example, two stops with the same score might have different assets. The individual scores are depicted in Figure 16 and mapped in Figure 17. The appendix contains a spreadsheet of the raw data collected from the study area audit.

The average bus stop score is 0.63, meaning just over half of basic assets are present. Only one bus stop had a score lower than 0.50, meaning less than half of basic assets are present. Of the 22 total Route 82 bus stops in North Lawndale, only two had a perfect score.

55 Yingling Fan, Andrew Guthrie, and David Levinson, "Waiting Time Perceptions at Transit Stops and Stations: Effects of Basic Amenities, Gender, and Security," Transportation Research Part A: Policy and Practice 88, June 2016: 251–64, https://doi.org/10.1016/j.tra.2016.04.012.
56 Ibid.
57 Xiao Shi et al., "Does Improving Stop Amenities Help Increase Bus Rapid Transit Ridership? Findings Based on a Quasi-Experiment," Transportation Research Interdisciplinary Perspectives 10, June 2021: 100323, https://doi.org/10.1016/j.trip.2021.100323.
58 "Public Right-of-Way Accessibility Guidelines (PROWAG)," U.S. Access Board, (Washington, DC: U.S. Access Board, 2024), https://www.access-board.gov/prowag.
59 Jim Sallis, "Auditing the Pedestrian Environment: A Brief Tool for Practitioners & Community Members," Active Living, September 2, 2015, https://activelivingresearch.org/blog/2015/09/auditing-pedestrian-environment-brief-tool-practitioners-community-members.

Figure 16: Bus audit scores

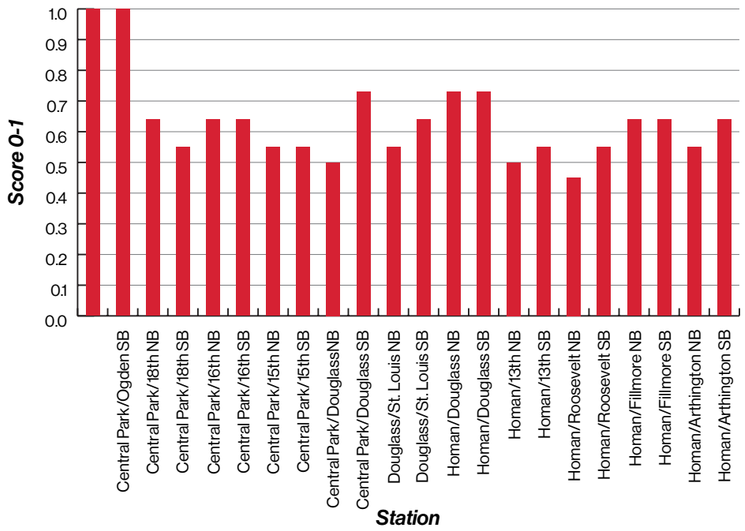
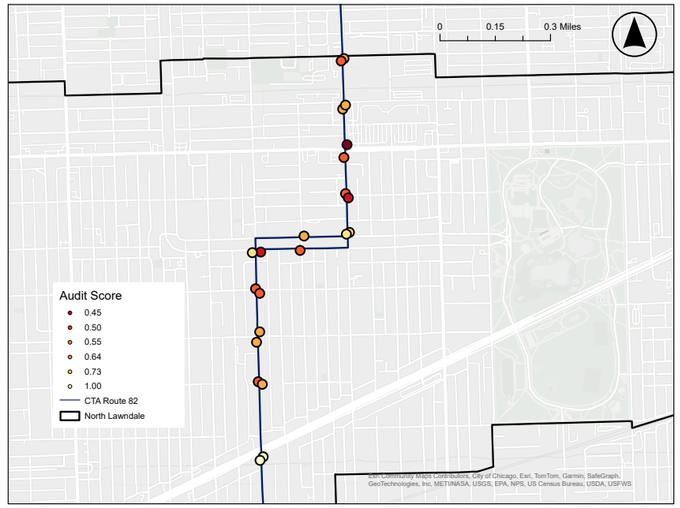


Figure 17: Map of bus audit scores



The Route 82 bus stops near the Pink Line's Central Park station have perfect scores. At Central Park and Ogden, Route 82 riders could wait under protective awnings where seating, trash cans, and lighting were present (see Figure 18).

The lowest-scoring bus stop at Homan and Roosevelt (see Figure 19) lacks shelter, shade, and seating. Additionally, there is no significant sidewalk buffer protecting waiting riders from fast-moving car traffic.

The assets present at individual bus stops varies, as shown in Figure 20. Assets related to accessibility, such as curb cuts, sidewalks, and tactile ramps, are present at all North Lawndale bus stops. The least common assets are trash cans, which are present at only 4 of the 22 stops.

A few bus stops had accessibility issues that could not be captured in the audit. At Homan and Fillmore, construction in the parking lane severely affected the stop's accessibility (see Figure 21). The 82 bus is forced to stop down the block from the bus sign, and on one observed occasion parked cars prevented the operator from moving close to the curb. Riders are forced to step into the street to board the bus. Although temporary, the construction poses a barrier to transit access. At other bus stops, illegal commercial loading was observed. These incidents significantly impact riders who have vision difficulties or use mobility aids.

Assets related to quality that provide a more pleasant waiting experience (such as bus shelters, shade from trees or other sources, and benches) are only present at a fraction of bus stops. These assets were occasionally in poor condition even if present. Broken benches and overflowing trash cans (see Figure 22) indicate a lack of care and maintenance by public agencies. While the most basic needs are met, most Route 82 riders in North Lawndale face uncomfortable waits. Bus shelters are the second-least common asset, and are present at only 23 percent of bus stops. Unsheltered stops do not protect riders from inclement weather such as rain, sleet, or snow.

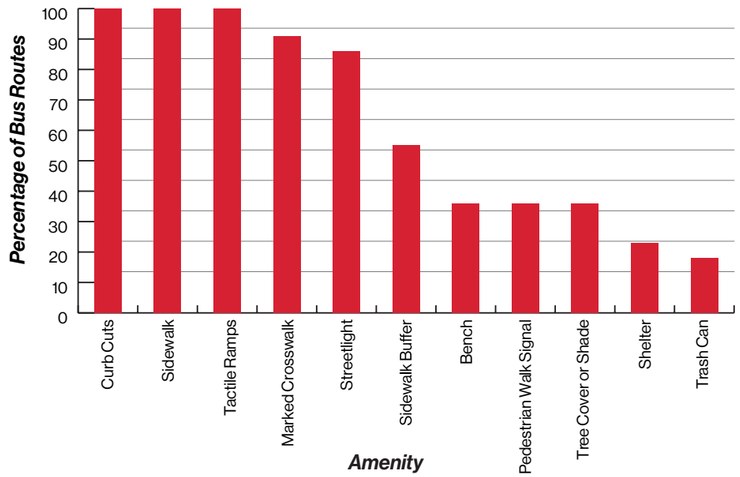
Figure 18: Southbound Central Park/Ogden

Riders board the Route 82 bus at Central Park and Ogden underneath the Pink Line. This bus stop was one of two with the highest possible asset score.

Figure 19: Northbound Homan/Roosevelt

The Northbound bus stop at Homan at Roosevelt lacks a shelter, bench, sidewalk buffer, and shade.

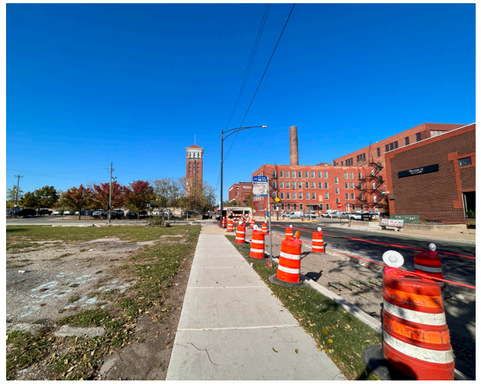
Figure 20: North Lawndale bus assets



Additionally, more than 70 percent of stops are unshaded, with neither trees nor built structures providing relief from the sun. The project team observed riders at Route 82 bus stops struggling to wait comfortably at bus stops without benches, shade trees, or shelters. Figures 22 and 23 show bus stops lacking these assets.

The urban heat island effect makes paved, unshaded, and tree-deficient urban areas more susceptible to extreme temperatures. Many North Lawndale bus stops along Route 82 fit this description perfectly, which leads to uncomfortable or dangerous waits times. By mid-century Chicagoans will experience ten times the amount of days over 95°F. It is crucial to mitigate urban heat with proven cooling solutions where transit riders need them most.

Figure 21: Southbound Homan/Filmore



Construction in the parking lane at Homan and Fillmore disrupts 82 bus service and negatively impacts accessibility.

Figure 22: Northbound Central Park/ Douglass

A trash can overflows with debris at Northbound Central Park and Douglass along Route 82.

Figure 23: Northbound Central Park/15th

The Northbound bus stop at Central Park and 15th lacks a shelter, bench, sidewalk buffer, and shade. A rider used the adjacent building's shadow while periodically checking for bus times.

Discussion

Overall, the study area audit found a lack of quality-based assets at North Lawndale bus stops. Bus stops were largely physically accessible, with sidewalks, curb cuts, tactile ramps, marked crosswalks, and streetlights present at 86 percent or more of the locations. However, shelters, benches, and trash cans were among the least common assets (see Figure 24). When present, these assets were often in poor condition, like at Homan and Arthington in Figure 25.

The absence of bus shelters and benches is alarming given the lack of tree cover, high transit rider vulnerability, and the high proportion of disabled residents in North Lawndale. To improve safety and the quality of rider experience, this report recommends increasing the presence of bus stop assets, addressing reliability, and further enhancing the level of service frequency. Riders in North Lawndale are more vulnerable to severe heat than other community

areas along Route 82. Furthermore, Route 82 riders experience excess wait times, bus bunching, and big gaps more often than other CTA bus routes. Mobility justice demands that North Lawndale riders don't just deserve equivalent service, but enhanced service. The low car access and high proportion of residents with disabilities compared to Chicago underscores this need. Adding benches, shelters, and shade trees can help mitigate the risk posed by extreme heat and provide the basic comforts that riders with disabilities are entitled to. Quality bus stop assets also improve rider experience, perceived safety, wait times, and overall ridership.

Increasing the level of service frequency and reliability can also mitigate the sensitivity to extreme heat. A higher frequency of buses translates to riders spending less time outside in extreme temperatures. The current gap between scheduled service frequency and reliability presents a particularly dangerous scenario for riders. An unreliable bus headway leads to unexpected, extended wait times in dangerous conditions. The high density of transit connectivity in North Lawndale and other community areas along Route 82 underscores the route's importance to the transit system and justifies higher bus frequency, as does the spatial inequity and lower access to opportunity residents have relative to more invested locations.

Figure 25: Northbound Homan/Arthington

A bench at Northbound Homan and Arthington is missing part of its seat, leaving a screw exposed.

Figure 24: Northbound Douglass/St. Louis

A bus stop at Northbound Douglass and St. Louis without a shelter or bench. Thin strip of concrete along the street is not accessible to those with mobility impairments.

Conclusion

Limitations

This report applies a radical understanding of mobility justice to the hyperlocal issue of Route 82 within North Lawndale. The authors acknowledge that issues surrounding public transit equity expand beyond North Lawndale and Route 82 into other disinvested areas of Chicago. The project team also acknowledges their position as urban planning students within a state institution, which influences their point of view from within academia and the planning industry rather than the community. In addition, the project team does not represent the racial or socioeconomic demographics of North Lawndale. In a further study of transit equity, more involved community collaboration would provide critical local perspectives. In addition, an expanded understanding of the social environment—including traffic, policing, and interpersonal violence—would complement this report's insight into Route 82's limitations corresponding to the built environment.

The project team was also limited by time and funding. As this project was conducted over the course of a semester, there was a set amount of time to gather data. Further research would benefit from an extended study period. The project was generously funded by the University of Illinois Chicago's Office of Community Collaboration. Further research would require additional funding.

The CTA also faces factors that may limit their ability to improve reliability along Route 82. Street infrastructure, traffic lights, and other vehicles on the road affect bus service but are not owned by the CTA, therefore limiting the agency's capacity to influence these factors. In addition, the CTA's funding is constrained and faces a future operating deficit that may impact system improvements related to reliability.

Future Research

As mentioned in the Frequency and Reliability section of this report, factors beyond this project's scope could provide more equitable service to North Lawndale. Future research should examine the effects of bus bunching, the addition of dedicated bus lanes, transit signal priority, winter bus stop conditions, road conditions, and land use around bus stops—all of which may influence reliability. Further research on Title VI metric standardization among transit agencies would also be helpful, as easier cross-comparison of agency data would provide transparency in methods and data across agencies.

To gain further insight into the community's perceived equity of Route 82, future research should include insights from North Lawndale bus riders and bus operators. While the project team makes quantitatively informed assumptions in this report about Route 82 ridership pertaining to work, school, errands, and other necessities, an ethnographic study would provide further insight into the why individual North Lawndale residents ride the Route 82 bus and which specific needs can address inequitable service. In addition, engagement with bus operators working on Route 82 would be an insightful addition to this report's research, perhaps in part through identifying challenges to service reliability. Bus operators are underrepresented in the literature on transit equity and would provide a different perspective on the nuances of Route 82 ridership in North Lawndale. The project team recommends that further research include ethnographic research focused on community members and bus operators.

Further research is also needed on the effects of programs such as The Chicago Region Tree Initiative (CRTI), a community forestry program that uses forestry data to determine which communities have the greatest need for trees. All census tracts within or intersecting North Lawndale are ranked as "highest" or "high" priority areas for CRTI due to extremely low canopy coverage, and an additional 41 percent of land in the neighborhood, including transit land, is classified as plantable space.[60] Tree planting initiatives may be environmentally valuable, but need to be developed in partnership with community members in order to consider factors such as the perceived safety concerns and aesthetics of tree cover.

60 "Community Tree Canopy Summaries," Chicago Region Tree Initiative.

While this report does not offer recommendations, it should serve as a guide for transit agencies, professionals, and activists to view possible improvements to Route 82 through a mobility justice lens. As systemic disinvestment continues in North Lawndale, Route 82 serves as a connection to schools, places of work, other transit, and essential services for residents. To provide equitable access to these amenities, reliability and bus stop conditions must be addressed. Furthermore, enhanced service, rather than equal service, should be a priority for transit agencies when serving underserved communities like North Lawndale. Identifying these areas for improvement is the first step in the long and multifaceted process of ensuring an equitable Route 82. Supporting mobility justice—giving space and resources to the community to advocate on their own behalf and address injustices—is the ultimate aspiration of this report.

Appendix

Reliability Metrics

On Time Percentage (OTP): The percentage of passenger bus trips for which the bus arrives on time. Definition of "on time" varies by agency as seen below.
a. "On time" is defined by 5 of 9 agencies, including CTA, as when a bus arrives <1 minute early and departs <5 minutes late.[61][62][63][64][65]
b. "On time" is defined by the Metropolitan Atlanta Rapid Transit Authority (MARTA) as when a bus departs 0 minutes early and <5 minutes late.[66]
c. "On time" is defined by the Massachusetts Bay Transportation Authority as:
i. When a bus departs <1 minute early and <3 minutes late for "frequent routes."
ii. When a bus departs <1 minute early and <6 minutes late for "infrequent routes."[67]
d. "On time" is defined by the Washington Metropolitan Area Transportation Authority as:
i. When a bus which runs on a schedule arrives and departs between <2 minutes early and <7 minutes late.[68]
ii. When a bus runs based on headways and is within the headway by 3 minutes.
e. "On time" is defined by the Southeastern Pennsylvania Transportation Authority as when a bus arrives between <2 minutes early and <6 minutes late.[69]
i. When a bus which runs on a schedule arrives and departs between <2 minutes early and <7 minutes late.[70]
ii. When a bus runs based on headways and is within the headway by 3 minutes.

Percentage of Routes in Compliance: The percentage of routes which are compliant with agency route reliability standards.
Note: The CTA does not publish a total percentage of routes in compliance in the Title VI report, but splits it into two percentages, one for minority routes and one for non-minority routes. The team calculated an overall percentage by measuring the distance of bus routes within minority 2020 census tracts, which the CTA defines as "when the percentage of the tract that is minority is equal to or greater than the average found in the service area."[71] The term

61 "Title vi Program Triennial Report," Chicago Transit Authority, 2022, https://www.transitchicago.com/assets/1/28/Title_VI_Program_Triennial_Report.pdf.
62 "DART Service Standards," Dallas Area Rapid Transit, December 2021, https://www.dart.org/docs/default-source/board/board-documents/dartservice-standards.pdf.
63 "Title vi Program Update," Los Angeles County Metropolitan Transportation Authority, metro.net, October 2022, https://libraryarchives.metro.net/DB_Attachments/LA%20Metro%20Title%20VI%20Program%20Update%20Sept2022%20Draft.pdf.
64 "State of the System Snapshot," Miami Dade Transit, 2023, https://www.miamidade.gov/transit/library/DTPW-system-snapshot-23.pdf.
65 Thomas Dinapoli, "Metropolitan Transportation Authority -New York City Transit and MTA Bus Company Bus Wait Assessment and Other Performance Indicators," 2019, https://www.osc.ny.gov/files/state-agencies/audits/pdf/sga-2019-17s54.pdf.\
66 Paula Nash, "Title vi Program Plan," Metropolitan Atlanta Rapid Transit Authority, Accessed November 20, 2024, https://www.itsmarta.com/uploadedFiles/Get_to_Know_MARTA/System_Information/Accessible_Services/Title%20VI%20Plan%202022-2025%20Final2.pdf.
67 "Title vi Program," Massachusetts Bay Transportation Authority, June 2023, https://cdn.mbta.com/sites/default/files/2023-11/2023-11-14-mbta-title-VI-program.pdf.
68 "Bus Service Guidelines - Metrobus," Washington Area Bus Transformation Project and Washington Metropolitan Area Transit Authority, 2020, https://www.wmata.com/initiatives/plans/upload/Final-MetroBus-Service-Guidelines-2020-12.pdf.
69 "Service Standards and Process," Southeastern Pennsylvania Transportation Authority, 2019, https://planning.septa.org/wp-content/uploads/2021/02/Service-Standards-and-Service-Development-Process-2020.pdf.\
70 "Bus Service Guidelines - Metrobus," Washington Area Bus Transformation Project and Washington Metropolitan Area Transit Authority, 2020, https://www.wmata.com/initiatives/plans/upload/Final-MetroBus-Service-Guidelines-2020-12.pdf.
71 "Title vi Program Triennial Report," Chicago Transit Authority, 2022, https://www.transitchicago.com/assets/1/28/Title_VI_Program_Triennial_Report.pdf.

"minority" is defined by the U.S. Census Bureau as "anyone who is not single-race white and not Hispanic."[72] The report clarifies that "the average minority percentage in the service area is 63.1 percent." The CTA defines a route as minority if "more than 33 percent of the roundtrip distance of the route or branch goes through census tracts defined as minority."[73] The counts of minority (84) and non-minority (29) routes were averaged out with the route compliance percentages (9.3 percent, 8.0 percent, respectively) provided in the CTA Title VI Report to determine the overall routes in compliance percentage of 9 percent.
Note: Los Angeles County Metropolitan Transportation Authority (LACMTA) and Massachusetts Bay Transportation Authority (MBTA) provide percentages for routes in compliance split into weekdays, Saturday, and Sunday. The overall percentage was calculated by multiplying the weekday percentage by five (because there are five weekdays in a week), adding the Saturday and Sunday percentages, and then dividing by 7 (because there are seven total days in a week).

Percentage of Big Gap Intervals: Percentage of times when the interval (time) between two buses is double the scheduled interval and greater than 15 minutes. This was derived from the CTA Performance Dashboard.

Percentage of Bunched Intervals: Percentage of times when the interval between two buses is 60 seconds or less. This was derived from the CTA Performance Dashboard.

Additional Wait Time: Average additional time which a passenger must wait at a stop for a bus. For CTA data, this was derived from the CTA Performance Dashboard, and using the interactive dashboard, the team split the additional wait times into individual days and by direction.

Peak and Off-Peak Qualifications: The authors standardized varying definitions of "peak" and "off-peak" service among agencies into binary categories. Varying definitions among agencies are due to the assumption that peak service in Chicago may look different and occur at different times than peak service in other cities. In addition, peak service may not reflect peak demand in North Lawndale. Considering WMATA was the only agency which used a tiered system, the authors used their Tier 1 (highest volume) service as a reference and disregarded all other tiers. SEPTA, DART, MBTA, MARTA and MDT all had three or more categories which went into detail about times of day and days of the week, but these agencies had ultimately only specified two specific headways (for example, SEPTA had six categories for frequency but only two headway standards of either 20 or 30 minutes). This made it easy to transpose these many categories into the binary of peak and off-peak.
ADA: The Americans with Disabilities Act, passed in 1990, guarantees Civil Rights for individuals with disabilities including access to programs, goods, and services.

72 U.S. Census Bureau, "Most Children Younger than Age 1 Are Minorities, Census Bureau Reports," www.census.gov, 2012, https://www.census.gov/newsroom/releases/archives/population/cb12-90.html.
73 "Title vi Program Triennial Report," Chicago Transit Authority, 2022, https://www.transitchicago.com/assets/1/28/Title_VI_Program_Triennial_Report.pdf.

Additional Tables and Figures

Bus Audit Raw Data

Bus Stop Asset Descriptions

Asset	Description
Pedestrian Walk Signal	Is there a pedestrian walk signal with a countdown at the bus stop? Not applicable if the bus stop is mid-block.
Ramp	Are curb cuts present at the intersections near the bus stop? Not applicable if the bus stop is mid-block.
Marked Crosswalk	Is the crosswalk(s) clearly marked? Not applicable if the bus stop is mid-block
Bus Shelter	Is there a bus shelter?
Bench	Is there a bench within 25 feet of the bus sign?
Tree Cover or Shade	Is there a tree within 25 feet of the bus sign? If so, does it provide shade? Do any nearby elements shade the bus stop?
Trash Can	Is there a trash can within 25 feet of the bus sign?
Trash Can Status	If there is a trash can, is it overflowing?
Streetlight	Is there a streetlight within 25 feet of the bus sign?
Sidewalk	Do sidewalks not exist (0), exist on one side (1), or exist on both sides (2)?
Sidewalk Buffer	Is there a buffer on the sidewalk between the street and the bus stop? There should be a space between the end of a bus stop and the edge of a crosswalk, intersection, or driveway.
Tactile Ramps	Are there tactile ramps at the intersections near the bus stop? Not applicable if the bus stop is mid-block.

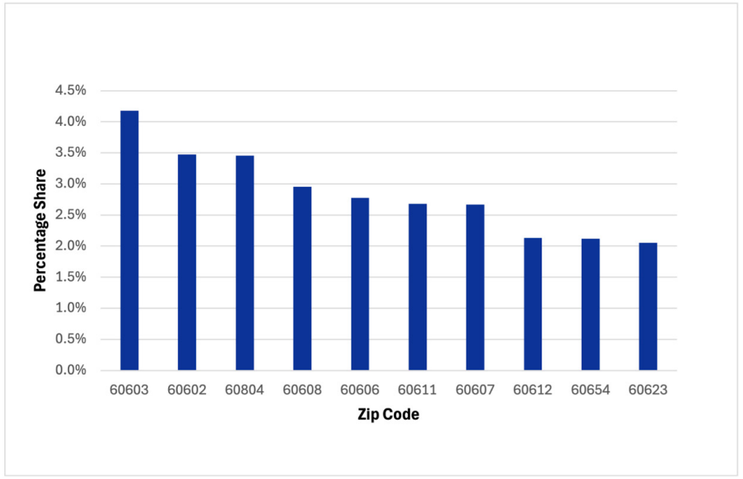
North Lawndale Route 82 Bus Stop Audit Data

	Pedestrian Walk Signal	Ramp	Marked Crosswalk	Bus Shelter	Bench	Tree Cover or Shade	Trash Can	Trash Can Status	Streetlight	Sidewalk	Sidewalk Buffer	Tactile Ramps
Central Park & Ogden (NB)	Yes	Yes	Yes	Yes	Yes	No; Pink Line has shade and cover	Yes	No overflow	Yes	Both sides	Yes	Yes
Central Park & Ogden (SB)	Yes	Yes	Yes	Yes	Yes	No; Pink Line has shade and cover	Yes	No overflow	Yes	Both sides	Yes	Yes
Central Park & 18th (NB)	No	Yes	Yes	No	No	Yes	No	N/A	Yes	Both sides	Yes	Yes
Central Park & 18th (SB)	No	Yes	Yes	No	No	Yes	No	N/A	Yes	Both sides	Yes	Yes
Central Park & 16th (NB)	Yes	Yes	Yes	No	No	Yes	No	N/A	Yes	Both sides	No	Yes
Central Park & 16th (SB)	Yes	Yes	Yes	No	No	Yes	No	N/A	Yes	Both sides	No	Yes
Central Park & 15th (NB)	No	Yes	Yes	No	No	No	No	N/A	Yes	Both sides	No	Yes
Central Park & 15th (SB)	No	Yes	Yes	No	No	No	No	N/A	Yes	Both sides	No	Yes
Central Park & Douglass (NB)	No	Yes	Yes	No	No	No	Yes	Overflow	Yes	Both sides	No	Yes
Central Park & Douglass (SB)	No	Yes	Yes	Yes	Yes	Yes	No	N/A	Yes	Both sides	No	Yes
Douglass & St. Louis (NB)	No	Yes	Yes	No	No	No	No	N/A	Yes	Both sides	Yes	Yes
Douglass & St. Louis (SB)	No	Yes	Yes	No	No	Yes	No	N/A	Yes	Both sides	Yes	Yes

	Pedestrian Walk Signal	Ramp	Marked Crosswalk	Bus Shelter	Bench	Tree Cover or Shade	Trash Can	Trash Can Status	Streetlight	Sidewalk	Sidewalk Buffer	Tactile Ramps
Homan & Douglass (NB)	No	Yes	Yes		Yes	No	No	N/A	Yes	Both sides	No	Yes
Homan & Douglass (SB)	No	Yes	Yes		Yes	No	No	N/A	Yes	Both sides	No	Yes
Homan & 13th (NB)	No	Yes	Yes	No	No	No	Yes	Overflow	No	Both sides	Yes	Yes
Homan & 13th (SB)	No	Yes	Yes	No	No	No	No	N/A	Yes	Both sides	Yes	Yes
Homan & Roosevelt (NB)	Yes	Yes	No	No	No	No	No	N/A	Yes	Both sides	No	Yes
Homan & Roosevelt (SB)	Yes	Yes	No	No	Yes	No	No	N/A	Yes	Both sides	No	Yes

	Pedestrian Walk Signal	Ramp	Marked Crosswalk	Bus Shelter	Bench	Tree Cover or Shade	Trash Can	Trash Can Status	Streetlight	Sidewalk	Sidewalk Buffer	Tactile Ramps
Homan & Fillmore (NB)	No	Yes	Yes	No	Yes	No	No	N/A	No	Both sides	Yes	Yes
Homan & Fillmore (SB)	No	Yes	Yes	No	No	Yes	No	N/A	Yes	Both sides	Yes	Yes
Homan & Arthington (NB)	No	Yes	Yes	No	Yes	No	No	N/A	No	Both sides	Yes	Yes
Homan & Arthington (SB)	No	Yes	Yes	No	No	No	Yes	No overflow	Yes	Both sides	Yes	Yes

Figure 26: Where North Lawndale Residents Work by Zip Code, 2021



Source: U.S. Census Bureau, OnTheMap Application and LEHD Origin-Destination Employment Statistics (Beginning of Quarter Employment, 2nd Quarter of 2002-2021).

Table 14: Transit rider vulnerability components

Component	Definition
Exposure	A measure of physical exposure to extreme heat.
Sensitivity	Degree to which transit riders are prone to being harmed by extreme heat. Children, older adults, infants, and riders with pre-existing health conditions can be more sensitive to heat.
Adaptive Capacity	Ability of transit riders to adjust to, cope with, or respond to extreme heat. Factors include service frequency, proximity to transit stops, and shade trees.

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Complete list of sources for Figure 15: Peer agency on-time performance, latest available data

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Glossary of Terms

Bus stop assets: Features added to a bus stop to make the experience of using a bus stop more pleasant or accessible to persons with disabilities.
Contract Selling: A predatory real estate practice wherein Black homebuyers purchased homes with excessive down payments, in monthly installments at high interest rates, towards inflated purchase prices but did not gain full ownership until payment was made in-full and all conditions were met. This often resulted in eviction if buyers were late on payment or for other minor infractions. This is essentially “the illusion of a mortgage without the protections of one.”[74] Contract selling prevented Black contract buyers from building any equity in the process, perpetuating the cycle of generational poverty.
Curb cut: A concrete ramp graded down from the surface of a sidewalk to street level. Curb cuts make it possible for pedestrians with strollers, grocery carts, wheelchairs, and walkers to safely and easily cross the street.
Interactive agency dashboards: Digital component of a transit agency’s website that allows private citizens to search and visualize data on ridership statistics, on-time performance, service coverage and frequency, and more.
Environmental Justice: Also known as EJ, defined by the EPA as providing an environment where all people enjoy the same degree of protection from environmental and health hazards and equal access to the decision-making process to maintain a healthy environment in which to live, learn, and work.[75]
Key Route: According to CTA Service Standards and Policies: “The Key Route bus network was established to ensure that customers across the more densely populated parts of the service area with high transit usage can readily access bus routes meeting more stringent frequency standards. Routes in the Key Route network are typically spaced one mile apart, which allows for approximately a half-mile journey to reach a route in this network.”[76]
Particulate matter 2.5: A measure of exposure to airborne particles less than 2.5 micrometers in diameter. Particulate matter can come from natural sources (pollen, bacteria, mold) and industrial sources (exhaust, smoke, chemicals). High exposure to particulate matter is associated with adverse health effects.
Tactile ramp: A strip added to curb cuts with raised, textured surface indicators. Tactile ramps warn pedestrians with vision impairments that they are approaching an intersection.
Tree Canopy: Parts of the tree that provide shade to people.
Redlining: Referring to the Home Owners Loan Corporation (HOLC) system for grading neighborhoods as “Best,” “Still Desirable,” “In Decline,” or “Hazardous.” The “Hazardous” neighborhoods, generally shown as red on maps, were often majority-Black neighborhoods or communities of immigrants. Homeowners were often denied loans and mortgages for homes in redlined areas based on HOLC grades, resulting in systemic barriers to homeownership for Black and immigrant populations.
Urban Heat Island: The warming effect of the urban environment caused by excess asphalt, concrete, and other man-made materials.

74 Samuel George et al, The plunder of black wealth in Chicago: New Findings on the Lasting Toll of Predatory Housing Contracts, May 2019, https://socialequity.duke.edu/wp-content/uploads/2019/10/Plunder-of-Black-Wealth-in-Chicago.pdf
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