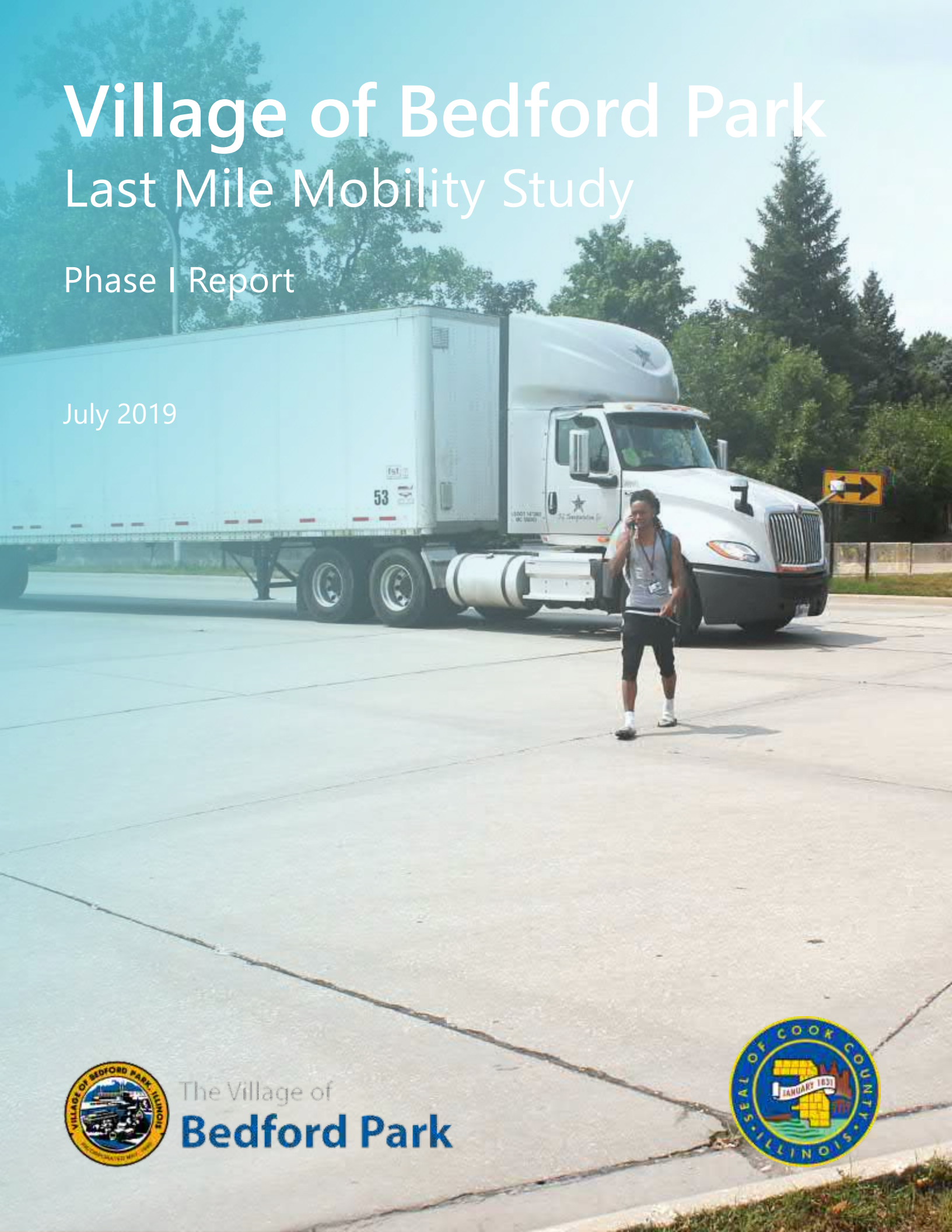
Village of Bedford Park

Last Mile Mobility Study

Phase I Report

July 2019



The Village of
Bedford Park

VILLAGE OF BEDFORD PARK
Last Mile Mobility Study
PHASE I REPORT

The study was funded through Cook County's Invest in Cook Program.

COOK COUNTY GOVERNMENT

PREPARED FOR

The Village of Bedford Park

The Village of Bedford Park

PREPARED BY

Antero Group, Shared-Use Mobility Center, and Active Transportation Alliance

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EXECUTIVE SUMMARY

Getting to work is a challenge for thousands of commuters across the Chicago region. This is especially true for employees that travel each day to industrial districts like the Bedford Park-Clearing Industrial Area. Though Bedford Park businesses employ nearly 30,000 workers across three work shifts, the area presents a challenging travel environment for commuters who do not arrive by car. Dangerous walking and biking conditions, limited transit service and mismatched schedules, high volumes of freight traffic, frequent railroad grade-crossing delays, and an array of other "last mile" challenges impede mobility in ways that go beyond the basic problem of accessing transit stations.

> **IN AN IDEAL WORLD, THE JOURNEY FROM A TRANSIT STOP TO WORK OR HOME IS QUICK, SAFE, AND CONVENIENT, BUT THERE IS OFTEN AN ARRAY OF "LAST MILE" CHALLENGES THAT IMPEDE MOBILITY.**

Given these mobility challenges, it's unsurprising that most employees opt to drive alone to the area. However, commuters' reliance on driving alone contributes to roadway congestion and negatively impacts access to jobs for people who walk, bike, or take transit. If left unchecked, these last mile challenges could choke economic development and job opportunities in Bedford Park, Cook County, and the broader Chicago region.

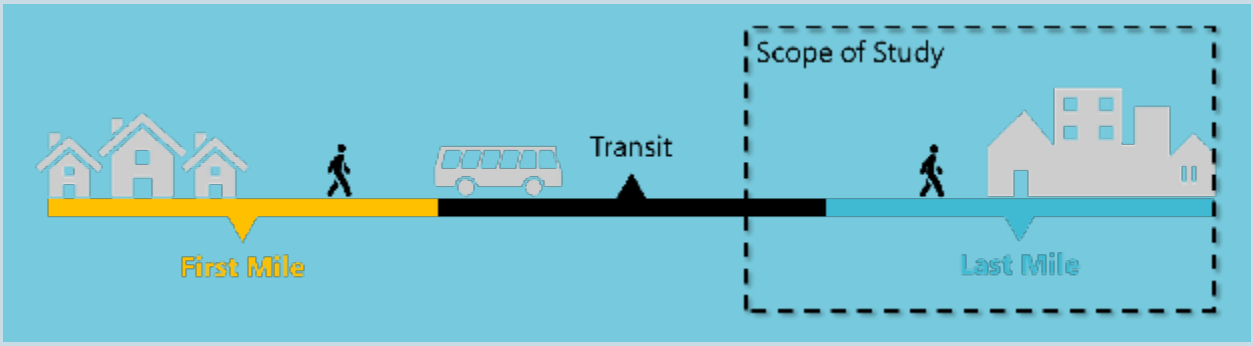
With funding from Cook County's *Invest in Cook* program, the Village of Bedford Park engaged a consultant team (Antero Group, Shared-Use Mobility Center, Active Transportation Alliance) to implement a Last Mile Mobility Study and Pilot Program. The goals of this study were to:

1. **Define the regional and last mile challenges impacting mobility in Bedford Park;**
2. **Assess Bedford Park's last mile challenges; and**
3. **Develop and evaluate a toolkit of potential last mile solutions.**

Completing this Phase I Report is the first step of a broader process of discovering, piloting, and scaling last mile and new mobility solutions. This report and forthcoming Bedford Park Last Mile Mobility Action Plan will provide a roadmap for advancing last mile and new mobility solutions that provide more efficient, accessible, and equitable transportation services in Bedford Park and the broader Chicago region.

1 – REGIONAL AND LAST MILE CHALLENGES IMPACTING MOBILITY IN BEDFORD PARK

Mobility to and from Bedford Park is impacted by the following regional and last mile challenges.



REGIONAL CHALLENGES

1. **Limited Transit Supply.** Bedford Park has limited transit access, due to the Village's "edge" location, regional patterns of land development, long-term socioeconomic trends.
2. **Rail Delays and Truck Bottlenecks.** Bedford Park experiences high volumes of both rail and commercial truck traffic and other associated mobility challenges.
3. **Severe Road Congestion.** Bedford Park's limited transit supply, high volumes of truck traffic, rail crossing delays, and high rates driving alone all contribute to road congestion in the area.

LAST MILE CHALLENGES

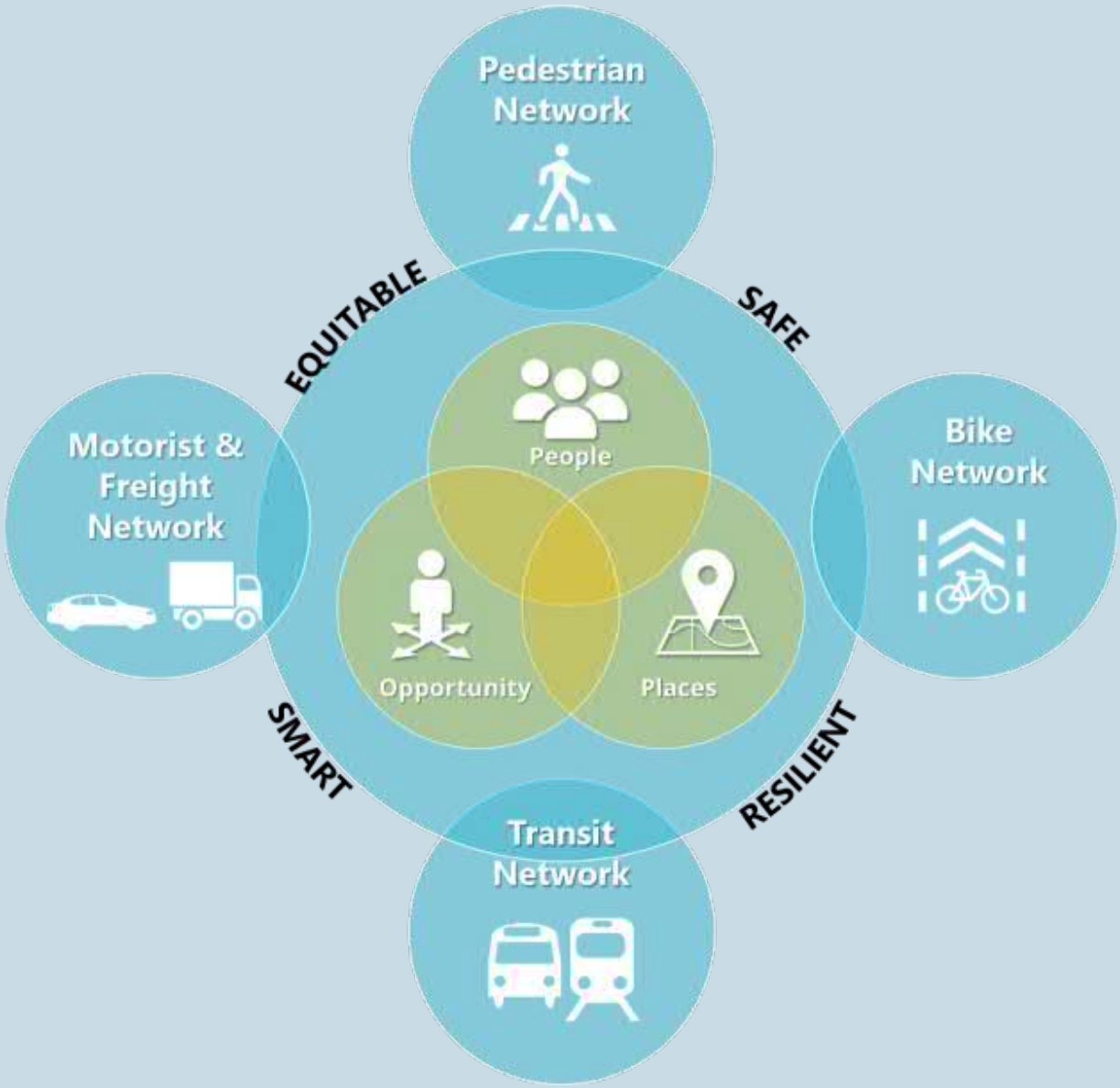
1. **Long Walks.** Some commuters must regularly walk over 1.5 miles from the nearest bus stop to their place of work. In many places, the sidewalk network connecting pedestrians from a transit stop to work is either incomplete or in poor condition.
2. **Limited Transit Access and Supply.** The average distance from a train stop into the Bedford Park-Clearing Industrial Area is 2.75 miles. The average wait time for a bus in Bedford Park is over 34 minutes. Poor alignment between bus schedules and work shifts was a commonly cited concern.
3. **Degraded Infrastructure.** Many of the walking and driving surfaces in Bedford Park are weathered or degraded. Faded pavement markings, potholes, and crumbling sidewalks create dangerous travel conditions for motorists and pedestrians alike.
4. **Dangerous Travel Conditions.** Pedestrians must walk alongside fast-moving, congested arterials and cross dangerous intersections to get to work. Bike commuters must share the road with heavy truck traffic and speeding motorists. Between 2012 and 2016, there were 22 pedestrian and bike crashes in Bedford Park, 4 of which resulted in fatalities. During the same period, there were 1,056 car crashes, which resulted in no fatalities.
5. **Restrictive Right-Of-Ways.** Most of the roads in Bedford Park have been designed to prioritize motorists and commercial vehicle traffic. Over time, this has created a travel environment that is not safe for pedestrians or cyclists. Retrofitting the right-of-ways to facilitate alternative modes of travel will be a challenge, but necessary for reducing congestion.
6. **Poor Transit System Legibility and Schedule Alignment.** Navigating multiple bus routes, schedules, and transfers necessary to get to and from Bedford Park can be challenging, which deters potential transit riders and encourages driving commutes. Clear, simple signage and schedules that are well aligned with work shifts will make commuting via transit easier.

2 — LAST MILE GAP ASSESSMENT

In order to assess Bedford Park's last mile challenges and develop a toolkit that promotes access to jobs and economic opportunities, the project team developed a framework for "integrated and equitable mobility." This framework is based on the following definitions and premises.

An **integrated mobility system** is one that facilitates the flows of people and goods in a way that is safe, efficient, reliable, and convenient. An integrated mobility system works well for all users, including pedestrians, cyclists, motorists, professional drivers, transit users, and others. In an integrated mobility system, smart and complete streets are business-as-usual and enable the seamless mobility of people and goods traveling along connected pedestrian, bike, transit, and motorist and freight mobility networks.

An **equitable mobility system** is one that not only addresses the physical construction of our streets, but the socioeconomic, cultural, and discriminatory barriers to access and comfort within public spaces. Centering on the experience of marginalized individuals and the most vulnerable communities helps in addressing these challenges. An equitable mobility system acknowledges that safety is different for different people and should be defined by the most vulnerable. An equitable mobility system facilitates connections between people and places, and—by extension—access to opportunity for all.



The project team used this framework to assess the last mile challenges associated with Bedford Park's Pedestrian, Bike, Transit, and Motorist and Freight mobility networks. In addition to assessing last mile challenges by a travel mode, gaps were also assessed through a corridor-specific lens for Bedford Park's five main transportation corridors.

3 — LAST MILE TOOLKIT AND NEXT STEPS

The Last Mile Solution Toolkit put forth in this report is based on the premise that emerging last mile and "new mobility" technologies and services, such as Mobility-as-a-Service (MaaS), mobility hubs, microtransit, autonomous vehicles, on-demand paratransit services, and others, can be integrated with public transit systems in ways that are mutually beneficial and that provide more efficient, accessible, and equitable transportation for all.

Therefore, the Toolkit shown on the next page includes both innovative and pragmatic interventions. The Toolkit is organized according to the framework for integrated and equitable mobility and includes solutions for Bedford Park's Pedestrian, Bike, Transit, and Motorist and Freight. Shared Mobility solutions are integrated into each of these four mobility networks. The Toolkit includes 20 broad "solutions" and over 100 specific "treatments" for modifying the physical, technological, operational components of Bedford Park's various transportation networks and as well as policies that govern them. In order to equip Bedford Park's leaders, staff, and other local and regional partners with information to plan, design, and implement specific actions, each solution within the Toolkit was evaluated based on the following guiding principles:

- **Safety.** Last mile solutions improve travel safety for all users, especially the most vulnerable.
- **Affordability.** Last mile solutions address mobility challenges in a way that is cost-effective for communities and affordable for travelers.
- **Community Support.** Last mile solutions respond to community concerns and leverage community strengths.
- **Feasibility.** Last mile solutions are planned, designed, and implemented in a way that recognizes physical, fiscal, political, and operational constraints.
- **Supportive of Transit.** Last mile solutions support the use of public transit and other sustainable modes of transportation.

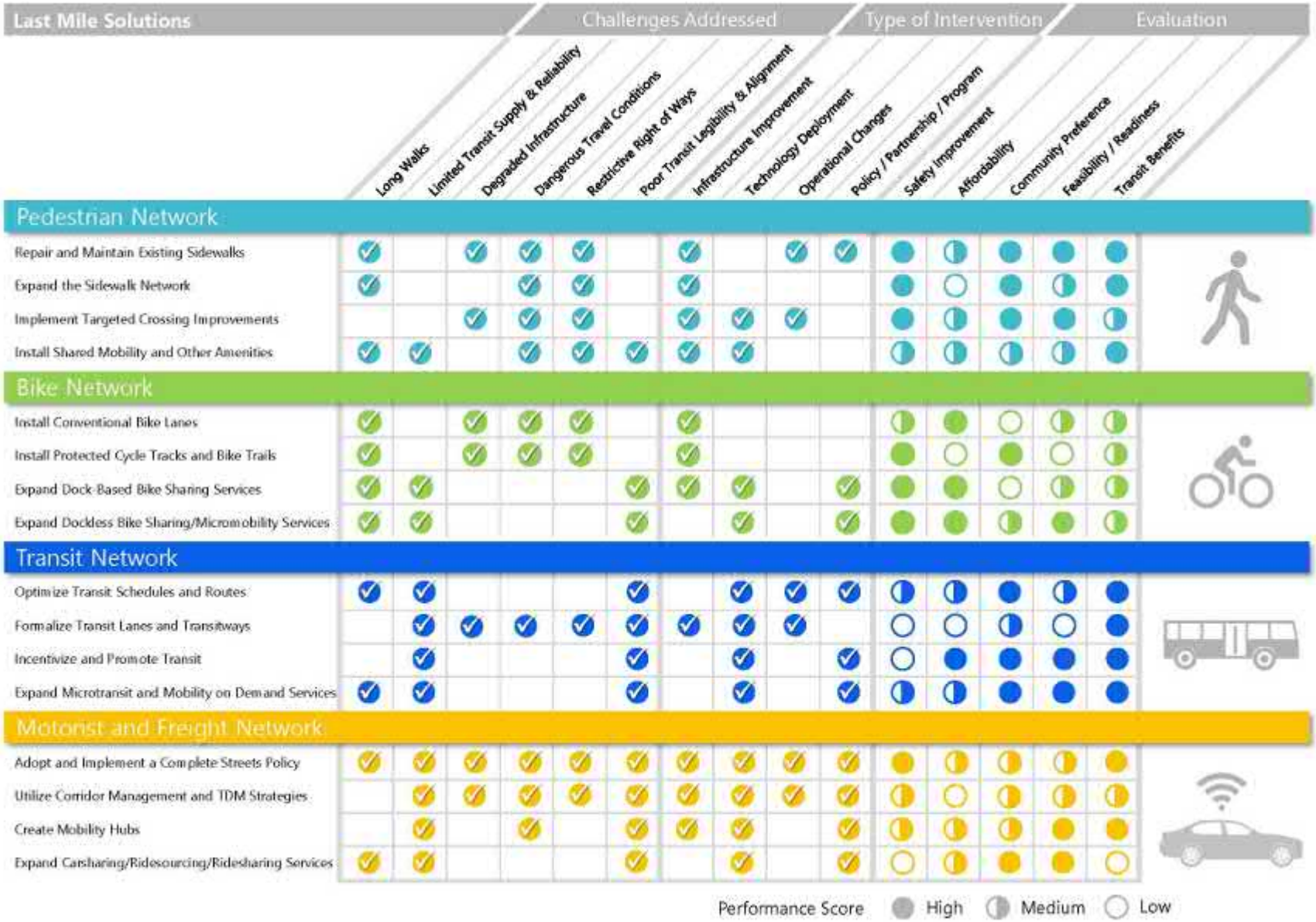
NEXT STEPS

This Phase I Report defines Bedford Park's last mile challenges and outlines a Toolkit consisting of potential last mile solutions. The next step is to engage Bedford Park's leaders, staff, employers, employees, regional partners, and mobility providers in a collaborative effort. This collaboration is aimed at identifying the specific local last mile solutions that best respond to the Village's unique challenges and opportunities; that are physically, economically, culturally, and operationally feasible; and that are scalable throughout other industrial areas in the region. Towards that end, Phase II of this project will include the following activities:

1. Targeted outreach to local and regional stakeholders and mobility providers;
2. A Last Mile Mobility Demo Day; and
3. Development of a Last Mile Mobility Action Plan for Bedford Park

Phase II of this project will produce a Last Mile Mobility Action Plan, lessons-learned, and relationships between local and regional stakeholders and mobility providers, which will serve as a springboard for scaling last mile solutions that improve mobility and access to opportunities for all.

LAST MILE SOLUTION TOOLKIT AND MAP



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Chapter 1

INTRODUCTION

PROJECT OVERVIEW

In June 2018, the Village of Bedford Park ("Village") embarked on a study to better understand and develop solutions to address important mobility challenges within the community. Although Bedford Park only has a population of 604 residents, the Village is home to 418 businesses that employ over 30,000 employees, owing to the Village's significant transportation and industrial assets and proximity to the City of Chicago. These employees generally commute to and from the area during various shifts throughout the day, creating a major traffic obstacle for residents and businesses. While the area does have public transit, most of the area's residents and employees use their own vehicles, owing to an array of challenges this study seeks to address. These challenges, often referred to as the "Last Mile Challenge," for area employers and residents include:

- Areas with limited pedestrian and bicycle access;
- Limited transit service and mismatched schedules for area employees;
- High volumes of freight traffic causing periodic congestion;
- Frequent railroad grade-crossing delays; and,
- Challenges involved with connecting commuters from transit nodes to employment centers in a convenient, reliable, and efficient manner.

INTRODUCTION

With funding through Cook County's *Invest in Cook* program, the Village engaged a consultant team ("Project Team") to complete an analysis of the community's Last Mile Challenge ("Phase I") and to implement a short-term Pilot Program ("Phase II") that is focused on addressing Bedford Park's last mile mobility challenges. The goals of the Phase I Study and Phase II Pilot Program are listed in the following section, Project Goals. Upon completion in summer 2019, this project will produce the following:

- Village of Bedford Park: Last Mile Mobility Study;
- Village of Bedford Park: Last Mile Mobility Action Plan;
- Outline of Important Relationships, Including Possible Solution Providers and Participants;
- A summary of the results; and,
- A program design for a full-scale Pilot Program.

PROJECT GOALS

The Project Team was engaged to complete a one-year project to be conducted in two phases. As mentioned above, the phases include a Phase I Study and a Phase II Pilot Program. The goals of each are outlined below.

PHASE I GOALS:

1. Define the regional and last mile challenges impacting mobility in Bedford Park.
2. Assess Bedford Park's last mile challenges.
3. Develop a toolkit of potential last mile solutions for future consideration and implementation.

PHASE II GOALS:

1. Identify the most feasible last mile solutions for Bedford Park.
2. Develop a Last Mile Mobility Action Plan for Bedford Park. w
3. Leverage the Pilot Program to launch a full-scale Last Mile Program.

Upon completion, this project will produce the following resources, each is discussed in more detail below:

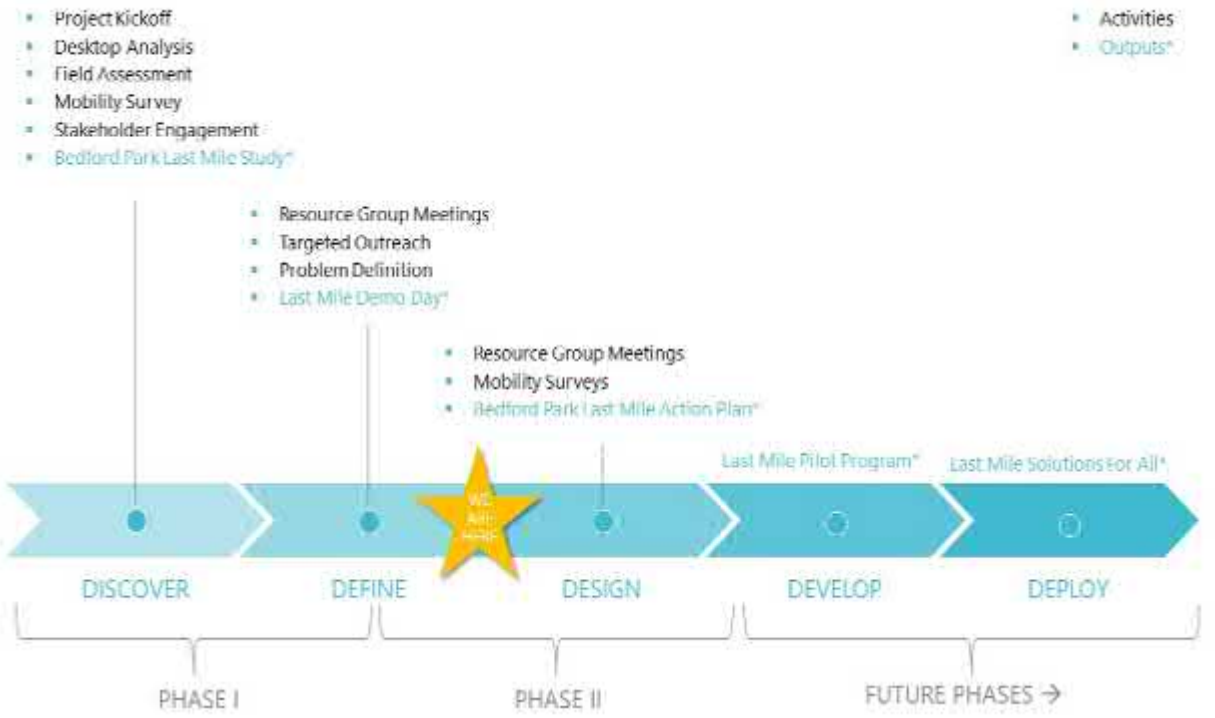
1. Village of Bedford Park: Last Mile Study
2. Village of Bedford Park: Last Mile Demo Day
3. Village of Bedford Park: Last Mile Action Plan

WHAT IS THE LAST MILE? AND WHAT IS A LAST MILE CHALLENGE?

An individual's trip encompasses the entire journey from their origin to their destination. A person may use any number of modes of transportation to complete their journey; they may walk, drive, ride a bicycle, take a train or bus, or in many cases combine several modes.

In an ideal world, the journey from a transit stop to work or home is quick, safe, and convenient, but there is often an array of "last mile" challenges that impede mobility. These challenges include any gaps or friction points that impact the last mile of a commuter's trip, such as: long travel distances due to limited transit service; unsafe walking conditions due to the lack of sidewalks and cross walks; poor alignment between transit schedules and commuting times; the lack of ridesharing and last mile mobility services; and others. **Figure 1.2** illustrates the six main types of last mile challenges identified through this study, which are defined in more detail in **Chapter 2.**

Figure 1.1. Project Approach



Together, Phase I and Phase II of this project, and their respective activities and outputs, can be framed as part of a broader process of discovering, defining, designing, developing, and deploying last mile solutions in Bedford Park (**Figure 1.1**). Outputs from this project, including this *Last Mile Study*, the *Last Mile Demo Day*, and the *Last Mile Action Plan*, can serve as a springboard for future efforts to develop and deploy last mile solutions in Bedford Park. They can also be a model for other Cook County communities facing similar challenges.

MOBILITY CHALLENGES

Bedford Park is a unique municipality. Although the community is home to only 604 residents, the Village's road network must facilitate the flow of nearly 30,000 daily commuters,[1] while also managing a road network with daily traffic volumes that range between 18,000 and 45,000 vehicles per day.[2] The Village's transportation system must also enable access to several regional economic anchors, including: the Bedford Park-Clearing Industrial Area, which occupies 90% of the Village's land area and supports the largest intermediate switching terminal railroad in United States and hundreds of businesses; the Midway Hotel Center, which is located just two blocks south of the Chicago Midway International Airport and includes ten hotels that provide 1,600 rooms; and an extensive local business district along Cicero Avenue and adjacent to Ford City Mall in Chicago. Ensuring safe, reliable, and efficient mobility for residents, commuters, and visitors would be a challenge for any community facing these transportation demands and land uses. In Bedford Park this is further complicated by an array of regional challenges, as well as localized last mile challenges, which are outlined below and discussed in detail later in this document.

[1] LEHD Origin-Destination Employment Statistics (Washington, DC: U.S Census Bureau, 2002-2015).
[2] Illinois Department of Transportation, "Annual Average Daily Traffic Counts," https://www.gettingaroundillinois.com/.

REGIONAL CHALLENGES

These challenges impact mobility in Bedford Park due to the Village's context within a collection of high-volume transportation corridors and industrial and commercial areas. Regional challenges can be difficult to address as there are multiple entities, almost always outside of the Village's authority and influence, that must be coordinated. The primary challenges have been identified as follows:

1. **Limited Transit Supply.** Bedford Park has limited transit supply, due to the Village's "edge" (i.e. inner suburban) location, regional patterns of land development, long-term socioeconomic trends, and recent disruptions in the urban mobility industry.
2. **Rail Delays and Truck Bottlenecks.** Bedford Park experiences high volumes of both rail and road freight traffic and other associated mobility challenges due to the business activities facilitated and generated by the Bedford Park-Clearing Industrial Area.
3. **Severe Road Congestion.** Bedford Park's limited commuter options, high volumes of truck traffic, a considerable number of rail crossing delays, and primarily single passenger commuters further adds to road congestion in the area.

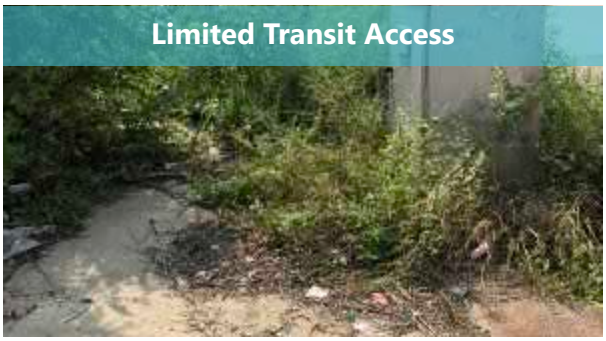
LAST MILE CHALLENGES

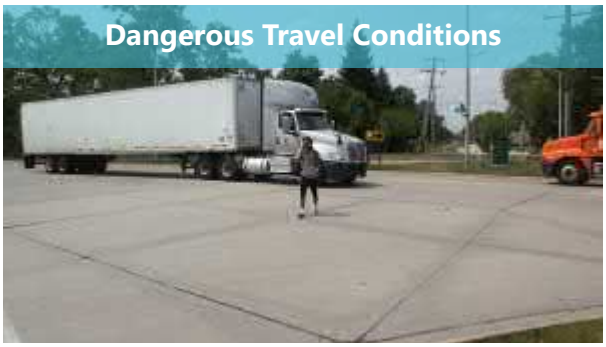
In addition to regional mobility challenges, Bedford Park commuters are also faced with an array of last mile challenges (**Figure 1.2**). These include:

1. **Long Walks.** Some commuters must regularly walk over 1.5 miles from the nearest bus stop to their place of work. In many places, the sidewalk network connecting pedestrians from a transit stop to work is either incomplete or in poor condition.
2. **Limited Transit Access and Supply.** The average distance from a train stop into the Bedford Park-Clearing Industrial Area is 2.75 miles. The average wait time for a bus in Bedford Park is over 34 minutes. Employees frequently cited long distances between transit stops and work, long wait times, and the poor reliability of bus service as reasons why employees do not see transit as a convenient or reliable option.
3. **Degraded Infrastructure.** Many of the walking and driving surfaces in Bedford Park and surrounding areas are weathered or degraded.
4. **Dangerous Travel Conditions.** Pedestrians must walk alongside fast-moving, congested arterials and cross dangerous intersections to get to work. Bike commuters must share the road with heavy truck traffic and speeding motorists and have limited to no bike facilities. Between 2012 and 2016, there were 22 pedestrian and bike crashes in Bedford Park, 4 of which resulted in fatalities. During the same period, there were 1,056 car crashes, which resulted in no fatalities.
5. **Restrictive Rights-of-Way.** Most of the roads in Bedford Park have been designed to prioritize motorists and commercial vehicle traffic.
6. **Poor Transit System Legibility and Alignment.** Navigating multiple bus routes, schedules, and transfers necessary to get to and from Bedford Park can be challenging, which deters potential transit riders and encourages driving alone.

The map shown in **Figure 1.3** illustrates the road congestion that occurs on a typical weekday in Bedford Park as a result of the combined impact of these regional and last mile challenges. These mobility challenges are described in more detail in the next chapter.

Figure 1.2. Six Main Types of Last Mile Challenges





PROJECT APPROACH

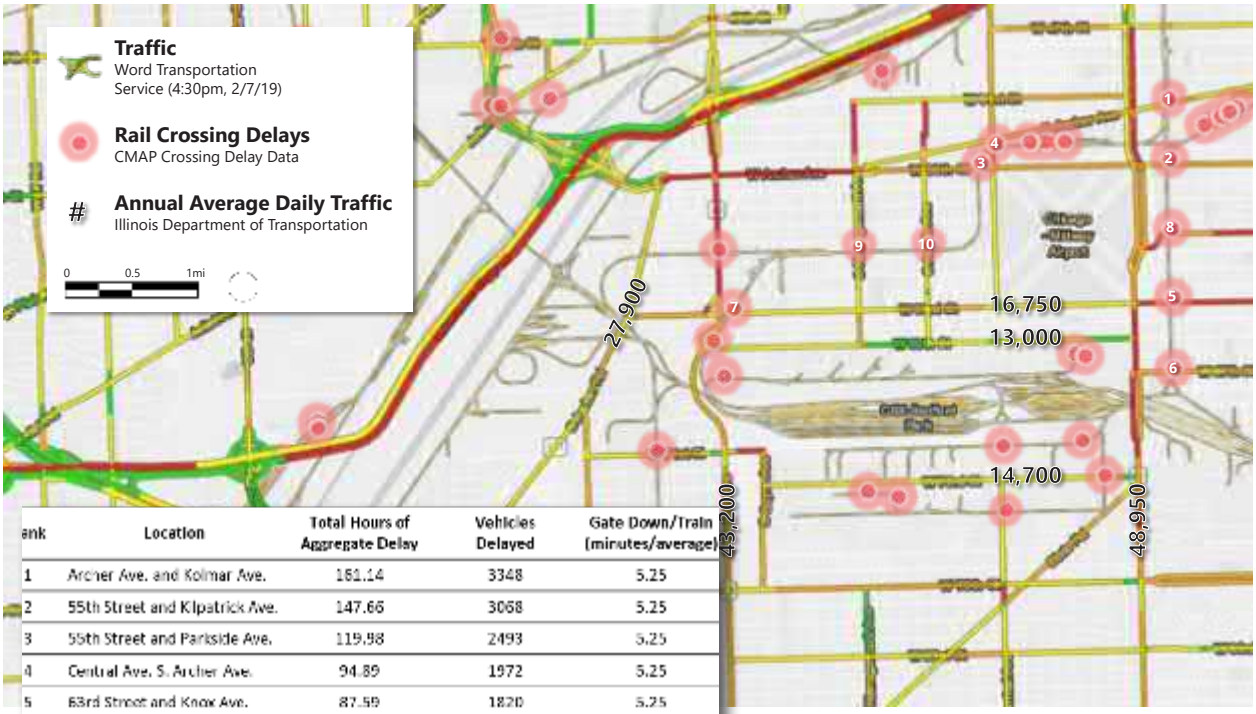
This study is based on the premise that addressing the root causes of Bedford Park's mobility challenges will require a coordinated effort amongst transit agencies; local, county, and state government; employers; private mobility providers; and other civic partners to implement integrated and equitable mobility solutions. This section describes the priorities that frame this study including, Regional Coordination, Integrated and Equitable Mobility, and Complete Streets, as well as the specific methods that were employed.

REGIONAL COORDINATION

To foster regional coordination this last mile mobility study and forthcoming last mile action mobility plan build upon and align with the policy priorities identified in *ON TO 2050, Connecting Cook County,* and *Invest in Transit*.

ON TO 2050 is the Chicago region's comprehensive regional plan. *GO TO 2050* was developed by the Chicago Metropolitan Agency for Planning (CMAP) through an extensive research, analysis, and public engagement. The plan was developed over a three-year process and was officially adopted by

Figure 1.3. Factors Contributing to Road Congestion in the Bedford Park Area



ank	Location	Total Hours of Aggregate Delay	Vehicles Delayed	Gate Down/Train (minutes/average)
1	Archer Ave. and Kolmar Ave.	161.14	3348	5.25
2	55th Street and Kilpatrick Ave.	147.66	3068	5.25
3	55th Street and Parkside Ave.	119.98	2493	5.25
4	Central Ave. S. Archer Ave.	94.89	1972	5.25
5	63rd Street and Knox Ave.	87.59	1820	5.25
6	Marquette Rd.	79.73	1657	5.25
7	63rs Street and Harlem Ave.	63.41	1318	5.25
8	59th Street and Kolmar Ave.	45.48	945	5.25
9	Narragansett Ave.	43.79	910	5.25
10	Austin Ave. and 60th Street	34.67	720	5.25

CMAP on October 10, 2018. The plan builds on the agency's first comprehensive regional plan, *GO TO 2040*, which was released in 2010 and guides transportation investments and frames regional priorities on development, the environment, the economy, and other issues affecting quality of life. Three priorities inform all the plan's goals: inclusive growth, resilience, and prioritized investment.

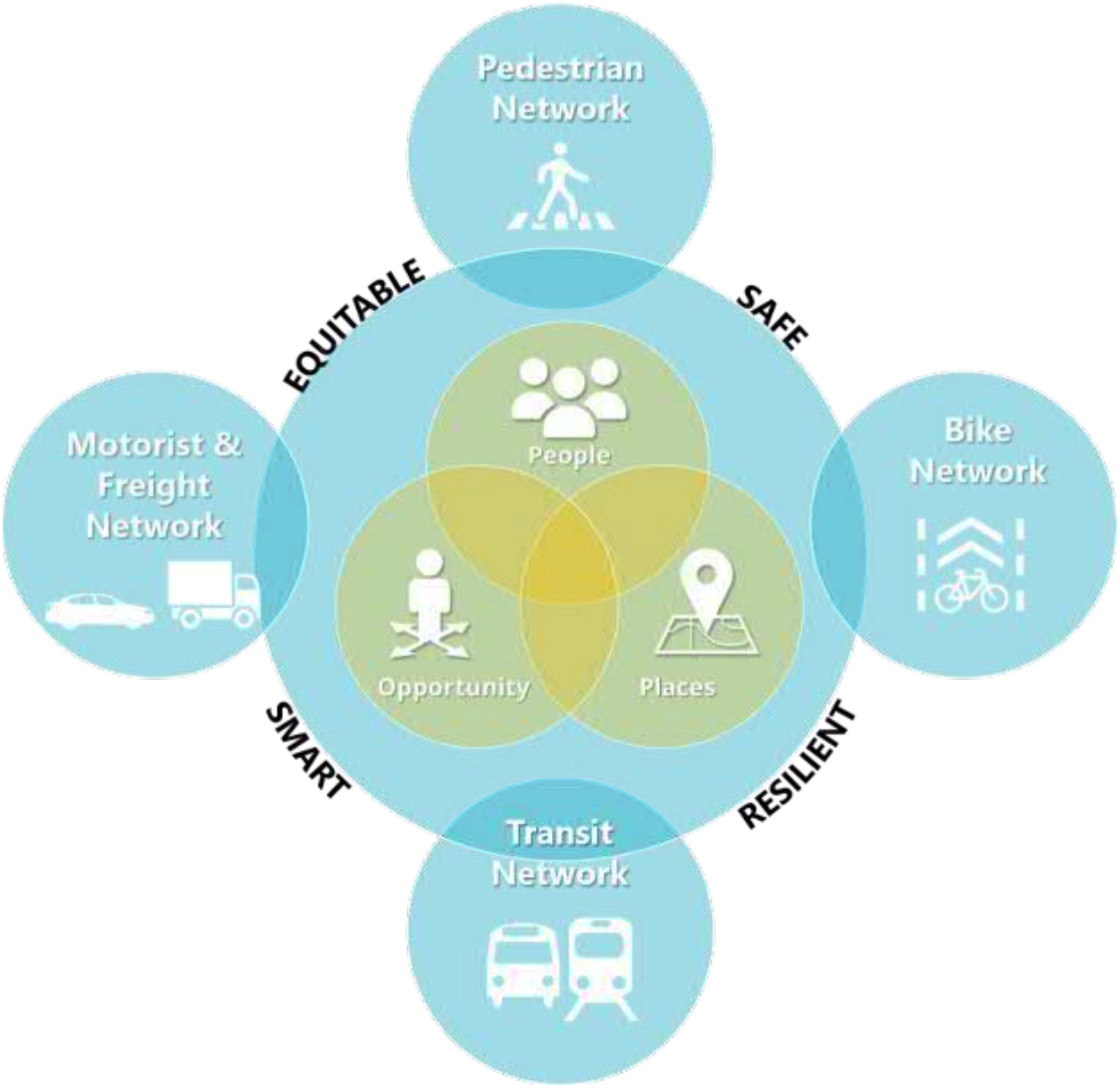
Connecting Cook County is the County's first strategic transportation plan in over 75 years. The plan was adopted on August 3, 2016 by the Cook County Board of Commissioners and guides where and how Cook County invests in transportation to more fully realize its opportunities to attract and retain businesses, people, capital, and talent. The plan establishes five policy priorities that shape Cook County's transportation policies and capital improvement program: prioritize transit and other transportation alternatives; support the region's role as North America's freight capital; promote equal access to opportunities; maintain and modernize what already exists; and increase investments in transportation (**Figure 1.4**).

Invest in Transit, the Regional Transit Authority's 2018-2023 Regional Transit Strategic Plan establishes the region's case for pursuing dependable funding streams that will enable the region's three transit agencies, the Chicago Transit Authority, Metra, and Pace, to deliver transit vital services well into the future. *Invest in Transit* outlines strategies for delivering value on investment, building on the strengths of the existing network, staying competitive. It also includes a list of Priority Projects, the key initiatives that the Transit Agencies cannot complete at current funding levels, but which are necessary to ensure continued high-quality transit for the region.

Figure 1.4. *Connecting Cook County*: Five Policy Priorities

Source: Connecting Cook County (2016)

Figure 1.5. A Framework for Integrated and Equitable Mobility



An understanding the regional planning context will enable Bedford Park staff, elected officials, and other stakeholders develop and implement last mile solutions that address local needs in a way that is aligned with regional priorities and resources. These and other plans that were referenced throughout this study are listed in the appendices.

INTEGRATED AND EQUITABLE MOBILITY

The way people and goods are moved is changing. Broader and more inclusive ways of thinking about mobility have emerged; as have new, more diverse voices and perspectives; and innovative technologies, partnerships, and business models. These emerging movements, voices, technologies and models are disrupting conventional transportation planning and creating exciting

new opportunities. They are transforming urban mobility and the ways by which people and goods move in urban areas.

The project team developed a framework for Integrated and Equitable Mobility to assist local and regional stakeholder in translating these emerging, new mobility ideas into on-the-ground outcomes. The framework shown in in **Figure 1.5** is based on the following two definitions:

An **integrated mobility system** is one that facilitates the flows of people and goods in a way that is safe, efficient, reliable, and convenient. An integrated mobility system works well for all users, including pedestrians, cyclists, motorists, professional drivers, transit users, and others.[3] In an integrated mobility system, smart and complete streets are business-as-usual and enable the seamless mobility of people and goods traveling along connected pedestrian, bike, transit, and motorist and freight mobility network.

An **equitable mobility system** is one that not only addresses the physical construction of our streets, but the socioeconomic, cultural, and discriminatory barriers to access and comfort that different communities experience within public spaces by centering on the experience of marginalized individuals and the most vulnerable communities.[4]

Moving towards a more integrated and equitable mobility system may require a shift in thinking (and investment priorities), from one that is primarily focused on one or two modes of travel to a more balanced approach that seeks to improve mobility for all users. Complete streets is a concept that can be used to guide transportation planning and investment decisions.

METHODS

The methods that were developed and deployed throughout this project support regional coordination, integrated and equitable mobility, and complete streets. Moreover, to ensure that the findings of this project and related documents are grounded in Bedford Park's physical, financial, technological, and operational constraints, the project team implemented a multifaceted and iterative research methodology that included the following elements (**Figure 1.6**):

- **Stakeholder Engagement.** A diverse set of local and regional stakeholders from the public, private, and civic sectors were engaged in a series of three Resource Group meetings in which preliminary findings and solution opportunities were reviewed, discussed, and refined. Moving forward, the Resource Group will also provide input on draft recommendation and could also be involved future efforts to develop and deploy last mile solutions.
- **Desktop Analysis.** Baseline data on Bedford Park's demographics and travel behavior, land use, transportation conditions, and business environment were collected, analyzed, and mapped (**Appendix A**). Additional datasets, such as crash data, business license data, survey results were added as they became available. The project team also inventoried and reviewed 15 local and regional plans, policies, programs (**Appendix B**), and 15 best practice case studies relevant to developing and implementing last mile solutions (**Appendix C**). Outputs from desktop analysis (e.g. maps, diagrams, graphs) were presented, discussed, and refined with project stakeholders through a series of Resource Group meetings.

[3] The McKinsey Center for Future Mobility refers to the broader concept of 'integrated mobility' as consisting of shared mobility along with six other interconnected mobility trends: infrastructure, autonomous driving, connectivity and internet of things (IoT), decentralization of energy systems, electrification of vehicles, and public transit.
[4] Adapted from "Untokening 1.0 – Principles of Mobility Justice," http://www.untokening.org/updates/2017/11/11/untokening-10-principles-of-mobility-justice

What is a Complete Street?

> Complete Streets are streets for everyone. Complete Streets provide safe access for all users, including pedestrians, cyclists, motorists, and transit riders of all ages and abilities.
>
> – Smart Growth America

Complete streets are designed and operated to enable safe access for all users, regardless of age, ability, or mode of transportation. Complete streets make it safe and easy to cross the street, walk to shops, and bike to work. They allow buses to run on time, improve public health outcomes, and help foster thriving local economies.

Bedford Park's unique transportation demands and physical constraints means that complete streets in this heavily industrialized community will have a different composition than complete streets in other parts of the region, but the goal remains the same: make streets safer and more accessible for all users.

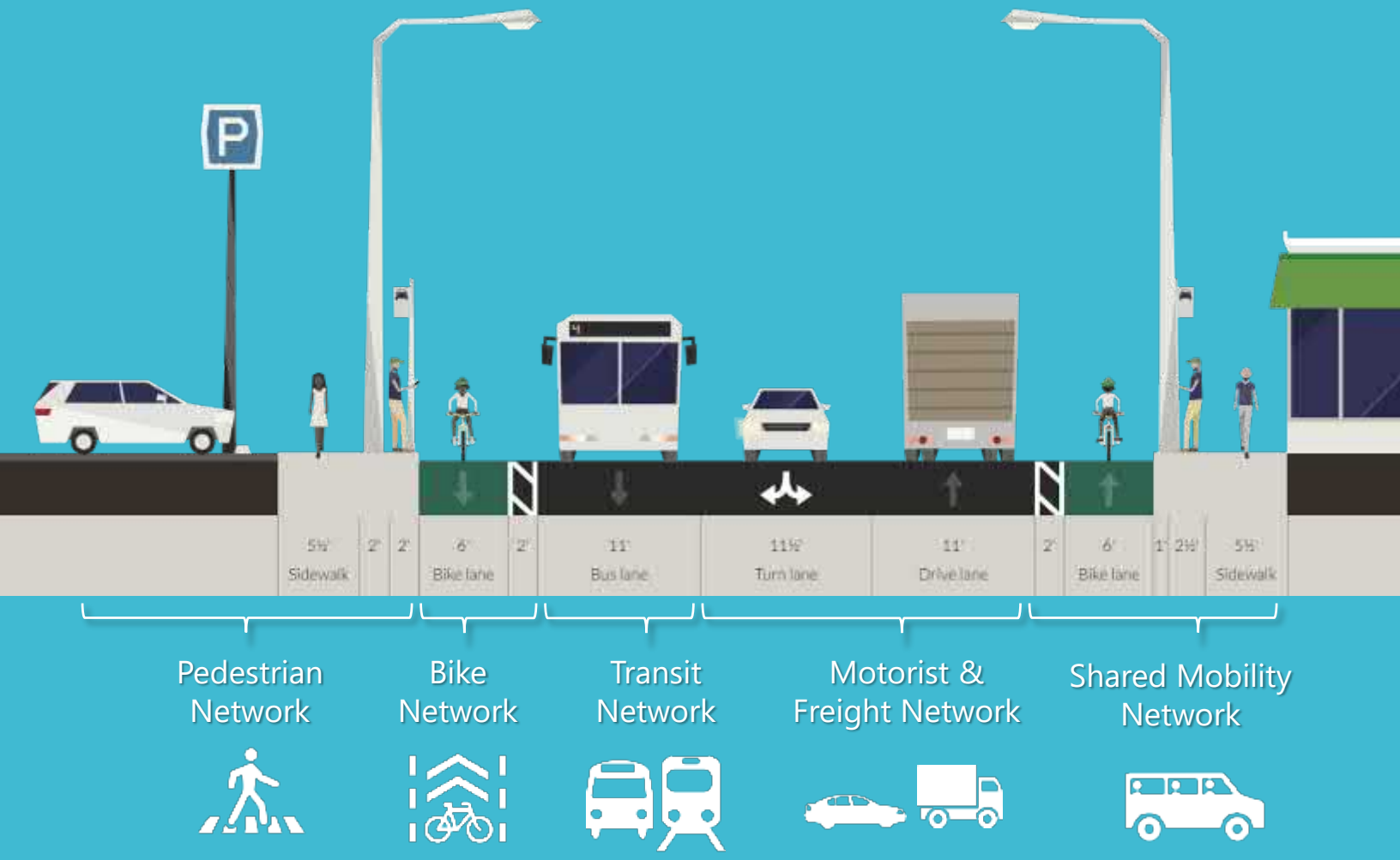


Image created using Streetmix.net licensed under Creative Commons.

What are the elements of a Complete Street?

There is no singular design prescription for Complete Streets; each one is unique and responds to its surrounding land use, transportation, and community context. Some of the most frequently used Complete Streets elements are shown below.

These Complete Street elements—and others—are embedded in the Last Mile Solution Toolkit presented in **Chapter 3**. This Toolkit can be used by Village staff when planning, designing, and implementing capital improvements.

Benefits

- Complete Streets improve road safety
- Complete Streets make economic sense
- Complete Streets improve transportation and mobility for all users
- Complete Streets help build community and social equity
- Complete Streets improve public health outcomes

Myths

Myth #1. "We don't need complete streets because everyone drives."	**In reality...** 85% of Bedford Park's residents and workforce drive alone to work. This is a key driver of road congestion in the area.
Myth #2. "Complete streets means putting bike lanes and sidewalks everywhere."	**In reality...** Complete streets elements are designed to be placed in the appropriate areas and to respond the transportation and neighborhood context.
Myth #3. "Complete streets means reconstructing all of the roadways right now."	**In reality...** Complete streets are generally constructed on roads that are already scheduled for improvement.

- **Field Assessment.** A field assessment was conducted, in which on the ground observations and photos were collected by members of the project team at areas of concern as determined by stakeholders. The project team developed a project- and community-specific First/Last Mile Gap Assessment Tool (**Appendix D**) to facilitate the efficient documentation of field observations. The field assessment focused on the five primary corridors that surround the Bedford-Park Clearing Industrial Area. Datasets from the Desktop Analysis and Field Assessment will be accessible to Village staff through an online interactive map.

- **Mobility Survey.** Origin/Destination data, trip journey information, travel behaviors, and other user- and company-specific data were collected through a Mobility Survey which was distributed to Bedford Park employers and employees. 268 Employee Surveys and 20 Employer Surveys were collected, coded, and analyzed (**Appendix E**). Data gathered through the Mobility Survey was used to provide a more granular snapshot of travel-related challenges, behaviors, and preferences with which to supplement U.S Census Data and other regional data sources.

This approach was used to define Bedford Park's last mile challenge (**Chapter 2**), organize the last mile gap assessment (**Chapter 3**), and to articulate last mile solutions (**Chapter 4**) and a clear path forward (**Chapter 5**).

Figure 1.6. Phase I Research and Outreach Methods

HOW TO USE THIS REPORT

This report is organized into following chapters:

1 **INTRODUCTION.** Chapter 1 provides an overview of this project, including the project goals, the mobility challenges it aims to address, outputs, and overall approach.

2 **BEDFORD PARK'S MOBILITY CHALLENGES.** Chapter 2 describes the regional, community-scale, and last mile challenges that impact mobility in Bedford Park.

3 **BEDFORD PARK'S LAST MILE ASSESSMENT.** Chapter 3 applies the integrated and equitabwle mobility framework to assess the modal and corridor-specific last mile challenges.

4 **LAST MILE TOOLKIT.** Chapter 4 presents a toolkit of last mile solutions that the Village staff and other stakeholders can further refine.

5 **THE PATH FORWARD**. Chapter 5 presents a clear path forward for leveraging this report, the Last Mile Toolkit, and the Resource Group to advance last mile solutions.

REFERENCES.

APPENDICES. The Appendices section provides a wealth of more detailed reference and supporting information.

Chapter 2

BEDFORD PARK'S MOBILITY CHALLENGES

Bedford Park's last mile mobility challenges are driven by the combined effects of regional and community-specific factors. This chapter defines the "last mile," and describes the regional and community-specific conditions (e.g. demographics and travel behavior, land use, transportation conditions, and business environment) that contribute to Bedford Park's last mile challenges. This chapter includes the following sections:

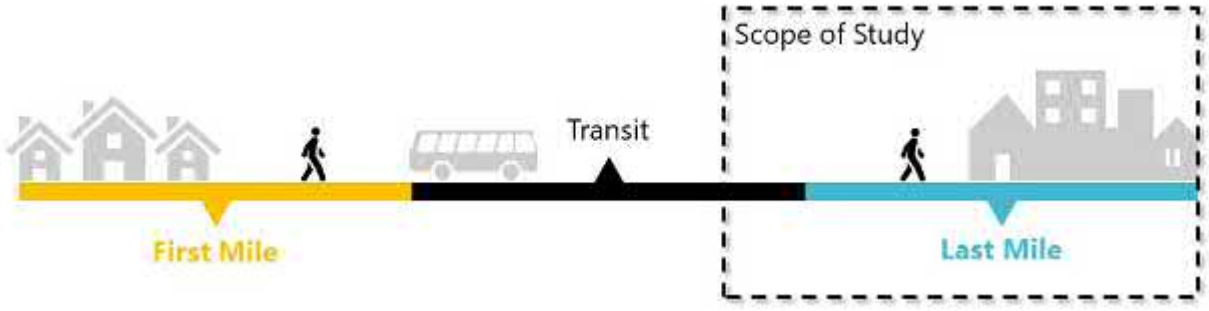
- Defining the Last Mile
- Regional Context
- Community Conditions
- Bedford Park's Last Mile Challenges

DEFINING THE LAST MILE

This study is focused primarily on the last mile of a commuter's trip (i.e. the last leg between a transit stop and their place of employment), so we use the term "last mile" hereafter (**Figure 2.1**). Bedford Park, located within the Chicago

BEDFORD PARK'S MOBILITY CHALLENGES

Figure 2.1. The First and Last Mile



region, utilizes the Chicago Transit Authority (CTA), Metra, and Pace to provide a range of rail, bus, and other mobility services that support the core of many local commuters' trips (**Figure 2.2** and **Figure 2.3**). The challenge with these modes, as it relates to Bedford Park, is that commuters and residents must often complete the last mile of their journey without public transit support, usually by walking. This last mile journey is further complicated by an array "last mile" challenges, or gaps, that impede mobility, such as long distances between transit stops and employment centers, dangerous travel conditions, and others. It is these challenges that Bedford Park is working to address in identifying improvements and alternative strategies to ensure that a journey from a nearby transit stop to work is quick, safe, and convenient.

Figure 2.2. Chicago Region's Transportation Agencies

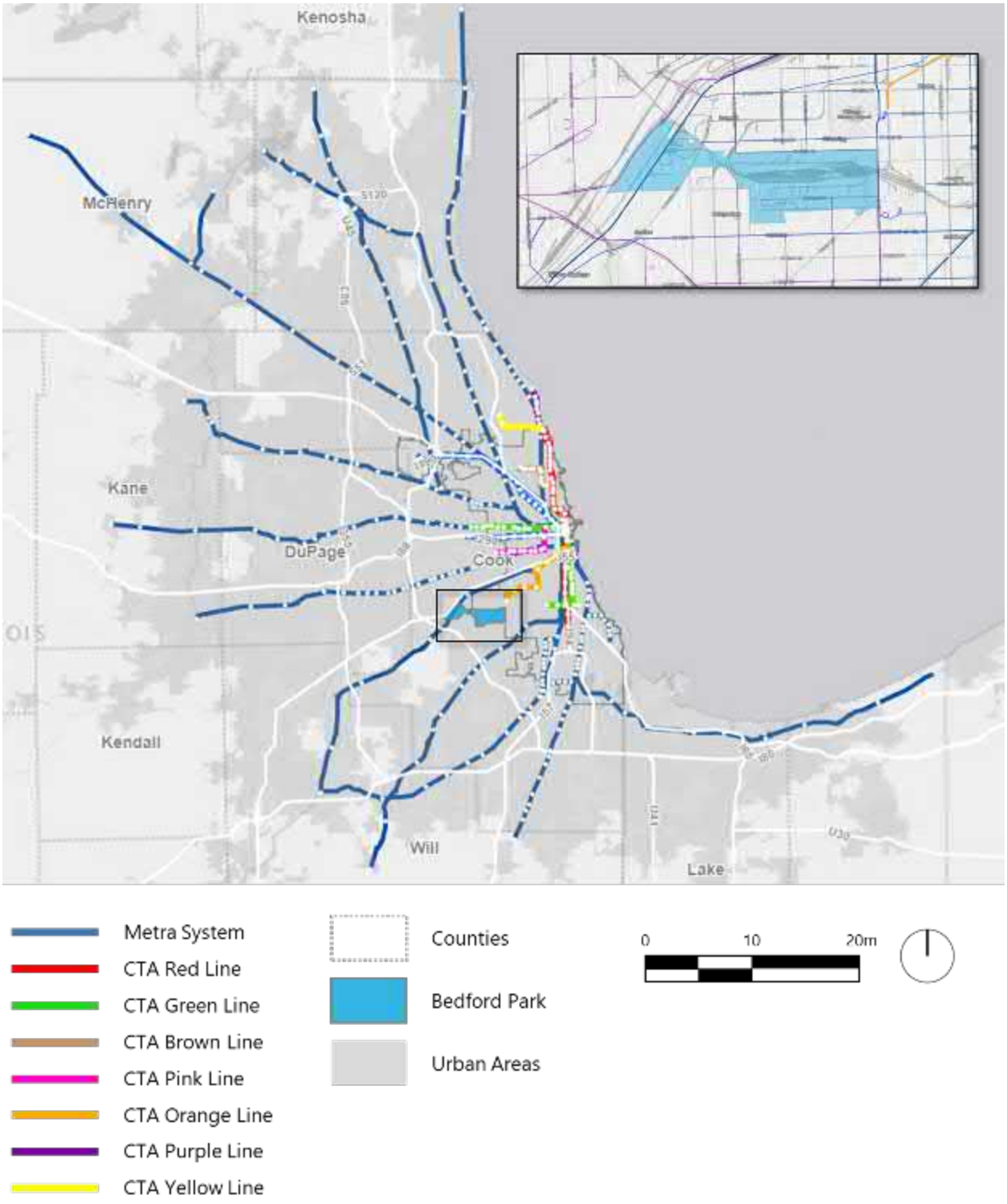
The **CTA** provides transit services to the City of Chicago and 35 suburban Cook County communities, including Bedford Park. It operates eight rapid transit lines with 145 rail stations. It also manages 1,864 buses that operate 129 bus routes with 10,768 posted bus stops. In 2017, CTA bus and rail ridership totaled 479.4 million, including 249.2 million bus rides and 230.2 million rail rides. For the year, bus and rail system ridership declined 3.7% compared with 2016, with bus ridership decreasing 3.8% and rail ridership falling 3.5%.

Metra is one of the largest and most complex commuter rail systems in North America, serving Cook, DuPage, Will, Lake, Kane and McHenry counties in northeastern Illinois. The agency provides service to and from downtown Chicago with 242 stations over 11 routes totaling nearly 500 route miles and approximately 1,200 miles of track. Metra operates nearly 700 weekday trains, providing nearly 290,000 passenger trips each weekday. In 2018, Metra provided about 76.1 million passenger trips, which is 3.2% decrease in ridership from 2017.

Pace is one of the largest bus service providers in the nation. It manages 209 bus routes, serving 284 communities in the six-county metropolitan area, as well as operates one of the largest vanpool systems in the country, with 784 vehicles in service. Pace is also responsible for the Americans with Disabilities Act transit services throughout all of metropolitan Chicago. In 2017, Pace served 35.6 million passengers which reflected a .8% increase over the 2016 ridership total of 35.3 million. Pace's ADA Paratransit ridership increased 1.9% in 2017.

The **RTA** is the agency charged with transit planning for the six-county Northeastern Illinois region. It implements projects, administers a variety of programs and develops plans aimed at growing ridership and improving mobility.

Figure 2.3. Chicago Region's Transit Network



REGIONAL CONTEXT

The Village of Bedford Park is located immediately southwest of the City of Chicago in Cook County, Illinois (**Figure 2.4**. With over 90% of the Village's land area dedicated to industrial land uses, Bedford Park is one of the most industrialized municipalities in the Chicago Metropolitan Area. Bedford Park's industrial heritage and character is largely a result of the community's proximity to several regional transportation assets, including the following:

- **Air.** Chicago Midway International Airport
- **Highway.** I-55 (Stevenson Expressway), I-294 (Tri-State Tollway), IL Route 50 (Cicero Avenue), IL Route 43 (Harlem Avenue), Illinois Route 171 (Archer Avenue)
- **Rail.** Belt Railway Company of Chicago (BRC) Clearing Yard
- **Water.** Chicago Sanitary and Ship Canal

Bedford Park's proximity and access to these regional transportation assets make the community desirable for transportation, distribution, and logistics (TD&L) firms that require direct access to national highway, air, and rail networks, as well as companies that ship bulk goods along the Chicago Sanitary and Ship Canal. Bedford Park also benefits from a regionally significant commercial and hospitality corridor along Cicero Avenue which runs north and south dividing Bedford Park from the City of Chicago.

While Bedford Park's locational advantages have positioned the community as an economic engine for the region, they also contribute to the area's mobility challenges. This section describes how Bedford Park's regional context and community conditions contribute to the area's last mile challenges. These regional and local factors will serve as a springboard for defining and assessing Bedford Park's last mile challenges and for framing last mile solutions.

REGIONAL CHALLENGES

1. Limited Transit Supply
2. Rail Delays and Truck Bottlenecks
3. Severe Road Congestion

CHALLENGE #1: LIMITED TRANSIT SUPPLY.

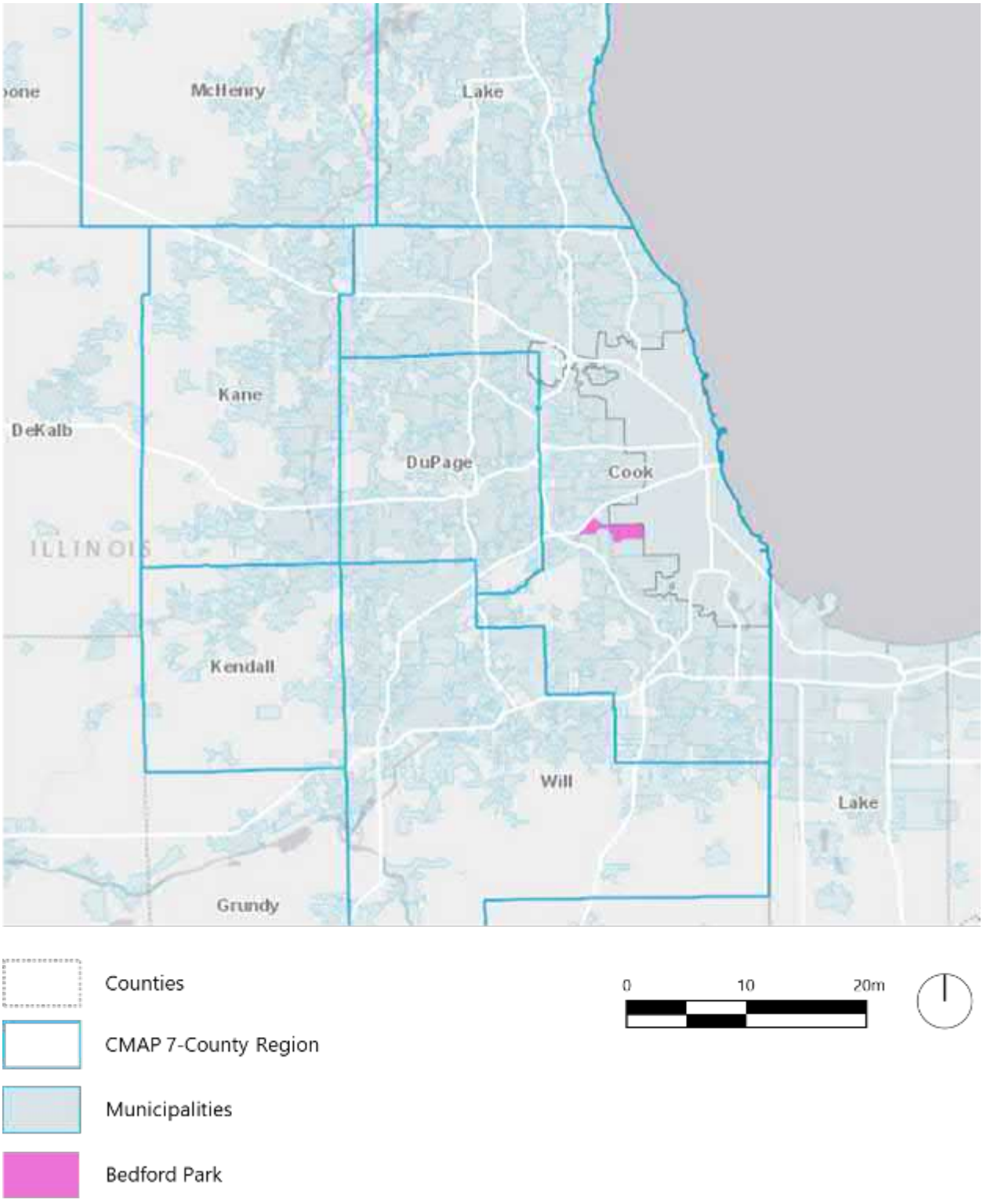
Bedford Park has limited transit supply, due to the Village's "edge" (i.e. inner suburban) location, regional patterns of land development, long-term socioeconomic trends, and recent disruptions in the urban mobility industry.

Bedford Park is located at the edge of the City of Chicago. Although distinctive from other suburban communities in Cook County, Bedford Park has many of the same demographic, land use, and transportation conditions that make it difficult to supply with frequent, high capacity, and reliable transit service. These include relatively low population density, sprawling land uses and large blocks, and an automobile-dependent urban design and road network. These local conditions make it difficult to provide the area with a level of service (LOS) that enables commuters to view transit as a convenient and reliable way to get to work.

In addition to unfavorable land use conditions that impact the supply of transit service, transit demand has been in decline nationally for the past decade. According to the American Public Transportation Association (APTA), national transit ridership declined 2.36% as of the third quarter in 2018 compared with the previous year.[5] If the New York area is excluded, ridership has declined nationally by 7% over the past decade.[6] The two factors that likely most affect public transportation ridership are the supply of transit service and competitive factors such as low gas prices and the growing popularity of ridesourcing and bikesharing services, which

[5] American Public Transportation Association, Transit Ridership Report, Third Quarter 2018, https://www.apta.com/resources/statistics/Documents/Ridership/2018-Q3-Ridership-APTA.pdf
[6] William J. Mallett, Trends in Public Transportation Ridership: Implications for Federal Policy (Federation of American Scientists, 2018).

Figure 2.4. Regional Context Map



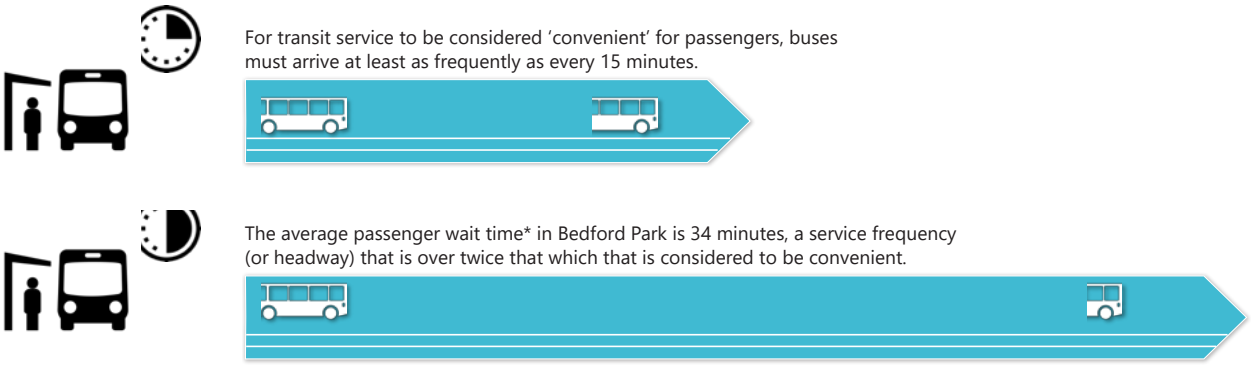
appear to have adversely affected transit ridership. Both factors have impacted transit ridership in Cook County. Like many other communities across the nation, Bedford Park is faced with a negatively reinforcing trend in which declining transit supply contributes to declining transit demand. It is important to understand how the outcomes of this dynamic impacts current and potential transit users.

In terms of transit supply, commuters who take a bus to work in Bedford Park must wait on average 34 minutes for a bus to arrive (**Figure 2.5**). Transit experts suggest that for transit to be considered a 'convenient' option for riders, buses and trains must arrive at least as frequently as every 10-15 minutes. These long wait times coupled with the potential for unreliable arrival times may cause commuters to prioritize driving over transit. This is just one example demonstrating how longer transit wait times and poor reliability can contribute to higher instances of people traveling alone.[7]

The distance between transit stops and destinations is another supply side factor that impacts transit demand. In the United States, a quarter mile to a half mile is generally considered to be a walkable distance.[8] In Bedford Park, however, the average walking distance from the nearest CTA or Metra station to the center of the five primary corridors that surround Bedford Park-Clearing Industrial Area is 2.75 miles (**Figure 2.6**). This last mile gap forces most train-based commuters to connect to a bus or another mode of travel to reach their destination.

In summary, the lack of frequent, reliable, and convenient transit service in the area is one factor, among others, that is contributing to Bedford Park commuter's reliance on driving alone to work. This reliance on single occupancy vehicle (SOV) trips, in turn, contributes to road congestion and other last mile mobility challenges.

Figure 2.5. Convenient Bus Service Frequency Versus Bus Service Frequency in Bedford Park



*Bus Based on posted CTA and Pace Bus route Schedules (See **Appendix G**)

[7] Florida Department of Transportation Transit Ridership, Reliability, and Retention (National Center for Transit Research, 2008).
[8] Planning Commission TOD Committee Walking Distance Research (Fairfax County, VA, 2012).

Figure 2.6. Pedestrian Travel Access Sheds

CHALLENGE #2: RAIL DELAYS AND TRUCK BOTTLENECKS.

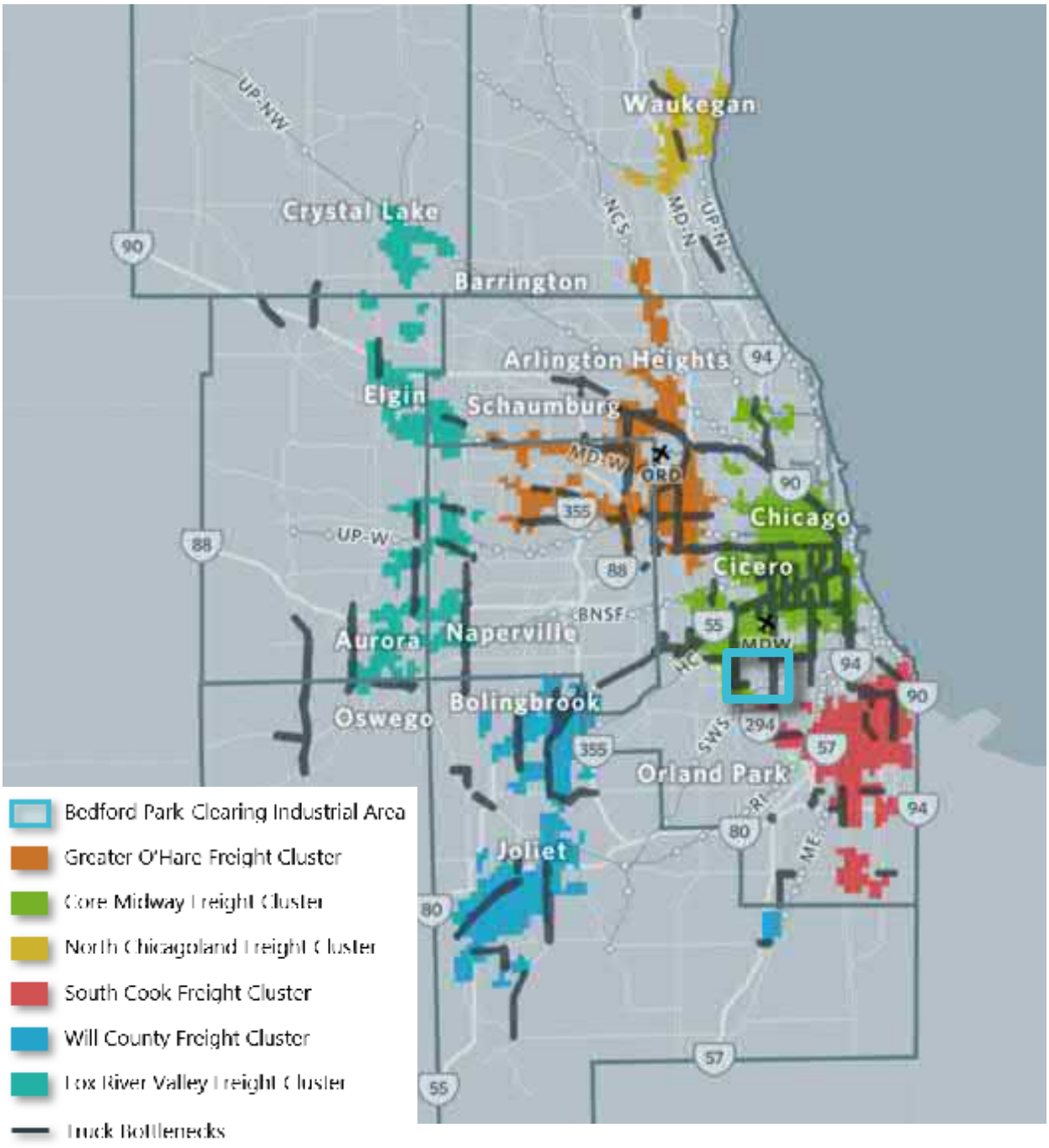
Bedford Park experiences high volumes of both rail and road freight traffic and other associated mobility challenges due to the business activities facilitated and generated by the Bedford Park-Clearing Industrial Area.

Bedford Park has historically played and will continue to play a significant role in supporting the Chicago region's position as the nation's freight capital. Bedford Park is the site of the 786-acre Belt Railway Company of Chicago's Clearing Yard,[9] one of the largest hump classification facilities in the United States.[10] The Clearing Rail Yard has over 350 miles of switching tracks, consisting of 92 classification, 44 departure, and 40 receiving tracks that separate, classify, and re-block rail cars for the 14 railroads serving Chicago. The Clearing Yard has the capacity to manage the flow of 32 inbound and 33 outbound trains and over 8,400 individual rail cars daily.[11] In addition to the Clearing Yard, Bedford Park is also home to a CSX intermodal terminal and numerous rail spurs, which facilitate the intermodal flow of domestic and international freight. Correspondingly, 90% of the Village's land area is devoted to the Clearing Yard and the hundreds of TD&L companies that either directly or indirectly benefit from their proximity to the Bedford Park-Clearing Industrial Area.

However, because of this business activity, thousands of trucks originate from and travel to the Bedford-Clearing Industrial Area each day. Commercial truck-induced congestion and incidents were among the highest priority concerns that emerged through this study. Moreover, some of the region's most severe rail crossing delay problem areas are within the greater Bedford Park area and impact the commutes of thousands of daily travelers who are heading into or through the area. Across the Chicago metropolitan region, cars and trucks are delayed at rail crossings for 7,800 hours each weekday—more than 2 million hours of delay per year across the region. Congestion in the region has been increasing 5 percent annually for the past 30 years, and the average Chicago region commuter now spends approximately 71 hours per year in traffic.[12] According to a recent study of global traffic patterns, the cost of congestion for Chicago was estimated to be $6.2 billion in 2018 (up from $5.5 billion in 2017).[13] This translates to approximately $1,994 per commuter.

[9] The Belt Railway Company of Chicago is (BRC) co-owned by six Class I railroads — BNSF Railway, Canadian National Railway, Canadian Pacific Railway, CSX Transportation, Norfolk Southern Railway, and Union Pacific Railroad — each of which uses the switching and interchange facilities of the BRC.
[10] A hump yard is the largest and most effective type of rail classification yards and serves to classify single rail cars or a block of coupled cars into larger unit trains, which are more efficient to ship over longer distances.
[11] The Belt Railway Company of Chicago "Connecting Chicago Since 1882" http://www2.beltrailway.com/
[12] CMAP Mobility: engine of our regional economy. Chicago Metropolitan Agency for Planning (CMAP), 2019, https://www.cmap.illinois.gov/mobility/explore#/. Accessed 12 Feb. 2019.
[13] INRIX 2018 Global Traffic Scorecard. INRIX, 2019. http://inrix.com/scorecard/. Accessed 12 Feb. 2019.

Figure 2.7. Freight and Truck Bottlenecks in tihe Chicago Metropolitan Region



Source: CMAP, 2018

Freight facilities tend to co-locate, so understanding the relationship between these clusters and areas of truck congestion can help prioritize both transportation investments and local land use decisions to support freight movement while ensuring a better quality of life for residents. **Figure 2.7** illustrates how truck bottlenecks, vehicular traffic, and at-grade rail crossing delay problem areas all contribute to road congestion in the Bedford Park area.[14]

[14] Truck bottlenecks are defined as locations where trucks experience at least six hours of congestion per weekday, (where congestion is defined as truck travel times more than 10% greater than free flow truck travel times).

In addition to contributing to road congestion, commercial truck traffic in Bedford Park creates an environment that is dangerous for walking and biking. Given Bedford Park's role as an industrial anchor for the region, the Village's road network and right-of-way (ROW) allocations have been designed to prioritize the flow of freight over other modes of transportation (**Figure 2.7**). Over time, this has resulted in a street network and road geometries that (while conducive for the efficient movement of freight traffic) are inherently dangerous for pedestrians and cyclists (**Figure 2.9)**. Several recent studies illustrate a clear relationship between vehicular speeds and pedestrian casualties. When vehicles move at or above 40 mph, there is a dramatic decrease in the chance of survival in a crash. For example, when collisions occur at or above 40 mph there is only a 10% chance of survival. Conversely, when collisions occur at or below 20 mph there is a 90% chance of survival (**Figure 2.10**).

Given that the movement of people and freight are both vital to Bedford Park's and the Chicago region's economic vitality, last mile solutions must address this dual challenge when it comes to freight mobility and personal mobility. Finding the right balance between physical, technological, operational, and

Figure 2.8. Overall Mode Priotiztation for Bedford Park

Mode	Prioritization
Freight	#1
Auto	#2
Transit	#3
Walk	#4
Bike	#5

Figure 2.9. Looking East on W 73rd Street in Bedford Park

Figure 2.10. A Pedestrian's Risk of Getting Killed When:

Source: Vision Zero Network

policy interventions that will produce multiple last mile mobility benefits for people and freight is a unique challenge for Bedford Park and other industrial areas in the region.

CHALLENGE #3: SEVERE ROAD CONGESTION.

Bedford Park's limited commuter options, high volumes of truck traffic, number of rail crossing delays, and high rates of driving alone all contribute to road congestion in the area.

Over 85% of Bedford Park's workforce drives alone to work. This reliance on single occupancy vehicles is largely driven by the challenges discussed above, such as:

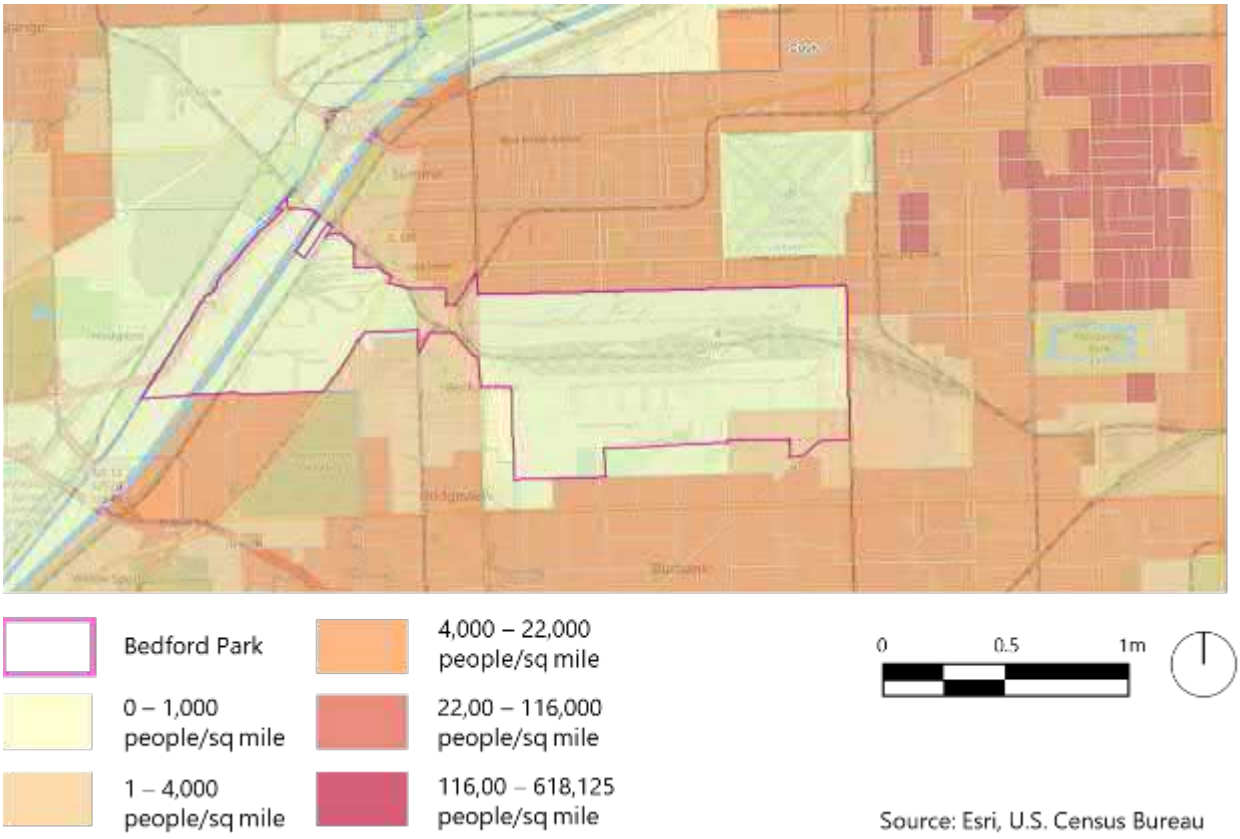
- The limited supply, reliability, and convenience of transit and other shared modes of travel;
- High volumes of truck traffic, number of rail crossing delays; and
- Other factors that contribute to unfavorable walking and biking conditions.

Taken together, Bedford Park's limited commuter options, high volumes of truck traffic, number of rail crossing delays, and high rates driving alone all contribute to road congestion in the area (**Figure 2.11**). Implementing last mile solutions that help commuters get to and from work in a way that is safe, convenient, and efficient, will therefore require interventions within all the various transportation networks and systems (e.g. pedestrian, biking, transit, motorist and freight, and shared mobility) that are involved with moving people and freight in Bedford Park.

In the following section we describe Bedford Park's local community conditions that influence and are influenced by these regional challenges. A baseline understanding of regional and local conditions is necessary because Bedford Park's last mile mobility challenges are driven by the combined effect of regional and community-specific factors. Moreover, a baseline understanding of these community conditions is necessary to develop context-appropriate last mile solutions for the community.

Figure 2.11. Figure 2.11. Typical Rush Hour Traffic on I-55 near Bedford Park

Figure 2.12. Population Density, 2018



COMMUNITY CONDITIONS

This section drills down into Bedford Park's current demographics, commuters' travel behavior, land use, transportation conditions, and business environment. Additional baseline community information is provided in **Appendix E.**

DEMOGRAPHICS AND TRAVEL BEHAVIOR

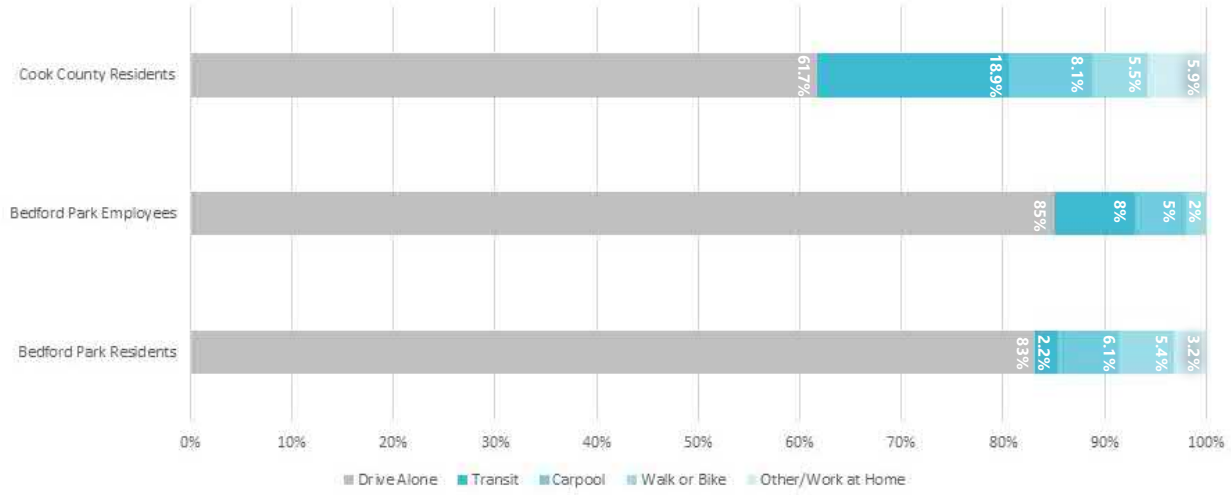
Bedford Park's 604 residents and 248 households are concentrated a small residential neighborhood, which is tucked between South Archer Avenue and the Bedford Park-Clearing Industrial Area. Given the Village's small population and large land area, Bedford Park has a much lower population than neighboring areas to the north, east, and south (**Figure 2.12**).

According to the Mobility Survey, 83% of Bedford Park's residents and 85% of the area's workforce drive alone to work. In comparison, 61.7% of Cook County residents drive alone to work. Only 8% of Bedford Park's workforce take transit to work, compared to 18.9% of Cook County residents who use this mode of travel (**Figure 2.13**). Correspondingly, the average household vehicle miles traveled (VMT) for Bedford Park residents is 19,241 and 15,706 and for Cook County residents overall. Annual Transportation Costs for Bedford Park residents is $13,131 and $11,062 for Cook County residents overall.[16]

It takes most Bedford Park employees between 30 and 59 minutes to commute to work (**Figure 2.14**). 13% of Bedford Park employees' commute takes over one hour.

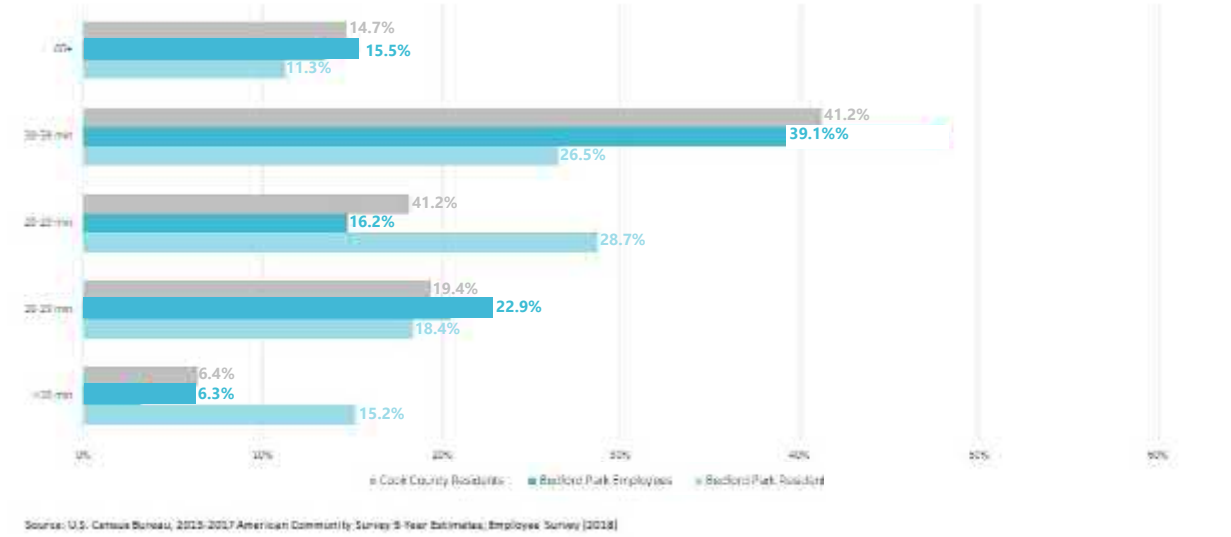
The Village's business license data includes shift times and number of employees that are changing

Figure 2.13. Mode of Travel to Work



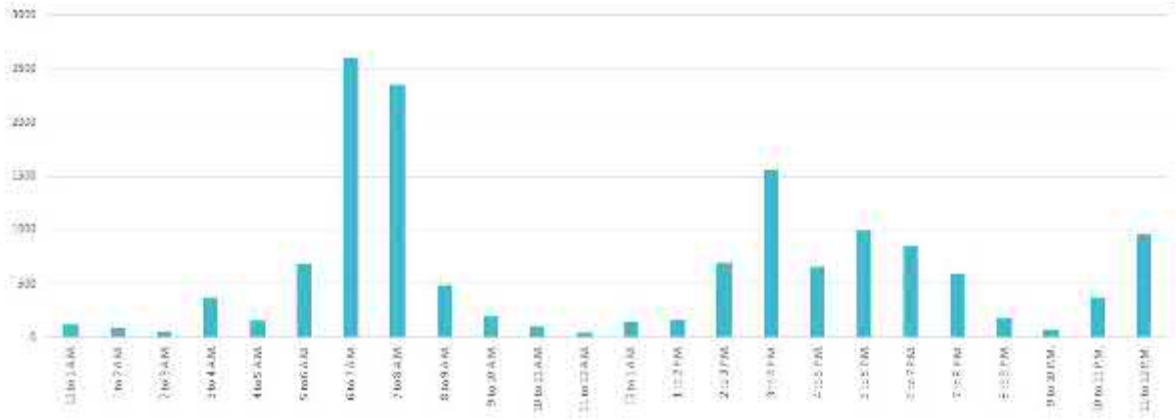
Source: U.S. Census Bureau, 2013-2017 American Community Survey 5-Year Estimates; Employee Survey (2018)

Figure 2.14. Travel Time to Work



[16] H+T® Affordability Index. Center for Neighborhood Technology, 2019, https://htaindex.cnt.org/. Accessed 23 March. 2019.

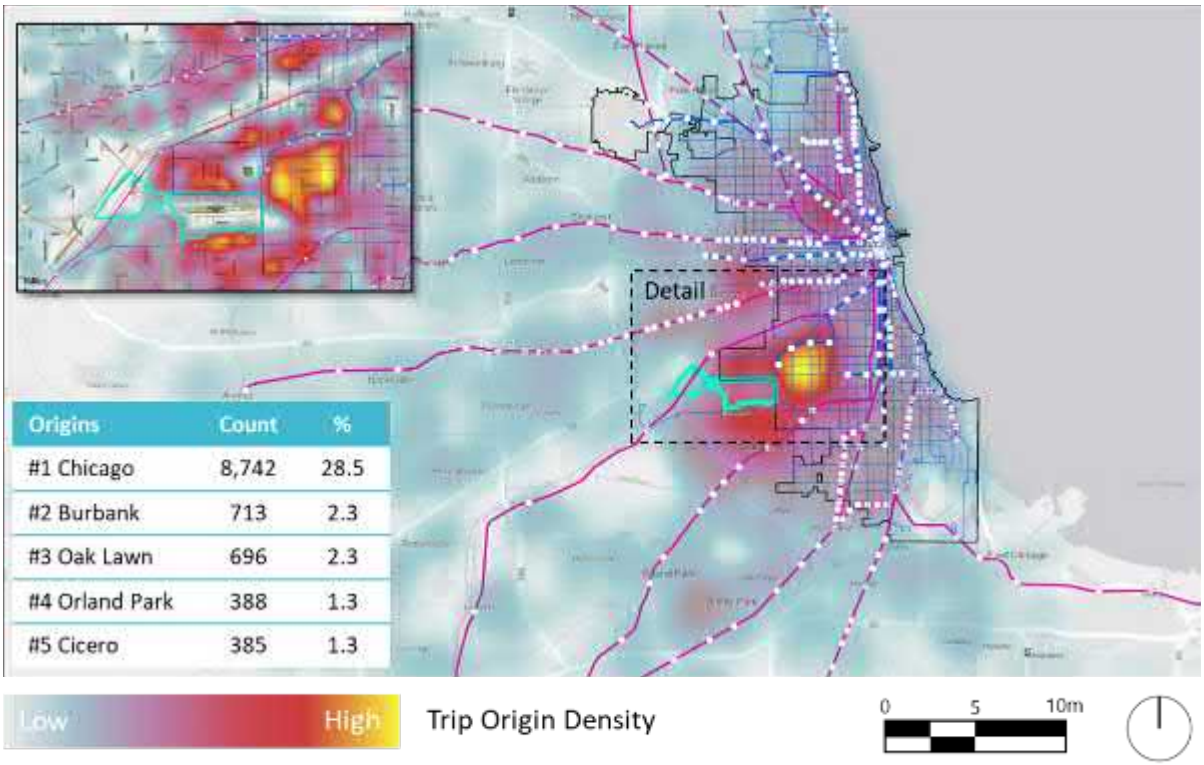
Figure 2.15. Rush Hour Time



shifts during that time. **Figure 2.15** below charts the number of employees that are changing shifts during a given hour during the work day. According to business license data, the top five rush hour times are: 6:00 A.M. to 7:00 A.M. (#1); 7:00 A.M. to 8:00 A.M. (#2); 3:00 P.M to 4:00 P.M. (#3); 5:00 P.M. to 6:00 P.M (#4); and 11:00 P.M. to 12:00 A.M (#5).

Figure 2.16 illustrates where Bedford Park employees live. 28.5% of Bedford Park employees live in Chicago. Many Bedford Park employees live in the Chicago neighborhoods of West Elsdon, Chicago Lawn, West Lawn, Gage Park, and Clearing. 36.7% of Bedford Park employees travel less than 10 miles between home and work. 14.3% of employees travel more than 50 miles.

Figure 2.16. Commuting Patterns, 2015



Source: OnTheMap (2002-2015 LEHD Origin Destination Employment Statistics)

LAND USE

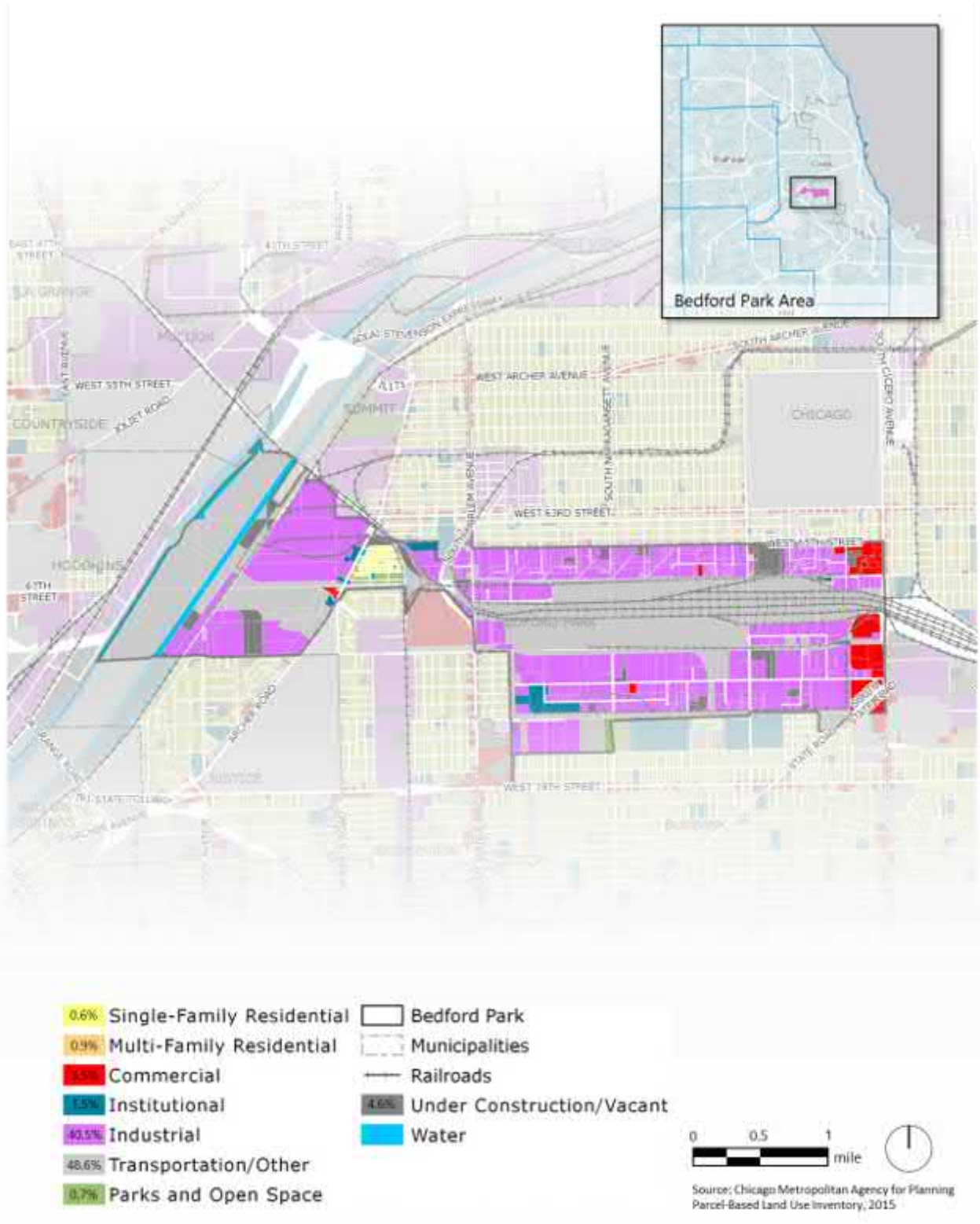
Bedford Park predominately includes industrial land uses (**Figure 2.17**). 90% of the Village's land area is allocated for transportation and industrial land uses, which are concentrated around the 786-acre Belt Railway Company (BRC) of Chicago's Clearing Yard and to the east of the Chicago Sanitary and Ship Canal. The areas designated for transportation and industrial land users, including the Clearing Yard, are collectively referred to as the Bedford Park-Clearing Industrial Area.

Commercial areas are the second most prevalent land use but represent only 3.5% of the Village's land area.[17] Bedford Park's commercial areas are concentrated along Cicero Avenue and are anchored by the Midway Hotel Center north of the BRC, and the Ford City Mall district south of the BRC. The Village's only residential area is tucked between South Archer Avenue and the Clearing Yard. Other institutional land uses are located on the edge of the Village's corporate boundary.

Bedford Park is generally surrounded by single-family residential neighborhoods. Local, mixed-use commercial corridors exist along Harlem Avenue, 63rd Street, South Archer Avenue, West Archer Avenue, and West 79th Street. There are also industrial areas in Summit, Bridgeview, and Justice, which are connected to Bedford Park through the BRC and through the Bedford Park Enterprise Zone (**Appendix E**).

[17] This excludes land that is either under construction or vacant.

Figure 2.17. Existing Land Use



MOTORIST AND FREIGHT NETWORK

Bedford Park is rich in regional transportation and logistics assets. **Figure 2.18** provides a map of the functional classification and annual average daily traffic (AADT) for the roads in the Bedford Park Area. Principal arterials that provide access to Bedford Park from I-55 (Stevenson Expressway) and I-294 (Tri-State Tollway) include Cicero Avenue, Harlem Avenue, which are both Class II Designated Truck Routes. Other important arterials and collectors that provide local access to the Bedford Park-Clearing Industrial Area include 63rd Street, 65th Street, Archer Road, 71st Street, Sayre Avenue, and 73rd Street.

Figure 2.18. Road Network

TRANSIT NETWORK

Figure 2.19 and **Figure 2.20** provide an inventory and map of transit service in the Bedford Park area, respectively. **Appendix E** provides additional transit service information. The Midway Airport Orange Line station and Summit, Wrightwood, and Ashburn Metra stop are the nearest rail stations to Bedford Park. The average distance from a station into Bedford Park is 2.75 miles.

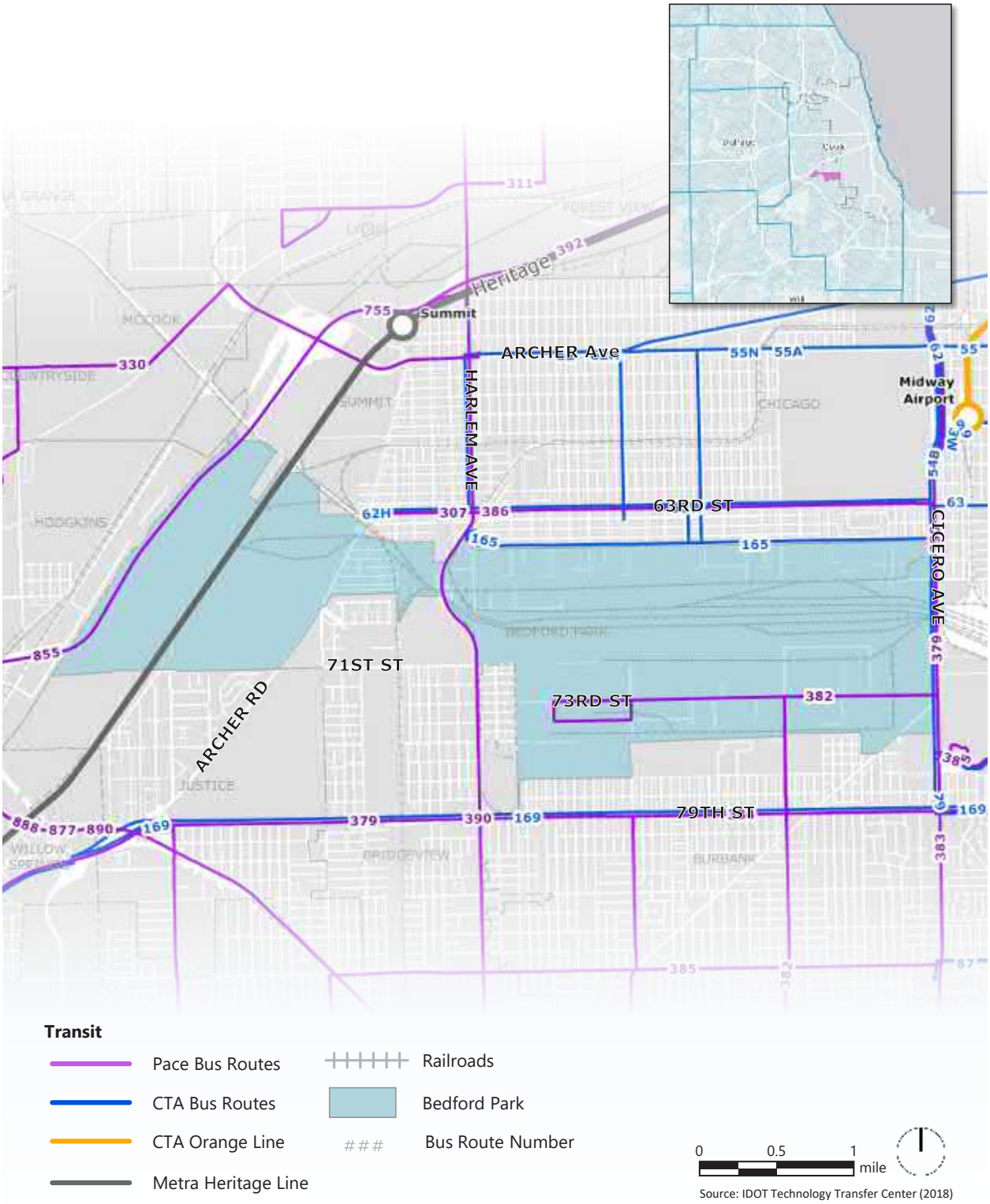
There are 14 bus routes that service Bedford Park area. However, none of these bus routes are 24-hour service and the average headway for buses is 34 minutes. There are several turnaround facilities near Bedford Park and the Toyota Park Transit Center is located immediately southwest of the Village in Bridgeview.

Figure 2.19. Inventory of Transit Service in the Bedford Park Area

Transit Agency	Asset/Service
CTA Routes/Stations	▪ **54B** (Cicero Avenue) ▪ **55A** (55th/Austin) ▪ **55N** (55th/Narragansett) ▪ **62H** (Archer/Harlem) ▪ **63W** (West 63rd Street) ▪ **79** (79th) ▪ **165** (West 65th) ▪ **169** (69th/UPS Express) ▪ **Orange Line** (Midway)
Pace Routes/Stations	▪ **379** (Midway – Orland Park) ▪ **382** (Central/Clearing) ▪ **384** (Narragansett-Ridgeland) ▪ **386** (South Harlem) ▪ **769** (Palos Heights/Oak Lawn – Soldier Field Express) ▪ **856** (Toyota Park – East Loop Express) ▪ **Toyota Park Transfer Center**
Metra Lines/Stations	▪ **Summit** (Heritage Line) ▪ **Ashburn** (SWS) ▪ **Wrightwood** (SWS)

Source: Regional Transportation Authority Mapping and Statistics (RTAMS)

Figure 2.20. Transit Network



BIKE NETWORK

Figure 2.21 and **Figure 2.22** provide an inventory and map of existing and planned bike facilities in the Bedford Park area, respectively. Planned bike facilities in the area include multi-use paths, cycle tracks, shared lanes, side paths, bike boulevards, and bike routes. Most of the bike facilities in the area are in the planning phase, but there are a few constructed segments of side paths in the neighborhoods surrounding Bedford Park. Bike facilities have been proposed by several different entities including: the Chicago Metropolitan Agency for Planning (CMAP), the Chicago Department of Transportation (CDOT), Village of Bridgeview, and Village of Justice. Future efforts to design, construct, and manage bike facilities in Bedford Park will involve coordination with these stakeholders and others, such as the Illinois Department of Transportation (IDOT).

Figure 2.21. Inventory of Bike Facilities in the Bedford Park Area

Street/Facility Name	Facility Type	Status	Source
I&M Canal Trail Extension	Multi-Use Path	Planned	CMAP
63rd Street	Cycle Track	Planned	CDOT
63rd Street	Shared Lane	Existing	CDOT
71st Street	Side Path	Existing	Village of Bridgeview
71st/73rd Streets	Side Path	Future	CMAP
73rd Street	Side Path	Planned	CMAP
Archer Road	Side Path	Planned	Village of Justice
Central Avenue (underpass)	Side Path	Planned	CMAP/IDOT
Ford City Connector	Multi-Use Path	Planned	CMAP
Narragansett/63rd	Bike Boulevard	Planned	CDOT
Roberts Road	Side Path	Planned	Village of Justice
Sayre Avenue	Bike Route	Planned	CDOT

Source: CMAP Bikeway Inventory System, 2018 Q2

Figure 2.22. Bike Network

BUSINESS ENVIRONMENT

Bedford Park is home to 418 businesses that employ 30,649 people. The top ten largest employers are shown in the **Figure 2.23**. Key industries by employment include the following: #1 Manufacturing: 7,974 (26.0%); #2 Wholesale Trade: 6,131 (20.0%); #3 Transportation and Warehousing: 3,717 (12.1%); #4 Professional: 2,020 (6.6%); and #5 Construction: 2,001 (6.5%).

In addition, Bedford Park has several regional economic assets including, the Belt Railroad of Chicago's Clearing Yards and the surrounding Bedford Park-Clearing Industrial Area; Midway Airport; the Midway Hotel Center; the Ford City Mall district; and a heavy industrial district along the Chicago Sanitary and Ship Canal (**Figure 2.24**).

65th Street, Cicero Avenue, 73rd Street, Harlem Avenue, and Archer Road are key corridors within the Bedford Park-Clearing Industrial Area and are assessed in more detail in **Chapter 4.**

Many of Bedford Park's manufacturing, industrial, transportation, and logistics employers hire shift workers as well as seasonal staff. Bedford Park's largest employers tend to have three shifts and are distributed throughout the Bedford Park-Clearing Industrial Area. **Figure 2.25** visualizes the general location of Bedford Park companies, their employment size, and whether they have one, two, or three shift changes. None of the CTA and Pace bus routes in Bedford Park provide 24-hour service, so transit is often not an option for 2nd and 3rd shift workers.

Figure 2.23. Top 10 Employers in Bedford Park

#	Company	Employees
1	FEDEX	1,100
2	CINTAS CORP.	685
3	INGREDION INC.	685
4	BELT RAILWAY CO.	440
5	HOME CHEF	345
6	MIDWAY WINDOWS & DOORS	300
7	POWER STOP, LLC	300
8	ASSEMBLERS, INC.	275
9	SUPERIOR MAILING SERVIVES	270
10	PACTIV	240

Source: Bedford Park Business License Data

Figure 2.24. Regional Economic Assets

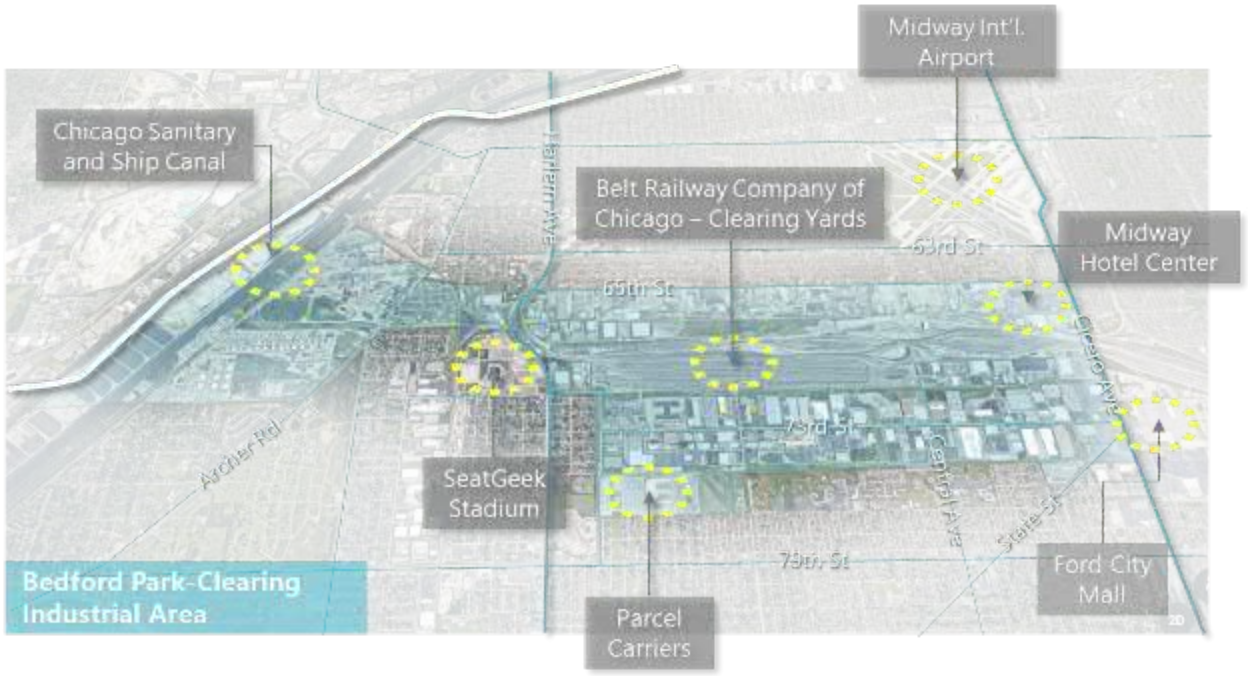


Figure 2.25. Employment and Shifts in Bedford Park

Approximately 60% of Bedford Park's workforce is between 30 and 54 years of age (**Figure 2.26**). 53.5% of Bedford Park's workforce may make more than more than $3,333 per month (**Figure 2.27**).

Bedford Park's regional context and local community conditions interact in ways that contribute to the community's last mile challenges. This section provided a baseline understanding of Bedford Park's community conditions, which set the stage for framing last mile challenge and potential solutions.

Figure 2.26. Workers by Age, 2015

Age	Count	Share
29 or Younger	4,969	16.2%
30 to 54	18,345	59.9%
55 or older	7,335	23.9%

Source: Source: U.S. Census Bureau, OnTheMap Application and LEHD Origin-Destination Employment Statistics

Figure 2.27. Earning per Monty, 2015

Earnings	Count	Share
$1,250 per month or less	5,293	17.3%
$1,251 to $3,333 per month	8,957	29.2%
More than $3,333 per month	16,399	53.5%

Source: Source: U.S. Census Bureau, OnTheMap Application and LEHD Origin-Destination Employment Statistics

BEDFORD PARK'S LAST MILE CHALLENGES

This section provides a summary of the six main last mile challenges, which are a result of the regional challenges and community conditions.

LAST MILE CHALLENGES

1. Long Walks
2. Limited Transit Access and Supply
3. Degraded Infrastructure
4. Dangerous Travel Conditions
5. Restrictive Right-Of-Ways
6. Poor Transit System Legibility and Schedule Alignment

CHALLENGE #1: LONG WALKS.

A quarter mile is generally considered to be a "walkable" distance for planning purposes. In other words, it is reasonable to expect someone to walk a quarter mile from a train station or bus stop to their destination. However, some Bedford Park commuters must regularly walk over 1.5 miles.

CHALLENGE #2: LIMITED TRANSIT ACCESS AND SUPPLY.

Providing convenient, frequent, and reliable transit service is necessary to make transit an attractive mode of transportation for commuters. However, the level of transit service that is currently available in Bedford Park does not make taking a train or riding a bus a convenient option. The average wait time for a bus in Bedford Park is over 34 minutes (CTA -22min, Pace 47 min). Employees frequently cited long distances between transit stops and work, long wait times, and the poor reliability of bus service as reasons why they do not view transit as a convenient or reliable option to get to work.

DEGRADED INFRASTRUCTURE

CHALLENGE #3: DEGRADED INFRASTRUCTURE.

Many of the walking and driving surfaces in Bedford Park and surrounding areas are weathered or degraded. Faded pavement markings, potholes, and crumbling sidewalks create dangerous travel conditions for motorists and pedestrians alike. In many places, the sidewalk network connecting pedestrians from a transit stop to work is either incomplete or in poor condition. Limited access to transit is another factor that contributes to reduced ridership.

CHALLENGE #4: DANGEROUS TRAVEL CONDITIONS.

Most of the existing sidewalks in Bedford Park do not have a buffer zone between pedestrians and vehicular traffic. Pedestrians must therefore walk alongside fast-moving, congested arterials and cross dangerous intersections to get to work. Bike commuters must share the road with heavy truck traffic and speeding motorists and have limited bike facilities. Between 2012 and 2016, there were 22 pedestrian and bike crashes in Bedford Park, 4 of which resulted in fatalities. During the same period, there were 1,056 car crashes, which resulted in no fatalities.

DANGEROUS TRAVEL CONDITIONS

RESTRICTIVE RIGHT-OF-WAYS

CHALLENGE #5: RESTRICTIVE RIGHT-OF-WAYS.

Most of the roads in Bedford Park have been designed to prioritize motorists and commercial vehicle traffic. However, the design elements that optimize roads for the efficient movement of commercial and personal automobiles also make roads inherently dangerous for pedestrians and cyclists. Retrofitting the rights-of-way to facilitate walking, biking, transit, and other emerging modes of transportation will be a challenge, but necessary for reducing congestion in the area.

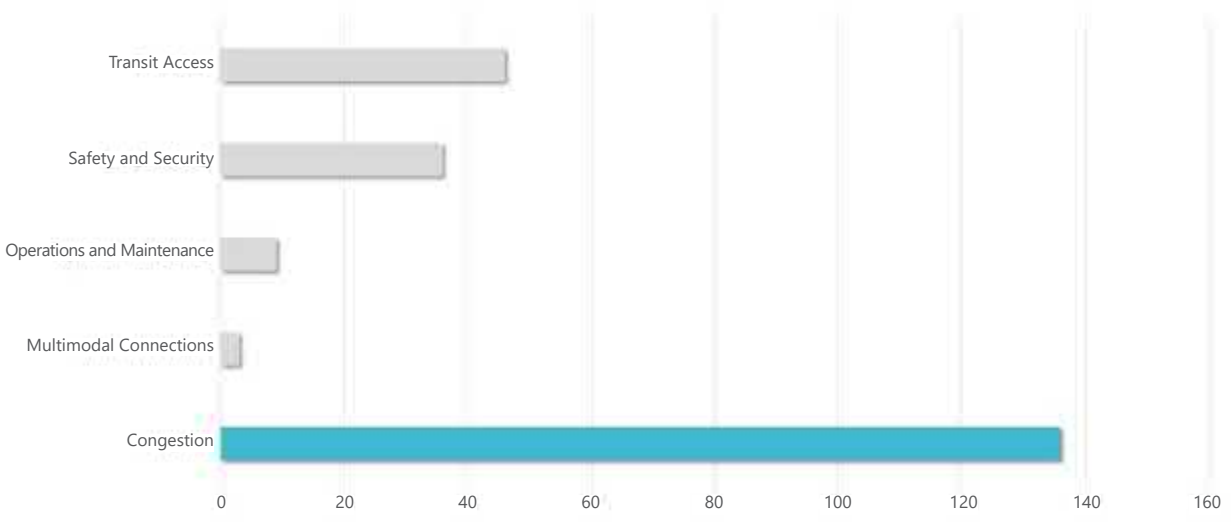
CHALLENGE #6: POOR TRANSIT SYSTEM LEGIBILITY AND SCHEDULE ALIGNMENT

Most current and potential transit commuters in Bedford Park need to make at least one transfer or connection to get to their destination. The prospect of having to navigate multiple train and bus routes and schedules, and coordinate transit schedules with work schedules, can deter potential transit riders and encourages driving alone. Poor alignment between bus schedules and shift changes also presents challenges for transit riders. For example, the last west-bound #165 leaves 65th and Harlem, which is an area with high employment density, at 6:14 P.M. This leaves any workers who get off work after 6:14 effectively stranded. Several Bedford Park employers have cited difficulties in getting to work via transit as a challenge in hiring and retaining late shift workers. Access to real-time information about transit options, schedules, delays, and other useful commuter information is also limited.

The combined effects of the six last mile challenges above creates a situation in which most commuters drive alone to work, either by choice or out of necessity. This reliance on single occupancy vehicles (SOVs), plus the high volumes of commercial traffic, are two of the main drivers of congestion in Bedford Park. This is overwhelming the #1 concern amongst commuters, as illustrated below (**Figure 2.28**).

Road congestion is the most visible (and frustrating) manifestation of Bedford Park's regional and last mile mobility challenges. So, it is understandable that this is survey respondent's #1 concern. By addressing these challenges, Bedford Park leaders, staff, and partners can make it easier for people to access jobs using public transit and other modes of transportation that will help to reduce road congestion. The next chapter describes a framework for responding to last mile challenges in a way that produces these and other community and regional benefits.

Figure 2.28. Categorized Responses to Employee Survey Question 8: What is the #1 challenge impacting your journey to work? (n=238)



Source: Employee Survey (2018), See **Appendix D** *for a summary of survey results.*

Chapter 3

BEDFORD PARK'S LAST MILE ASSESSMENT

This chapter further defines last mile challenges impacting mobility in Bedford Park by describing challenges specific to the four interconnected transportation network tpes (**Figure 3.1)**: Pedestrian Network (**Figure 3.2**), Bike Network (**Figure 3.3**, Transit Network (**Figure 3.4**, and the Motorist and Freight Network (**Figure 3.5**) within Bedford Park. Although each network is discussed individually, they are all part of an integrated mobility system. This assessment also examines the last mile gaps within the five primary corridors that surround the Bedford Park-Clearing Industrial Area: North Corridor, East Corridor, South Corridor, West Corridor, and Far West Corridor (**Figure 3.6**. Assessments were completed through site visits, surveys, interviews, and resource group meetings that all led to potential last mile solutions, outlined below and in more detail in **Chapter 4**.

LAST MILE GAP ASSESSMENT: BY TRANSPORTATION NETWORK

This section discusses each of the available modes of transportation within Bedford Park, assessing their functionality, specific challenges, and improvements.

Figure 3.1. A Framework for Integrated and Equitable Mobility in Bedford Park

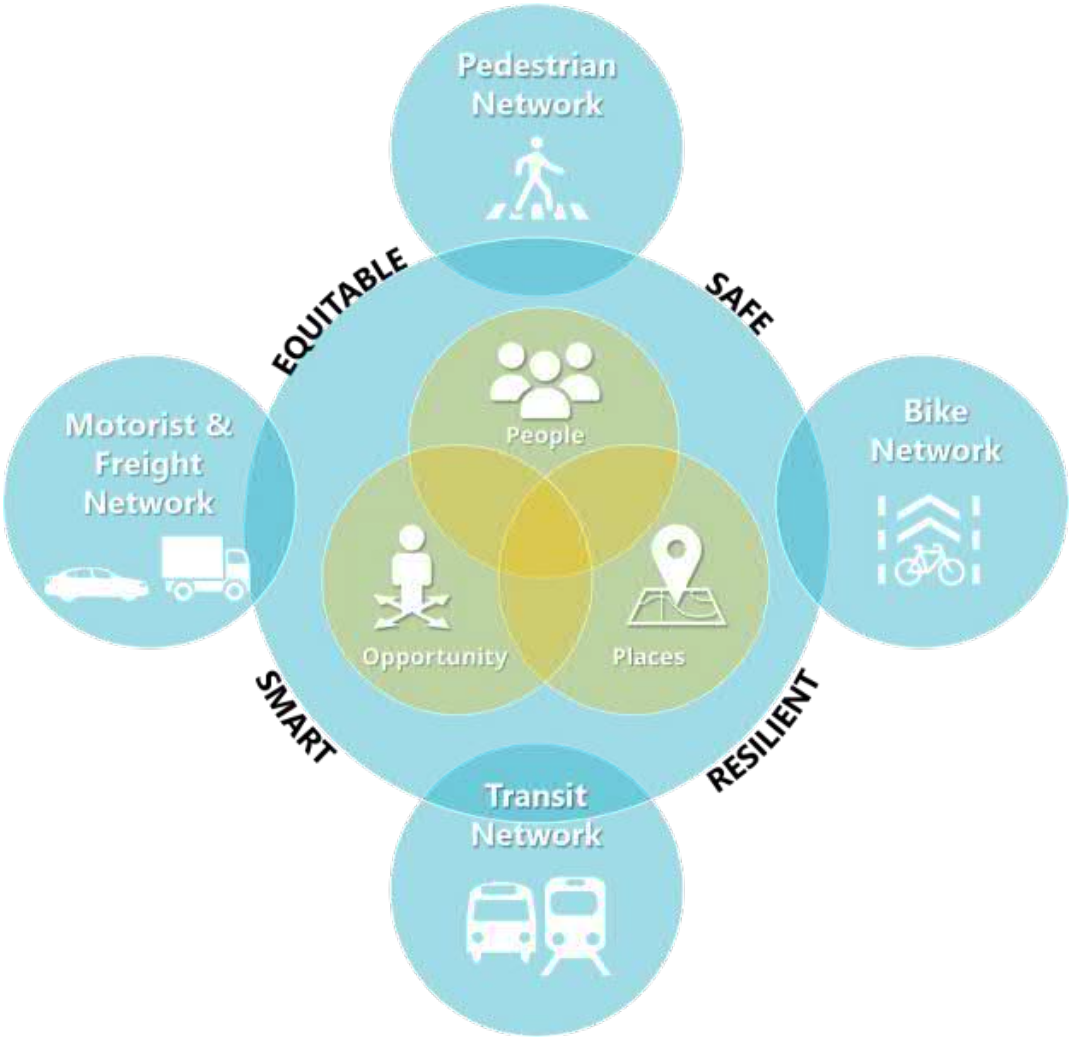


Figure 3.2. The Five Main Corridors Surrounding the Bedford Park Clearing Industrial Area

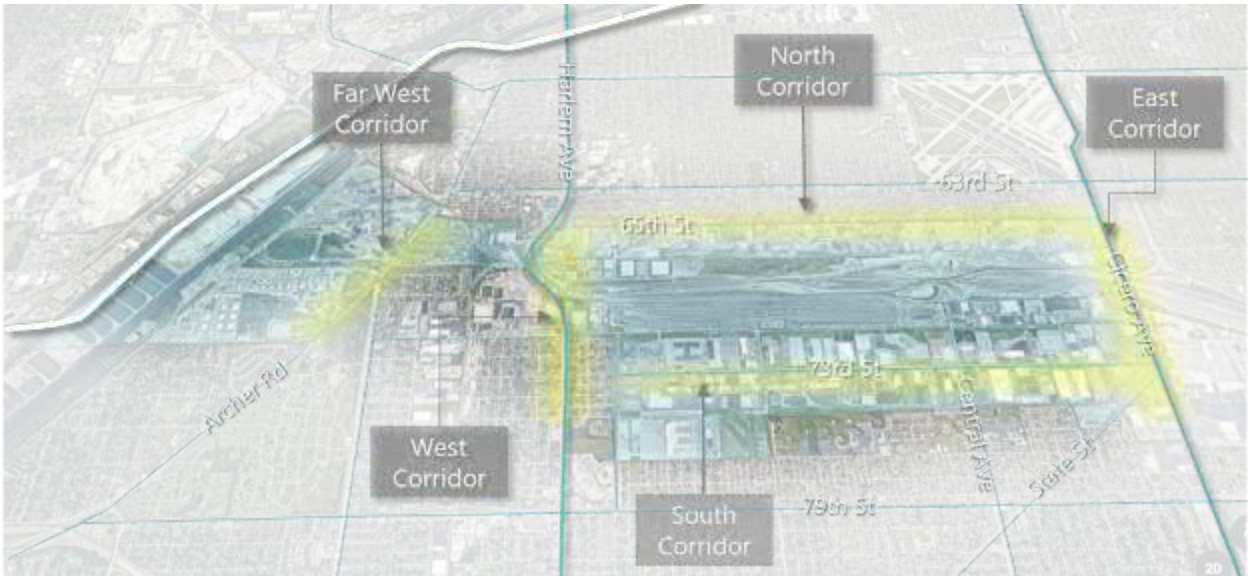


Figure 3.3. Last Mile Assessment: Pedestrian Network

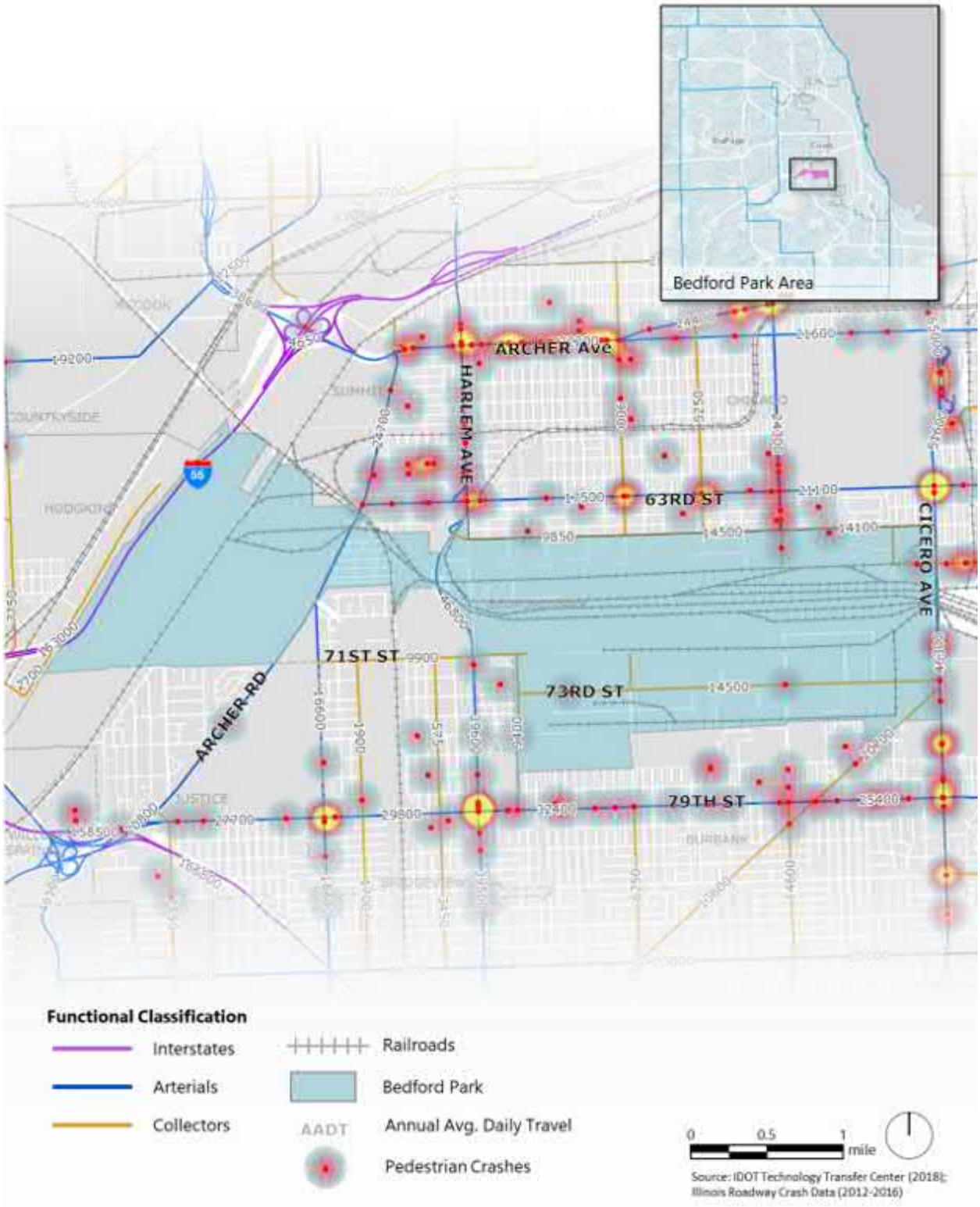


Figure 3.4. Last Mile Assessment: Bike Network

Figure 3.5. Last Mile Assessment: Transit Network

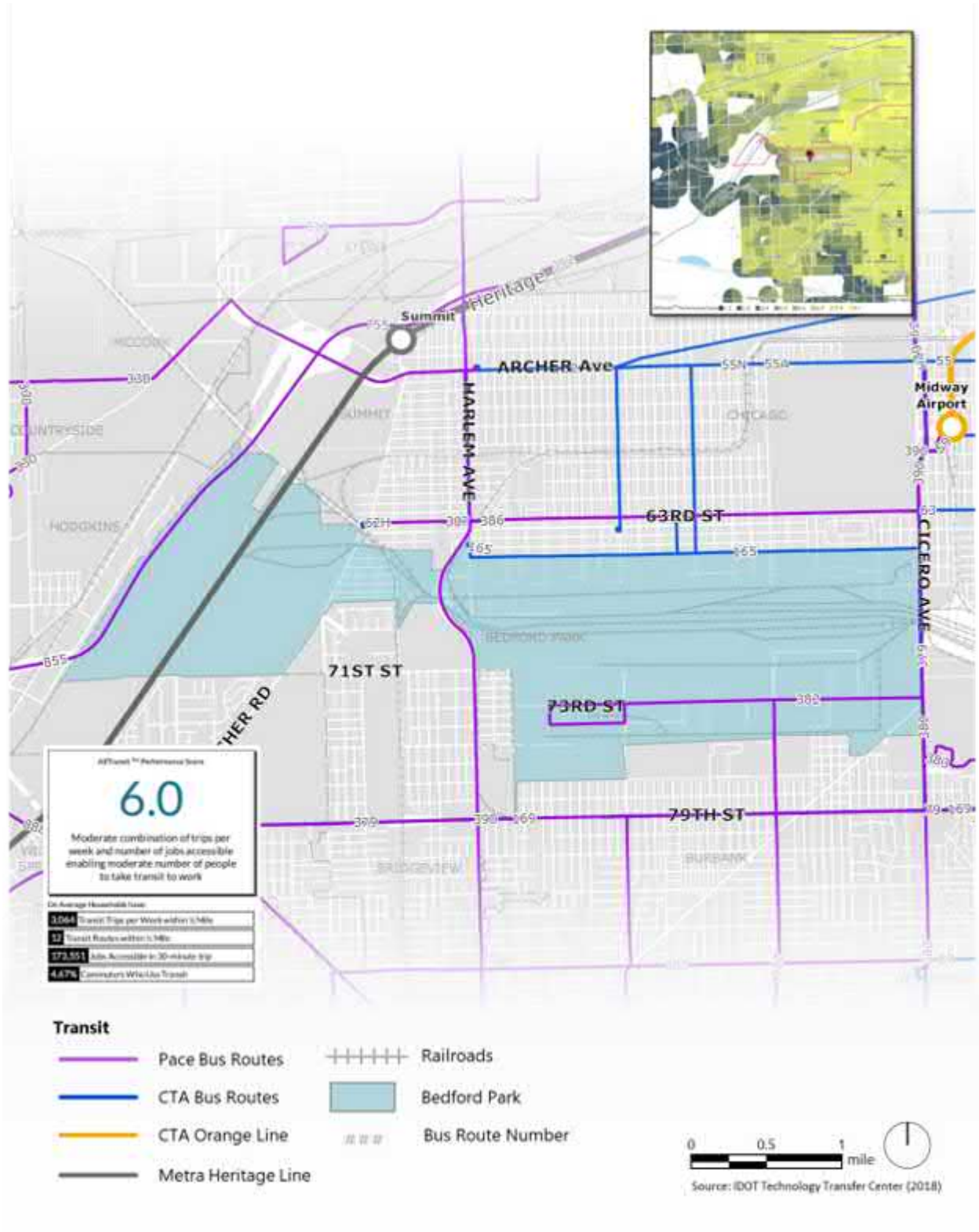
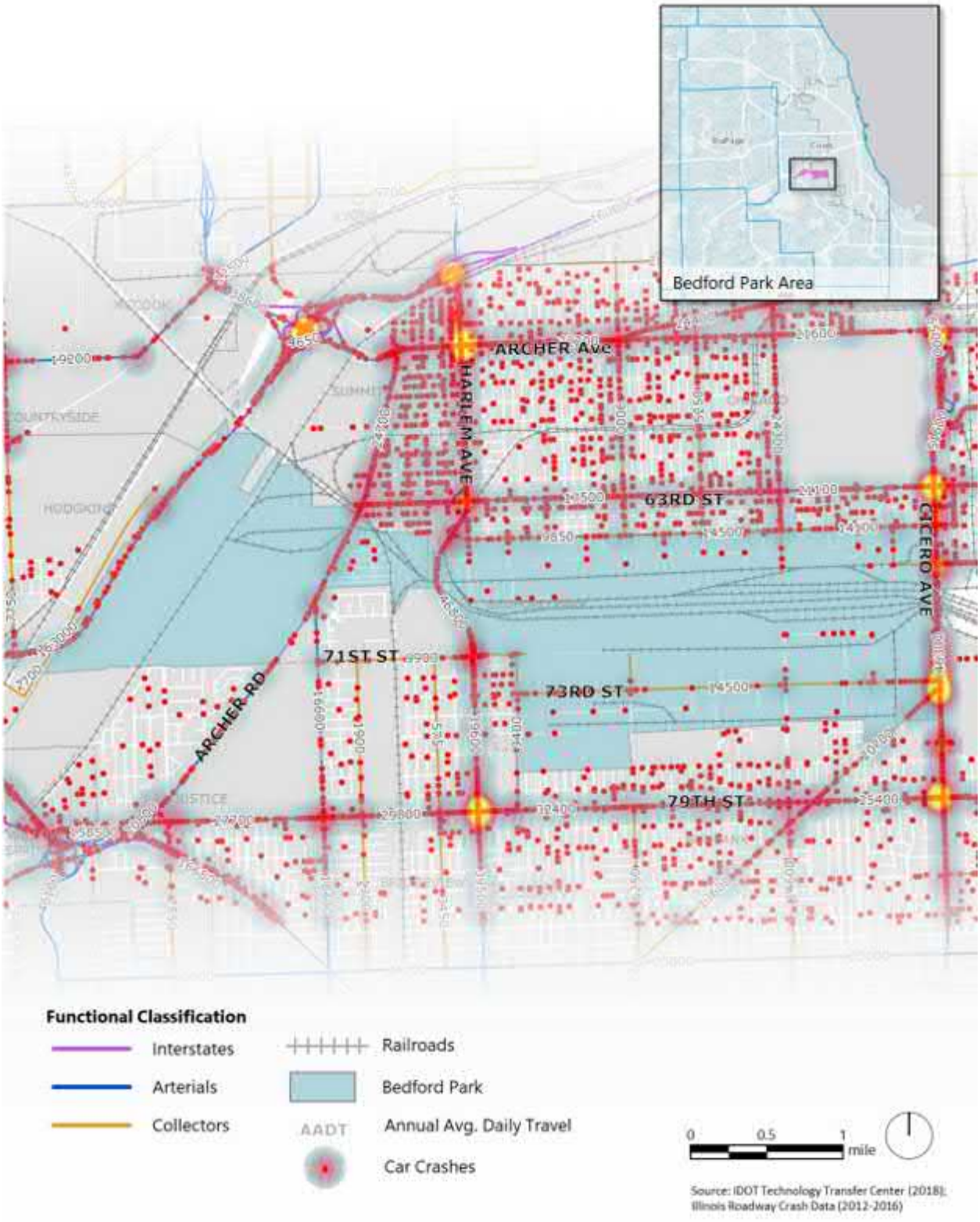


Figure 3.6. Last Mile Assessment: Motorist and Freight Network



TRANSPORTATION NETWORKS

Four interconnected transportation networks were identified in Bedford Park. Additionally, a shared mobility network that operates within the four identified transit networks was used for assessment purposes.

- Pedestrian Network
- Bike Network
- Transit Network
- Motorist and Freight Network
- *Shared Mobility Network*

PEDESTRIAN NETWORK

This section provides an assessment of the various elements of Bedford Park's pedestrian network including sidewalks, pedestrian crossings, pedestrian ramps, pedestrian scaled lighting, signals, and others. Although sidewalk functionality is critical to pedestrian mobility, there are other elements that should be considered, such as:

- Sidewalks
- Pedestrian Crossings
- Pedestrian Refuges
- Sidewalk Extensions
- Pedestrian Ramps
- Guidance for the Visually Impaired
- Signage and Wayfinding
- Pedestrian Countdown Signals
- Lighting
- Seating
- Water Fountains
- Weather Protection
- Curbs
- Waste Receptacles
- Active Building Edges
- Trees and Landscaping

Deficiencies in the pedestrian network can quickly lead to safety challenges. Between 2012 and 2016, there were 239 crashes involving pedestrians in the broader Bedford Park area (**Figure 3.3**). While only nine of these crashes occurred within Bedford Park's municipal boundary, these safety concerns directly impact the last mile journey for employees that currently walk to work from nearby neighborhoods and transit stations, or that could potentially walk to work.

Most of Bedford Park's arterial corridors and major collectors (i.e. 65th Street, 73rd Street, Harlem Avenue, Cicero Avenue, and Archer Road) have a near complete network of sidewalks. However, there are some sidewalk gaps along these arterials, which present challenges for people walking between transit and their place of employment. Moreover, most of the sidewalks along the arterials and collector streets in Bedford Park have little to no buffer zone between pedestrians and fast moving commercial and automobile traffic, which makes walking in Bedford Park both stressful and dangerous (**Figure 3.7**).[18] Some of Bedford Park's streets only have sidewalks along one side of the street in certain areas (e.g. 73rd Street).

Along the major corridors, traffic signals are spaced every quarter mile to three-quarters of a mile, providing limited opportunities for pedestrians to cross streets. Most people are unwilling to walk more than a quarter of a mile to reach the nearest traffic signal; rather, they choose to cross a street mid-block when they see a gap in traffic. Illegal mid-block crossings were observed during the Project Team's site visit and cited during interviews with Bedford Park employers. Where traffic signals are present, some lack pedestrian countdown signals, which provide pedestrians

[18] A buffer zone of 4 to 6 feet is desirable to separate pedestrians from the street. The buffer zone will vary according to the street type. In downtown or commercial districts, a street furniture zone is usually appropriate. Parked cars or bicycle lanes can provide an acceptable buffer zone.

Figure 3.7. The Four Sidewalk Zones

Source: NACTO

information about the amount of time they have allotted to safely cross a street.

Many pedestrian crossings and ramps need repair. This is especially true along 73rd Street where it appears that wheels from turning trucks have crushed many of the curb ramps. Crumbling curbs can cause stormwater drainage issues such as ponding, which can impede walking. Similarly, poor snow removal can force pedestrians to walk in travel lanes where the snow has been cleared.

Retrofitting Bedford Park's existing pedestrian facilities to match best practices will provide a safer and less stressful experience for all users of the community's pedestrian network. Whether commuters reach Bedford Park by car, transit, rideshare, shuttle, bike, or some other mode, they will have to use the sidewalk network at some point during their trip. Bedford Park planners should therefore take steps to bring the existing pedestrian network up to a state of good repair and expand the network where necessary. These steps will help ensure that the pedestrian network functions in a way that complements other modes of travel.

LAST MILE CHALLENGES: PEDESTRIAN NETWORK
■ Commuters that wish to walk into the Bedford Park-Clearing Industrial Area from nearby neighborhoods in Chicago, Burbank, Bridgeview, and Summit must cross one or more high crash corridors.
■ High Crash Corridors include: W Archer Avenue / W 55 Street Corridor; W 63rd Street Corridor; W 79th Street; and S Cicero Avenue Corridor.
■ Traffic signals in the Bedford Park-Clearing Industrial Area are spaced every quarter mile to three-quarters of a mile, providing limited opportunities for pedestrians to cross streets.
■ The W 65th Street and W 73rd Street corridors have a near (50-65%) complete sidewalk network, but gaps in the sidewalk network force pedestrians onto grassy areas and parking lots.
■ Snow, street ponding, and temporary construction work may block the Clear Path Zone forcing pedestrians onto grassy areas, parking lots, or the into travel lanes, as shown in **Figure 3.7**.
■ Overgrown vegetation impedes the Clear Path Zone in some places.
■ Most sidewalks have little to no Buffer Zone to protect pedestrians from fast-moving traffic.
■ Crosswalks, where present, generally have minimal (or faded) pedestrian pavement markings.
■ Poor street and pedestrian-scale lighting is a concern for workers who commute when it is dark.
■ High Priority Intersections within the Bedford Park-Clearing Industrial Area that need additional pedestrian safety improvements and were identified through survey responses, site assessments, and Resource Group Meetings, include the following: W 65th Street and S Sayre Avenue; W 73rd Street and S Central Avenue; W 73rd Street and S Sayre Avenue; W 55th Street and S Sayre Avenue; and W 73rd St and Cicero; and W 71st Street and Harlem Avenue.
■ Planning and implementing infrastructure projects that improve pedestrian access to the Bedford Park-Clearing Industrial Area will require coordination with neighborhood jurisdictions (e.g. Village of Burbank, Village of Summit, Village of Bridgeview, and the City of Chicago).

The visual assessment (**Figure 3.8** of the pedestrian network helps showcase the first/last mile challenges.

[36] See Chapter 3 of SUMC's TCRP Research Report 195, *Broadening Understanding of the Interplay Among Public Transit, Shared Mobility, and Personal Automobiles,* Transit Research Board of the National Academies, 2018.

Figure 3.8. Visual Assessment: Pedestrian Network

BIKE NETWORK

The bike network is becoming increasingly important as cities and regions seek to promote healthier and more affordable, equitable, and sustainable modes of transportation. Encouraging cycling as an attractive mode of transportation requires the provision of safe, convenient, and connected bike facilities. This section provides an assessment of the various elements of the Bedford Park area's bike network, which can serve as a springboard for identifying last mile solutions. Elements of the Bike Network include:

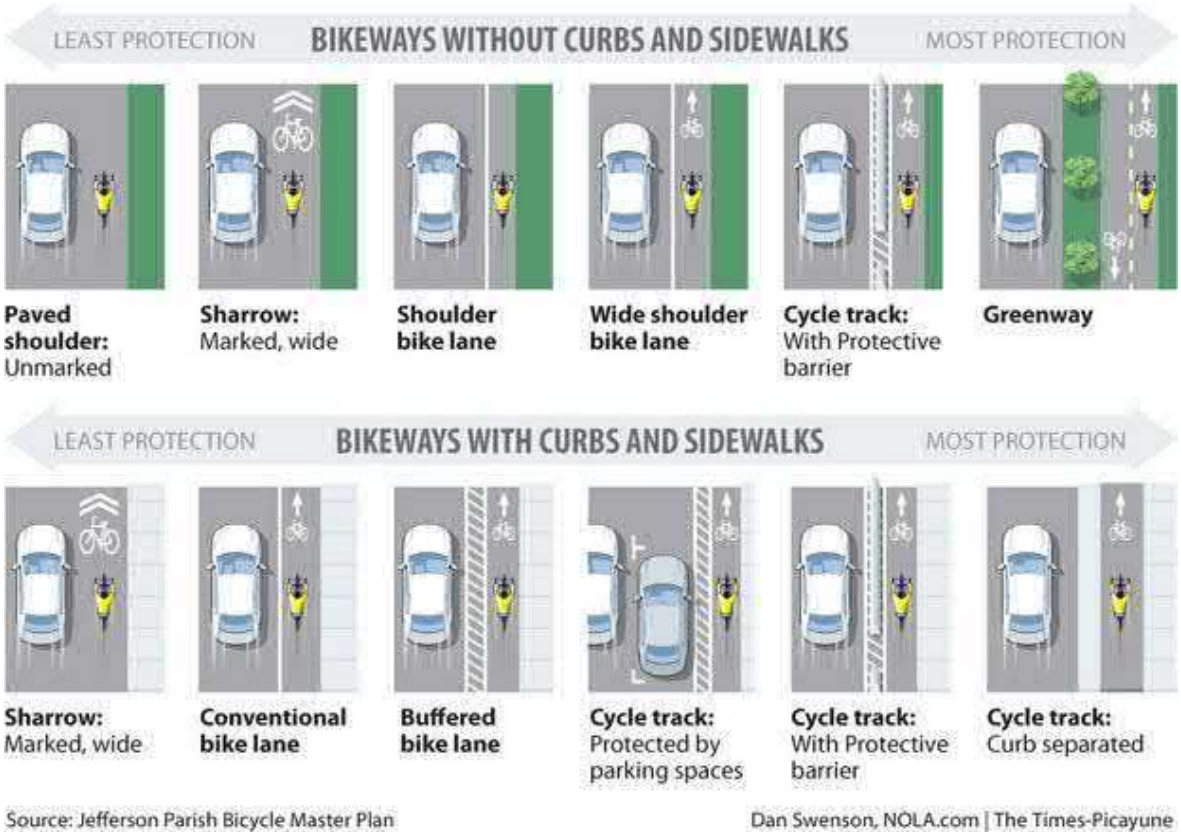
- Sharrows
- Conventional Bike Lanes
- Buffered Bike Lanes
- Cycle Tracks
- Side Paths/Greenways/Trails
- Bike Bridges
- Advanced Stop Bars/Bike Boxes
- Two-Stage Turn Que Boxes
- Corner Refuge Islands
- Bike Signals
- Wayfinding Signage and Markings
- Bike Share Stations
- Bike Racks
- Bike Corrals
- Bike Parking Structures

Bedford Park's predominately industrial land use, road design, and traffic patterns create a challenging and unsafe environment for cycling. The lack of a connected network of off-road facilities (e.g. side paths, trails, cycle tracks, protected bike lanes) forces cyclists to share the road with fast speeding vehicular and commercial vehicle traffic, increasing the risk of crashes. Between 2012 and 2016 there were 8 bike crashes in Bedford Park and 136 crashes in the broader Bedford Park area.

Several opportunities for expanding the bike network in the Bedford Park area have been identified though recent planning efforts including, CMAP's 2016 Regional Greenways and Trails Plan, the Village of Summit's Active Transportation Plan, the Village of Justice's 2030 Vision Plan, and the Chicago's Streets for Cycling 2020 Plan. However, most of the bike facilities are still in the planning phase.

Bikeways can be defined using marked sharrows, conventional bike lanes, buffered bike lanes, cycle tracks, and greenways and off-road trails. **Figure 3.9** below illustrates different types of bike facilities and the relative level of protection.

Figure 3.9. Types of Bike Facilities



There are several segments of existing bike routes in the neighborhoods surrounding Bedford Park (**Figure 3.3**). However, many of these routes are not connected to a broader network (e.g. there are disconnected segments of marked bike lanes and sharrows on 63rd Street). None of these nearby bike facilities currently extend into Bedford Park.

The lack of bike facilities creates dangerous travel conditions for current bike commuters and discourages biking as a commuting option. This is problematic for several reasons. First, current bike commuters must either share the road with motorist and commercial traffic or ride on sidewalks, which is illegal. Second, biking may be the most affordable mode of transportation for some commuters. Third, the lack of bike facilities may result in missed opportunities to reduce road congestion by shifting some commuters—especially those coming from nearby neighborhoods in Chicago, Burbank, Summit, and Bridgeview—out of space-intensive single occupancy vehicles (SOVs) and onto bikes. Fourth, bike-sharing and scooters-sharing are becoming an increasingly popular and economical last mile solutions for commuters.

Establishing safe, convenient, and connected bike facilities in Bedford Park can encourage commuters to bike to work. An expanded bike network can also support other new modes of transportation such as bike sharing, scooter sharing, and other 'micromobility' vehicles that may soon appear on the streets in the Bedford Park area.

LAST MILE CHALLENGES: BIKE NETWORK

- Bedford Park's land use and traffic patterns, current road conditions, and right-of-way allocation create a challenging and unsafe environment for cycling.
- There are minimal and disconnected bike facilities in Bedford Park and nearby areas.
- Employees that commute via bike must contend with dangerous travel conditions.
- Bicycling could be a viable last mile solution based on the distance that many commuters are traveling (37% of commuters travel less than 10 miles to work), but the lack of bike facilities, dangerous travel conditions, and other factors may discourage bike commuting.
- Design and construction decisions have prioritized motorist and freight traffic over other modes of travel. Over time, this has resulted in a right-of-way allocations and roadway designs that are difficult to retrofit.
- In terms of last mile solutions, bike improvements were identified as the lowest priority by survey respondents and Resource Group meeting participants. Cultural and institutional barriers to expanding the bike network can be more challenging to overcome than physical barriers and design challenges.
- Off street and protected bike facilities (e.g. side paths, bike trails, cycle tracks) are the most appropriate type of bike-related improvement given Bedford Park's land use and traffic patterns, but these treatments cost much more than conventional bike lanes (e.g. the proposed I&M Trail Extension would cost approximately $13 million.

TRANSIT NETWORK

Effective transit systems are supported by a range of physical infrastructure elements within the streetscape, as well as growing array of digital infrastructure elements. Elements of the Transit Network include:

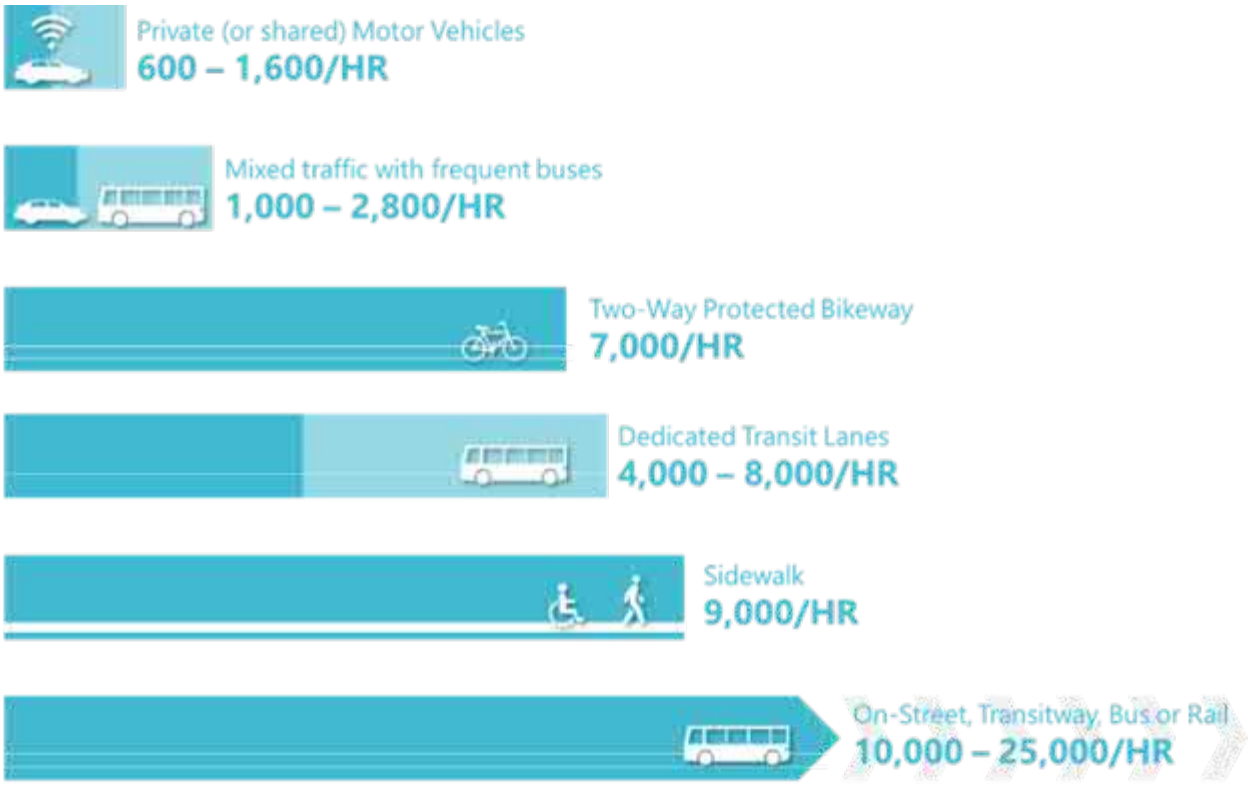
- Bus Fleets/Rolling Stock
- Transit Lanes
- Transitways/Railway
- Bus Stops/Train Stations
- Accessible Boarding Areas
- Transit Signals
- Ticket Vending Machines
- Wayfinding Signage
- Real-Time Arrival Screens
- Bike-Equipped Vehicles
- Bike Parking
- Transit Apps/Platforms
- Stop/Station Amenities

When compared to other modes of travel, transit has the greatest capacity for moving large amounts of people in constrained space (**Figure 3.10**). The efficiency of bus and rail transport will likely secure transit's position as the backbone of urban mobility systems in the future. However, the ubiquity of smart phones and emerging last-mile and mobility-on-demand (MOD) services such as bike-sharing, scooter-sharing, car-sharing, car-hailing, and autonomous vehicles (AVs), are creating new opportunities for providing flexible and convenient transportation options. These new technologies and services are creating opportunities and challenges for transit providers. Bedford Park is served by CTA and Pace bus service. Last mile mobility gaps related to the frequency, reliability, and supply of transit (e.g. long wait times, lack of late-night and weekend service, poor reliability, and long walking distances to the nearest transit station) were ranked the #2 highest priority last mile challenge by survey respondents after congestion.

This section provides an assessment of the transit network in the Bedford Park area. Given Bedford Park's current demographics, travel patterns, and land use constraints, and the operational challenges that transit agencies face when servicing "edge" communities, expanding conventional fixed-route transit is likely not an economically or operationally viable solution to Bedford Park's last mile challenges. For example, population and employment density, diverse trip generating businesses and land uses, and walkable neighborhoods are key factors that impact transit operators' ability to deliver high-density and high-frequency transit service. Bedford Park's relatively low total daytime population density and limited diversity and distribution (both spatial and temporal) of trip generators does not currently justify increasing the current level of services (e.g. 34+ minute headways) to a level of service that would be considered convenient by passengers (e.g. 10 to 15-minute headways).

Although expanding conventional fixed-route bus service may not be the most viable solution for improving access to Bedford Park, the area could prove to be fertile grounds for testing and scaling other transit service options and innovative public-private partnership models for delivering last mile mobility. For example, one potential solution could entail utilizing a private (or public) last mile microtransit operator to connect commuters from nearby transit hubs (e.g. Midway Airport, SeatGeek Stadium, Summit Metra stop). Another option includes Pace's forthcoming arterial rapid transit (Pulse) route on Harlem Avenue to the Bedford Park-Clearing Industrial Area. **Chapter 4** provides more detailed discussion of this concept and other potential last mile solutions.

Figure 3.10. People Moving Capacity per hour by Mode of Travel



Source: Adopted from NACTO Transit Street Design Guide

LAST MILE CHALLENGES: TRANSIT NETWORK

- The average walking distance from the nearest transit stations (i.e. CTA Midway Station and Metra Summit, Ashburn, Wrightwood stations) into the Bedford Park-Clearing Industrial Area is 2.75 miles.
- Some commuters must walk over 1.5 miles from the nearest bus stops on Cicero Avenue and Harlem Avenue to their place of employment along 75th Street and 65th Street.
- The last mile trip from some bus stops to employment centers is impacted by gaps in the pedestrian network. For example, bus commuters coming from the Pace Bus stop (Bus #386) at Harlem Avenue and 75th Street much jump a jersey barrier to access FedEx, USPS, and UPS facilities in southwest end of Bedford Park.
- Many of Bedford Parks industrial employers have large campuses with relatively low employment densities (e.g. low jobs/acres). Areas with low employment densities are difficult to service with fixed route transit.
- The average headway for bus services to Bedford Park is 34 minutes (CTA – 22 min, Pace – 47 min). Headways of 8-12 minutes is considered necessary for riders to view transit as a convenient option.
- Most of Bedford Park's largest employers have three shifts. Since there is no 24-hour bus service in Bedford Park, 2nd and 3rd shift workers have limited to no transit options for their return trip. Multiple survey respondents stated that they are "stranded" if they miss the bus.
- Several companies cited the lack of 24-hour bus service as a challenge to attracting and retaining blue collar, shift workers.
- The lack of frequent, reliable, and convenient transit service that drops workers off close to work has been cited as a challenge for attracting and retaining white collar, professional workers who desire to take transit (or walk) to work and who come from transit-rich areas.
- Nine out of the 15 bus routes that service Bedford Park have experienced reduced ridership in the past year, reflecting a regional trend towards decreasing transit ridership. If this trend continues, this could result in a mutually reinforcing cycle in which decreasing ridership contributes to a decreased level of service.
- Bedford Park's population and employment density, dispersed land use (e.g. large warehouse facilities), and limited walkability does not currently justify increasing the current level of services (e.g. 34+ minute headways) to a level of service that would be considered convenient by passengers (e.g. less than 15-minute headways).
- Most Pace and CTA bus stops in Bedford Park offer limited amenities for travelers (e.g. shelters, benches).

The visual assessment (**Figure 3.11**) of the transit network helps showcase the first/last mile challenges.

Figure 3.11. Visual Assessment: Transit Network

MOTORIST AND FREIGHT NETWORK

The motorist and freight network ("vehicle network") is a critical infrastructure system. Like the transit network, the vehicle network is comprised of physical infrastructure elements and an array of intelligent transportation system (ITS) technologies that support safe and efficient transportation. Elements of the Motorist and Freight Network include:

- Pavement Surface
- Pavement Markings
- Road Signs
- Travel Lanes/Turning Lanes
- Intersections
- Intersection Monitoring and Detection Devices
- Adaptive/Traffic Signals
- Traffic Signal Interconnections
- Transit/Emergency Vehicle Signal Priority (TSP)
- Dynamic Message Systems
- Close Circuit Television Cameras (CCTV)
- Pedestrian Push Buttons and Countdown Signals
- On-Street Parking/Meters
- Parking Lots
- Smart/Street Lighting
- Railroad Crossings
- Truck Routes
- Loading Zones
- Distribution Networks

The primary goal of the vehicle network design is to enable motorized vehicles to access an area without disrupting other modes or the community. Historically, transportation planning has prioritized the efficient flow of personal motorized vehicles and commercial vehicles over other modes of travel. Over time, this prioritization has resulted in street networks and road geometries that are inherently dangerous for other modes, such as pedestrians and cyclists. Traffic calming strategies and Traffic Demand Management are potential solutions that can help enhance the vehicle network.

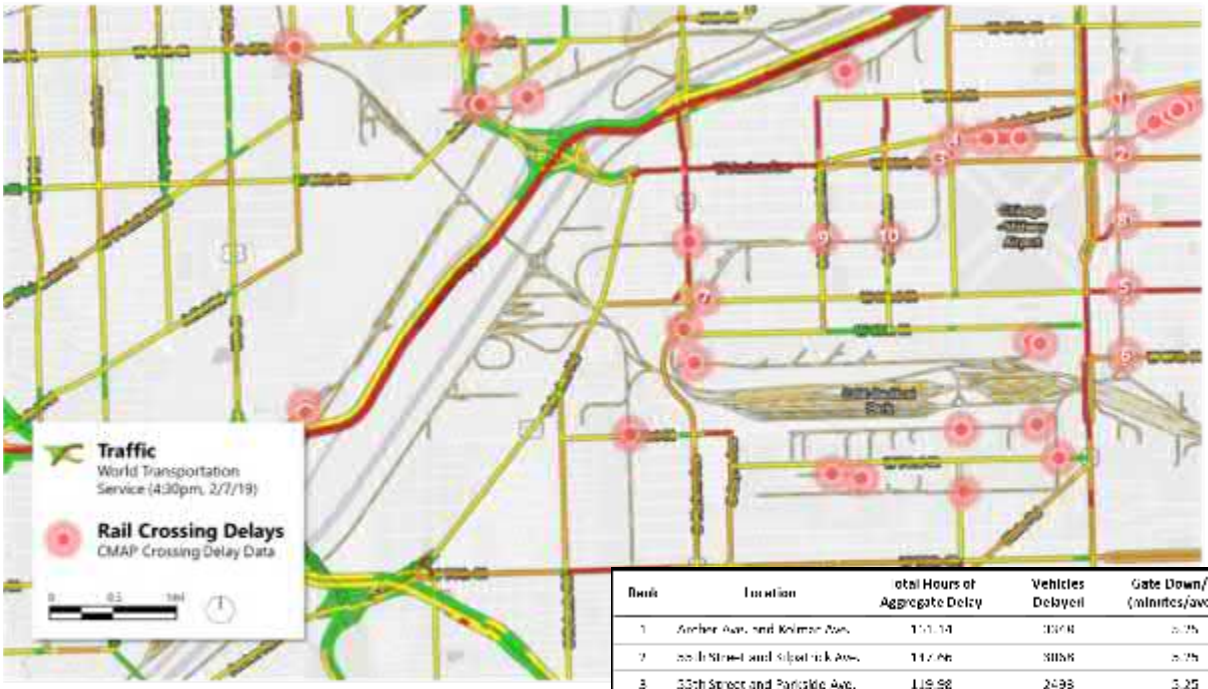
The vehicles that flow into and through Bedford Park contribute to the area's economy, they bring people to work, transport goods to market, and help people go about their lives, but these vehicles also create mobility challenges. Single occupancy vehicles (SOV) are a major consumer of street space both when in motion and when parked. When there are few alternatives to driving, commuters often choose to drive alone, even when they live relatively close to their place of work. This reliance on SOVs contributes to congestion, increases vehicle miles traveled (VMT) and pollution, and decreases community livability and road safety. Congestion was the #1 concern identified through Bedford Park Mobility Survey. Between 2012 and 2016 there were 1,056 car crashes in the Bedford Park area.[19]

[19] DISCLAIMER: The motor vehicle crash data referenced herein was provided by the Illinois Department of Transportation. The author is responsible for any data analyses and conclusions drawn.

In addition to commuters' reliance on SOVs, traffic in Bedford Park is also caused by the freight logistics (rail and truck) associated with the Bedford Park-Clearing Industrial Area. Commercial truck-induced congestion and incidents were among the highest priority concerns that emerged through this study. Across the Chicago metropolitan region, cars and trucks are delayed at rail crossings for 7,800 hours each weekday—more than 2 million hours of delay per year across the region. At the local level, at-grade rail crossings and commercial truck traffic-induced bottlenecks can cause severe delays, causing people to be late for work or miss critical transfers and connections (due to their scarcity).

The next section includes a detailed assessment of the five main travel corridors that surround the Bedford Park Clearing Industrial Area. **Figure 3.12** provides a map of Rail Crossing Delays in the Bedford Park area as well as a snapshot of road congestion. Figure 3.5 maps the high crash corridors in the Bedford Park area.

Figure 3.12. Rail Crossing Delays and Road Congestion Snapshot



Rank	Location	Total Hours of Aggregate Delay	Vehicles Delayed	Gate Down/Train (minutes/average)
1	Archer Ave. and Kolmar Ave.	141.14	3008	3.25
2	56th Street and Kilpatrick Ave.	117.46	3006	3.25
3	55th Street and Parkside Ave.	115.98	2498	3.25
4	Central Ave. S. Archer Ave.	84.68	1972	3.25
5	63rd Street and Knox Ave.	57.19	1820	3.25
6	Marquette Rd.	79.70	1657	3.25
7	63rd Street and Keeler Ave.	63.4	1318	3.25
8	59th Street and Kolmar Ave.	45.48	945	3.25
9	Narragansett Ave.	43.79	910	3.25
10	Austin Ave. and 60th Street	34.67	720	3.25

LAST MILE CHALLENGES: MOTORIST AND FREIGHT NETWORK

- 85% of Bedford Park's workforce drive alone to work.
- Between 2012 and 2016 there were 1,056 car crashes in the Bedford Park area.
- Regional truck bottlenecks impact the Bedford Park area, including Harlem and Cicero Avenues.
- Local truck bottlenecks impact Bedford Park, including 71st Street between Harlem Avenue and Sayre Avenue (i.e. the entrance to the CSX intermodal facility) and the intersection of 73rd Street and Sayre Avenue.
- Bedford Park has relatively high volumes of commercial vehicle traffic due to the Bedford Park-Clearing Industrial Area.
- At-grade rail crossings cause severe delays near Midway Airport. Rail crossing delays often occur during peak rush hour times.
- The combined impacts of commuters' reliance on single occupancy vehicles; the high volume of commercial truck traffic; and rail crossing delays lead to severe road congestion.
- Instances of "traffic" and "congestion" were overwhelmingly cited as the #1 challenge impacting workers' last mile commute.
- The conduct of professional drivers was a commonly cited concern (e.g. rolling stops, excessive speeding, general rudeness directed at other travelers).
- Faded pavement markings, particularly crosswalks and stop bars, were observed along 73rd Street.
- School Zone contributes to slow down on Central Avenue from 79th Street to 73rd Street.
- Non-actuated signals and "long red lights" were commonly cited concerns.

SHARED MOBILITY NETWORK

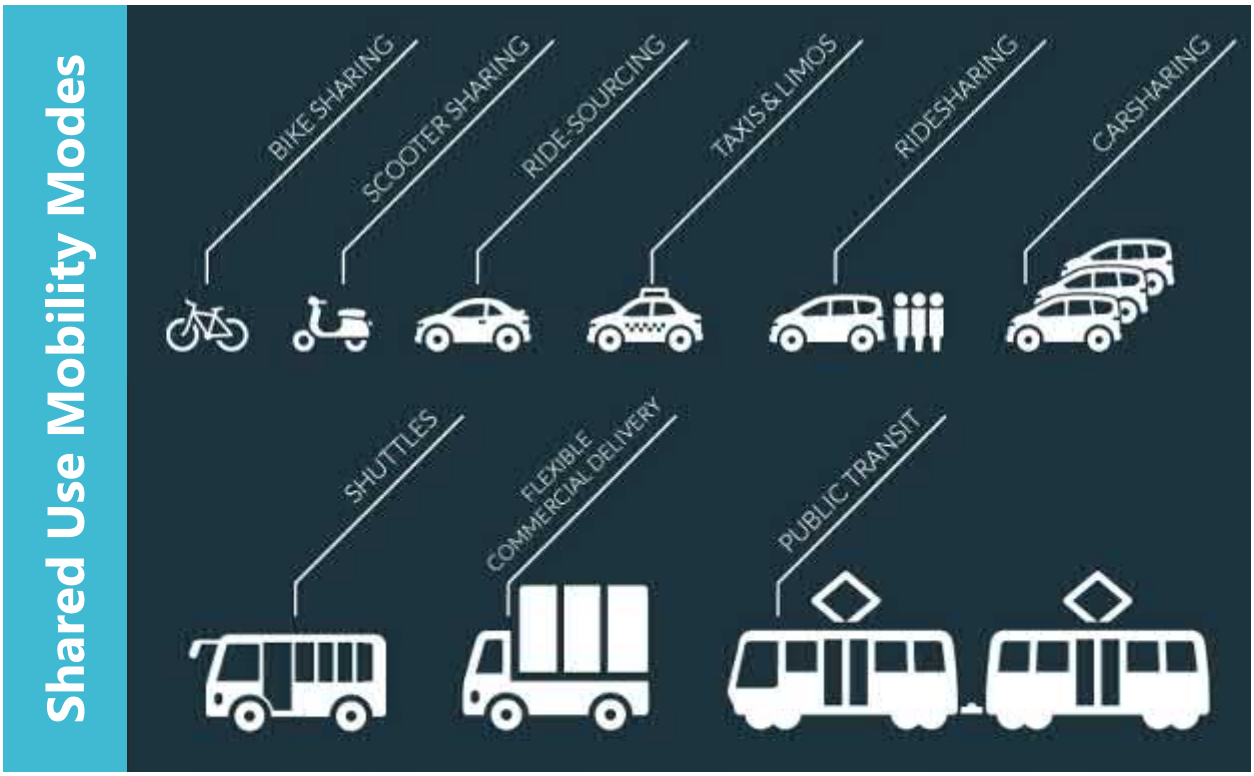
Shared mobility is defined by the Shared-Use Mobility Center (SUMC) as "transportation services and resources that are shared among users, either concurrently or one after another."

Shared mobility includes any type of transportation that involves an element of sharing, including public transit, taxis, shuttle services, ridesharing, carsharing, bikesharing, and other modes (**Figure 3.13**). Appendix F provides a definition of each category of shared mobility service.

Moreover, the shared mobility network is a collection of vehicles that operate within the four identified transit networks (Pedestrian, Bike, Transit, Motorist and Freight). For the purpose of this assessment, we explore the shared mobility network on its own. However, in the toolkit shared mobility solutions are integrated into the other four mobility networks (e.g.bikesharing, shuttles, and ridesharing).

Until recently, the primary operators of shared mobility were traditional public transit agencies responsible for large urban and regional transit networks, such as CTA, Metra, and Pace in metropolitan Chicago. However, as ridehailing companies such as Uber and Lyft arrived on the scene in 2009 and 2012, respectively, the entire transportation industry was disrupted and continues to evolve at a rapid pace. With the introduction of these low-cost, highly customizable transportation alternatives, consumers now have an alternative to owning cars and taking public transit. Governments and transit agencies have been taking note. This section summarizes key takeaways and trends from the literature on shared mobility and case studies (**Appendix B**), and provides a broad shared mobility opportunity assessment for the Bedford Park area. See **Appendix F** for a detailed opportunity assessment for specific types of shared mobility solutions and their viability in Bedford Park.

Figure 3.13. Figure 3.13. Shared-Use Mobility Modes



Source: Shared Use Mobility Reference Guide (SUMC, 2015)

The impacts of shared mobility services on cities and public transit agencies is a key area of concern for city officials and transit operators across the nation. There are ongoing skirmishes between transportation network companies (TNCs), like Uber and Lyft, and city governments and taxi industry groups; debates regarding the viability of dockless bike sharing systems and scooter sharing; and the challenges associated with designing and allocating the public right-of-way to accommodate new modes. These all demonstrate that the introduction of these disruptive technologies and business models into cities' economic, physical, technological, and political landscapes come with, well, disruptions.

Our review of th shared mobility industry projections (See **Figure 3.14**), literature, case studies (**Appendix B**), and consumer preference data, including this project's Mobility Survey, reveals a strong trend towards increasing demand for shared mobility services. Shared mobility technologies, companies, and platforms can be a part of an integrated and equitable mobility system alongside public transportation and other transportation networks. The following assessment of Bedford Park's shared mobility network is based on this fundamental premise, as well as the following concepts:

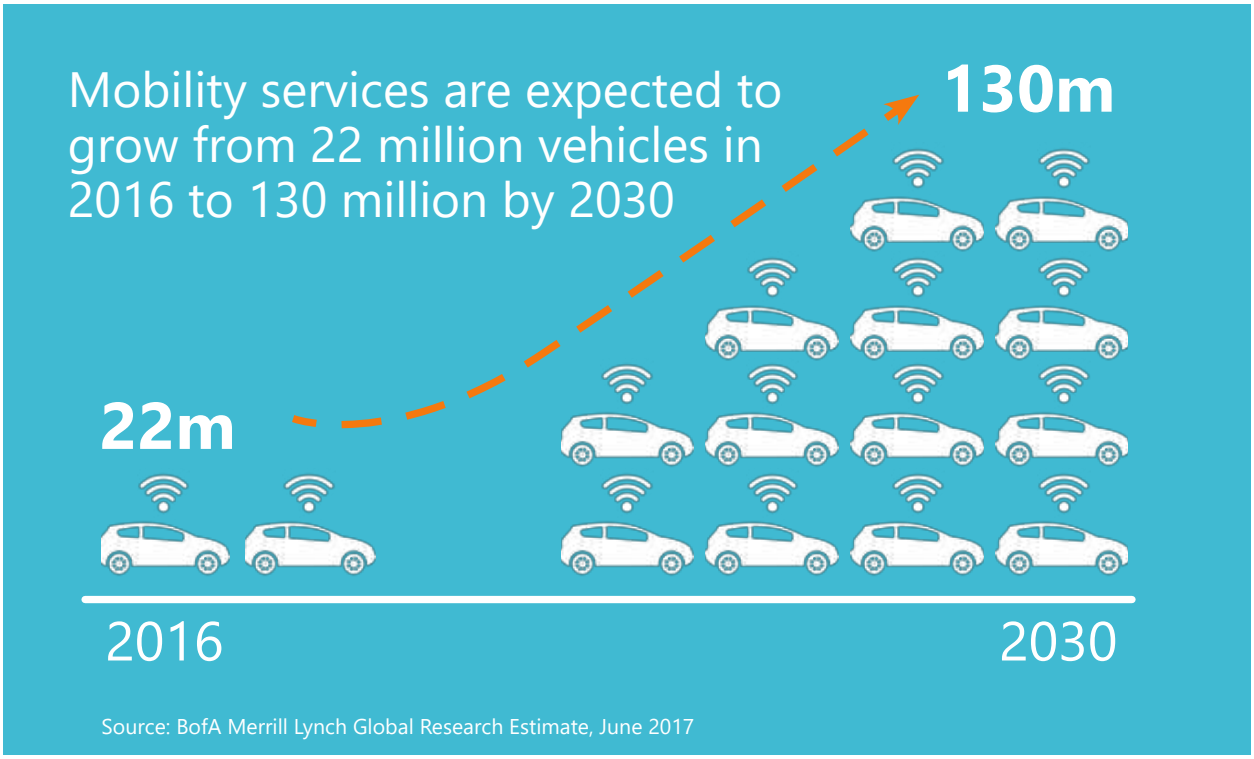
- The increasing demand for new modes of shared mobility warrants serious attention and action on the part of city officials and public transit agencies.
- New shared mobility platforms can be integrated into the city's existing transportation systems in ways that are mutually supportive, if such integrations are properly designed and managed.
- Jumping in too fast, and locking in unviable companies, technologies, and platforms, or sitting on the sidelines too long and taking a "wait-and-see" approach, may lead to poor integrations (i.e. integrations that are neither seamless nor mutually beneficial) and missed opportunities.
- Public Private Partnerships (P3s)—throughout all stages of the program development—will be critical in designing, operating, and managing successful mobility integrations.

Research analysis in Shared Mobility and the Transformation of Public Transit (2016) support industry projections showing growth in shared modes of transit.[20] Although this continues to be a debated issue, the 2016 analysis shows that greater use of shared modes is associated with greater likelihood to use transit frequently, own fewer cars, and have reduced transportation spending; Shared modes largely complement public transit, enhancing urban mobility; Because shared modes are expected to continue growing in significance, public entities are encouraged to identify opportunities to engage with them to ensure that benefits are widely and equitably shared; Public-sector agencies and private mobility operators are eager to collaborate to improve paratransit using emerging approaches and technology; Emerging business models include new forms of public-private partnership for provision of mobility and related information services.

Private Transit: Existing Services and Emerging Directions (2018) research analysis also supports industry trends.[21] The 2018 analysis found that private transit services can complement public transit and help reduce solo car trips; Some private transit services divert drive-alone trips and may cause reductions in VMT; Without prudent regulation, private transit services can contribute to conflicts over use of street space and public rights-of-way; Private transit's safety benefits stem from per capita VMT reductions; Private transit can expand transportation access in underserved or hard-to-serve communities.

[20] National Academies of Sciences, Engineering, and Medicine. Shared Mobility and the Transformation of Public Transit. The National Academies Press. (Washington, DC 2016).
[21] National Academies of Sciences, Engineering, and Medicine. Private Transit: Existing Services and Emerging Directions. The National Academies Press. (Washington, DC 2018).

Figure 3.14. Projected Growth in Mobility Services



SHARED MOBILITY OPPORTUNITY ASSESSMENT

The SUMC proprietary Shared Mobility Mapping Tool categorizes areas in terms of their current potential for supporting new or expanded shared mobility.[22] The assessment is based on several underlying factors including land use, walkability, quality of nearby transit service, jobs, and local household characteristics (**Figure 3.15**). The shared opportunities are classified into three categories: High, Medium, and First/Last Mile Connections. Areas with insufficient or missing data in key areas are not categorized.[23]

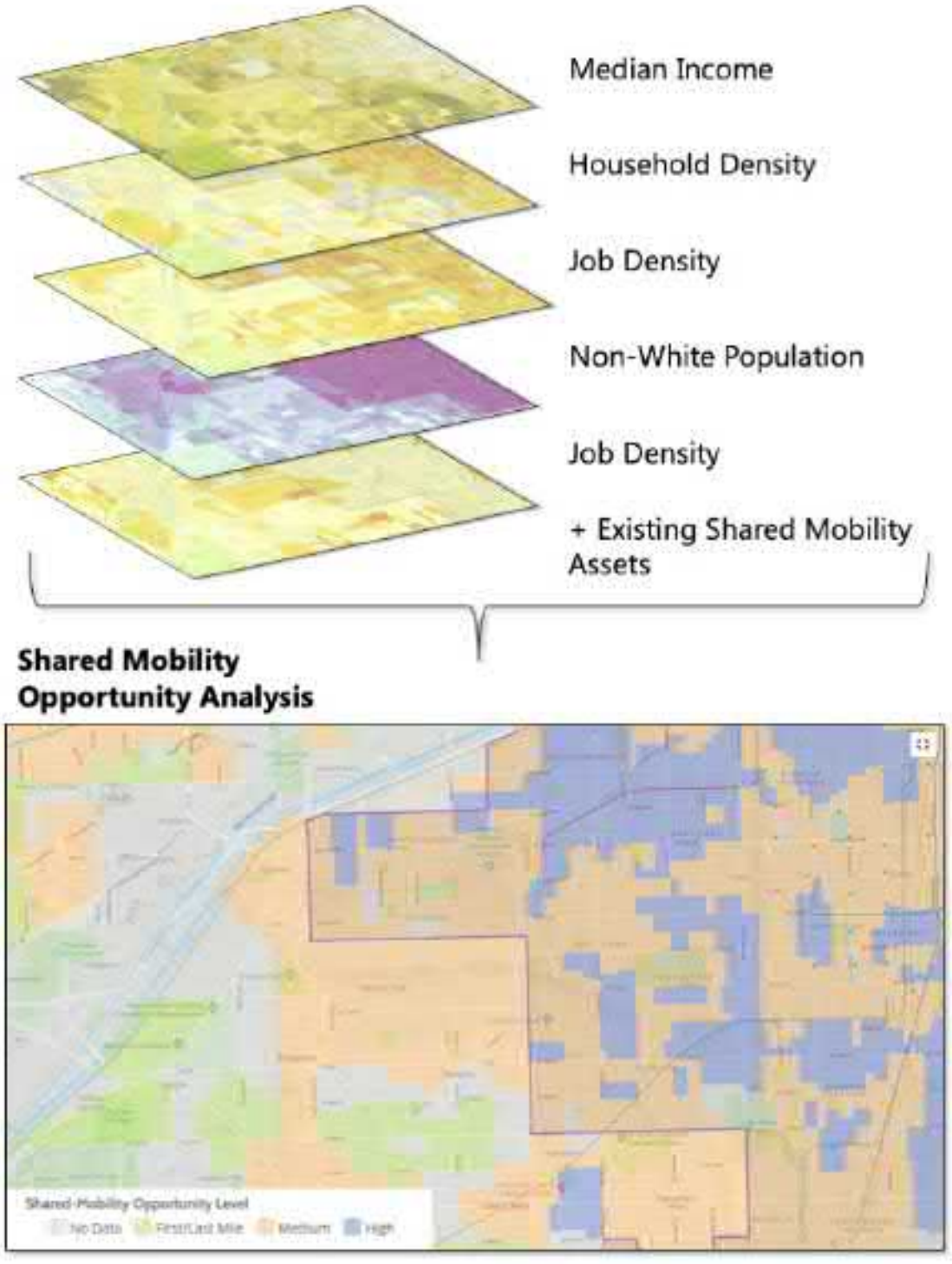
Due in part to the concentration of employment; underlying walkability of the street grid; and proximity to frequent transit service, most of Bedford Park was rated a "medium" shared mobility opportunity. This suggests that while it would be somewhat more difficult for the market to attract private services, the underlying conditions are favorable enough that services might do well with the right policy or financial supports. Several adjacent areas in Chicago provide even greater opportunities. However, the western end of the Village, bordering the Sanitary and Ship Canal and in the shadow of I-55, provide a more challenging environment for shared mobility services, even with public-sector support.

Like much of the southwest side of Chicago and its near suburbs, Bedford Park is largely disconnected from the supply of vehicle-based shared mobility assets, such as bikesharing and carsharing, in Chicago and the wider region. However, it is well served by ridehailing services like Uber and Lyft, with the full spectrum of those companies' service offerings available in the municipality at reasonable wait times (under five minutes

[22] http://maps.sharedusemobilitycenter.org/sumc/#
[23] SUMC's opportunity analysis estimates potential demand for carsharing and bikesharing by calculating the disparity between existing resources and new resources that a given market can absorb. To conduct this analysis, SUMC developed a series of models for predicting availability of carsharing and bikesharing within a census block group, based on the key demographic factors in markets where demand and supply are thought to be most balanced. The resulting model was then applied to more than 50 cities across North America, using the difference between predicted and actual levels of carsharing and bikesharing to identify opportunity areas.

for core services like UberX and UberPool). **Appendix F** provides a more detailed analysis of the opportunity associated with different shared mobility modes (e.g. carsharing, bikesharing, scooters, ridehailing/TNCs, microstransit, on-demand carpooling, TNC Rush Hours).

Figure 3.15. Shared Mobility Opportunity Assessment



LAST MILE CHALLENGES: SHARED MOBILITY NETWORK

- The nearest station-based (round-trip) carsharing vehicles are several Zipcars located at Midway Airport.
- Dockless bicycle and scooter operators depend on user density and network effects for productive service and have not yet begun operating in any suburbs of the metro area.
- The Divvy bikesharing network is limited to the City of Chicago and one northern suburb, and the system has been slow to expand to the south and west of downtown. The nearest station is some 5 miles from Bedford Park at S Damen and W 61st Street.
- As its service is focused largely on trips in and out of the urban core, Via's service to Midway largely duplicates CTA Orange Line service for the purposes of reaching Bedford Park.
- Until recently Chariot was the only major microtransit operator providing services in the Chicago region. However, in January 2018, Chariot announced that they will be closing for business, calling into question the viability of microtransit.
- The average price for an UberPool ride originating within the Bedford Park-Clearing Industrial Area to the Midway Transit Hub is approximately $10 (a costly commute for those individuals using this transit mode daily).
- In Bedford Park and its nearby transit hubs, vehicle supply appears to be at its lowest in the weekday early mornings, as well as late in the day on weekends, when TNC activity are known to be concentrated on nightlife areas of the city, north and northwest of the Loop.

LAST MILE GAP ASSESSMENT: BY CORRIDOR

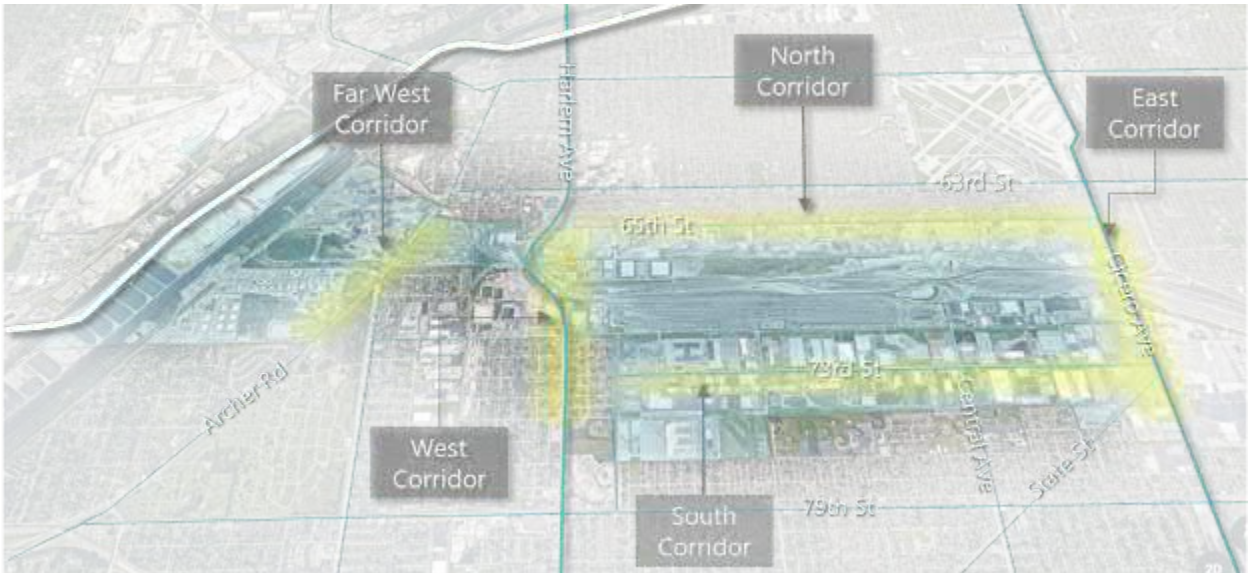
The previous section assessed Bedford Park's last mile challenges associated with five interrelated transportation networks. This section provides an assessment of Bedford Park's last mile challenges associated with the Village's five primary corridors (**Figure 3.16**) and each corridor's attributes (**Figure 3.17**).

THE FIVE PRIMARY CORRIDORS

There are five primary arterial corridors that surround the Bedford Park Industrial Area:[24]

- North Corridor. 65th Street from Harlem Avenue to Cicero Avenue
- East Corridor. Cicero Avenue from 65th Street to 73rd Street
- South Corridor. 73rd Street from Sayre Avenue to Cicero Avenue
- West Corridor. Harlem Avenue from 65th Street to
- Far West Corridor. Archer Road from 71st Street to 65th Street

Figure 3.16. The Five Primary Corridors



[24] The project team defined the center line of the corridors by the five primary arterials that traverse them. To capture side streets, business campuses that extend beyond or are set back from the primary arterials, pedestrian routes, parking lots, and other site-specific conditions that may influence commuters' last mile journey the corridor boundaries were expanded approximately 2-4 blocks beyond the center of the corridor. The five primary corridors should therefore be considered general areas of focus rather than strictly defined geographies. A high-level description of the land use and transportation patterns, market conditions, and last mile challenges and opportunities is provided for each of the five corridors.

Figure 3.17. Corridors Attributes

Corridor	North Corridor 65th Street	East Corridor Cicero Avenue	South Corridor 73rd Street	West Corridor Harlem Avenue	Far West Archer Road
Corridor Extent	Harlem Ave to Cicero Ave	65th St to 73rd St	Sayre Ave to Cicero Ave	65th St to 73rd St	71st St to 65th St
Functional Classification	Major Collector	Principal Arterial	Major Collector	Principal Arterial	Minor Arterial
Jurisdiction	Local	State	Local	State	Local
Average AADT (Truck Volume)	12,816 (10,850)	48,033 (5,425)	14,500 (N/A)	43,200 (7,200)	24,466 (2,750)
State of Acceptable Conditions	N/A	Excellent (30%), Preservation Eligible (70%)	Excellent (30%), Preservation Eligible (70%)	Excellent (100%)	N/A

Source: getting aroundillinois.com (accessed 2/19/19)

NORTH CORRIDOR

65th Street from Harlem Avenue to Cicero Avenue

The North Corridor is bounded by 63rd Street to the north, the Belt Railway of Chicago (BRC) rail yard to the south, Harlem Avenue to the west, and Cicero Avenue to the east. For purposes of mapping travel distances to the corridor, the intersection of 65th Street and Narragansett Avenue is the geographic center of the corridor. The North Corridor is the longest of the five primary corridors. It is home to the largest number of businesses (238) and the largest number of employees (6,000).

In terms of land use, the portion of the corridor that is located south of 65th Street includes predominately industrial, warehousing, and office land uses. The area north of 65th Street falls within the City of Chicago's Clearing Community Area and includes multi-family and single family, bungalow-style, housing.[25] Most of the area north of 65th Street has a housing density of 6-12 households per acre, but there is an area with a household density of 12+ households per acre.

In terms of transportation, the North Corridor has an approximately 40% complete sidewalk network in varying states of repair. The nearest transit stops are the Midway Orange Line station (2.5 miles to the center of the corridor) and the Summit Metra station on the Heritage Route (3.4 miles to the center of the corridor). The North Corridor is serviced by CTA bus routes 165, 63W, and 55 N, and Pace Routes 386 and 307. In 2017, 63rd Street had an Annual Average Daily Traffic (AADT) count of 12,816 vehicles per day. The Shared Mobility Score for the North Corridor is "medium", according the SUMC's Shared Mobility Mapping Tool.

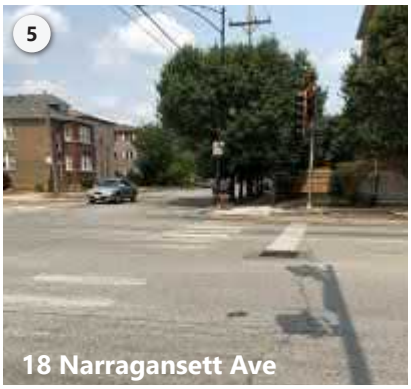
The Midway Hotel Center, located at the southeast corner of the intersection of 65th Street and Cicero Avenue, is a key point of interest along this corridor. This district includes ten branded hotels with more than 1,600 rooms and several restaurants. The Village is also in the process of developing a multipurpose sports, event, and convention facility ("Event Center") at 65th Street and Laramie Avenue. Strengthening the Midway Hotel Center and developing the Event Center are key economic development priorities identified by Village leadership and staff.

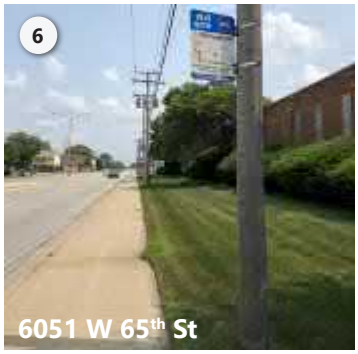
There are 38 Manufacturing firms that are primarily located along the south side of 65th Street. There are also 23 Wholesale Trade and 16 Transportation firms dotted throughout the corridor. Most hotels, restaurants, and retail establishments are located along the east end of the corridor near the Midway Hotel Center. Manufacturing (16.0%), Retail Trade (12.6%), and Accommodations & Food Services (9.2%) are the top three industries in the North Corridor.

Last mile mobility to and from the corridor is impacted by several local and regional factors. Last mile challenges include, among others: an incomplete sidewalk network and poor sidewalk conditions, the lack of 24-hour bus service, poor lighting, and dangerous intersections and pedestrian crossings. Last mile connection opportunities include, among others: implementing targeted pedestrian safety improvements, "right-sizing" the corridor right-of-way (ROW) and launching a 24/7 last mile shuttle service that connects employees in the corridor to nearby transit hubs and neighborhoods.[26] A visual assessment (**Figure 3.18**) and a more detailed discussion of the North Corridor's last mile challenges and opportunities is provided in **Figure 3.19**

[25] The Village's corporate boundary extends to the back of curb on the north side of 65th Street. Sidewalks north of 65th fall under the City of Chicago's Jurisdiction (Wards 13 and 23).
[26] Such as the recently completed crossing improvements at West 65th Street and Sayre Avenue.

Figure 3.18. Visual Assessment of the North Corridor





1. This image shows a sidewalk gap due to a parking lot extending to the back of curb. Providing design guidance to developers can help ensure a complete and continuous network of sidewalks.
2. This image shows sidewalk that is narrowed due to overgrown brush and which lacks a Buffer Zone. To avoid the brush, pedestrians must walk even closer to fast moving traffic.
3. This image shows a sidewalk along a side street that connects to W 65th Street that lacks pedestrian access.
4. This image shows a Rectangular Rapid Flashing Beacon (RRFB) that provides a mid-block crossing opportunity, but lacks curb ramps and curb cuts necessary to provide ADA access through the center median.
5. This image shows faded crosswalk pavement markings, which reduces visibility of pedestrian crossing area.
6. This image shows a bus stop with no shelter or bench, which could be improved by working with the adjacent business to install a shelter on its property.
7. This image shows fencing along W 65th Street, which bars pedestrians from accessing hotels and restaurants at non-driveway locations. Providing access points away from driveways for people and adding sidewalks or striping through parking lots could improve pedestrian safety and experience.

Figure 3.19. North Corridor Challenges and Solution Opportunities for Each Transportation Network

NORTH CORRIDOR	LAST MILE CHALLENGES	SOLUTION OPPORTUNITIES
PEDESTRIAN	• Long walks for people coming from bus stops on Cicero Avenue and Harlem Avenue • Sidewalk gaps through commercial parking lots along the south side of W 65th Street • Vegetation encroaching on sidewalk adjacent to vacant properties • No buffer between fast-moving travel lanes and pedestrians on sidewalk • Many crosswalk markings are faded or are not visible to drivers, especially commercial drivers • Some intersections lack ADA-compliant curb ramps • There are few controlled crossings that enable pedestrians to cross from north to south side of W 65th Street • There is no dedicated pedestrian access from sidewalks to the Midway Hotel Center	• Connect sidewalk gaps so that there is a complete sidewalk network on the south side of W 65th Street and along other side streets in the corridor • Develop design guidelines for businesses to ensure pedestrian access from sidewalks to building entrances • Trim vegetation that is encroaching on sidewalks • Continue to update intersections with ADA compliant curb ramps • Coordinate with CDOT to restripe crosswalks • Coordinate with surrounding jurisdictions to improve the safety for people walking into the Bedford park-Clearing Industrial Area surrounding areas • Ensure snow removal on sidewalks and at curb ramps
BIKE	• No bike facilities throughout the corridor • The narrow off-street ROW limits the opportunity for installing an off-street bikeway or cycle track • Current speed limits and volume of freight traffic creates unsafe biking conditions	• Explore the feasibility of right-sizing 65th Street by removing two travel lanes, installing a continuous center left turn lane and installing bike lanes or a cycle track
TRANSIT	• The limited frequency and poor reliability of transit leaves commuters with few other options than driving alone to work • Bus stops lack space for shelters and amenities • Bus stops are abundant, but there are few safe (i.e. controlled) crossing opportunities to access stops	• Install pedestrian safety improvements at uncontrolled crossings at high-use bus stops located between traffic signals • Improve amenities by providing more benches and shelters where space permits • Develop incentive program for businesses to host bus shelters on properties, where space permits
VEHICLE / FREIGHT	• Faded and missing pavement markings • Congestion is the #1 last mile challenge • The North Corridor has several at-grade railroad crossings that cause severe delays • Poor road condition	• Use Traffic Demand Management strategies and other incentives that make it safer and more convenient to walk, bike, or take transit
SHARED MOBILITY	• There are no existing shared mobility services in the North Corridor	• The North Corridor has a “medium” Shared Mobility Opportunity Score, but expansion of shared mobility options may require subsidies, cost-share, or other incentives) • Establish a shuttle-based circulator route • Explore the feasibility of creating a network of bike facilities through the corridor

EAST CORRIDOR

Cicero Avenue from 65th Street to 73rd Street

The East Corridor is bounded approximately by 63rd Street to the North, 75th Street to the south, the Belt Railway of Chicago rail yard to the West and Ford City Mall to the East. The intersection of 71st Street and Cicero Avenue is the approximate geographic center of the corridor. The East Corridor, which is centered on Cicero Avenue is the busiest corridor in terms of average daily traffic. In 2017, the corridor had an Annual Average Daily Traffic (AADT) count of 48,033 vehicles per day, including a truck volume of 5,425 trucks per day. Along with Harlem Avenue, Cicero Avenue is a critical north-south corridor that connects commercial traffic originating from Bedford Park and surrounding communities either to I-294 to the south and I-55 to the north.

The East Corridor is comprised almost entirely of commercial land uses on either side of Cicero Avenue, except for where the corridor crosses over the rail yard. Bedford Park's Local Business District (B1) covers all of Bedford Park's portion of the corridor (i.e. everything west of Cicero Avenue), which includes the Midway Hotel Center to the north end of the corridor and a large commercial district consisting of big box retailers, strip mall development, and Ford City Mall to the south.

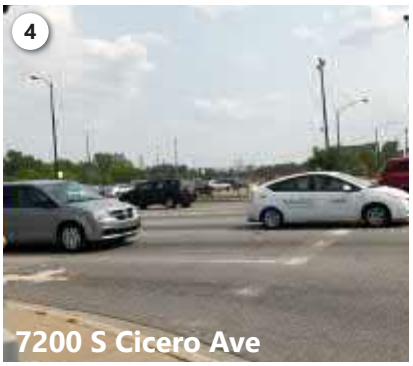
In terms of transportation, the East Corridor has a nearly complete sidewalk network on both sides of Cicero Avenue. However, the prevalence of sidewalk gaps, parking lot driveways, intersections lacking pedestrian safety features (e.g. pedestrian actuated signals, pedestrian crossing pavement markings, ADA curb ramps) collectively make for a dangerous and disorienting pedestrian environment. The nearest transit stop is the Midway Orange Line station (1.7 miles to the center of the corridor).

The East Corridor is serviced by CTA bus routes 54B and Pace Bus Routes 379, 382, 383, 384 385, 390. In 2017, the segment of Cicero Avenue within the East Corridor had an Annual Average Daily Traffic (AADT) count of 48,033 vehicles per day. The Shared-Mobility Opportunity Level for the East Corridor is "medium," but some areas to the north and east of the corridor—where many Bedford Park employees reside—have a "high" Shared-Mobility Opportunity Level.

There are 236 businesses along the East Corridor, which generate approximately 10,007 jobs for the community. This corridor is also home to Bedford Park's largest collection of big box retailers, which are concentrated along Cicero Avenue south of the rail yard and that extend southward beyond the Village's limits. Walmart is the largest employer in the corridor, but other big box retailers include Target, Home Depot, Best Buy, and Ford City Mall in Chicago. Despite the abundance of retail businesses, the Retail Trade industry accounts for only 21% of the workforce. The largest industry in the corridor, in terms of employment is Manufacturing, which accounts for 42% of the jobs in the corridor.

Last mile mobility to and from the corridor is impacted by several local and regional factors. Last mile challenges include, among others: a dangerous and disorienting pedestrian environment along Cicero Avenue; the lack of bike facilities; and truck bottlenecks and congestion. Last mile connection opportunities include, among others: implementing targeted pedestrian safety improvements; launching a crowdsourced carpool or shuttle service that could connect people from neighborhoods northeast, east, and southeast of Bedford Park into the industrial area; and creating a mobility hub near Ford City Mall. A visual assessment (**Figure 3.20**) and a list of the East Corridor's last mile challenges and solution opportunities is provided in **Figure 3.21**.

Figure 3.20. A Visual Assessment of the East Corridor



1. This image shows a utility pole that impeded the Clear Path Zone along S Cicero Avenue. To be ADA compliance there must be at least four feet of clearance from utilities.

2. This image shows a sidewalk that lacks a Buffer Zone between pedestrians and travel lanes. This design is common throughout the Village.

3. This image shows a sidewalk that stops abruptly just north of Target, which creates safety hazard for pedestrians and is not ADA compliant. Developing (and enforcing) design guidelines for developers can reduce occurrences of this in gap in the future.

4. This image shows an intersection that does not provide pedestrians the option to cross from west to east. While a pedestrian actuated signal is installed, the signal does not appear to be functioning.

5. This image shows a wide intersection crossing with no pedestrian countdown signal. Pedestrians had no indication of whether it was safe to cross, so they returned to their car instead of commuting a short distance by foot.

6. This image shows pedestrians ducking under trees. While trees can improve the pedestrian experience by providing shade and reducing stress, poorly managed tree canopies and green infrastructure can create a mobility impediment.

7. This image shows overgrown brush that is obstructing the Clear Path Zone and a CTA bus stop. This obstruction forces pedestrians to cross dangerously close to high-speed traffic along S Cicero Avenue.

Figure 3.21. East Corridor Challenges and Solution Opportunities for Each Transportation Network

EAST CORRIDOR	LAST MILE CHALLENGES	SOLUTION OPPORTUNITIES
PEDESTRIAN	• Long walks for people coming from bus stops on Cicero Ave. to centers of employment to the west • Sidewalk gaps • Light poles obstruct sidewalks, which results in pedestrian infrastructure that is not ADA-compliant • Limited to no buffer between fast-moving travel lanes and sidewalk	• Improve sidewalks by increasing width and reducing obstructions from public utilities, so that they are ADA compliant • Remove obstacles such as overgrown trees that impede the Clear Path Zone • Ensure continuation of sidewalks so they do not abruptly terminate • Improve signaling so that all crosswalks work for pedestrians when walk buttons are pressed
BIKE	• No bike facilities throughout the Cicero Avenue corridor • Very high-speed freight trucking traffic that utilizes full extent of the right-of-way. Speed limits and volume of freight traffic create unsafe biking conditions	• Minimal feasibility for bicycle lanes along Cicero Avenue without extending the right-of-way or dedicating a lane previously used for automobile traffic for a mixture of bike lanes and increased space for pedestrians
TRANSIT	• There is a relatively large number of bus stops (covered and uncovered) throughout the Cicero Ave. corridor. However, limited frequency and reliability of transit forces people to drive alone	• Improve bus transit connections at major destinations such as Midway Airport and Ford City
VEHICLE / FREIGHT	• Faded and missing pavement markings • Congestion is the #1 last mile challenge • Poor road condition	• Use Traffic Demand Management strategies and to incentivize people to take other modes of transit
SHARED MOBILITY	• No existing shared mobility services in the area	• The East Corridor has a “high” Shared Mobility Opportunity Score (i.e. expansion of shared mobility options is a high-priority for this high-traffic area) • Consider introducing a shuttle-based circulator route from Midway Airport south along Cicero Avenue and west along 65th, 73rd, and 79th

SOUTH CORRIDOR

73rd Street from Sayre Avenue to Cicero Avenue

The South Corridor is bounded by the Belt Railway of Chicago rail yard to the North, 75th Street to the south, Sawyer Avenue to the west, and Cicero Avenue to the east. The intersection of 73rd and Mason Ave. is the approximate geographic center of the corridor. The South Corridor, which is centered on 73rd Street, is the second-longest arterial in the Village and home to some of the Village's largest employers, including Walmart, Cintas, FedEx, and Pactiv. With 197 businesses and 6,110 employees, the South Corridor is key to Bedford Park's economy.

The South Corridor is comprised of mostly industrial, transportation, and commercial land uses. The type and distribution of zoning in the corridor include: 50% Light Manufacturing (L1), 40% Heavy Industrial (H1), and 10% Motor Freight Terminal (F).[27] The Village's Local Business Overlay District covers approximately 15% of the Corridor on the east edge along Cicero Avenue. The portion of the Village of Burbank that is immediately to the south of the corridor is predominately a single-family residential area and has a household density of 3 to 6 households per acre. The area to the west and south of Reavis High school has a slightly higher population household density of 6 to 11 households per acre.

In terms of transportation, the South Corridor has an approximately 60% complete sidewalk network, which is generally in a state of good repair. The nearest transit stops are the Midway Orange Line station (3.4 miles to the center of the corridor) and the Ashburn Metra station on Metra's Southwest Service Line (3.4 miles to the center of the corridor). The South Corridor is serviced only by CTA bus route 54B (South Cicero), and Pace Bus Routes 382, 383, and 386, which runs along Harlem Avenue just to the west of the corridor. In 2017, the segment of W 73rd Street that runs through the corridor had an Annual Average Daily Traffic (AADT) count of 14,500 vehicles per day. The Shared Mobility Score for the South Corridor is "medium," according the SUMC's Shared Mobility Mapping Tool.

The eastern end of the South Corridor has a high concentration of big box retailers including Walmart, Target, Home Depot, Best Buy, and Ford City Mall, which is located just east of Village's limits in the City of Chicago. Manufacturing businesses—many of which that have two or three work shifts—dominate the center of the corridor, and FedEx and UPS anchor the west end of the corridor. In terms of employment, manufacturing industry is the largest employer and employs 32.7% of all employees in the corridor. The Retail Trade industry accounts for 16.6% of all employees and 19.8% of all businesses. No other industry has double-digit employer or employee totals along the South Corridor.

Last mile mobility to and from the corridor is impacted by several local and regional factors. Last mile challenges include, among others: long walks into the center of the corridor from Cicero Avenue and Harlem Avenue, an incomplete sidewalk network (e.g. there are long stretches along the south side of 73rd Street that have no sidewalks), lack of 24/7 transit service, limited frequency and poor reliability of transit into the corridor, poor lighting, and dangerous intersections and pedestrian crossings (e.g. the intersections of Sayre Avenue and 75th Street, and Central Avenue and 75th Street). Last mile connection opportunities include, among others: implementing targeted pedestrian safety improvements, optimizing the transit network and schedules, and launching a 24/7 last mile shuttle service that connects employees in the corridor to nearby transit hubs and neighborhoods (e.g. SeatGeek Stadium, Ford City Mall, and Burbank). A visual assessment (**Figure 3.22**) and a more detailed discussion of the South Corridor's last mile challenges and opportunities is provided in **Figure 3.22**

[27] Zoning summaries include only the portions of the corridor that are within Bedford Park's corporate boundaries

Figure 3.22. A Visual Assessment of the South Corridor

1. This image shows a gap in the sidewalk network. Pedestrian "desire lines" can be used to identify priority locations for sidewalk expansions.
2. This image shows a sidewalk gap and illustrates the lack of a Buffer Zone between travel lanes and the sidewalk. To cross this gap, pedestrians must either walk through parking lot, over grass, or in traffic.
3. This image shows an intersection with faded pavement markings. The lack of clearly-marked pedestrian crosswalks create confusion for motorists and pedestrians that are attempting to cross the road.
4. This image shows a Pace bus stop with limited amenities and which is located in an area with relatively low employment density.
5. This image shows a non-ADA accessible curb cuts and curb ramp, which are a common gap in the Pedestrian Network throughout the South Corridor.
6. This image shows a sidewalk gap resulting from utility work. A policy requiring companies to repair disrupted sidewalk segments after utility work would minimize these gaps.
7. This image illustrates a pedestrian making a illegal crossing at the intersection of W 75th Street and S Sayre Avenue. Pedestrians coming from S Harlem Ave/W75th Street 386 Pace stop and heading to/from the FedEx, UPS, and USPS facilities in the South Corridor must (illegally) cross a physical barrier and a dangerous intersection with not formal pedestrian crossing.

Figure 3.23. South Corridor Challenges and Solution Opportunities for Each Transportation Network

SOUTH CORRIDOR	LAST MILE CHALLENGES	SOLUTION OPPORTUNITIES
PEDESTRIAN	• Long walks for people coming from bus stops along Cicero and Harlem Avenues • Sidewalk gaps, especially along the south side of W 73rd Street • Limited to no Buffer Zone to protect pedestrians from fast-moving traffic • Most intersections lack ADA-compliant curb ramps • Missing or faded pavement markings throughout	• Connect sidewalk gaps so that there is a complete sidewalk network on at least one side of 73rd Street • Require contractors to promptly reconstruct sidewalk segments disrupted due to construction or utility work • Require employers to remove snow along the sidewalks in front of their business
BIKE	• There are limited bike facilities throughout the corridor • Current speed limits and volume of freight traffic create unsafe biking conditions	• Explore the feasibility of installing a bike lane or cycle track along W 73rd Street • The large right-of-way and setbacks along W 73rd Street could potentially accommodate a cycle track along the north side of the street
TRANSIT	• The limited frequency, lack of 24-hour service, and poor reliability of transit leaves commuters with few other options than driving alone to work • Some bus stops are in areas with limited employment density • 90% of employees in the corridor drive alone to work	• Close, consolidate, and/or relocate bus stops to areas with highest employment density and demand • Improve bus station amenities at high-demand locations (e.g. shelters, benches, heating)
VEHICLE / FREIGHT	• Faded and missing pavement markings • Congestion is the #1 last mile challenge • Excessive speeding along W 73rd Street (by personal vehicles and commercial trucks) was observed during the site assessment and was cited as a high priority concern by survey respondents • Poor road condition	• Install traffic calming features along W 73rd Street leading up to intersections with high volumes of pedestrian traffic • Use Traffic Demand Management strategies to incentivize people to take other modes of transit • Install a traffic light at the intersection of W 75th Street and Central Avenue
SHARED MOBILITY	• Other than Uber and Lyft, there are no existing shared mobility services in the area • The average cost of an UberPool (i.e. Uber's cheapest service) ride from the Bedford-Park Clearing Industrial Area to the nearest transit hubs is approximately $10.60. • The South Corridor has a "medium" Shared-Mobility Opportunity Level, but the areas to the south provide a more challenging environment for Shared-Mobility	• The South Corridor has a "medium" Shared-Mobility Opportunity Level (i.e. expansion of shared mobility options may require subsidies, cost-share, or other incentives) • Establish a shuttle-based circulator route through the industrial corridor • Launch a 24/7 last mile shuttle service that could connect people from nearby transit hubs and neighborhoods

WEST CORRIDOR

Harlem Avenue from 65th Street to 73rd Street, 71st Street, and Sayre Street

The West Corridor is bounded by 63rd Street to the North, 75th Street to the south, Harlem Avenue to west and Sayre Avenue to the east. The intersection of Harlem Avenue and 71st Street is the approximate center of the corridor. The West Corridor also includes segments of 71st Street and Sayre Avenue. This corridor is primarily utilized as a north-south thoroughfare connecting residential and commercial areas north and south of the rail yard. Together, Harlem Avenue and the various rail lines that run parallel and underneath it, create a physical boundary that divides the Bedford Park-Clearing Industrial Area east of Harlem from Bedford Park's residential area and the industrial area along Archer Road and the Chicago Sanitary and Ship Canal (i.e. Far West Corridor).

The portion of the West Corridor that falls within Bedford Park is comprised primarily of industrial, and transportation, distribution, and logistics (TD&I) land uses. The type and distribution of zoning in the corridor include: 50% Heavy Industrial (H1), 30% Light Manufacturing (L1), 10% Motor Freight Terminal (F), and 10% other industries. Much of the southern portion of the West Corridor, including the areas south of 71st Street and west of Harlem Avenue, are within the Village of Bridgeview. The portion of Bridgeview that is located immediately southwest of Bedford Park is comprised of mostly single-family residential neighborhoods with a housing density of 1.5 to 3 households per acre and moderate density commercial development along Harlem Avenue.

In terms of the corridor's transportation networks, the West Corridor has highly variable sidewalk conditions. The nearest transit stop is the Summit Metra station (3.3 miles to the center of the corridor). The West Corridor is serviced only by Pace bus routes 386 and 856, the Toyota Park - East Loop Express, which provides weekday rush hour service between the Toyota Park Transit Center (now "Bridgeview Transit Center") at Toyota Park (now "SeatGeek Stadium") in Bridgeview and the East Loop in Chicago. In 2017, the segments of Harlem Avenue within the West Corridor had an Annual Average Daily Traffic (AADT) count of 43,200 vehicles per day, including a relatively high rate of truck traffic with 7,200 commercial vehicles per day. The Shared-Mobility Opportunity Level for the West Corridor is "medium." Adjacent west and south areas of the corridor, bordering the Sanitary and Ship Canal and in the shadow of I-55, provide a more challenging environment for shared mobility services, even with public-sector support. This is due to the low population and workforce density, as well as other transportation, land use, and socio-economic factors.

The West Corridor along Harlem Avenue has a moderately dense concentration of employment with 107 employers and approximately 2,699 employees along the 1.8-mile long corridor. Argo Community High School anchors the northern end of the corridor, SeatGeek Stadium, and the FedEx and UPS facilities the southern end. Harlem Avenue serves as a critical north-south thoroughfare that connects Bedford Park to I-294 to the south and I-55 to the north. Cicero Avenue and Harlem Avenue are the only two north-south crossings over the Clearing Yards for about a 5.26-mile stretch (i.e. from S Pulaski Road to S Archer Road). The limited north-south connectivity over the Clearing Yards is one of the key reasons why both Harlem Avenue and Cicero Avenue are Truck Bottlenecks.

Last mile mobility to and from the corridor is impacted by several local and regional factors. Last mile challenges include, among others: an incomplete sidewalk network along Harlem Avenue; severe truck bottlenecks along Harlem Avenue and at the intersection of 71st Street and Sayre Avenue, and 73rd Street and Sayre Avenue; limited pedestrian connectivity from Harlem Avenue bus stops in Bridgeview to companies in the South Corridor (e.g. FedEx and UPS facilities). Last mile connection opportunities include,

among others: expanding the sidewalk network; implementing targeted pedestrian safety and crossing improvements; collaborating with Pace to expand the usage of the Bridgeview Transit Center and expanding the mobility hub's multimodal and shared mobility connectivity into the Bedford Park-Clearing Industrial Area; and continuing to coordinate with Pace on the implementation of the Pulse route along Harlem Avenue. A visual assessment (**Figure 3.24**) and a more detailed discussion of the North Corridor's last mile challenges and opportunities is provided in **Figure 3.25.**

Figure 3.24. A Visual Assessment of the West Corridor

1 This image shows pedestrians walking to/from parcel carrier facilities must walk long stretch of W 75th Street, which (according to survey respondents) is often not cleared of snow during winter months.

2 This image shows how pedestrians coming from the S Harlem Avenue/W 75th Street Pace Route #386 bus stop and heading to/from FedEx, UPS, and USPS facilities must (illegally) cross a physical barrier and a dangerous intersection with not formal pedestrian crossing.

3 This image shows a Pace bus stop at W 74th Street and S Harlem Avenue with limited amenities facilities for transit riders.

4 This image shows a CTA bus stop where bus riders must board or exit the bus at an area where the sidewalk is in very poor condition. Improving the user experience will require coordination of transit agencies and local municipalities.

5 This image shows a sidewalk lacking a curb and a well-defined defined Clear Path Zone along W 65th Street, east of S HarlemAvenue.

Figure 3.25. West Corridor Challenges and Solution Opportunities for Each Transportation Network

WEST CORRIDOR	LAST MILE CHALLENGES	SOLUTION OPPORTUNITIES
PEDESTRIAN	• Stretches of road with no sidewalks near 65th and Harlem Avenue • No sidewalk or passthrough available to pedestrians at 75th and Sayre • Limited crosswalks throughout West Corridor • Turning truck traffic and no walk signals	• Connect sidewalk gaps so that there is a complete sidewalk network on at least one side of 65th Street near Harlem Avenue • Implement targeted crosswalks improvements and pedestrian safety improvements in areas with high employment density and foot traffic
BIKE	• Limited bike facilities throughout the corridor • Roads are not conducive to bike traffic • Volume of freight traffic creates unsafe biking conditions • No bike lanes and high traffic speeds on Harlem Avenue	• Explore the feasibility of installing a bike lane or cycle track along Harlem Avenue
TRANSIT	• Poorly marked transit stops and difficult pedestrian access • CTA bus route #165 has eight westbound trips during the AM peak, and eight eastbound trips in PM peak. CTA service during off peak hours and the weekend is limited.	• Relocate bus stops to areas with highest employment density • Add additional amenities at bus stops (e.g. shelters, benches, heating) • Coordinate bus schedules with major shift changes
VEHICLE / FREIGHT	• Continuous truck back-up at CSX turn-in location • Left turn lane at 71st & Harlem quickly backs-up, traffic coming over south over hill at increased speeds forced to stop quickly. • Poor road conditions (e.g. faded road markings, potholes)	• Optimize traffic signals to allow for longer and increased number of trucks to turn • Add Pedestrian Actuated Signals
SHARED MOBILITY	• No existing shared mobility services in the area • Limited shared mobility opportunity along western end of the Village due to the low population and workforce density, as well as other transportation, land use, and socio-economic factors	• Establish a shuttle-based circulator route through the industrial corridor • Work with Pace to expand the usage of Pace Transit Center at Harlem Avenue and W 71 Street • Create multimodal and shared mobility connections between the Pace Transit Center and Bedford Park's industrial area • Continue to coordinate with Pace on the implementation of the Pulse route along Harlem Avenue

FAR WEST CORRIDOR

Archer Road from 71st Street to 65th Street

The Far West Corridor runs diagonally along the Archer Road in parallel to the Chicago Sanitary and Ship Canal. The north end of the corridor is 63rd Street and the south end is 71st Street. The corridor extends two blocks east of Archer Road to include the Village's residential area. The approximate center of the corridor is slightly north of the intersection of Archer Road and 68th Street. This corridor is primarily utilized as a northeast-southwest thoroughfare connecting travelers to I-55 and I-294. Archer Road is classified as a minor arterial and used heavily by truck traffic flowing from the industrial areas between Archer Road and the Chicago Sanitary and Ship Canal, which include Ingredion, ACH Food, and other heavy industrial companies.

Archer Road splits Bedford Park's Far West Corridor into two very distinctive areas. The area west of Archer Road is characterized by heavy industrial and logistics land uses whereas the area east of Archer Road is characterized by residential and institutional land uses. Bedford Park's Village Hall, Police Department, Library, Park District, Walker Elementary School, the Swanson Center, and only residential area are located east of Archer Road. The type and distribution of zoning in the corridor include: 30% Heavy Industrial (H1), 20% Light Manufacturing (L1), 25% Residential, 15% Parks, and 10% Institutional. The north end of the corridor leads into a commercial corridor in the Village of Summit after crossing under the Indiana Harbor Belt (IHB) Railroad bridge. The southern end of the corridor includes transportation, distribution, and logistics (TD&L) companies; and the Resurrection and Bethania cemeteries, which are located just south of the corridor in the Village of Justice.

In terms of transportation, the residential area within the Far West Corridor has a complete sidewalk network in excellent condition. However, the sidewalk network on the west side of Archer Road ends south of the Institute for Food Safety and Health campus. The nearest transit stop is the Summit Metra station (1.3 miles north of the corridor). The Far West Corridor is not currently serviced by CTA or Pace buses, but there is a bus terminal at 63rd Street and Archer. In 2017, Archer Road had an Annual Average Daily Traffic (AADT) count of 24,466 vehicles per day, including a relatively high rate of truck traffic with 2,750 commercial vehicles per day. Due to the area's low population and employment density and disturbed land use, the corridor provides the most challenging environment for shared mobility services.

The Far West Corridor has the lowest employment density within the village with less than 15 employers. Village Hall, Bedford Park District, and Walker Elementary School are centrally located along the eastern portion of the corridor with a grid of streets and sidewalks servicing the entire residential area, including a park with two baseball diamonds and a greenway network surrounding the residential area. While the eastern portion of the corridor is primarily residential, the western portion of the corridor includes some of the largest employers in the village, namely Ingredion, Inc., which is a global provider and manufacturer of ingredients for the food manufacturing industry.

Last mile mobility to and from the corridor is impacted by several local and regional factors. While the eastern portion of the corridor (i.e. Bedford Park's residential district) has a nearly complete sidewalk network in excellent condition, the sidewalk network west of Archer Avenue is virtually non-existent. There is a stretch of sidewalk starting at 65th Street that leads north to Summit, which permits pedestrian access to Ingredion's campus and the Illinois Institute of Technology from the north. Taken together, the minimal pedestrian facilities, the lack of transit service, and limited Shared-Use Opportunity makes this corridor very difficult to reach by any mode other than a personal (or shared) vehicle. A more detailed discussion of the North Corridor's last mile challenges and opportunities is provided in **Figure 3.26**.

Figure 3.26. Far West Corridor Challenges and Solution Opportunities for Each Transportation Network

FAR WEST CORRIDOR	LAST MILE CHALLENGES	SOLUTION OPPORTUNITIES
PEDESTRIAN	• The sidewalk network along the west side of Archer Road is only 30% complete and permits pedestrian access only from the north • The entrance drive to Ingredion's Gate 5 and Ace Hardware's Lumber Yard creates a dangerous crossing situation for pedestrians walking into the Far West Corridor from the north • There are no pedestrian crossings across Archer Road connecting the Bedford Park residential area to the industrial area	• Implement targeted pedestrian safety improvements along the west side of Archer Avenue • Provide high visibility crosswalks across Archer Road near Village Hall • Improve sidewalks in industrial area to allow for a more viable live-work situation in the village
BIKE	• There are currently no bike facilities throughout the Far West Corridor • Volume and speed of and private and commercial freight traffic creates unsafe biking conditions	• Continue to participate in the Illinois and Michigan (I&M) Canal Trail Extension Steering Committee and explore the feasibility of extending the trail from Willow Springs (where the current terminus lies) north to the Portage Historical Site in Forest View
TRANSIT	• Other than the 63rd Street and Archer Road Terminal located immediately the north of the corridor, there is no CTA or Pace bus serving the Far West Corridor	• Improve pedestrian connectivity from the 63rd Street and Archer Road Terminal into the Far West Corridor • Improve connections to Metra Summit station with increased coordination with Pace buses
VEHICLE / FREIGHT	• High rates of heavy commercial vehicle truck traffic cause stress to roads and necessitates more ongoing road maintenance	• Provide high-visibility wayfinding signage for commercial vehicle traffic to better understand where their access points are for businesses, Village Hall, and other major destinations. • Optimize traffic signals to allow for more trucks to turn left at targeted intersections to reduce truck bottlenecks
SHARED MOBILITY	• There are currently no existing shared mobility services in the area • The Far West Corridor has very limited Shared- Mobility Opportunity Level due to the area's low population and workforce density, dispersed land use, and other socio-economic factors	• Launch a 24/7 last mile shuttle service that could provide last mile connectivity from nearby transit hubs (e.g. the Summit Metra Station and 63rd Street and Archer Road Terminal) and neighborhoods (e.g. Summit, Clearing) in the Far West Corridor

SUMMARY

The Last Mile Gap Assessment covers the four interconnected travel networks of Bedford Park (Pedestrian, Bike, Transit, Motorist and Freight) as well as the overarching Shared Mobility Network and delineates five primary corridors in the Bedford Park Clearing Industrial Area (North, East, South, West, and Far West). The corridors are examined using the travel networks. Visual assessments of the networks and corridors help to illustrate the current transportation challenges of Bedford Park.

Collectively the transit networks are affected by the type of infrastructure, demographics, travel patterns, land use constraints, operational challenges, and disruptive technologies.

- **Pedestrian Network.** The pedestrian network has deficiencies such as lack of buffer zones, infrequent mid-block crossings, lack of amenities, and routes in need of repair, resulting in safety challenges. Improving and expanding the routes pedestrians frequent will promote a safer and more enjoyable walking experience for all users of the community's pedestrian network.
- **Bike Network.** Bike routes in Bedford Park do not connect to the broader network and lack bike facilities (e.g. off street and protected bike paths), creating a dangerous bike network. Providing more bike facilities will improve the safety and promote bike commuting in Bedford Park.
- **Transit Network.** The transit network currently is served by CTA and Pace bus service, but it is infrequent, has poor reliability, lacks late-night and weekend routes, and requires long walks to nearest transit stations. Expanding conventional fixed-route bus service is not necessarily a viable solution. Alternatively, transit solutions could include other options and innovative public-private partnership models for delivering last mile mobility, such as a last mile microtransit.
- **Motorist and Freight Network.** This vehicle network includes many SOVs and commercial vehicles which result in bottlenecks and traffic congestion, including long delays from rail traffic and long red lights. Enhancing the motorist and freight network with traffic calming and Traffic Demand Management could make the network inherently safer for other modes of transportation, such as pedestrians and cyclists.
- **Shared Mobility Network.** SUMC defines the shared mobility network as "transportation services and resources that are shared among users, either concurrently or one after another."[28] The Shared Mobility Network includes challenges surrounding infrequent and costly TNCs, lack of proximate car sharing vehicles, and lack of mobility sharing systems. Overall, Bedford Park has a "medium" shared mobility opportunity and given the right policy or financial supports, mobility services (e.g. carsharing, bike sharing, scooter sharing, TNCs, Microtransit, On-Demand Carpooling) might do well.

[28] https://sharedusemobilitycenter.org/what-is-shared-mobility/

Each corridor faces similar challenges and solution opportunities.

- **North Corridor.** A major collector street with a "medium" shared mobility opportunity, long walks, limited bike facilities, high-speed traffic, poor road conditions, and traffic congestion.
- **East Corridor.** A principal arterial with a "high" shared mobility opportunity, long walks, no bike facilities, high-speed traffic, limited transit frequency, congestion, missing pavement markings, and no shared mobility services.
- **South Corridor.** A major collector street with a "medium" shared mobility opportunity, long walks, no buffer zone, limited bike facilities, high speed traffic, limited transit frequency, and congestion.
- **West Corridor.** A principal arterial with no existing shared mobility services in the area, long stretches without sidewalks, limited bike facilities, poorly marked transit stops, continuous truck back-up, and poor road conditions.
- **Far West Corridor.** A minor arterial with no existing shared mobility services, limited sidewalk network and pedestrian crossings, no bike facilities, loud and high-speed traffic, and high rates of commercial vehicle truck traffic.

Solutions for the corridors include, but are not limited to, connecting the sidewalk gaps and making improvements to sidewalks and signaling; installing more bike facilities; improving bus transit connections; using Traffic Demand Management; utilizing traffic calming strategies; optimizing traffic signals; providing pedestrian actuated signals; wayfinding with high-visibility; and a 24/7 last mile shuttle service.

The next section, **Chapter 4**, provides a more detailed discussion of potential last mile solutions.

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CENTRAL DIRECTORY
Badford Park Waterworks
Carr Lumber & Mfg. Co.
Belt Railway Co.
Alpa Construction
BEDFORD PARK
Central Av
bus stop
COUNTRY THUNDER
COUNTRYTHUNDER.COM

Chapter 4

LAST MILE SOLUTION TOOLKIT

This chapter provides a Toolkit of potential last mile solutions that the Village, regional agencies, mobility providers, and other partners can deploy in response to the challenges described in **Chapter 3**. The following Last Mile Solution Toolkit ("Toolkit") (**Appendix G**) is structured in accordance with our framework for an integrated and equitable mobility system and includes solutions for the Pedestrian, Bike, Transit, and Motorist and Freight transportation networks.

LAST MILE SOLUTION TOOLKIT

HOW TO USE THE TOOLKIT

The Toolkit presented here describes an array of potential solutions that can be applied to the Pedestrian, Bike, Transit, and Motorist and Freight networks in Bedford Park. The Toolkit includes both pragmatic and innovative solutions that address Bedford Park's unique **Last Mile Challenges**. The Toolkit includes four solutions for each of the transportation networks (e.g. Pedestrian Network, Bike Network, Transit Network, Motorist and Freight Network). Each solution includes a set of more specific treatments and implementation actions. The Toolkit provides a snapshot of useful descriptive information and evaluation criteria for each solution that the Village staff and partners can reference when making planning and capital improvement decisions; these include:

- **Challenges Addressed.** A list of the last mile challenge(s) that are addressed by the solution (e.g. Long Walks, Limited Transit Supply and Reliability, Degraded Infrastructure, Dangerous Travel Conditions, Restrictive Right of Ways, Poor Transit Legibility and Alignment);
- **Type of Intervention.** The primary intervention a solution encompasses (e.g. Infrastructure Improvements, Technology Deployment, Operational Changes, Policy/Partnership/Program); and
- **Evaluation.** A high-level evaluation of each Last Mile Solution (e.g. Safety Improvement, Affordability, Community Preference, Feasibility/Readiness, Transit Benefits).

Each solution was evaluated by five guiding principles, shown below. Solutions were assigned a score based on the degree to which it performed against the evaluation criteria. Scores were generating using the Delphi Method and based on a scale of 0 to 10, with 0 being lowest performance and 10 being highest performance.[29]

The purpose of this Toolkit is to provide Bedford Park decision-makers and partners with a targeted set of solutions for the area's last mile challenges. Additional information on treatments and action is provided in **Appendix G.**

FIVE GUIDING PRINCIPLES

Safety. Last mile solutions improve travel safety for all users, especially the most vulnerable.

Affordability. Last mile solutions address mobility challenges in a way that is cost effective for the Village and for commuters.

Community Support. Last mile solutions respond to community concerns and leverage community strengths.

Feasibility. Last mile solutions are planned, designed, and implemented in a way that recognizes fiscal, political, and operational constraints.

Supportive of Transit. Last mile solutions support the use of public transit and other sustainable modes of transportation.

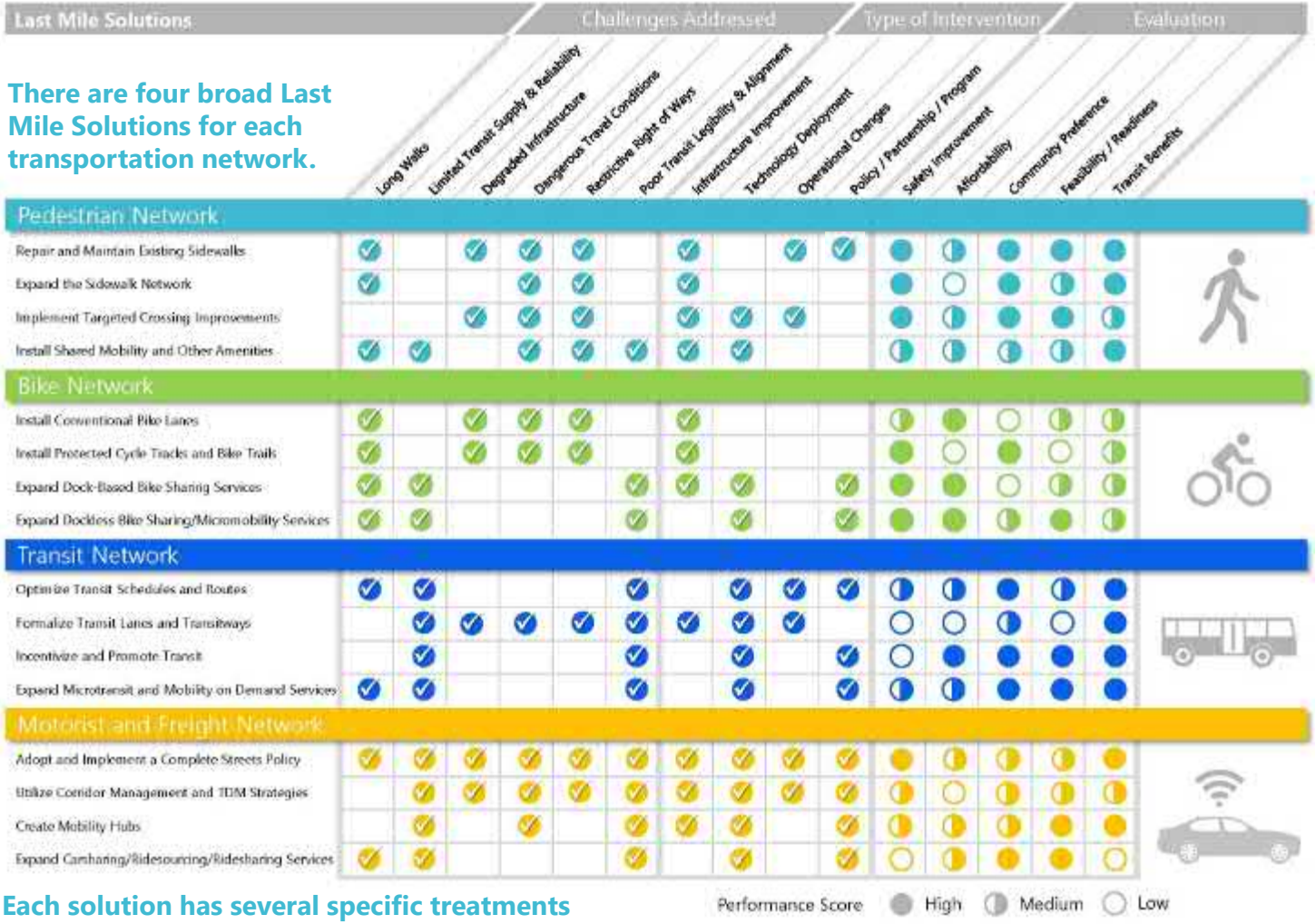
[29] The Project Team reviewed information and data gathered through the following sources to assign a score for each evaluation criteria: the mobility survey (Appendix D); resource group meetings; the last mile assessment; case studies (Appendix B); infrastructure cost tables (Appendix H); and the last mile mobility demo day.

Figure 4.1. How to Use the Last Mile Toolkit

Refer here for guidance on which last mile challenge(s) each solution addresses and the type of intervention(s) the solution entails.

Each solution was evaluated based on the following five evaluation criteria.

There are four broad Last Mile Solutions for each transportation network.



Each solution has several specific treatments and actions which are listed in the Toolkit.

Figure 4.2. Last Mile Solution Toolkit and Map

Last Mile Solutions	Challenges Addressed									Type of Intervention			Evaluation		
	Long Walks	Limited Transit Supply & Reliability	Degraded Infrastructure	Dangerous Travel Conditions	Restrictive Right of Ways	Poor Transit Legibility & Alignment	Infrastructure Improvement	Technology Deployment	Operational Changes	Policy / Partnership / Program	Safety Improvement	Affordability	Community Preference	Feasibility / Readiness	Transit Benefits
Pedestrian Network															
Repair and Maintain Existing Sidewalks	✓		✓	✓	✓		✓		✓	✓	●	◑	●	●	●
Expand the Sidewalk Network	✓			✓	✓		✓				●	○	●	◑	●
Implement Targeted Crossing Improvements			✓	✓	✓		✓	✓	✓		●	◑	●	●	◑
Install Shared Mobility and Other Amenities	✓	✓		✓	✓	✓	✓	✓			◑	◑	◑	◑	●
Bike Network															
Install Conventional Bike Lanes	✓		✓	✓	✓		✓				◑	●	○	◑	◑
Install Protected Cycle Tracks and Bike Trails	✓		✓	✓	✓		✓				●	○	●	○	◑
Expand Dock-Based Bike Sharing Services	✓	✓				✓	✓	✓		✓	●	●	○	◑	◑
Expand Dockless Bike Sharing/Micromobility Services	✓	✓				✓		✓		✓	●	●	◑	●	◑
Transit Network															
Optimize Transit Schedules and Routes	✓	✓				✓		✓	✓	✓	◑	◑	●	◑	●
Formalize Transit Lanes and Transitways		✓	✓	✓	✓	✓	✓	✓	✓		○	○	◑	○	●
Incentivize and Promote Transit		✓				✓		✓		✓	○	●	●	●	●
Expand Microtransit and Mobility on Demand Services	✓	✓				✓		✓		✓	◑	◑	●	●	●
Motorist and Freight Network															
Adopt and Implement a Complete Streets Policy	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	●	◑	◑	◑	●
Utilize Corridor Management and TDM Strategies		✓	✓	✓	✓	✓	✓	✓	✓	✓	◑	○	◑	◑	◑
Create Mobility Hubs		✓		✓		✓	✓	✓		✓	◑	◑	◑	●	●
Expand Carsharing/Ridesourcing/Ridesharing Services	✓	✓				✓		✓		✓	○	◑	●	●	○

Performance Score ● High ◑ Medium ○ Low

TOOLS FOR THE PEDESTRIAN NETWORK

Every trip begins and ends with walking, so everyone is a pedestrian at some point.[30] Pedestrians need continuous and unobstructed paths, well-lit spaces, shaded places to rest and walk, and clear wayfinding signage for a safe and comfortable last mile experience. Pedestrian networks should be safe, comfortable, and enjoyable for all users, especially the most vulnerable users: the young, elderly, and people with disabilities.

Bedford Park's sidewalk network is constructed, like many communities, to support primarily residential uses. However, with such a heavy influx of workforce entering the community daily, bringing existing sidewalks and crosswalks up to a state of good repair would be an appropriate and useful initial effort. Then, filling in gaps and expanding the sidewalk network—especially in high foot-traffic areas and corridors leading to- and from transit stops—would enhance commuters' last mile journey and improve access to transit. Other pedestrian amenities, such as pedestrian-scaled lighting, additional seating and weather protection, and wayfinding signage, can be installed as needed and would further enhance the pedestrian experience. Below is a discussion of several Pedestrian Network solutions and treatments that could readily be prioritized.

PEDESTRIAN NETWORK LAST MILE SOLUTIONS

1. Repair and Maintain Sidewalks
2. Expand the Sidewalk Network
3. Implement Targeting Crosswalk Improvements
4. Install Shared Mobility and Other Networks

[30] Or rolling in the case of people with disabilities.

1. REPAIR AND MAINTAIN SIDEWALKS

Description

This Last Mile Solution includes treatments with the following characteristics

Challenge(s) Addressed	Long Walks Degraded Infrastructure Dangerous Travel Conditions Restrictive Right of Ways
Type of Intervention(s)	Infrastructure Improvement Operational Changes

Evaluation

Score: 0 - 4 – low / 5 - 7 – medium / 8 - 10 – high

Safety Improvement	9
Affordability	7
Community Preference	8
Feasibility / Readiness	9
Transit Benefits	9

TREATMENTS + ACTIONS

- Conduct a village-wide sidewalk assessment
- Identify and repair high priority sidewalks
- Create buffer zone where feasible
- Improve snow removal practices
- Install green stormwater infrastructure

Figure 4.3. Sidewalk Improvment Treatments

2. EXPAND SIDEWALK NETWORK

Description

This Last Mile Solution includes treatments with the following characteristics

Challenge(s) Addressed	Long Walks Dangerous Travel Conditions Restrictive Right of Ways
Type of Intervention(s)	Infrastructure Improvements Operational Changes

Evaluation

Score: 0 4 = low / 5 7 = medium / 8 10 = high

Safety Improvement	9
Affordability	4
Community Preference	8
Feasibility / Readiness	5
Transit Benefits	7

TREATMENTS + ACTIONS

- Connect gaps in sidewalk network
- Widen sidewalks and create buffer zones
- Install mid-block crossings where appropriate
- Formalize pedestrian cut-throughs and improve internal parking lot circulation
- Provide high-quality sidewalks

Figure 4.4. Sidewalk Expansion Treatments

3. IMPLEMENT TARGETED CROSSING IMPROVEMENTS

Description

This Last Mile Solution includes treatments with the following characteristics

Challenge(s) Addressed	Degraded Infrastructure Dangerous Travel Conditions Restrictive Right of Ways
Type of Intervention(s)	Infrastructure Improvements Technology Deployment Operational Changes

Evaluation

Score: 0 - 4 low / 5 - 7 medium / 8 - 10 high

Safety Improvement	8
Affordability	5
Community Preference	9
Feasibility / Readiness	8
Transit Benefits	7

TREATMENTS + ACTIONS

- Install and maintain ADA curb ramps, tactile pads, and high visibility crosswalks
- Install accessible pedestrian countdown signals with leading pedestrian intervals
- Install pedestrian refuge islands where appropriate
- Create bump-outs and curb extensions
- Install Rectangular Rapid Flashing Beacons (RRFBs)

Figure 4.5. Crossing Improvements

4. INSTALL SHARED MOBILITY AND OTHER PEDESTRIAN AMENITIES

Description

This Last Mile Solution includes treatments with the following characteristics

Challenge(s) Addressed	Long Walks Limited Transit Supply & Reliability Dangerous Travel Conditions Restrictive Right of Ways Poor Transit System Legibility and Legibility
Type of Intervention(s)	Infrastructure Improvements Technology Deployment

Evaluation

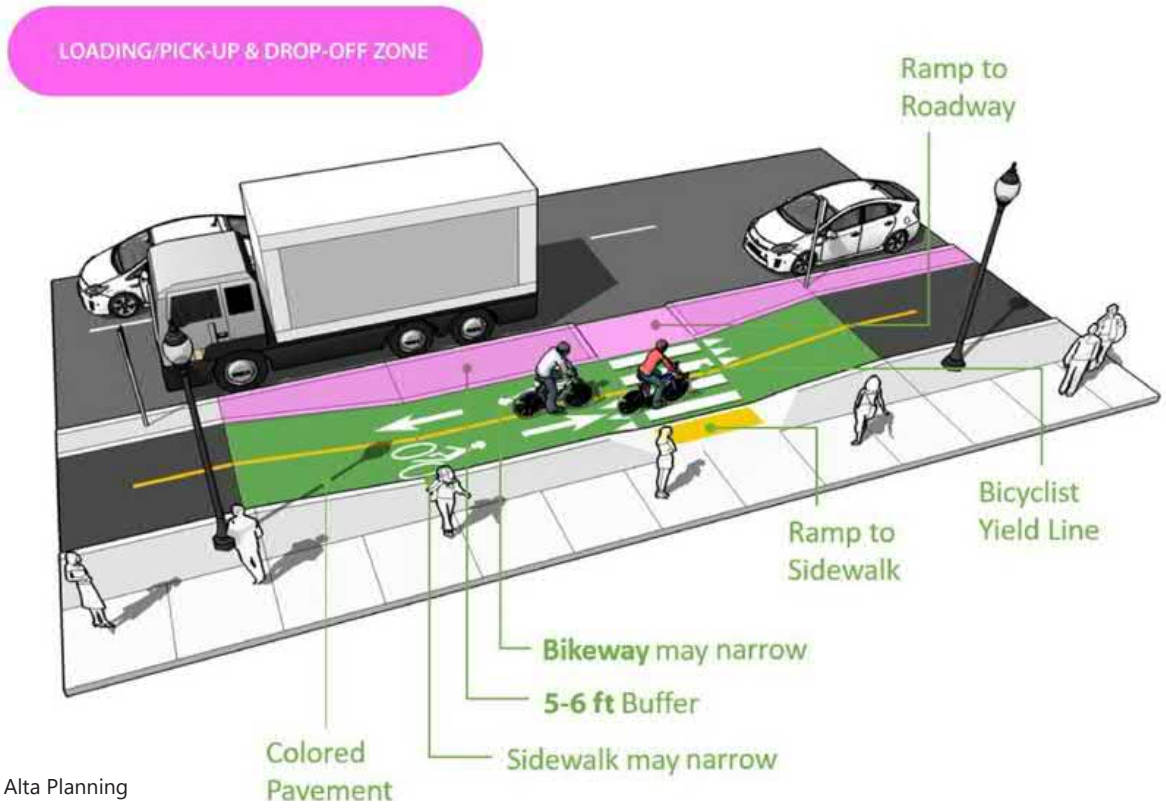
Score: 0 - 4 = low / 5 - 7 = medium / 8 - 10 = high

Safety Improvement	6
Affordability	6
Community Preference	7
Feasibility / Readiness	5
Transit Benefits	8

TREATMENTS + ACTIONS

- Create TNC pickup and drop-off zones
- Install pedestrian-scaled lighting
- Install more seating and weather protection
- Install pedestrian-scaled wayfinding signage

Figure 4.6. Pick-up and Drop-off Zone Concept



Alta Planning

TOOLS FOR THE BIKE NETWORK

Cycling is a healthy, affordable, equitable, and sustainable mode of transportation, with positive impacts on congestion and road safety. Cities that have invested in bike facilities have seen congestion levels decline and streets become safer for all users.[31] Communities are well-served prioritizing cycling by ensuring that comprehensive cycle networks are planned and implemented. Offering a range of bike facilities that provide safe, convenient, and connected routes will help cyclists to reach key destinations without the need for motorized travel.

Bedford Park and the surrounding areas currently present a challenging environment for biking. However, CMAP and several neighborhood communities have proposed a network of bike facilities that could improve bike access to the Bedford Park area. For example, proposed side paths, bike trails, bike boulevards in Summit, Burbank, Justice, and Chicago—if implemented—would improve access for the 38% of Bedford Park's workforce who live within a bikeable distance. The challenge, however, will be constructing a connected network of bike facilities that make it safe to bike throughout the Bedford Park-Clearing Industrial Area. Given the prevalence of commercial traffic and other design constraints, this local network of bike facilities would have to utilize more off-street and protected bike facilities which are costlier and more challenging to implement. Below is a discussion of several Bike Network solutions and treatments that could be considered alongside other last mile solutions.

BIKE NETWORK LAST MILE SOLUTIONS

1. Install Conventional Bike Lanes
2. Install Protected Cycle Tracks and Bike Trails
3. Expand Dock-Based Bike Sharing
4. Expand Dockless Bike Sharing and Other Micromobility Services

[31] Thomas Gotschi, "Costs & Benefits of Bicycling Investments in Portland, Oregon." Journal of Physical Activity & Health 8 (2001), 49-58.

1. INSTALL CONVENTIONAL BIKE LANES

Description

This Last Mile Solution includes treatments with the following characteristics

Challenge(s) Addressed	Long Walks Degraded Infrastructure Dangerous Travel Conditions Restrictive Right of Ways
Type of Intervention(s)	Infrastructure Improvements

Evaluation

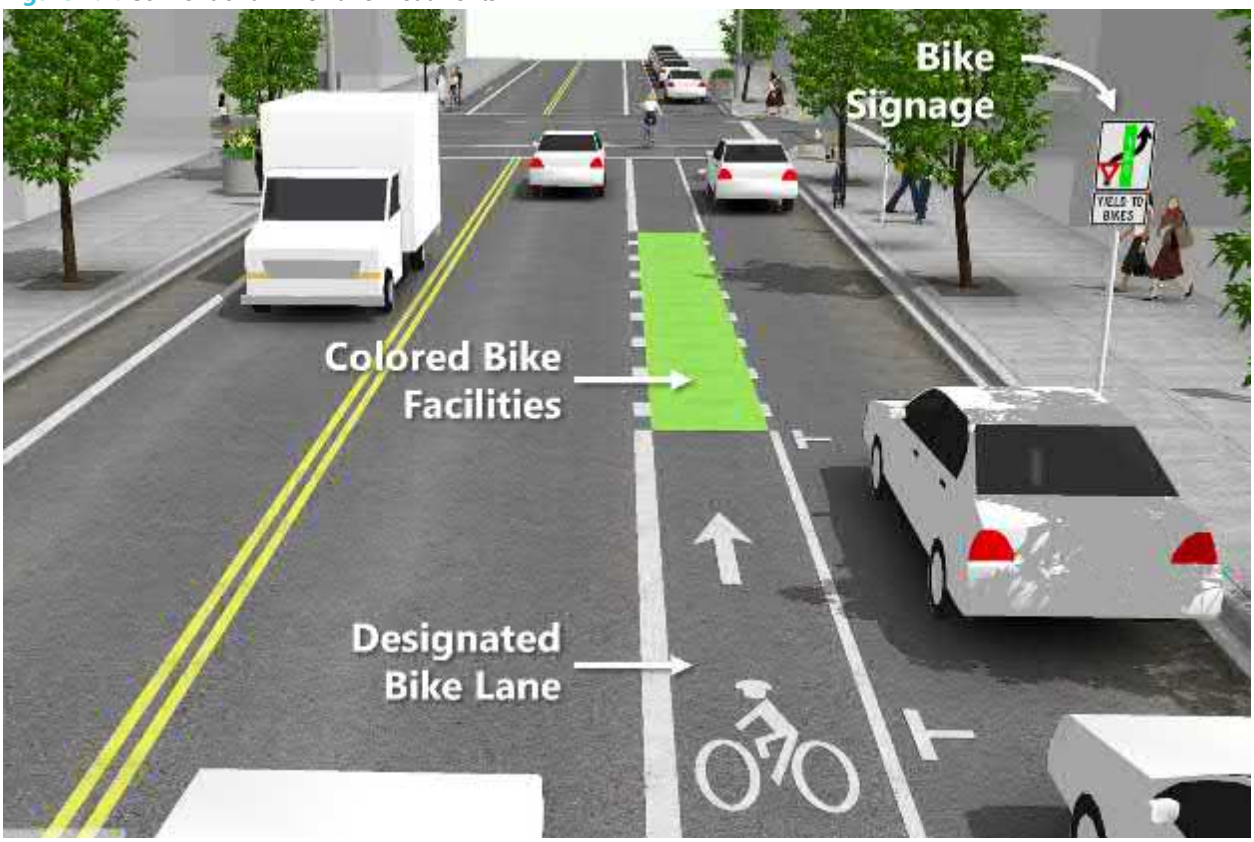
Score: 0 - 4 low / 5 - 7 medium / 8 - 10 high

Safety Improvement	5
Affordability	8
Community Preference	2
Feasibility / Readiness	5
Transit Benefits	5

TREATMENTS + ACTIONS

- Create bikeways using sharrows, marked shared lanes, and buffered bike lanes
- Install colored bike facilities
- Install bikeway signage

Figure 4.7. Conventional Bike Lane Treatments



2. INSTALL PROTECTED CYCLE TRACKS AND BIKE TRAILS

Description

This Last Mile Solution includes treatments with the following characteristics:

Challenge(s) Addressed	Long Walks Degraded Infrastructure Dangerous Travel Conditions Restrictive Right of Ways
Type of Intervention(s)	Infrastructure Improvements

Evaluation

Scores: 0 - 4 low / 5 - 7 medium / 8 - 10 high

Safety Improvement	9
Affordability	3
Community Preference	7
Feasibility / Readiness	4
Transit Benefits	5

TREATMENTS + ACTIONS

- Install protected cycle tracks
- Install raised cycle tracks
- Install two-way cycle tracks
- Install off-street trails / paths
- Continue to support the I&M Canal Trail expansion efforts

Figure 4.8. Protected Cycle Track Treatments

3. EXPAND DOCK-BASED BIKE SHARING

Description

This Last Mile Solution includes treatments with the following characteristics:

Challenge(s) Addressed	**Long Walks** **Limited Transit Supply and Reliability** **Poor Transit System Legibility and Alignment**
Type of Intervention(s)	**Infrastructure Improvements** **Technology Deployment**

Evaluation

Score: 0 – 4 = low / 5 – 7 = medium / 8 – 10 = high

Safety Improvement	3
Affordability	8
Community Preference	4
Feasibility / Readiness	5
Transit Benefits	7

TREATMENTS + ACTIONS

- Partner with Divvy
- Promote Divvy for Everyone (D4E)
- Install bike racks and corrals
- Identify candidate bike sharing station locations

Figure 4.9. Divvy Bike Sharing Station

Source: Wikimedia Commons

4. EXPAND DOCKLESS BIKE SHARING AND OTHER MICROMOBILITY SERVICES

Description

This Last Mile Solution includes treatments with the following characteristics

Challenge(s) Addressed	Long Walks Limited Transit Supply and Reliability Poor Transit System Legibility and Alignment
Type of Intervention(s)	Infrastructure Improvements Technology Deployment

Evaluation

Score: 0 - 4 = low / 5 - 7 = medium / 8 - 10 = high

Safety Improvement	2
Affordability	9
Community Preference	5
Feasibility / Readiness	8
Transit Benefits	7

TREATMENTS + ACTIONS

- Launch a micromobility pilot program
- Pilot and evaluate dockless bike sharing
- Pilot and evaluate e-scooter sharing
- Partner with micromobility providers
- Scale up micromobility services if pilot is successful
- Install micromobility parking, charging stations, and other supportive infrastructure

Figure 4.10. . Micromobility Parking Facility

TOOLS FOR THE TRANSIT NETWORK

From fixed-route bus and rail services to small, on-demand paratransit services, transit offers a sustainable and efficient way to move people in urban areas. Transit is complementary to walking and cycling and enables people to take longer trips without the use or ownership of a private vehicle. Providing dedicated space within the road right-of-way helps transit networks to deliver reliable, convenient, and frequent service to passengers without delays from mixed traffic.

Transit plays a critical role in ensuring equal access to jobs and economic opportunity. While new mobility technologies, services, and business models are transforming the urban mobility industry, public transit will continue to be the backbone of an integrated and equitable mobility system in Bedford Park and the broader region. Bedford Park leaders and staff should continue to work with neighboring municipalities, transit agencies, Cook County, employers, and other civic partners to advocate for solutions that improve the convenience, frequency, reliability, and overall user experience of existing transit service in the area. Improvements, such as better aligning transit service schedules with work schedules, and improving bus stops, would encourage transit ridership and help ensure that transit remains a convenient and popular means by which to get to Bedford Park. Bedford Park should also explore innovative partnerships with last mile mobility provides to expand the reach of transit into areas that are not readily served by conventional fixed-route bus and rail service. Below is a discussion of several Transit Network solutions and treatments that could be considered alongside other last mile solutions.

TRANSIT NETWORK LAST MILE SOLUTIONS

1. Optimize Transit Schedules and Routes
2. Formalize Transit Lanes and Transitways
3. Incentivize and Promote Transit
4. Expand Microtransit and Mobility on Demand Services

1. OPTIMIZE TRANSIT SCHEDULES AND ROUTES

Description

This Last Mile Solution includes treatments with the following characteristics:

Challenge(s) Addressed	**Long Walks** **Limited Transit Supply and Reliability** **Poor Transit System Legibility and Alignment**
Type of Intervention(s)	**Technology Deployment** **Operational Changes** **Policy/Partnership/Program**

Evaluation

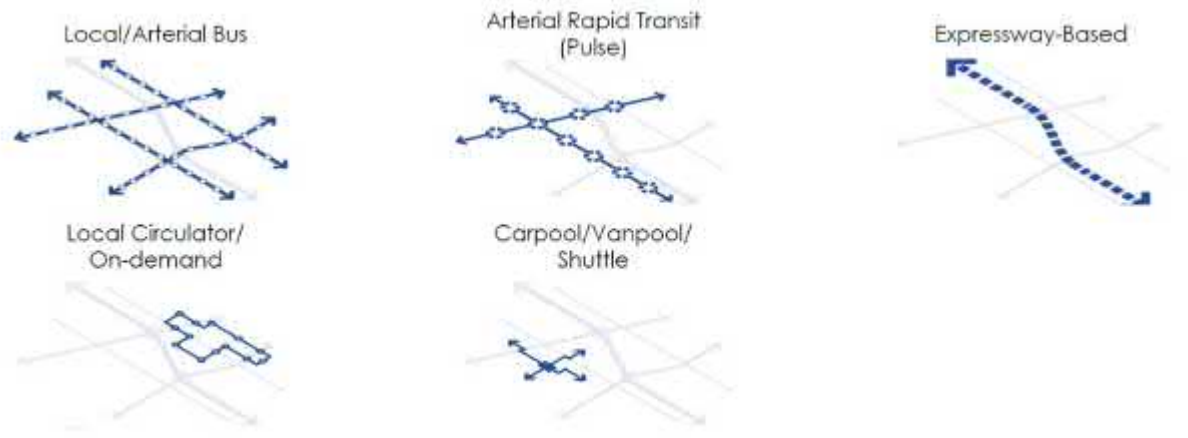
Score: 0 - 4 = low / 5 - 7 = medium / 8 - 10 = high

Safety Improvement	4
Affordability	6
Community Preference	10
Feasibility / Readiness	7
Transit Benefits	9

TREATMENTS + ACTIONS

- Align bus schedules with shift changes
- Optimize routes and service type
- Provide feedback to CTA and Pace regarding shift change times and user requests

Figure 4.11. Examples of Pace Bus Service Types



2. FORMALIZE TRANSIT LANES AND TRANSITWAYS

Description

This Last Mile Solution includes treatments with the following characteristics

Challenge(s) Addressed	**Limited Transit Supply and Reliability** **Degraded Infrastructure** **Restrictive Right of Ways** **Poor Transit System Legibility and Alignment**
Type of Intervention(s)	**Infrastructure Improvements** **Technology Deployment** **Operational Changes,** **Policy/Partnership/Program**

Evaluation

Score: 0 - 4 = low / 5 - 7 = medium / 8 - 10 = high

Safety Improvement	4
Affordability	2
Community Preference	7
Feasibility / Readiness	1
Transit Benefits	9

TREATMENTS + ACTIONS

- Support the implementation of Pace's Pulse Route on Harlem
- Advocate for bus route improvements that support more reliable bus service including:
  - Dedicated Bus Lanes
  - Bus Pull-Offs
  - Peak-Only Bus Lane

Figure 4.12. Rendering of Pace Pulse Bus Station

3. INCENTIVIZE AND PROMOTE TRANSIT

Description

This Last Mile Solution includes treatments with the following characteristics:

Challenge(s) Addressed	**Limited Transit Supply and Reliability** **Poor Transit System Legibility and Alignment**
Type of Intervention(s)	**Technology Deployment** **Policy/Partnership/Program**

Evaluation

Scores: 1 – 4 low / 5 – 7 medium / 8 – 10 high

Safety Improvement	2
Affordability	9
Community Preference	8
Feasibility / Readiness	10
Transit Benefits	10

TREATMENTS + ACTIONS

- Promote Ventra's pre-tax benefit program
- Recognize employers that provide subsidized or free transit passes to employees
- Encourage carpooling

Figure 4.13. Explanation of Ventra's Transit Benefits Programs

4. EXPAND MICROTRANSIT AND MOBILITY ON DEMAND SERVICES

Description

This Last Mile Solution includes treatments with the following characteristics

Challenge(s) Addressed	**Long Walks** **Limited Transit Supply and Reliability** **Poor Transit System Legibility and Alignment**
Type of Intervention(s)	**Technology Deployment** **Policy/Partnership/Program**

Evaluation

Score: 0 – 4 = low / 5 – 7 = medium / 8 – 10 = high

Safety Improvement	5
Affordability	5
Community Preference	9
Feasibility / Readiness	9
Transit Benefits	8

TREATMENTS + ACTIONS

- On-Demand Public Transport
- First/Last Mile Service
- Late Night Service/Guaranteed Ride Home
- Accessible Services

Figure 4.14. Picture of Via's Platform

TOOLS FOR THE MOTORIST AND FREIGHT NETWORK

Moving people and goods safely and efficiently is critical for the economic health of Bedford Park and the region. However, individual and freight mobility is impacted by commuters' reliance on single occupancy vehicles (SOVs), truck bottlenecks, at-grade railroad crossing delays, and other factors that contribute to road congestion. In addition to managing highly congested roads, the Village is also faced with the ongoing challenge of maintaining and repairing a road network that receives a high degree of stress from commercial truck traffic. 85% of the area's workforce drives alone to work and some of the area's primary arterials see over 50,000 vehicles per day. Conventional transportation planning interventions and operations and maintenance (O&M) activities, such as modifying the timing of traffic signals and road geometries, repairing potholes, repaving roads surfaces, and restriping road markings, are necessary, but are not sufficient for maintaining a high-quality transportation system that delivers a high level of service under these conditions.

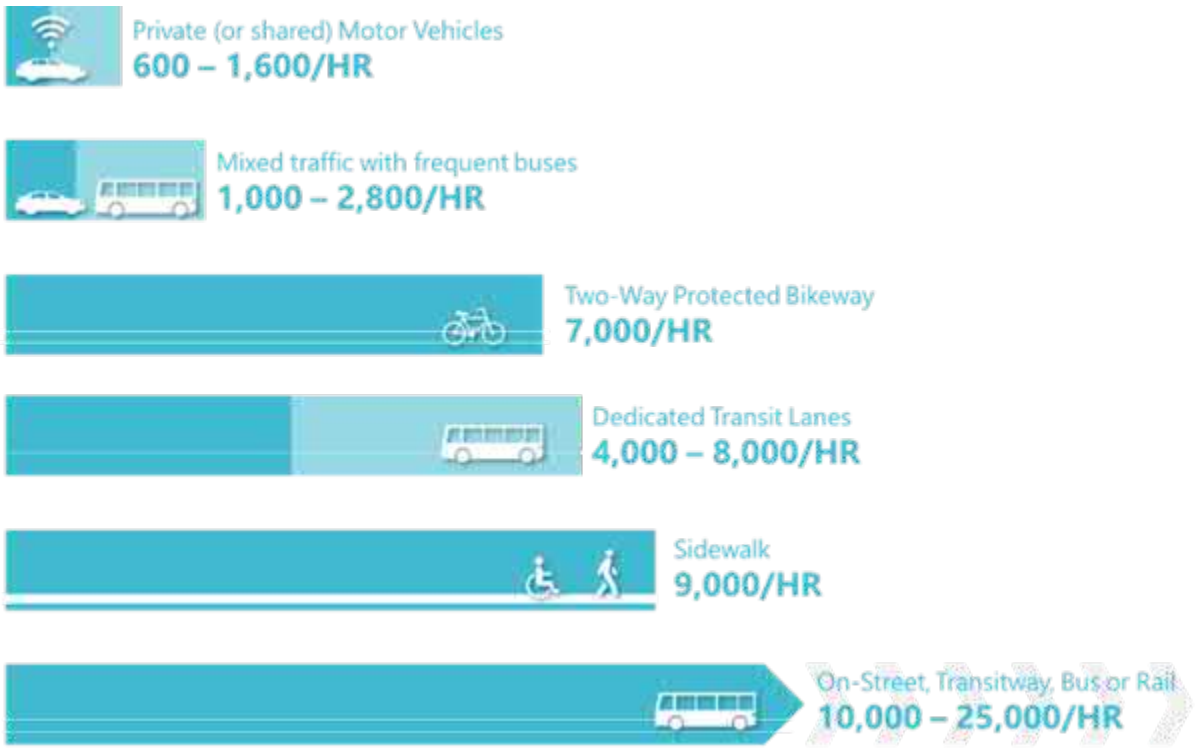
Bedford Park, regional transit agencies, and other local and regional stakeholders can reduce congestion in the area by working together to implement solutions that make it safer and more convenient for commuters to take alternative modes of transportation (e.g. walking, biking, transit, shared mobility). Shifting commuters from SOVs to other, more-space efficient modes of transportation, would reduce congestion is simple geometry. Consider the following: a typical 10-foot travel lane can only facilitate the movement of 600-1,600 people in private (or shared) motor vehicles per hour.[32] On the other end of the spectrum, that same 10-foot lane—if converted into a dedicated transitway—could facilitate the movement of 10,000 to 25,000 people per hour. That is over 15 times more people moving capacity than a lane transporting SOVs! **Figure 4.15** illustrates the people moving capacity of different modes of transportation.

MOTORIST & FREIGHT NETWORK LAST MILE SOLUTIONS

1. Adopt and Implement a Complete Streets Policy
2. Utilize Integrated Corridor and Transportation Demand Management Strategies
3. Create Mobility Hubs
4. Expand Last Mile Carsharing/ Ridesourcing / Ridesharing Services

[32] In Chicago, the minimum lane width in a work zone is 10 feet on residential and 12 feet for all other streets, unless otherwise approved (Source: Chicago Department of Transportation: Rules and Regulations for Construction in the Public Way (Chicago, 2019)

Figure 4.15. People Moving Capacity by Street Design



1. ADOPT AND IMPLEMENT A COMPLETE STREETS POLICY

Description

This Last Mile Solution includes treatments with the following characteristics

Challenge(s) Addressed	Long Walks Limited Transit Supply and Reliability, Degraded Infrastructure Dangerous Travel Conditions Restrictive Right of Ways Poor Transit System Legibility and Alignment
Type of Intervention(s)	Infrastructure Improvements Technology Deployment Operational Changes Policy/Partnership/Program

Evaluation

Score: 0 - 4 = low / 5 - 7 = medium / 8 - 10 = high

Safety Improvement	8
Affordability	5
Community Preference	7
Feasibility / Readiness	7
Transit Benefits	8

TREATMENTS + ACTIONS

- Develop a Complete Streets Policy
- Adopt Complete Streets policy
- Measure progress towards implementing Complete Streets
- Engage stakeholders in on-going efforts to promote walking, biking, and transit

Figure 4.16. Complete Streets Concept for 71st Street in Bedford Park

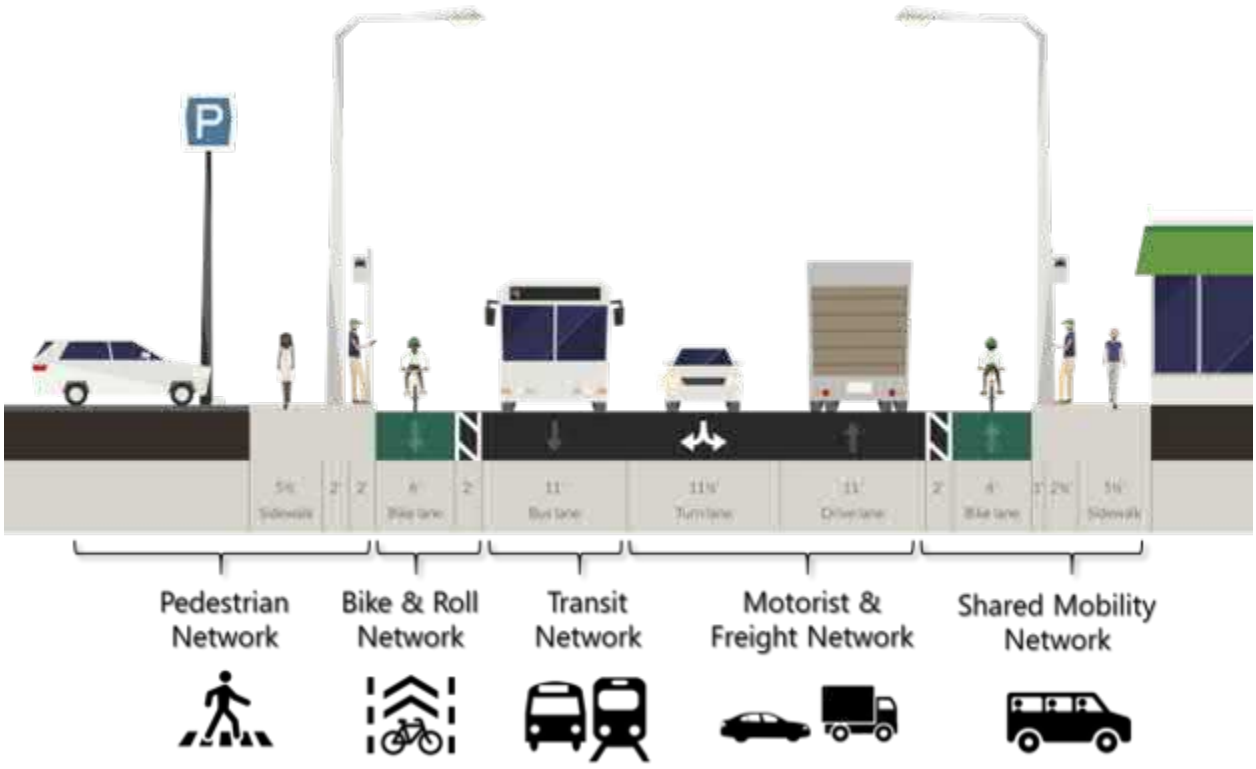


Image created using Streetmix.net licensed under Creative Commons.

2. UTILIZE INTEGRATED CORRIDOR AND TRANSPORTATION DEMAND MANAGEMENT STRATEGIES

Description

This Last Mile Solution includes treatments with the following characteristics:

Challenge(s) Addressed	Limited Transit Supply and Reliability Degraded Infrastructure Dangerous Travel Conditions Restrictive Right of Ways Poor Transit System Legibility and Alignment
Type of Intervention(s)	Infrastructure Improvements Technology Deployment Operational Changes Policy/Partnership/Program

Evaluation

Scores: 0 - 4 = low / 5 - 7 = medium / 8 - 10 = high

Safety Improvement	8
Affordability	2
Community Preference	7
Feasibility / Readiness	6
Transit Benefits	8

TREATMENTS + ACTIONS

- Implement congestion-reducing corridor management strategies, such as:
  - Smart intersections and ramp meters
  - Active arterial management
  - Congestion pricing/managed lanes
  - Dynamic parking management
- Implement transportation demand management (TDM) strategies and policies

Figure 4.17. Integrated Corridor Management Concept

3. CREATE MOBILITY HUBS

Description

This Last Mile Solution includes treatments with the following characteristics

Challenge(s) Addressed	Limited Transit Supply and Reliability, Degraded Infrastructure Dangerous Travel Conditions Restrictive Right of Ways Poor Transit System Legibility and Alignment
Type of Intervention(s)	Infrastructure Improvements Technology Deployment Operational Changes Policy/Partnership/Program

Evaluation

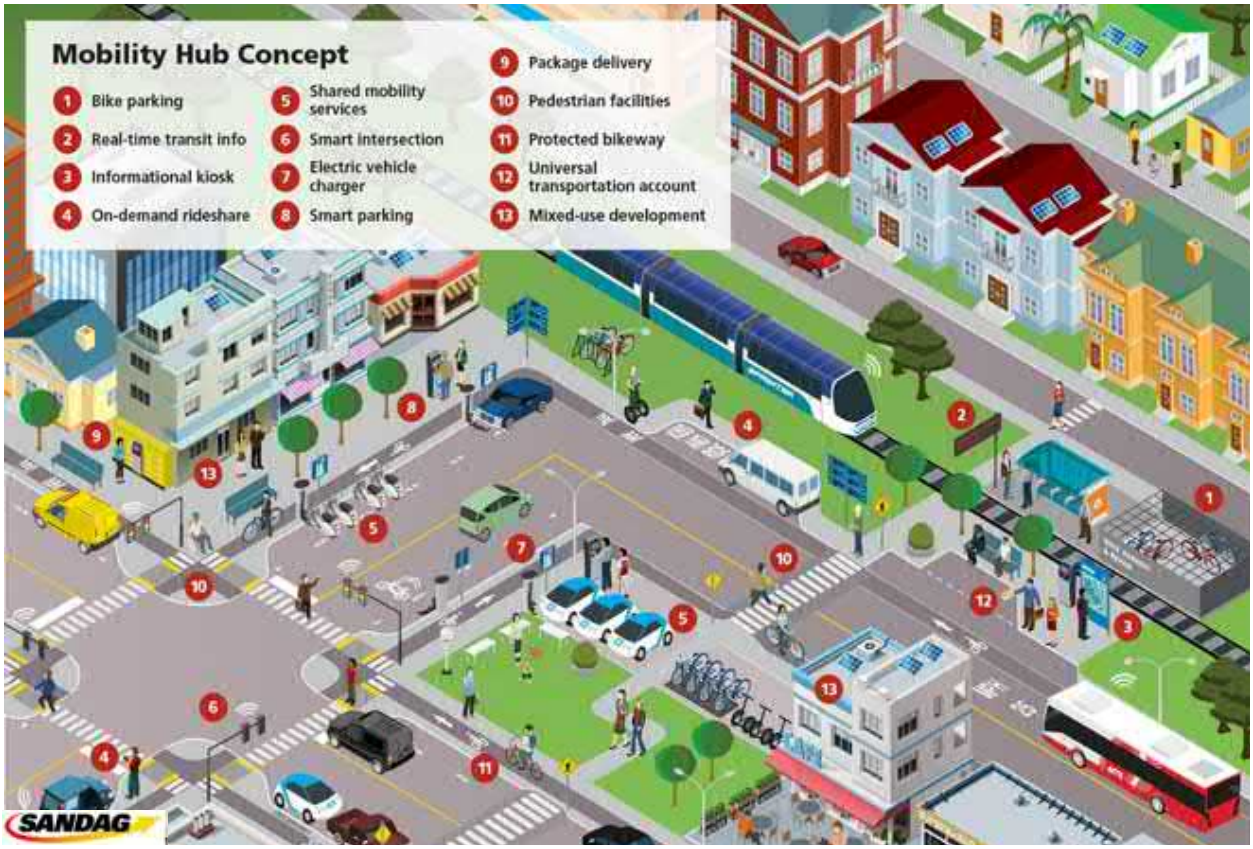
Score: 0 - 4 = low / 5 - 7 = medium / 8 - 10 = high

Safety Improvement	5
Affordability	5
Community Preference	7
Feasibility / Readiness	8
Transit Benefits	9

TREATMENTS + ACTIONS

- Create a multimodal mobility hub that includes:
  - Dock-based/dockless bike sharing
  - Real-time transit info
  - TNC pick-up/drop-off zones
  - Electric vehicle charging stations
  - Protected bikeways
  - Smart parking

Figure 4.18. Mobility Hub Concept



4. EXPAND LAST MILE CARSHARING/RIDESOURCING/RIDESHARING SERVICES

Description

This Last Mile solution includes treatments with the following characteristics:

Challenge(s) Addressed	Long Walks Limited Transit Supply and Reliability Poor Transit System Legibility and Alignment
Type of Intervention(s)	Technology Deployment Policy/Partnership/Program

Evaluation

Score: 0 - 4 low / 5 - 7 medium / 8 - 10 high

Safety Improvement	4
Affordability	7
Community Preference	10
Feasibility / Readiness	8
Transit Benefits	3

TREATMENTS + ACTIONS

- Partner with transit agencies and mobility companies to provide:
  - On-Demand Public Transport
  - First/Last Mile Service
  - Late Night Service/Guaranteed Ride Home
  - Accessible Services

Figure 4.19. Screenshot from a Lyft Ride Spot Check

Chapter 5

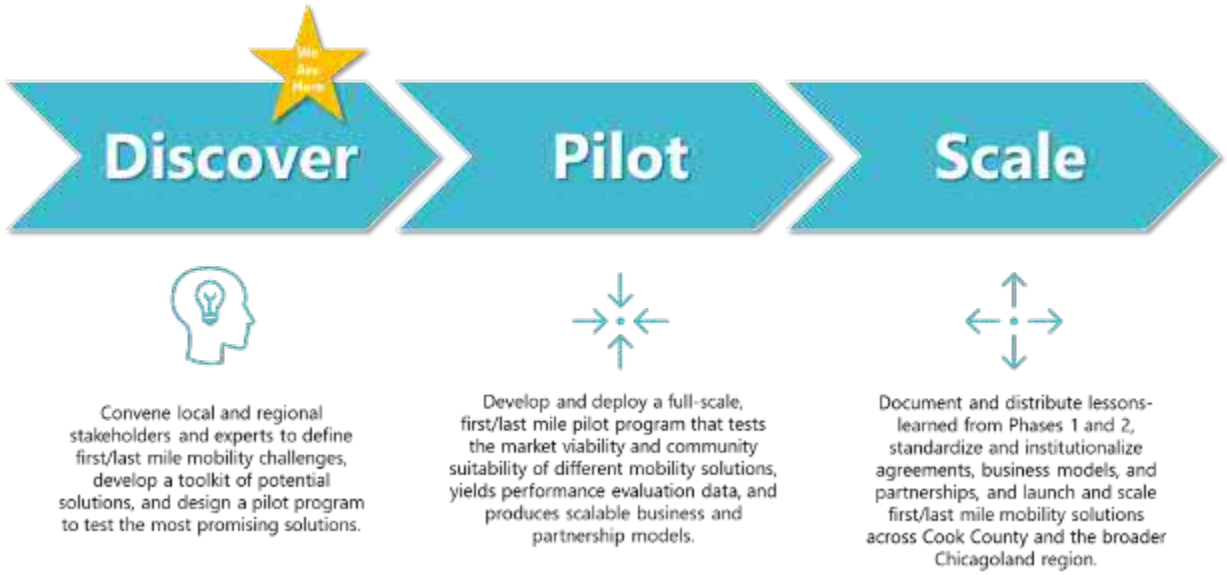
THE PATH FORWARD

NEXT STEPS

In sum, this Phase I Report defines Bedford Park's regional and last mile challenges and puts forth a toolkit of potential solutions for addressing the Village's mobility challenges. Completion of this Phase I Report is the first step of a broader process of discovering, piloting, and scaling last mile and new mobility solutions throughout the region (**Figure 5.1**).

THE PATH FORWARD

Figure 5.1. The Big Picture



Moving forward, the Village should continue to engage village staff and leadership, employers, employees, and other regional partners and mobility providers in a collaborative effort focused on identifying the specific local last mile solutions that: 1) address Bedford Park's unique mobility challenges and opportunities; 2) are physically, fiscally, and operationally feasible; and 3) and that can be readily scaled throughout other industrial areas in the region.

Towards that end, Phase II of this project includes the following actives:

1. Targeted outreach to local and regional stakeholders and mobility providers;
2. A Last Mile Mobility Demo Day; and
3. Development of a Last Mile Mobility Action Plan for Bedford Park

A key output of Phase II will be a Last Mile Mobility Action Plan for Bedford Park. In addition to this Action Plan, Phase II will also produce valuable lessons-learned, relationships local and regional stakeholders and mobility providers, which will collectively serve as springboard for implementing a full-scale pilot program.

Figure 5.2. Getting from Point A to Point B

The list below outlines specific next steps that can be implemented to get from Point A to Point B.

- Implement the Phase II of this project
  - Targeted Outreach
  - Last Mile Mobility Demo Day
  - Tactical Urbanism Event
- Develop a Last Mile Mobility Action Plan for Bedford Park
  - Review this Phase I Report and utilize when creating the Last Mile Mobility Action Plan
  - Develop targeted last mile improvement recommendation for each transportation network and/or corridor
  - Finalize the plan and incorporate into ongoing capital improvement planning and implementation efforts.
- Develop and implement a full-scale Mobility Pilot Program
  - Develop and refine the Pilot Program design (e.g. scope, goals, objectives, and performance criteria, etc.) through Phase II activities
  - Issue a draft Pilot Program Request for Proposal (RFP) for review and comment by public and private partners
  - Secure funding for the pilot program, and procure a last mile mobility technology and service provider(s), and implement the pilot program

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APPENDICES

APPENDICES

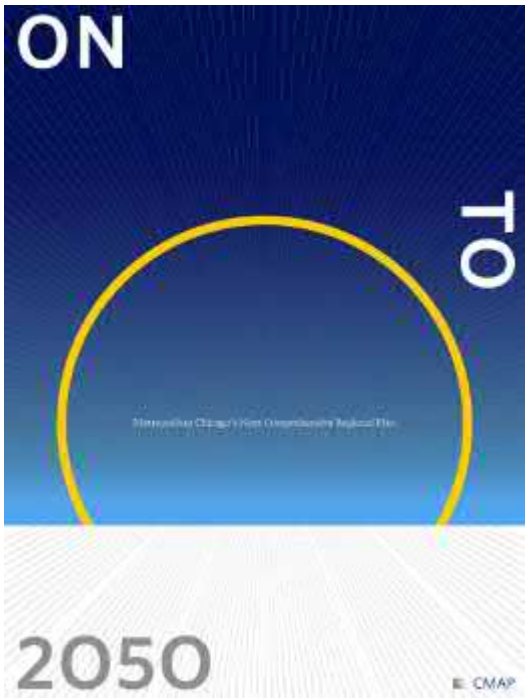
APPENDIX A: PLAN INVENTORY

LIST OF LOCAL AND REGIONAL PLANS POLICIES

1. CMAP ON TO 2050 Comprehensive Plan (2018)
2. RTA Invest in Transit: 2018-2023 Regional Transit Strategic Plan (2018)
3. RTA & Pace Pulse Central Harlem Avenue Corridor Study (2018)
4. MPC Transit Means Business (2018)
5. VBP Indoor Multipurpose Sports & Event Facility (2018)
6. VBP Comprehensive Zoning Map (January 2017)
7. Summit Active Transportation Plan (June 2017)
8. Connecting Cook County: Long Range Transportation Plan (2016)
9. Tax Increment Financing Corridor Studies (2015)
10. Cicero Avenue Corridor Plan (2014)
11. Southwest Conference of Mayors 2012 Bicycle Plan (2012)
12. Harlem Avenue Corridor: Existing Conditions Report (2011)
13. VBP 65th Street Corridor: Redevelopment Plan (2006)
14. South Cicero Corridor Study (2005)

1 ON TO 2050

CHICAGO METROPOLITAN AGENCY FOR PLANNING (2015)



Overview

- Inclusive Growth: Long-term regional prosperity requires economic opportunity for all residents and communities.
- Resilience: Our region and its communities must anticipate and adapt to future challenges—both known and unknown—driven by climate, commerce, technology, and other factors.
- Prioritized Investment: We must carefully target public resources to maximize regional benefits for mobility, the economy, and quality of life for all residents.

Key Takeaways

- At current funding levels, the conditions of regional transportation systems are declining while the costs to repair them are increasing. In replacing our aging infrastructure, we can take the opportunity to modernize, to increase efficiency, and improve mobility.
- Coordinating infrastructure operations and maintenance maximizes public investment. Units of government should partner to deliver infrastructure projects, enhance cooperation to improve roadway operations, share highway traffic management resources, and integrate local goals with roadway regulations.
- Walkable communities and safe, connected networks for bicycling can reduce the number of automobile trips, reduce vehicle miles travelled, and improve the overall performance of the transportation system.
- Complete Streets is a transportation policy and design approach that requires streets to be planned, designed, operated, and maintained to enable safe, convenient, and comfortable travel and access for all anticipated roadway users, regardless of their age, abilities, or mode of travel.
- Existing and emerging technologies, such as real-time data and expanded communications capabilities, can help us make more effective use of the transportation system.
- The region should avoid prohibiting or mandating specific technologies and focus on integrating new technologies into existing transportation systems and services in ways that leverage the new services' strengths and help achieve reinvestment in existing communities, inclusive economic growth, congestion management, and emissions reduction.
- Effective and competitive transit service requires not only strategic investments in service and infrastructure, but also coordinated land use planning and appropriate pricing for roads and parking. To ensure better and more equitable access, the region should diversify and increase funding sources as well as better link housing, transit, and jobs.

The full report is available here: https://www.cmap.illinois.gov/onto2050

2 RTA INVEST IN TRANSIT: 2018-2023 REGIONAL TRANSIT STRATEGIC PLAN

REGIONAL TRANSIT AUTHORITY (2018)

Overview

- Pursue dependable funding streams that will enable the region's transit agencies to provide this vital service well into the future
- Support a thriving, resilient region with transit systems that provide attractive, cost-effective travel options and help reduce congestion
- Advocate for region-wide policies and pricing strategies that support transit

Key Takeaways

- Focus limited resources on making targeted improvements and increasing transit speeds in multi-modal corridors in order to connect and strengthen communities.
- Adapt to the future by applying best practices to our operations, partnering with freight and roadway agencies to prioritize transit, and piloting new technology and mobility solutions.
- There has been a 5.7 percent region-wide growth in zero-vehicle households happening primarily in Chicago and suburban Cook County.
- In the southwest and northwest neighborhoods, carpooling is used for a greater share of work trips. These same neighborhoods with lower transit mode share and high carpool mode share have greater concentrations of workers employed in manufacturing.
- Manufacturing workers have lower TUP (Transit Use Propensity) scores and manufacturing jobs are located in areas with lower than average Accessible Places Scores. This means these jobs are more challenging to connect to using transit and may be part of the reason these neighborhoods have lower transit mode shares, with people using carpooling for their commute.
- Suburban markets are challenging for transit because of low densities, lack of pedestrian infrastructure, land use, different types of employment with non-traditional shift times, and lack of last mile connections. Serving these markets will require innovative transportation solutions.
- Midway-Bedford Park is included in the list of corridors that are relatively difficult to reach by transit even though workers come from areas with relatively good transit access.

The full report is available here:

https://www.rtachicago.org/sites/default/files/documents/strategicprograms/strategicplan/Invest%20in%20Transit_weboptimized_1.12.2018.pdf

3 RTA & PACE PULSE CENTRAL HARLEM AVENUE CORRIDOR STUDY

RTA & PACE (2018)

Overview

- Increase passenger and pedestrian safety
- Improve bus speed and reliability
- Enhance pedestrian connectivity to current and future bus stop locations
- Promoting transit-oriented development
- Preparing the corridor for eventual Pulse arterial rapid bus transit service

Key Takeaways

- This study of Harlem Avenue was jointly initiated by Pace and the Regional Transit Authority (RTA) as a part of the RTA Community Planning Program and the Pace Rapid Transit Program.
- By providing funds and technical assistance to complete plans as well as support to implement those plans, the RTA's Community Planning program encourages municipalities in the region to develop walkable and more sustainable communities near transit stations and along transit corridors.
- Over the past two decades, Pace has been implementing the recommendations of the Vision 2020 Plan, which is the strategic plan governing service development. As part of this process, Pace has established the Rapid Transit Program to guide corridor development, which includes Harlem Avenue – one of Pace's seven near-term priority corridors for implementing Pulse arterial rapid bus service.
- While Pulse service has not yet been designed for this corridor, the recommended improvements will help prepare the corridor for future Pulse implementation.

The full report is available here:

http://pulse.pacebus.com/images/Harlem/Harlem-OH2-Boards.pdf

4 MPC TRANSIT MEANS BUSINESS

REGIONAL TRANSIT AUTHORITY (2018)

Overview

- Businesses are choosing to locate near transit to access larger labor pools.
- Locations near transit offer businesses increased resiliency.
- Transit-accessible locations outperform the regional average on job growth, especially near rail.
- Transit is a real benefit when the employer pays the fare.
- Last-mile solutions to connect mass-transit to places of employment has resulted in the development of employer-sponsored last-mile alternatives and new public transit solutions addressing employer needs.

Key Takeaways

- Transit has a net economic benefit: Investing in transit results in regional economic growth.
- The Chicago region receives a higher net economic benefit—$1.21 to $3.00 worth of economic benefit for every $1 invested in transit—than any other region throughout the country based on recent transit studies conducted by consulting firms and transit agencies.
- The economic benefits of transit in Chicago include access to talent, less traffic, more disposable household income, more well-paid jobs, and increased local revenue from new development near transportation and infrastructure investments.
- Additional benefits to Chicago resulting from transportation investment included: increased productivity, higher property values, equitable and affordable transportation, reduced vehicle emissions, reduced fatalities and injuries, and improved health outcomes.
- Public transit was the 10th largest employer in the Chicago region in 2017.
- Transit is a real benefit when the employer pays the fares. Some firms in Chicago have begun subsidizing mass-transit and bikeshare memberships for their employees.

The full report is available here:

https://uploads-ssl.webflow.com/5ba52f91e783e250be30249b/5bc60eae0d28c745f3a46256_transit-means-business.pdf

5 VILLAGE OF BEDFORD PARK INDOOR MULTIPURPOSE SPORTS & EVENTS FACILITY

VILLAGE OF BEDFORD PARK (2018)

Overview

- A multipurpose sports and event facility at 65th and Lavergne is planned near the Midway Hotel Center, which will impact future transportation needs for the area.
- This will increase traffic flow through 65th Street near hotel center and Cicero Avenue.
- Development team interested in autonomous vehicles.
- Need to plan early for autonomous vehicle routes to accommodate users and visitors to the sports and recreation center.

Key Takeaways

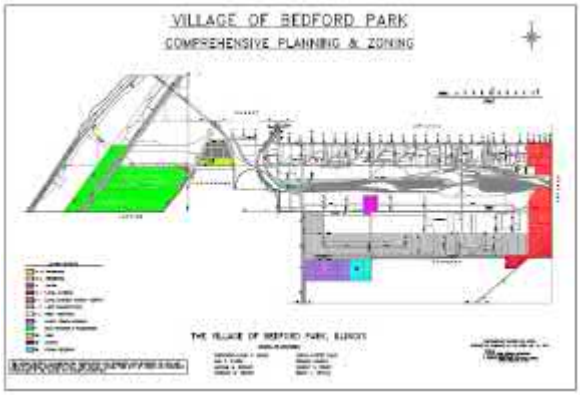
- The Village anticipates attracting weekend business and users with the long-term goal of convention and consumer shows, which will increase traffic demand to the area.
- It is anticipated that the facility will be net negative at first and break even in a few years. The Village will be responsible for debt service while the selected operator will be responsible for operations costs. Additional budgeting for roadway and transit improvements have not been determined; however, the Village is interested in improving mobility and utilizing autonomous vehicles to access the facility.
- Hunden Strategic Partners issued a Request for Indications of Interest for a Proposed Indoor Sports and Event Facility.
-

The original Request for Indications of Interest and Addendum #1 are available here:

https://hundenpartners.com/wp-content/uploads/2018/07/Bedford_Park_Addendum_1.compressed.pdf

6 VILLAGE OF BEDFORD PARK COMPREHENSIVE ZONING MAP

VILLAGE OF BEDFORD PARK (2017)



Overview

- Residential zoning is concentrated primarily to the western portions of the Village, directly north of Bridgeview and north of Justice.
- Heavy industrial throughout the central and northern portions of the Village.
- Light manufacturing throughout the southern portion of the Village.
- Local businesses are zoned along Cicero on the eastern edges of the Village.

Key Takeaways

- Majority of the Village's Land Use is dedicated to and/or occupied by Heavy Industrial use.
- A Local Business Overlay District creates the eastern border of VBP.
- Multiple rail lines and the world's busiest Railroad Yard run east and west dissecting the VBP and creating accessibility issues.
- Last mile challenges result from lack of connectivity between industrial and manufacturing employers and transit corridors.
- Last mile challenges also result from the lack of connectivity between the hotels in Bedford Park and the Midway Airport train station.

The Village's zoning map is available here:

http://villageofbedfordpark.com/wp-content/uploads/2016/03/B.P.-Zoning-Map-1.12.17.pdf

7 SUMMIT ACTIVE TRANSPORTATION PLAN

ACTIVE TRANSPORTATION ALLIANCE (2017)

Overview

- Develop an Active Transportation Plan and a Complete Streets policy. The Complete Streets policy outlines strategies for Summit to consider all modes of transportation when maintaining, constructing, and reconstructing its roads.
- Near-term and long-term pedestrian and bicycle focused projects to improve connectivity with neighbors such as Bedford Park regional routes.
- Recommendations of policies and programs that the Village can pursue to encourage more walking and bicycling trips.

Key Takeaways

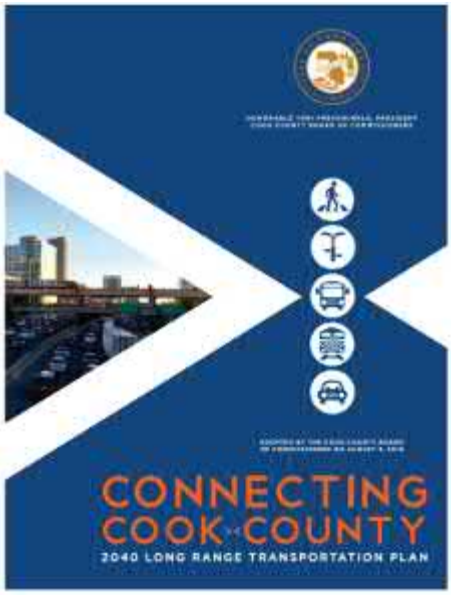
- Goal: To prioritize creating safe, accessible, hospitable, and welcoming streets that connect people to local businesses, school, and parks in Summit and its neighboring communities, such as Bedford Park.
- Proposed Active Transportation Network that includes a Bike Priority Corridor bordering the Village of Bedford Park and Trail Alternatives near Bedford Park.
- Policy level recommendations include budgeting for Complete Streets and Safe Routes to School.

The full report is available here:

https://atpolicy.org/wp-content/uploads/2018/03/ATP_Summit_Final-Plan.pdf

8 CONNECTING COOK COUNTY: LONG RANGE TRANSPORTATION PLAN

COOK COUNTY (2016)



Overview

- PRIORITIZE transit and other transportation alternatives.
- SUPPORT the region's role as North America's freight capital.
- PROMOTE equal access to opportunities.
- MAINTAIN and MODERNIZE what already exists.
- INCREASE investments in transportation.

Key Takeaways

- New shared-use mobility services like Zipcar could reduce private car ownership and increase reliance on other modes.
- Transportation makes manufacturing, distribution, and logistics key sectors of the County's economy, supporting over Jobs 176,000 and generating billions in personal income.
- Cook County's large and expansive transit system provides 650 million trips per year representing 11 percent of all trips taken regionally and within the County. The public transportation network plays a vital role in reducing congestion on area roads and highways as well as providing mobility—and access to jobs—to residents without a vehicle.
- Cars, of course, will continue to have a central place in serving the mobility needs of County residents. However, in recent years, it has even become apparent that new road capacity can lead to more traffic, offsetting any temporary reductions in congestion.
- Need to consider redesigning existing streets and intersections to provide enhanced mobility for bicycling, walking, and transit; and for senior citizens, families with young children, and those with disabilities, by adding bike lanes, sidewalks, and improved compatibility with bus traffic.
- Bike sharing and car sharing, for example, can provide crucial "last-mile" connections from transit stops to final destinations. Other times, modes such as buses and passenger cars compete for limited space and resources.

The full report is available here:

http://www.connectingcookcounty.org/pdf/CookCounty_LRTP_FINAL_WebVersion.pdf

9 TAX INCREMENT FINANCING CORRIDOR STUDIES

VILLAGE OF BEDFORD PARK & TESKA (2015)

Overview

- Goal: To spur industrial development that will generate local jobs and expand the tax base.
- Impact: Improvement of existing utilities and roadways to enhance the potential for development and accessibility of redevelopment sites.
- Opportunities: New infrastructure can be funded that promotes integrated mobility across transportation modes.

Key Takeaways

- Teska has assisted Bedford Park with the establishment and maintenance of multiple Tax Increment Financing Districts. The collective success of the Village's TIF districts has provided significant economic benefits to the Village through improvements to infrastructure and recruitment and retention of commercial and industrial businesses.
- Relevant TIF districts include: 72nd/Cicero TIF, 65th Street TIF, Archer Road Industrial TIF, and Hotel TIF.
- The Village engaged Teska Associates in 2015 to evaluate vacant parcels along Archer Road for TIF eligibility. These parcels include the recently vacant Landmark Banquets facility, and numerous industrially zoned vacant parcels. These industrial parcels had remained vacant for many years and qualified as an Industrial Park Conservation Area eligible for TIF designation.
- The impact of these TIF districts has been increased development, specifically industrial development throughout Bedford Park, which has resulted in new safety challenges for transportation users. However, it has also provided new opportunities to fund new transportation infrastructure investment.

The full report is available here:

http://www.teskaassociates.com/portfolio/bedford-park-tif

10 CICERO AVENUE CORRIDOR PLAN

SOUTHWEST CONFERENCE OF MAYORS (2014)

Overview

- Creating a cohesive identity for the Corridor
- Improving pedestrian mobility and safety along and across the Corridor.
- Balancing the needs of local communities with travel characteristics of a regional north-south arterial.
- Providing solutions for roadways and intersections focused on safety for vehicles, pedestrians, and transit access.
- Improving access to transit to increase the use of transit service.
- Providing provisions for pedestrian crossings at all cross-streets with signalized intersections and bus stop locations.
- Providing pedestrian and bicycle improvements and connections focused on access to land uses along Cicero Avenue plus cross-streets and regional facilities.

Key Takeaways

- The Cicero Avenue Corridor Plan is a transportation and economic development plan for the nine-mile segment of Cicero Avenue from 55th to 127th Street, which include six municipalities: Bedford Park, Chicago, Burbank, Hometown, Oak Lawn, and Alsip.
- Cicero Avenue is a major transportation corridor in the southwest suburban Cook County area. Daily passenger vehicle traffic on Cicero Avenue averages 35,400 vehicles per day in the Study Area.
- Cicero Avenue functions as an Urban Strategic Regional Arterial (SRA) route designated as Illinois Route 50 and falls under the jurisdiction of the Illinois Department of Transportation (IDOT). As a state route, Cicero Avenue serves a regional travel function and facilitates the safe and efficient movement of people and goods.
- Priorities for the City of Chicago in this study area are to maintain the safe function and quality service of Midway Airport, reinforce the vitality of local industrial tenants and retail nodes, and support multi-modal transportation mobility and efficiency.
- The Village's priorities for the Corridor are business development and diversifying the economic base, improving transportation safety and mobility, and enhancing aesthetics and appearance of both the public way and private properties fronting the Corridor.

The full report is available here:

http://www.rtams.org/reportLibrary/3337.pdf

11 SOUTHWEST CONFERENCE OF MAYORS 2012 BICYCLE PLAN

ACTIVE TRANSPORTATION ALLIANCE (2012)

Overview

- Create a safe network of bicycle facilities that will connect residents to parks, schools, and other regional destinations, as well as create an implementation strategy.
- Recommendations for preparing local bike plans.
- Creating bicycle safety, education, and encouragement programs.
- Installing regional signage.

Key Takeaways

- Require new housing developments to provide secure and convenient bike parking, much like the parking spaces required for residents' cars.
- Require new retail developments to provide pedestrian facilities like sidewalks that connect storefronts to the public right-of-way for safer accessibility on foot.
- Require new industrial and office developments to provide lockers and showers to encourage active transportation among employees.
- Ensure transportation equity: The elderly, children, and economically disadvantaged do not have access to private automobiles, and are frequently underserved by traditional mobility-based transportation planning.
- Ensure choice and accessibility: Many people want to make the choice to use active transportation, but the network currently undervalues this form of transportation.
- Ensure safety: Designing streets for bicycle and pedestrian access reduces vehicular conflicts and related crashes. Improved lighting can also reduce crime.

The full report is available here:

https://atpolicy.org/wp-content/uploads/2016/05/SCM_Bike_Plan_Jan29_Web_Res.pdf

12 HARLEM AVENUE CORRIDOR: EXISTING CONDITIONS REPORT

SOUTHWEST CONFERENCE OF MAYORS & URS (2011)

Overview

- To unite the Corridor, its activities and character, and to make it a more highly functioning transportation corridor.
- Turn this Corridor into an activity center for the southwest suburbs.
- This planning project is designed to complement, not supersede, the existing plans of the Harlem Avenue Corridor communities: Bedford Park, Burbank, Oak Lawn, Chicago Ridge, Palos Hills, Orland Park, Bridgeview, Worth, Palos Heights, and Tinley Park.
- Non-motorized users face numerous challenges within the Corridor. The existing sidewalk gaps make walking and bicycling difficult at many locations. In some cases, even where sidewalks exist, walking can still be a challenge as the sidewalks are often narrow, have obstructions (i.e., utility poles, signs, etc.) that must be alleviated.

Key Takeaways

- In many cases, the Corridor right-of-way restricts, or prohibits, any significant improvements that would enhance walking and bicycling.
- Heavy traffic volumes and high truck percentages, in particular in the northern section of Harlem Avenue, are not conducive to non-motorized users.
- Recent access management and sidewalk improvements benefit non-motorized users.
- Most of the major intersections within the Corridor widen to six through lanes, and include exclusive turn-lanes, to accommodate heavy traffic volumes, which creates mobility challenges for non-motorized transportation users.
- From a non-motorized perspective, these large intersections are problematic as pedestrians have numerous travel lanes to cross, have heavy conflicting left-turn movements, have a short amount of time to cross, and often do not have sufficient median refuge if they are unable to cross the street during the appropriate signal timing phase.

The full report is available here:

https://www.olpl.org/documents/HarlemAvenueCorridorPlan2011.pdf

13 65TH STREET CORRIDOR REDEVELOPMENT PLAN

VILLAGE OF BEDFORD PARK & URS (2006)

Overview

- Two-phase plan completed in 2006: Market & Land Use Analysis; Programming & Implementation.
- TIF district currently defined by boundaries: Cicero Avenue on the west, LeClaire Avenue on the east, 65th Street on the north, and 67th Street on the south.

Key Takeaways

- This TIF district was defined to enable the redevelopment of this site into the now-thriving Midway Hotel Center.
- Several surface parking lots north of 65th street for the businesses in Bedford Park's commercial core. Many are in disrepair and some are being sold for residential use.
- Proposed Transportation Infrastructure Improvements include Central & Narragansett Corridor Alternatives and the Chicago Regional Environmental & Transportation Efficiency.
- Overall plan seeks to redevelop the 65th street corridor through updated zoning ordinances, design guidelines, improved rights of way, specific commercial & industrial uses, and increased retail.

14 SOUTH CICERO CORRIDOR STUDY

VILLAGE OF BEDFORD PARK & URS (2005)

Overview

- Examines demand and supply characteristics of suburban markets surrounding Midway Airport along Cicero Avenue
- The Study sets forth recommendations on how future development can be captured within the Study Area and lead to new economic vitality in this key Chicago corridor.

Key Takeaways

- The Study Area contains a tremendous density of transportation and infrastructure rights-of-way, the intersection of which often results in traffic delays and reduced quality of transportation service.
- Several major initiatives are intended to provide relief to traffic congestion and improve quality of movement and access, and are in various stages of planning. These include:
  - Central Avenue Overpass Alternative
  - Chicago Regional Environmental and Transportation Efficiency (CREATE)
  - Extension of CTA Orange Line to Ford City Mall
  - Midway Express
  - Mid-City Transitway

The full report is available here:

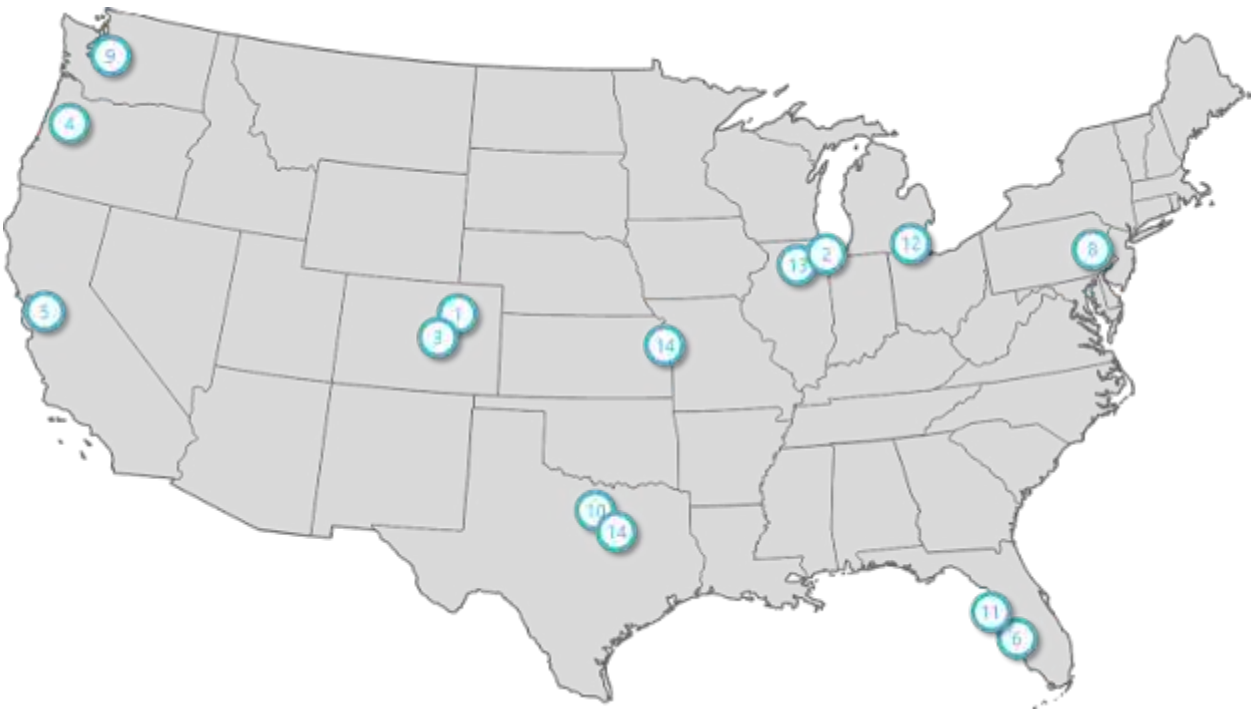
https://www.cityofchicago.org/content/dam/city/depts/zlup/Planning_and_Policy/Publications/South_Cicero_Corridor_Redevel_Plan/South_Cicero_Redevelopment_Plan_Part%201.pdf

APPENDIX B: CASE STUDIES

LIST OF LAST MILE CASE STUDIES

1. RTD Denver Autonomous Shuttle (CO)
2. CTA & Divvy Ventra Integration (IL)
3. Go Centennial Pilot (CO)
4. West Salem Connector On-Demand Transit Project (OR)
5. Carpool to Transit (CA)
6. HART HyperLINK (FL)
7. RFP: KCATA – On Call Innovative Service Model Research (KS, MO)
8. Rabbittransit – Geisinger Transportation Program (PA)
9. Pierce County/ Lyft Agreement (WA)
10. Denton Co. Transportation Authority On-Demand Self- Driving Car Service (TX)
11. Pinellas Co. – TD Late Shift (FL)
12. Detroit – Woodward 2 Word (MI)
13. Oak Brook – Chariot Last-Mile Pilot (IL)
14. Arlington – Drive.ai Pilot (TX)

CAST STUDY LOCATIONS



1 RTD DENVER AUTONOMOUS SHUTTLE

DENVER, COLORADO

Overview

On Monday, December 4, 2017 a demonstration kicked off what the State of Colorado hoped to be a new normal in last mile mobility. The EZ-10 shuttle was tested to move passengers from the 61st and Pena Station to the nearby office buildings or bus stop in an autonomous shuttle. This initial shuttle ran 5 mph on a set route and used 12-15 sensors to monitor speed or any obstacles.

In January 2019, RTD kicked off a second pilot project in the same area called the 61AV Project. This shuttle can carry up to 12 passengers at a time and connects the Pena Boulevard Station with a Park-n-Ride facility, while also making several stops through Panasonic's "Smart City" campus. Rides are free during the four-to-six-month trial period.

Source: Denver Post, 2017

Key Takeaways

- EZ-10, the autonomous shuttle, was part of a public-private partnership between RTD, CDOT, and Panasonic to help solve the region's "last mile" commuting issues
- Sensor sensitivity still needs refinement. During a demo, a small tumble weed on the route caused the shuttle to stall.
- Autonomous vehicles are not legal on public roads in CO. The companies had to work with CDOT to close off a portion of a road just for the shuttle to travel.
- Federal regulators require that an operator be inside EZ-10.
- EZ-10 pilot program was used to rollout a second pilot program with 61AV.
- Autonomous vehicles can provide additional connectivity between stations and businesses.
- Autonomous vehicles can potentially be used to connect future growth in this newly developed business district.

2 CTA & DIVVY VENTRA INTEGRATION

CHICAGO, ILLINOIS

Overview

CTA received funding for a project that incorporates the local bike sharing provider, Divvy, Chicago's nearly 600-station bikeshare service, into CTA's Ventra trip planning/payment app. The integration will allow users to find available bikes and docks and check out or pay for bike rentals through the same app they use to plan and pay for transit trips.

Source: Ideo, 2018

Divvy is an integral part of Chicago's transit system and plays a key role in first/last mile connections. Multi-modal trips are common for transit users, so streamlining the process can make Divvy seamless and more attractive to transit users. The project was part of the FY 2016 Mobility on Demand Sandbox (MOD) Sandbox Grant Program.

Key Takeaways

- CTA and the City hope that tighter integration between transit and bikeshare system will further cement Divvy's role as an extension for the public transit system.
- CTA and Divvy integration will occur after the Ventra app is rolled out.

3 GO CENTENNIAL PILOT

CENTENNIAL, COLORADO

Overview

The Go Centennial Pilot was a public-private partnership between the City of Centennial, CH2M, the Denver South Transportation Management Association, Southeast Public Improvement Metropolitan District, Lyft, Via Mobility Services, and Xerox (Conduent) to address the first and last mile problem – how to get travelers to/from transit stations. This model applied an on-demand, demand-responsive mobile platform to provide efficient transportation connections to and from the Regional Transportation District (RTD) Dry Creek Light Rail Station in Centennial, Colorado.

Travelers used the Go Centennial App to book first or last mile trips. The App communicated directly with the Lyft platform to order a car (including WAVs). Lyft rides were available M-F 5:30am-7:00pm to riders traveling to/from Dry Creek Station and a service area in the City of Centennial.

Key Takeaways

- Accessible service was a required piece of the pilot, with WAVs operating throughout the program's service hours and made available through the Lyft platform. Though this provided excellent mobility for persons with disabilities, the contract structure for this "always on" WAV availability, which was constantly billing whether it was providing rides or not, significantly drove up both the per-trip and overall project costs.
- The program ran in parallel to the area's existing RTD Call-n-Ride service; the majority of its riders seem to have come from this service rather than representing new riders.
- Ridership was far lower than expected, with about 1,300 trips provided over a year of service. And while it was hoped that the service would provide much lower costs than the existing Call-n-Ride, this was the case only for per-trip costs on the Lyft side of the program. The total cost of about $130,000 (including Lyft and WAV operations, software development and marketing) penciled out to a cost of about $100/trip.
- The pilot is largely regarded as a cautionary lesson for three reasons: first, it duplicated an existing Call-n-Ride service and did not sufficiently differentiate itself in the value that it hoped to provide. Second, it provided a key example of how not to structure the WAV component of an on-demand ride. Third, it showed that an on-demand program needs a sufficiently large service area to succeed at scale.

4 WEST SALEM CONNECTOR ON-DEMAND TRANSIT PROJECT

DENVER, COLORADO

Overview

Looking to solve the first-and last-mile issue, Chariot began operating the West Salem Connector on June 1, 2015 as a pilot project in Salem, OR. The West Salem Connector was a reservation-based, shared-ride transit service that ran Monday-Friday, 6am to 9pm. When riders booked trips online or by calling, the booking software automatically generated a trip manifest. That information was then relayed to the bus drivers via on-board tablets.

Source: APTAcom, 2017

Drivers picked up and dropped off riders in a 14-passenger cutaway bus on a route that changed every hour based on demand. The only scheduled element of the system is at a Transit Center, where the bus had 10-minute layover. West Salem ceased operations of the Connector and in January 2018 began operating regular bus service in West Salem, through Chariot. Two new regular bus routes, as well as two adjusted regular routes, were implemented to better serve the area.

Key Takeaways

- Riders were able to connect to fixed bus routes.
- Project created difficulty to coordinate with users without a smartphone.
- Confusion and overbooking issues were caused by real-time and in-advance booking being available.
- West Salem Connector program illustrated the need for regular bus service in specific areas.

5 CARPOOL TO TRANSIT

SAN FRANCISCO BAY AREA, CALIFORNIA

Overview

San Francisco Bay Area Rapid Transit (BART) received funding through the FY 2016 Mobility on Demand Sandbox (MOD) Grant Program for an integrated carpool to transit program that helped users find carpool matches as well as match them to their transit destinations. The project provided a seamless way to reserve and pay for in-demand parking spaces at BART stations, allow preferential parking for carpoolers, while also increasing transit ridership by improving access to BART stations.

Today the Casual Carpooling program has designated over 20 pick-up locations in the Bay Area to allow commuters to find a car- pool match. The area's bikeshare program is also located at over half of the carpool pick-up locations.

Key Takeaways

- Software allows users to find carpool matches and match them to their transit destinations.
- Users can reserve and pay for in-demand parking spaces at BART stations.
- Preferred parking for carpoolers at busy stations used to discourage single occupancy vehicles.
- Integrating bikeshare stations at the pick-up locations has given commuters more options.

6 HART HyperLINK

HILLSBOROUGH COUNTY, FLORIDA

Overview

HART's HyperLINK was a first/last mile solution implemented in Hillsborough County, Florida. HyperLINK was fully ADA accessible and designed as a shared-ride service. Based on research, residents who have more accessibility to public transit will take advantage of it.

Source: GoHART.com

The door-to-bus smartphone app (also available through call center) made booking and catching a ride on HyperLINK easy. The costs were $1 to connect to a designated HART stop, within the zone. Or, if riders need to connect anywhere within the zone, they paid $3. HART paid Transdev, the rideshare provider, $10 for each ride. Rides were subsidized 70-90% with state grant funding and HART's budget. On July 31, 2018 HART ended HyperLINK service in the area.

Key Takeaways

- First/Last Mile solution that is fully ADA accessible and designed as a shared-rider service.
- On-demand feature made trips more convenient and accessible to residents in select locations.
- The need to add a concierge number highlights the importance of catering to riders with and without a smart phone.
- Program drew negative feedback when Teslas were integrated into the fleet.
- Public questioned use of funds being used on this program.

7 RFP: KCATA | ON CALL INNOVATIVE SERVICE MODEL RESEARCH

KANSAS CITY, KANSAS / KANSAS CITY, MISSOURI

Overview

The Kansas City Area Transportation Authority (KCATA) is the regional transit authority in the Kansas City metropolitan area. As a way to increase overall ridership on the transportation services offered by the transit agency, KCATA put out a request for proposals from a qualified and experienced firm(s) to provide on-call services in the areas of innovative service model research, planning, crowd-sourcing/ hackathon management, implementation, and evaluation services.

Source: KCATA.com

Key Takeaways

In the RFP, the organization looks to contract with firms for the following services:

- Ideation Strategy/Management for Emerging Technology and Service Model Assessments: To enhance service, implement new on-demand service models, and collect and monetize data– through technological engagement strategies.
- Market Analysis: To understand the market for mobility services, formulate market strategies, understand consumer and potential consumer profiles, and develop consumer service adoption strategies.
- Service Evaluation and Impact Analysis: Evaluate the economic, environmental, ridership, and financial impacts.

8 RFP: RABBITTRANSIT | GEISINGER TRANSPORTATION PROGRAM

SCRONTON AND DANVILLE, PENNSYLVANIA

Overview

Geisinger Health System partnered with Rabbittransit, a regional transportation company that operates in 10 counties in central and southcentral Pennsylvania in order to address "no shows" at Geisinger Health System facilities.

Patients will be referred to the program by Geisinger staff. Rides are then coordinated through community organizations that Geisinger Health has partnered with. The pilot program will be conducted in two locations: the Scranton area, within 25 miles, to test an urban setting, and the Danville area, within 50 miles, to test a rural setting.

Source: www.rabbittransit.org

Key Takeaways

- Pilot program is offering rides free of charge to gauge use and interest.
- Nearly 150,000 people missed doctor's appointments in the Geisinger Health System in 2017.
- 25% of "no shows" to appointments were attributed to lack of transportation.
- Two locations chosen for pilot to better understand if there is an impact based on geography:
  - Scranton, PA (urban setting)
  - Danville, PA (rural setting)
- Rabbittransit is also able to arrange patient transport in additional counties in Geisinger's coverage area through its partnerships with other transportation companies in the region.

9 PIERCE COUNTY | LYFT AGREEMENT

PIERCE COUNTY, WASHINGTON

Overview

Pierce County Transit in Washington state received funding through the FTA's MOD Sandbox Grant program to fund its "Limited Access Connections" program. The County entered into a general services agreement with Lyft in March of 2018 to address first/last mile accessibility issues.

Pierce Co Transit identified specific zones throughout the county that transit riders experienced first mile/last mile accessibility issues. Lyft rides provided connections to transit stops within the previously identified zones. The County paid for "Eligible Rides" within those zones.

- 48 rides per user per month
- Max paid under agreement $152,653

Source: www.piercetransit.org

Key Takeaways

- The program was created to help both "first/last mile" connections and students at Pierce College with transit options after the Pierce Transit fixed route service ends for the day.
- Improved efficiency by using fixed zones and set time parameters.
- Needed to create alternatives for people without a smartphone- concierge hired midway through pilot.

10 DENTON COUNTY TRANSPORTATION AUTHORITY ON-DEMAND SELF-DRIVING CAR SERVICE

DENTON COUNTY, TEXAS

Overview

In July 2018, Drive.ai kicked off a six-month pilot program to bring on-demand self-driving car-service to Frisco Texas. This pilot program is a model for the deployment of self-driving vehicles in a public setting, one of the first of its kind not only in Texas, but the nation, and a major step forward for the industry.

Drive.ai's self-driving on-demand service will be operated in conjunction with Frisco Transportation Management Association, a public-private partnership dedicated to bringing innovative last-mile transportation options to Frisco, Texas.

Pilot offered rides to over 10,000 people within a geofenced area consisting of office, retail, and entertainment. Riders used a ride-hailing smartphone app to hail complimentary on-demand rides in self-driving cars that connect to popular destinations. The pilot required a driver to be in the vehicle at all times, in case human intervention was needed.

Key Takeaways

- Drive.ai fleet conducted several testing rides prior to pilot launch. Over 1 million simulated miles were logged along the fixed route prior.
- Program has already expanded pilot to Arlington, Texas.
- Multiple public meetings, with over 200+ attendees, held prior to the launch of pilot.
- DCTA involved throughout the project to ensure safe operations and provide public education on the new mobility option.
- Demonstrations and meetings with first responders to educate them on the vehicles conducted prior to launch.

11 PINELLAS COUNTY | TD LATE SHIFTSHUTTLE

PINELLAS COUNTY, FLORIDA

Overview

Pinellas County is a large tourism destination on Florida's Gulf Coast with many service industry workers who work late hours at local nightlife establishments. Workers had trouble getting to/from work in the late or early hours of the day. Fixed-route service in the sprawling suburban area does not run overnight, making transit an impractical choice for one side or the other of many workers' commutes. As a result, employees without access to a car walked or rode bikes in non-pedestrian friendly areas.

Source: www.psta.net

In response to these mobility issues, Pinellas County launched the TD (Transportation Disadvantaged) pilot program in 2016. This State-funded initiative cost users $20/month for a monthly bus pass + 25 free on-demand trips through Uber, United Taxi, or Wheelchair Transport. On-demand trips were limited to rides to/from work at times buses were not running. To qualify, residents needed to lack reliable transportation and have a household income below 150% of the federal poverty line (or about $38,000 for a family of four).

Key Takeaways

- Pilot was developed around a focused target market.
- To date, the pilot program has resulted in increased ridership.
- Employees able to work more shifts, spend more time with family, and get more sleep.
- Pilot slated to run through 2019.

12 DETROIT | WIIDWARD 2 WORK

DETROIT, MICHIGAN

Overview

Detroit's Department of Transportation (DDOT) launched the Woodward 2 Work pilot in May 2018 to increase transit access for late shift workers. Detroit has many residents working late shifts who lack reliable and safe door-to-door commuting options.

Source: www.detroitmi.gov/w2w

The Woodward 2 Work (W2W) pilot provides discounted Lyft rides to anyone going to or from an eligible bus stop on the Route 53-Woodward bus line. Route 53 was identified through a public outreach process. The bus route runs 24 hours a day, beginning just south of Eight Mile Road at the northern edge of the city and connecting straight to the heart of downtown (approximately 9 miles). DDOT chose Route 53 because of the large number of riders it could reach, especially those working later shifts.

Riders text the project hotline between 12am and 5am. In response, they receive a code to enter into the Lyft app for a $7 discount on any ride.

Key Takeaways

- The Woodward 2 Work pilot is a Public- Private Partnership between DDOT and Lyft to provide residents working late a ride to/from their bus stop on Woodward.
- Route 53 Woodward bus line selected because it runs 24 hours a day and reaches a large number of riders who work later shifts.
- The pilot was guided by community outreach to identify community challenges and build a project from those needs.
- Community outreach component of the pilot planning process ensured the end user was involved from the beginning.
- A Lyft concierge service is also available for those who do not have a smartphone.

13 OAK BROOK | CHARIOT/RTA/ METRA LAST MILE PILOT

OAK BROOK, ILLINOIS

Overview

Chariot was a "microtransit" service that provided a flexible, on demand service in passenger shuttles along preset routes. Founded in the Bay Area in 2014, Chariot used a model that "crowdsourced" routes from the general public and available to anybody who downloaded Chariot's hailing/payment app, as well as establishing "private" routes servicing specific employers or districts. Chariot was acquired by Ford Smart Mobility in 2016. At its height, the company was operating in at least 7 US metros, as well as London.

In July 2018, the Regional Transit Authority (RTA) and the west suburban Village of Oak Brook announced a pilot that provided rides over the ~5 miles between Metra's Elmhurst station and Oak Brook's Commerce Drive commercial district. Chariot Trips were free for employees of participating businesses, or $6.30 for the general public. The rides were provided in 14-passenger vans equipped with wi-fi and driven by professional employees of Chariot.

Six months into the pilot, Ford announced that Chariot would be ceasing all operations as of March 2019, and immediately began winding down the company's services, including the Oak Brook pilot. As of February 2019, RTA was searching for another partner to continue service.

Key Takeaways

- Though Chariot as a product offering was terminated by Ford before the pilot could be formally assessed, anecdotally it had solid and increasing ridership.
- Ford's shuttering of Chariot was the latest in a number of failures in the microtransit sector. Though the business model generated much interest and venture capital investment starting in the early 2010s, other providers that have shuttered over the last several years include Bridj, Split, and Leap.
- The microtransit business model appears to have a number of challenges compared to some of the other emerging modes (particularly ridesourcing, which is based entirely on using contractors who bring their own vehicles):
  - Microtransit is a more capital-intensive business model, involving the leasing or purchase of vehicles and employment (rather than contracting) of professional drivers.
  - Too much operating similarity to transit to survive without subsidy. Almost no public transit survives on farebox revenue alone.
  - Insufficient demand: it takes time for new modes of travel to get established with a large enough group of users to support it. Microtransit may have less "runway" in which to get over this initial building of a customer base.

14 ARLINGTON | DRIVE.ai

ARLINGTON, TEXAS

Overview

In October 2018, the City of Arlington launched its second autonomous vehicle pilot program, operating shuttles on streets within Arlington's Entertainment District and surrounding areas. This on-demand ride hailing system, connects passengers with employment centers, restaurants, entertainment venues, public recreational spaces, and the Arlington Convention Center.

Kiosks at designated pick-up locations or a mobile app that riders can download, allow users to request a vehicle. The shuttle service is free of charge and available to the general public. The shuttle ran on a fixed route within a defined service area and includes special routes during Cowboy's home games.

Source: www.arlington-tx.gov

Key Takeaways

- Shuttles ran on-demand on a fixed route within a defined service area in Arlington's entertainment district.
- The shuttles only picked-up and dropped-off at pre-determined points within the service area.
- The shuttles hold three passengers.
- A human driver is still always in the vehicle for human intervention if needed.
- Weather can affect the shuttle's capability; shuttles will not run in weather more than a light rain.
- The "Entertainment District" pilot program area allowed for many people to see and try out the shuttle.
- Shuttles are not wheelchair accessible.

APPENDIX C: FIRST/LAST MILE ASSESSMENT TOOL

Pedestrian Network Gaps

Corridor/Area

1) Check/circle the gaps that you observe	2) Map, number, and describe these gaps	3) Tally the gaps
❑ **A)** Areas with no sidewalk		
❑ **B)** Temporary / permanent obstructions to sidewalk		
❑ **C)** Areas with limited / no signals or crosswalks		
❑ **D)** Areas with unsafe / very unsafe walking conditions		
❑ **E)** Areas with limited / no ADA facilities		
❑ **F)** Other:		

2

Bike Network Gaps

Corridor/Area

1) Check/circle the gaps that you observe	2) Map, number, and describe these gaps	3) Tally the gaps
❑ **A)** Areas with limited / no bike facilities		
❑ **B)** Temporary / permanent obstructions to bike lanes		
❑ **C)** Areas with limited / no bike parking		
❑ **D)** High priority bike share location		
❑ **E)** Areas with unsafe / very unsafe biking conditions		
❑ **F)** Other:		

3

Transit Network Gaps

Corridor/Area

1) Check/circle the gaps that you observe	2) Map, number, and describe these gaps	3) Tally the gaps
❑ A) Areas with limited / no transit		
❑ B) Temporary / permanent obstructions to transit lanes		
❑ C) Poorly marked / equipped transit stops		
❑ D) Poorly connected / spaced transit stops		
❑ E) Infrequent / very infrequent transit service		
❑ F) Other:		

4

Road Network Gaps

Corridor/Area

1) Check/circle the gaps that you observe	2) Map, number, and describe these gaps	3) Tally the gaps
❑ A) Congested / very congested road segments		
❑ B) Temporary / permanent obstructions to travel		
❑ C) Limited / no taxi services		
❑ D) Limited / no ride-hailing services		
❑ E) Limited / no car-sharing stations		
❑ F) Other:		

5

Other Gaps

Corridor/Area:

1) Check/circle the gaps that you observe	2) Map, number, and describe these gaps	3) Tally the gaps
❑ A) Other:		
❑ B) Other:		
❑ C) Other:		
❑ D) Other:		
❑ E) Other:		
❑ F) Other:		

APPENDIX D: EMPLOYEE SURVEY RESULTS

SURVEY TOOL – PAGE 1

Village of Bedford Park Mobility Study + Pilot Program
Employer Survey

This Employer Survey is being administered as part of the Village of Bedford Park's Last Mile Mobility Study and Pilot Program. This study was funded through a Cook County Invest in Cook grant and is intended to help the village better understand and develop solutions to Bedford Park's "first / last mile" (FLM) transportation challenges. FLM challenges include any issues that impact the first or last part of your commute, such as long walks to bus and train stops, unsafe walking conditions, poorly maintained sidewalks, and others. Your participation in this Employer Survey is voluntary and anonymous and will help improve access to jobs for all people traveling to and from Bedford Park.

1. **What is the name of the company you represent?** *Write in your company name.*

   _____

2. **What is your company's address?** *For example: 6700 S Archer Rd, Bedford Park, IL 60501*

   _____

3. **How many people does your company employ at this address?** *Write in the number of employees.*

   _____

4. **How do employees get to work?** *Use your best guess to estimate the percentage of employees who travel to by the following modes of travel.*

   Drive Alone: _____ Carpool _____ Take Transit: _____ Walk/Bike: _____ Other: _____
   *Must add up to 100%

5. **Does your company have major shift change times?** *If yes, check the hour(s) in which a large group of employees are arriving at or leaving from your company. If no, leave unchecked.*

N/A			
12:00 AM	6:00 AM	12:00 PM	6:00 PM
1:00 AM	7:00 AM	1:00 PM	7:00 PM
2:00 AM	8:00 AM	2:00 PM	8:00 PM
3:00 AM	9:00 AM	3:00 PM	9:00 PM
4:00 AM	10:00 AM	4:00 PM	10:00 PM
5:00 AM	11:00 AM	5:00 PM	11:00 PM

6. **Please indicate if the following last mile challenges are a low, medium, or high concern.** *Check one box in each row.*

Last Mile Challenge	Low	Medium	High
Unsafe walking conditions between transit stops and your place of work			
Sidewalks and crosswalks are not accessible for people with disabilities			
Buses and trains do not arrive frequently enough			
Bus and train schedules are not reliable			
Bus and train schedules do not align with your companies shift changes			
Bus stops are not located close to your place of work			
Unsafe biking conditions			
Not enough taxis in the area			
Not enough rideshare or carshare services in the area			
Rideshare services are not accessible (e.g. too expensive, long wait times)			
Other. *Please Describe*			

SURVEY TOOL – PAGE 2

Village of Bedford Park Mobility Study + Pilot Program
Employer Survey

7. **What do you think is the #1 challenge impacting the last mile of your employees' journey to work?** *Write in your response.*

8. **Would you like to participate in the Village of Bedford Park's Last Mile Resource Group?** *This group will meet four times between June 2018 and June 2019 to develop and review solutions to the community's last mile challenges.*

Yes ☐ No ☐

If you answered "Yes" above, please enter your contact information.

Name	
Title **Organization**	
Email	
Phone	

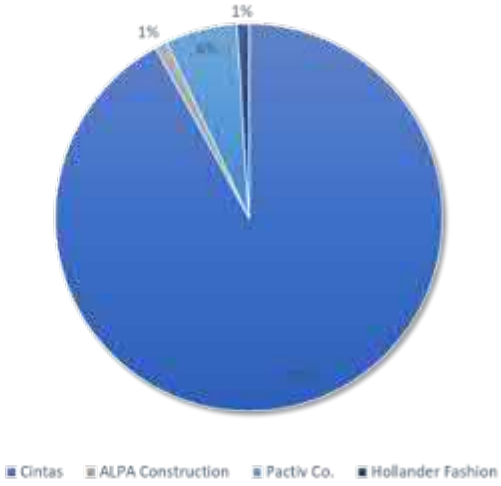
Thank you!

SURVEY RESULTS

Q1. Where do you work?

	Count	Percent
Cintas	248	92%
ALPA Construction	3	1%
Pactiv Co.	16	6%
Hollander Fashion	1	1%
	268	**100%**

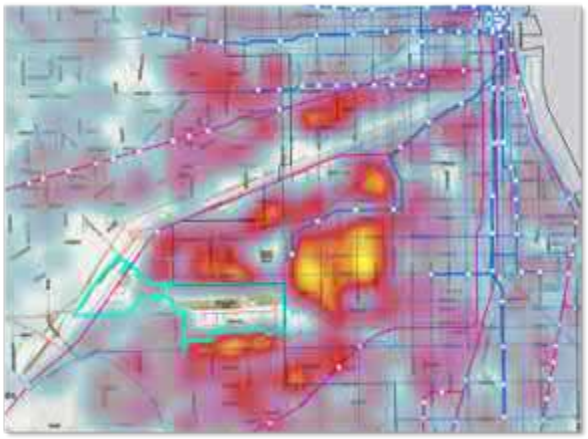
*Results for surveys received by 12/31/18



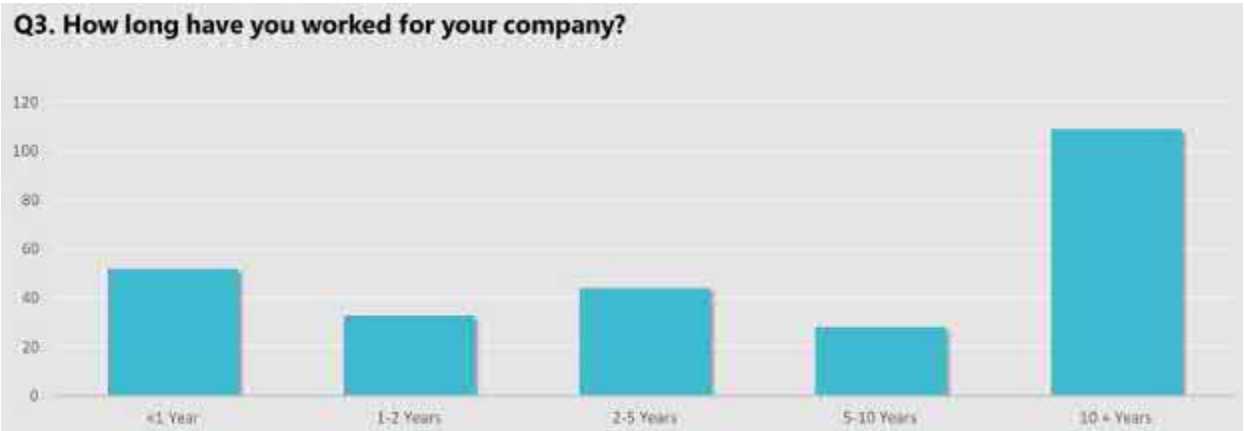
Q2. Where do you live?

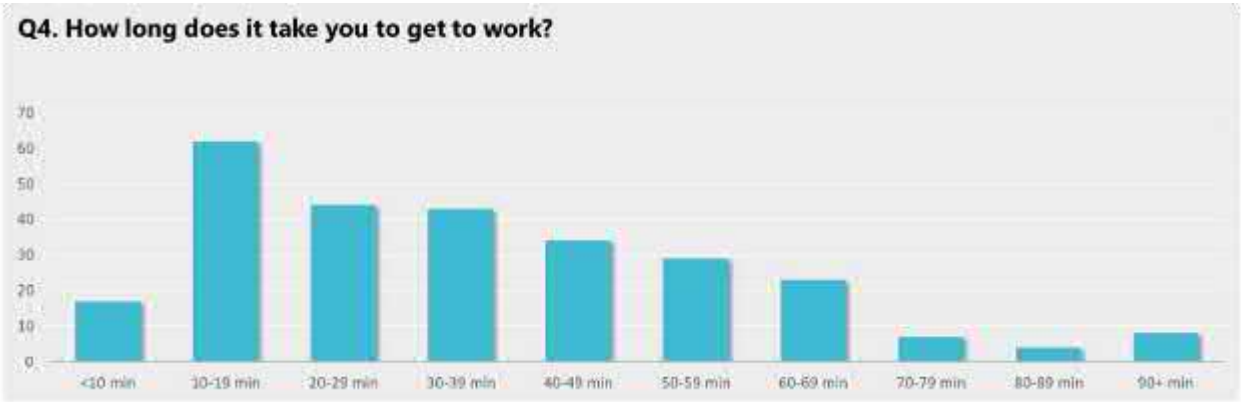
Top 10 Employee Origins*

*This list will be developed by geocoding survey responses.

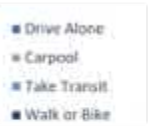


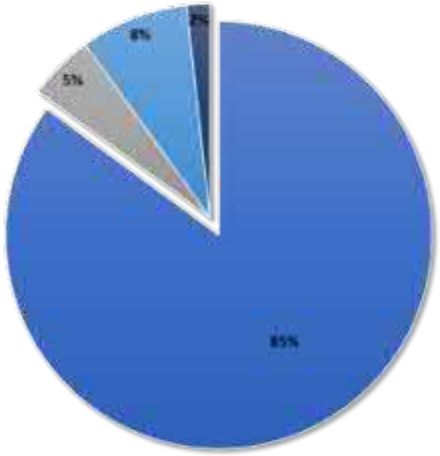
Q3. How long have you worked for your company?





Q4. How do you typically get to work?





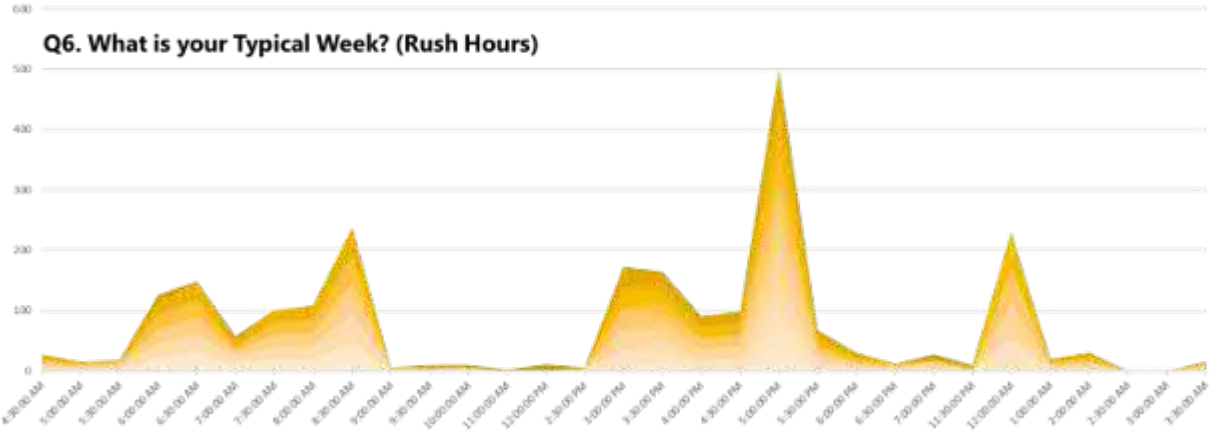
Source: Employee Survey (2018)

MODE OF TRAVEL TO WORK, 2015

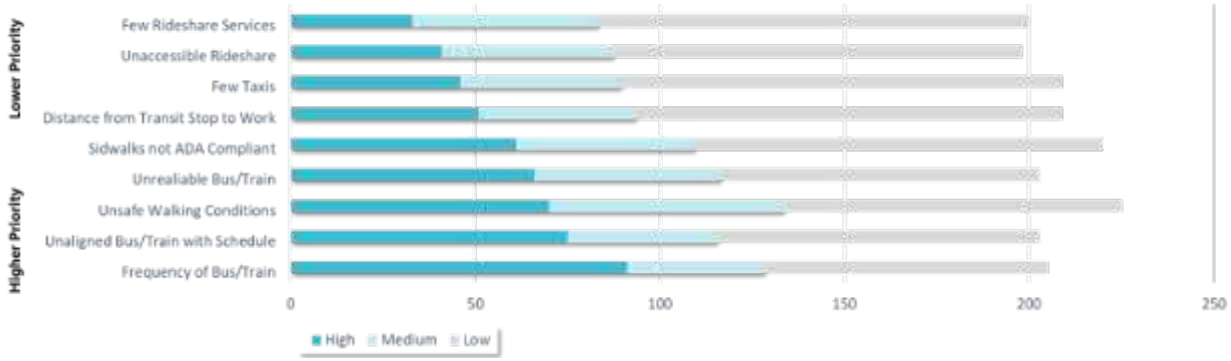
	Community		Cook County		CMAP Region	
	Count	Percent	Count	Percent	Count	Percent
Work at Home*	2	N/A	102,231	N/A	163,368	N/A
Drive Alone	275	85.1	1,497,663	64.8	2,783,650	72.6
Carpool	27	8.4	208,944	9.0	333,064	8.7
Transit	10	3.1	444,730	19.2	515,377	13.4
Walk or Bike	11	3.4	130,257	5.6	160,132	4.2
Other	0	0.0	28,908	1.3	43,951	1.1
TOTAL COMMUTERS	323	186.0	2,310,522	586.4	3,896,174	586.6

Source: 2015 American Community Survey five-year estimates *Not included in "total commuters"

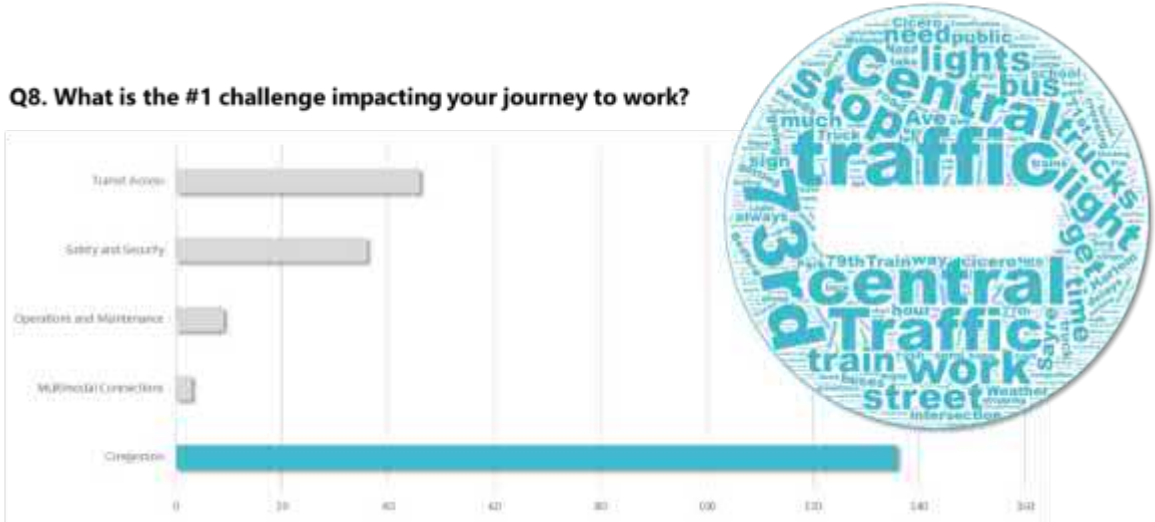
Source: 2015 American Community Survey (five-year estimates), CMAP Community Snapshots



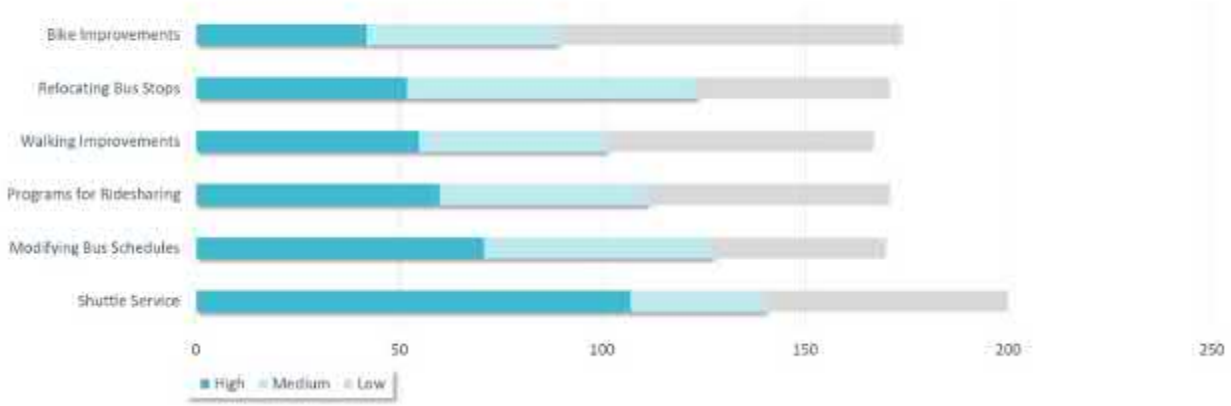
Q4. Please indicate if the following last mile challenges are a low, medium, or high concern.

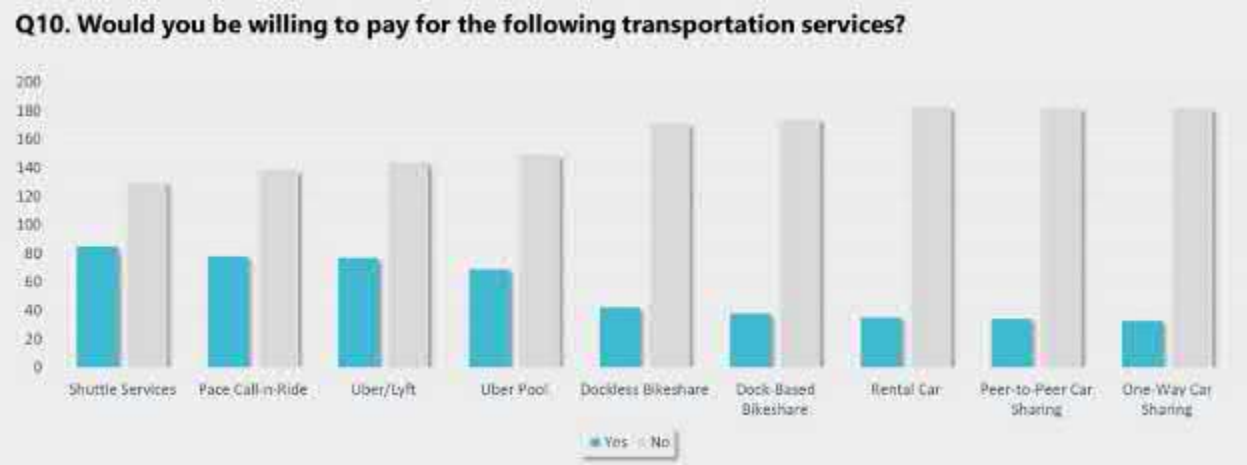


Q8. What is the #1 challenge impacting your journey to work?



Q9. Please rank if the following last mile solutions in order of priority.





NOTES

- The Survey Tool: The Employee Survey (see above) was published in print and digital formats. Surveys were available in both English and Spanish.
- Distribution Methods: The Employee Survey (see above) was distributed in print and online channels (via Survey Monkey). Printed surveys were made available in large numbers at Resource Group meetings and through the village staff. Resource Group participants and other businesses helped to distribute the survey link or hard copy surveys to employees before or after shifts. Some businesses elected to have computers on-site for employees to participate. The Village of Bedford Park staff also distributed hard copy surveys to those who inquired and utilized Municipal Hall and the Fire Station as survey collection locations.
- Employer Survey: An Employer Survey was also developed and distributed to Resource Group participants and through the Bedford-Park Clearing Industrial Association (BPCIA). Thirty employers completed the Employer Survey. Information collected through the Employer Survey was used to provide anecdotal information used throughout this Phase I report and to identify employers for Targeted Outreach activities in Phase II.
- Next Steps: Both the Employer Survey and Employee Survey will remain open throughout Phase II of this project.

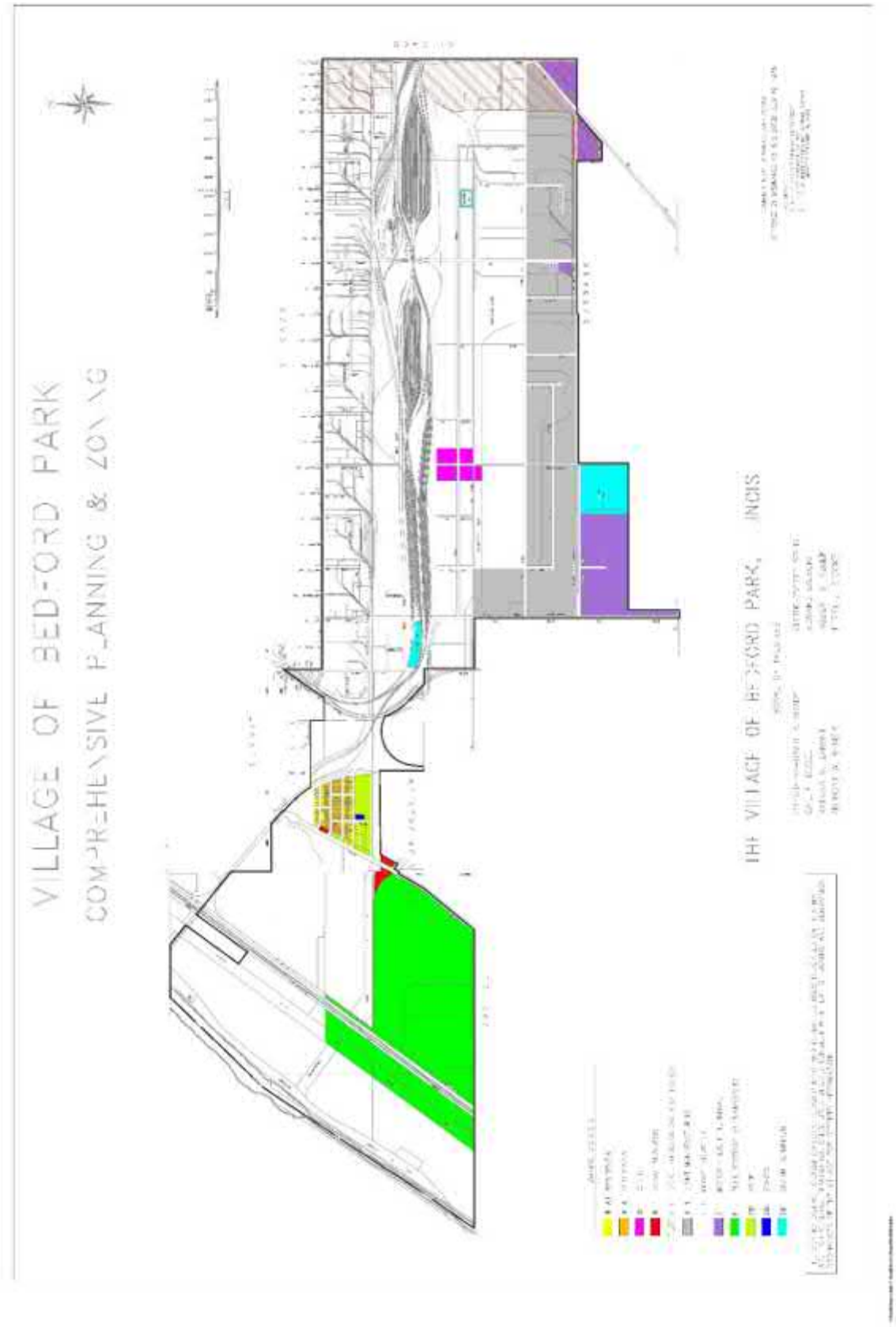
APPENDIX E: COMMUNITY DATA

KEY DEMOGRAPHIC AND TRAVEL INFORMATION FOR PEOPLE WHO LIVE AND WORK IN BEDFORD PARK

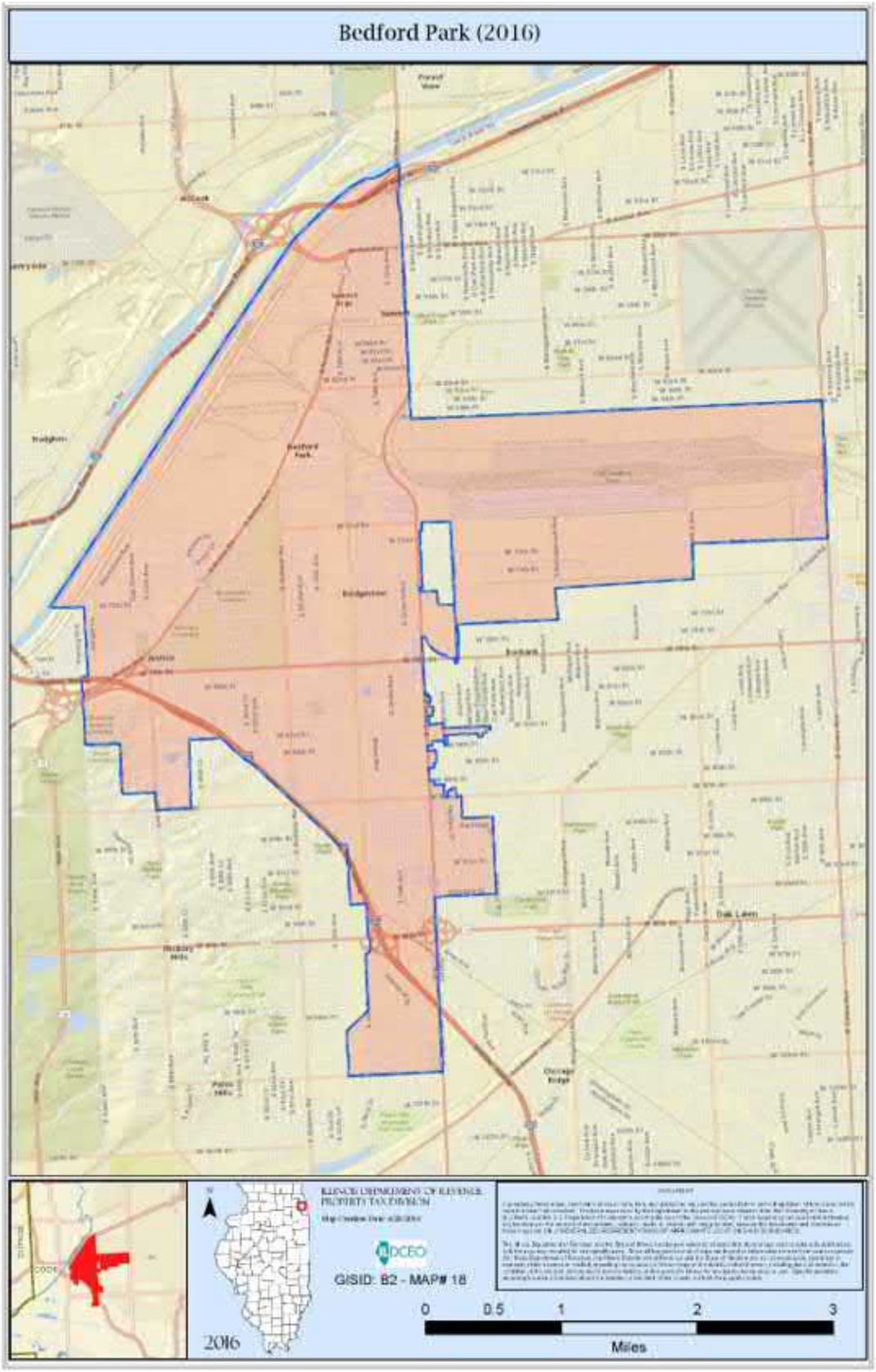
RESIDENTS People who live in Bedford Park	WORKFORCE People who work in Bedford Park
Population, 2017[1]: 604	**Total Workforce, 2015**[2]: 30,649
Employment Population 16 Years and Over[1] 315	
Total Households[1] : 248	**Number of Businesses**[3]: 418
Median Age, 2017[1]**:** 40.3	Worker Age[2]: ■ Age 29 or younger: 4,969 (16.2%) ■ Age 30 to 54: 18,345 (59.9%) ■ Age 55 or older: 7,335 (23.9)
Mode of Travel to Work, 2017[1] ■ Drive Alone: 83% ■ Transit: 2.2% ■ Carpool: 6.1% ■ Walk or Bike: 5.4% ■ Other/Work at Home: 3.2%	**Mode of Travel to Work, 2018**[4]**:** ■ Drive Alone: 85% ■ Transit: 8% ■ Carpool: 5% ■ Walk or Bike: 2% ■ Other/Work at Home: 0%
Average Household VMT: 28,870	**Average Household VMT:** N/A
Average Transportation Costs: $13,131	**Average Transportation Costs:** N/A
Employment of Community Residents, 2017 By Industry Sector ■ #1 Manufacturing: 55 (17.5%) ■ #2 Educational & Health Care: 49 (15.6%) ■ #3 Retail Trade: 35 (11.1%) ■ #4 Transportation: 33 (10.5%) ■ #5 Construction: 27 (8.6%) ■ Other: 99 (31.4%) By Employment Location ■ #1 Manufacturing: 55 (17.5%) ■ #2 Educational & Health Care: 49 (15.6%) ■ #3 Retail Trade: 35 (11.1%) ■ #4 Transportation: 33 (10.5%) ■ #5 Construction: 27 (8.6%) ■ Other: 99 (31.4%)	**Employment in the Community Residents, 2015** By Industry Sector ■ #1 Manufacturing: 7,974 (26.0%) ■ #2 Wholesale Trade: 6,131 (20.0%) ■ #3 Transportation: 3,717 (12.1%) ■ #4 Professional: 2,020 (6.6%) ■ #5 Construction: 2,001 (6.5%) ■ Other: 8,806 (29.5%) By Residence Location ■ #1 Chicago: 8,742 (28.5%) ■ #2 Burbank: 713 (2.3%) ■ #3 Oak Lawn: 696 (2.3%) ■ #4 Orland Park: 388 (1.3%) ■ #5 Cicero: 385 (1.3% ■ Other: 19,725 (64.3) 10,924

[1] 2013-2017 American Community Survey 5-Year Estimates
[2] U.S. Census Bureau. (2018). LEHD Origin-Destination Employment Statistics (2002-2015)
[3] Bedford Park Business License Data (gathered 9/20/2018)
[4] Mobility Survey Data

COMPREHENSIVE PLANNING & ZONING MAP



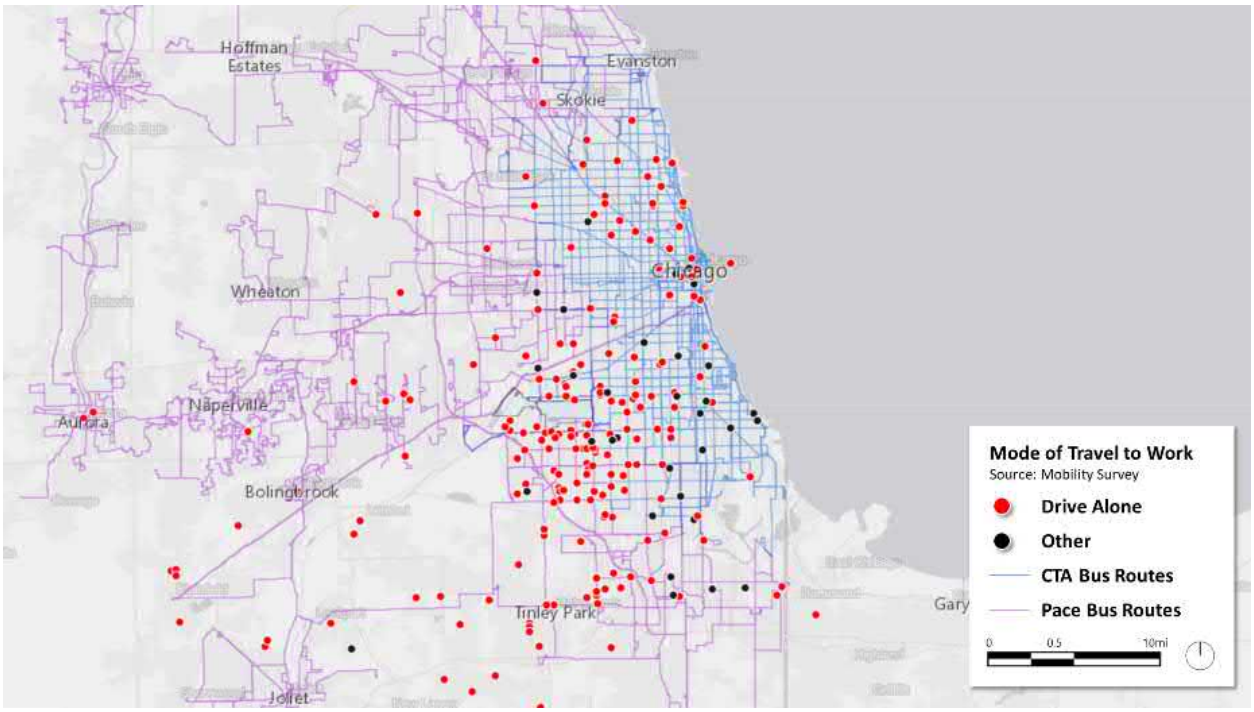
BEDFORD PARK ENTERPRISE ZONE MAP



SUMMARY OF TRANSIT SERVICE IN BEDFORD PARK

	Weekday Headways	Weekend Service	Direct Service to Bedford Park	24 HR service	Avg Daily Boarding M-F 2016	Avg Daily Boarding M-F 2017	% Change
CTA Routes & Stations							
165/63W *63rd/65th Street West*	30 min	Yes	Yes	No	117	119	2.30%
54B *Cicero Avenue*	20 min	Yes	Yes	No	3,249	3,113	-4.20%
55A	30 min	No	Yes	No	321	320	-0.10%
55N	30 min	Sat. Only	Yes	No	589	577	-1.90%
62H	15-20 min	Sat. Only	No	No	1,036	1,014	-2.10%
59	20 min	Sat. Only	No	No	3,380	3,179	-5.90%
Orange Line (Midway)	9 min	Yes	No	Yes	9,108	8,947	-1.80%
Pace Routes							
387 *Toyota Park*	20 min	Events Only	No	No	n/a	24	
379 *West 79th Street*	30 min	Yes	Yes	No	1,775	1,869	5.03%
382 *Central Clearing*	60 min	No	Yes	No	230	228	-0.88%
383 *South Cicero*	30 min	Sat. Only	Yes	No	1,243	1,299	4.31%
384 *Narragansett-Ridgeland*	30 min	Yes	N	No	584	566	-3.18%
385 *87th-111th-127th*	60 min	No	No	No	838	837	-0.12%
386 *South Harlem*	30 min	Yes	Yes	No	1,411	1,426	1.05%
390 *Midway CTA – UPS*	10 min - 2hrs	No	Yes	No	281	305	7.87%
Metra Lines & Stations							
Heritage Corridor *Summit Station*	~ 40 Min. - 7 trains	No	No (Summit)	No	96	N/A	
Southwest Service Ashburn	30 min - 1 h 15 min	Yes	No (Chicago)	No	211	N/A	

MODE OF TRAVEL TO WORK



Source: Mobility Survey Data (2018); RTAMS

This map visualizes the results from the Employee Survey (See Appendix B). Each point represents the trip origin (i.e. home) location for survey respondents and their mode of travel to work. According to the survey, 85% of Bedford Park's employees drive alone to work. This includes workers who live within a relatively short commuting distance (0 - 5 miles) and who could theoretically walk or bike to work. However, local road conditions and other factors currently make it difficult to access the Bedford Park through any means other than SOVs.

APPENDIX F: SHARED MOBILITY RESOURCES

SHARED MOBILITY TERMS

TERM	MEANING	OTHER NAMES/ TREATMENTS
Bikesharing	Short-term bike rental, usually for individual periods of an hour or less over the course of a membership (periods which can range from a single ride, to several days, to an annual membership). Information technology (IT)-enabled public bikesharing provides real-time information about the location and demand for bikes, either docked (locked at stations at the end of a ride) or dockless (free-floating and self-locking) throughout a community. The bicycles used in bikesharing can be either traditional, fully human powered vehicles, or equipped with low-speed electric motors or pedal-assist devices (known as e-bikes or pedelecs). Though bikesharing predates the term, it falls under the broader category of micromobility (see below), especially in its dockless flavors.	Bike sharing, dockless bikes, dockless bikeshare
Carsharing	A service that provides members with access to an automobile for intervals of less than a day. Major carsharing business models include traditional or round-trip, which requires users to borrow and return vehicles at the same location; one-way or free-floating, which allows users to pick up a vehicle at one location and drop it off at another. Peer-to-peer (p2p), is an ownership arrangement, generally deployed in a round-trip model, which allows individual car owners to earn money at times when they are not using their vehicles by making them available for rental to other carshare members.	Car sharing
Micromobility	An umbrella term for services based on the availability of personal mobility devices, small enough to fit in a bike lane and generally IT-enabled. These devices may be fully human propelled or use small, low-speed, usually electric motors with a maximum speed of 25-30 mph. The most widely known forms of micromobility are dockless bikes (both human powered and electric assist; see bikesharing above) and e-scooters (small electric kick scooters), though an increasing variety of other device types are reaching the market. While these devices are generally accessed through a shared service, they can also be personally owned. These services are increasingly part of a suite of mobility offerings by large, vertically integrated companies.	Scootershare, dockless bikeshare

TERM	MEANING	OTHER NAMES/ TREATMENTS
Microtransit	IT-enabled, multi-passenger transportation services that serve passengers largely on demand. Some models use dynamically generated routes, androutes and may expect passengers to make their way to and from common pick-up or drop-off points. Vehicles can range from large SUVs to vans to shuttle buses in the 12-20 passenger range. Because they provide transit-like service but on a smaller, more flexible scale, these services have been referred to as "microtransit," though in many operational aspects they resemble the demand-responsive transit that public agencies have been providing as "dial-a-ride" for decades.	Dynamic shuttles, flexible transit, demand-responsive transit
Private Shuttles	Traditional private shuttle services include corporate, regional, and local shuttles that make limited stops, often only picking up specified riders.	Employer shuttles, "tech buses"
Ridesharing	At its core, ridesharing involves adding passengers to a private trip in which driver and passengers share a destination. Such an arrangement provides additional transportation options for riders while allowing drivers to fill otherwise empty seats in their vehicles. Traditional forms of ridesharing include carpooling and vanpooling. This term is sometimes used to refer to ridesourcing (see below) but that is not the meaning employed in this report.	Carpooling, vanpooling, "slugging"
Ridesourcing	Ridesourcing providers such as Uber and Lyft—codified in California law as Transportation Network Companies (TNCs)—use online platforms to connect passengers with drivers and automate reservations, payments, and customer feedback. Riders can choose from a variety of service classes, including drivers who use personal, non-commercial, vehicles; traditional taxicabs dispatched via the providers' apps, and premium services with professional livery drivers and vehicles. Ridesourcing has become one of the most ubiquitous forms of shared mobility.	Transportation network company (TNC); ridesharing; ride-hailing; e-hailing

TERM	MEANING	OTHER NAMES/ TREATMENTS
Ride-Splitting	Dedicated operators, as well as several ridesourcing providers, have launched IT-mediated products that allow customers requesting a ride for one or two passengers to be paired in real time with others traveling along a similar route.	Dynamic carpooling
Shared-Use Mobility (SUM), Shared Modes, SUM operators	In general, shared-use mobility comprises intra-urban transportation services in which vehicles are accessed by multiple users for a variety of trip purposes. This umbrella term includes the forms listed above along with traditional public transit, taxis, and other vehicles for hire.	Shared mobility

The terminology in this chart is based on Murphy and Feigon (2016), TCRP Research Report 188: Shared Mobility and the Transformation of Public Transit, Transit Cooperative Research Program, Transportation Research Board, updated to reflect more recent market developments.

Source: National Academies of Sciences, 2016

SHARED MOBILITY OPPORTUNITY ASSESSMENT

CARSHARING

The nearest station-based (round-trip) carsharing vehicles are several Zipcars located at Midway Airport, more than a mile from Bedford Park, and beyond that at the Pulaski Orange Line stop, another two miles northeast. The pilot zone for free-floating (one-way) carshare in Chicago, centered on the Loop and Near North Side, is more than seven miles from Bedford Park at its closest point. This shared mobility mode, most useful for errands and occasional trips rather than as part of a commute or other frequent trip, is thus far largely unavailable in Bedford Park but has potential for growth, especially at the commercial zone at the city's southeastern flank. Results from the mobility survey suggest that rental car, peer-to-peer, and one-way car sharing services were low priority solutions for survey respondents.

BIKESHARING AND SCOOTERS

The Divvy bikesharing network, which was acquired by Lyft in July 2018, is limited to the City of Chicago and one northern suburb, and the system has been slow to expand to the south and west of downtown. The nearest station is some five miles from Bedford Park at Damen Avenue and 61st Street. Chicago's 2018 dockless bicycle pilot, centered on several far South Side wards south of 79th Street, but reached no closer than

four miles from Bedford Park. Under a proposed agreement with the City of Chicago's Department of Transportation (CDOT), Lyft would invest $50 million to expand Divvy over the next three years. The expansion would bring Divvy to all 50 wards—including the 23rd, 13th, and 18th wards that border Bedford Park—by 2021 through the addition of about 10,500 bikes and 175 stations. The new bikes will have electric pedal-assist and hybrid locking capabilities.

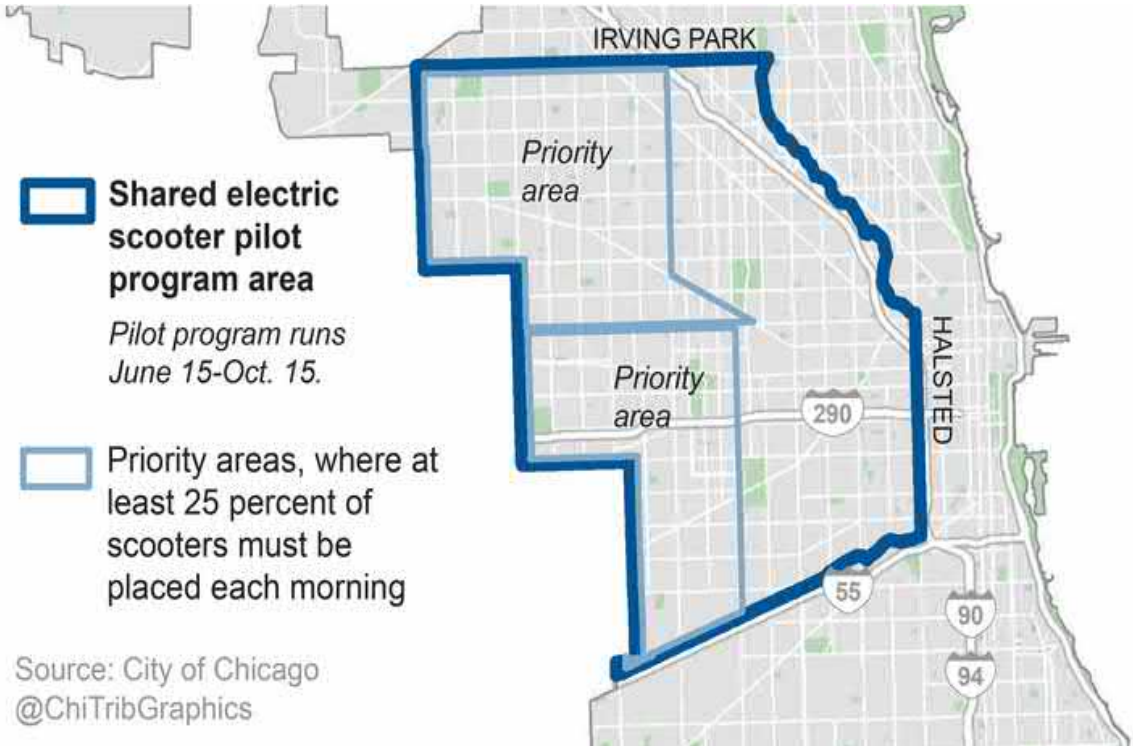
The City of Chicago also launched an electric scooter sharing pilot program in a large section of the Northwest, Southwest and West sides (**Figure F.1**. The program, which runs from June 15 through October 15, limits travel speeds to 15 mph and restricts where the scooters can be parked. It includes a minimum of 2,500 and a maximum of 3,500 scooters in the pilot area, divided evenly among selected vendors. Dockless bicycle and scooter operators, which depend on density and network effects for productive service, have not yet begun operating in any suburbs of the metro area. However, the participation of Lyft, Spin, and Lime Bike in Bedford Park's Last Mile Mobility Demo Day, suggest that there is an interest in expanded to suburban markets.

RIDEHAILING (TNCS)

Bedford Park is well within the service areas of the major TNC's operating in Chicagoland, Uber and Lyft. The analysis below details estimates about several TNC operations in the area. The commute-focused, pooled-ride service Via (which edges into the larger-vehicle microtransit space) operates only in central and north Chicago (east of Western, north of 79th), and to and from the region's airports. As its service is focused largely on trips in and out of the urban core, Via's service to Midway largely duplicates CTA Orange Line service for the purposes of reaching Bedford Park.

Figure F.2 shows an estimate of the relative supply of Uber vehicles (derived from the average wait time) available over the course of a week in Bedford Park, at nearby transit stations, and for comparison, in the central Loop. While the detail

Figure F.1. Shared Electric Scooter Pilot Program Area



is based only on data provided by Uber, spot checks of the Lyft app suggest that the service is generally competitive with Uber within a few minutes and a few dollars, with many of their independent contractor drivers providing rides on both platforms.

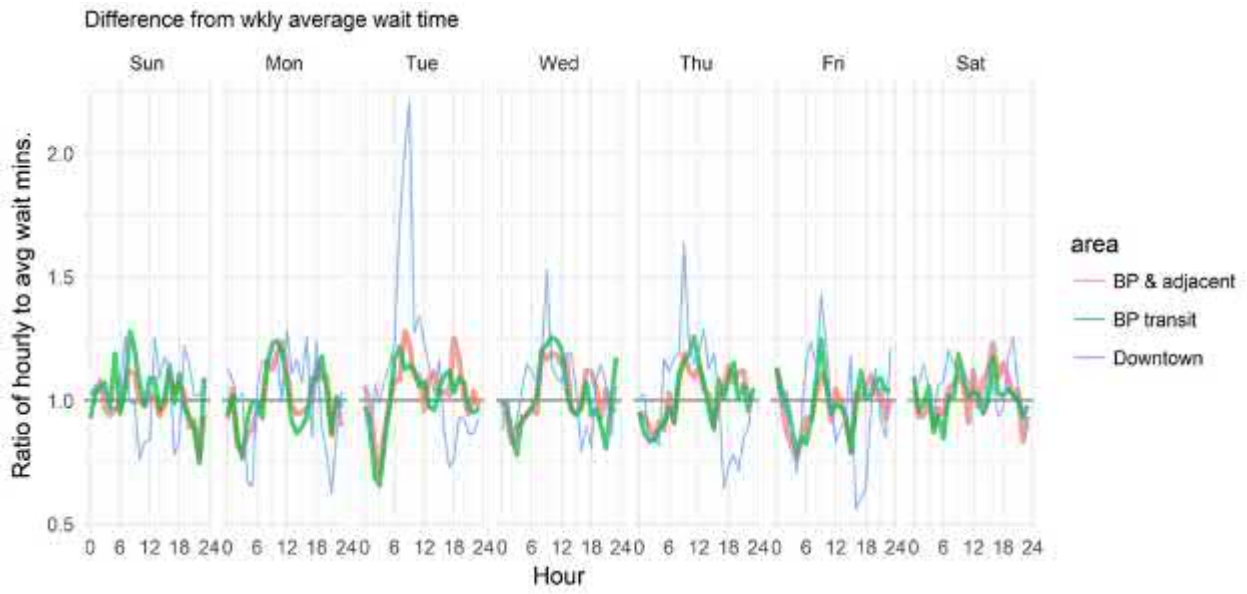
MICROTRANSIT

Microtransit is a term for on-demand, pooled rides between a limited number of points in vans or other larger vehicles, a service that falls somewhere between the on-demand, point-to-point flexibility of TNCs and the capacity and efficiency of fixed-route public transit. Until early 2019, Chariot was the sole microtransit provider in the Chicago region, including a route operated under an RTA last-mile pilot between the Elmhurst Metra station and Oakbrook Terrace. Chariot's owner, Ford Smart Mobility, announced in the first months of 2019 that the division would cease all operations, and at present no other entity is providing microtransit services in the Chicago region. Via, which in the Chicago market is primarily a ridesourcing provider, also offers microtransit services in several other US and overseas markets.

ON-DEMAND CARPOOLING

Several platforms have begun offering carpool services, available on demand, that match riders with drivers who are largely going their same direction. These services are distinct from TNCs in that they are matching rides, not offering a commercial vehicle for hire service. The new wave of apps offers a more flexible version of traditional carpooling in that both drivers and riders can decide when to participate or not, rather than being locked into a daily ride with the same group of people. The platforms may offer features like geofencing, linking to company emails, and guaranteed ride home that make them useful for application by workplaces that want to provide services for their employees or limit driving to their facilities. The companies Waze (previously known for their driving directions) and Scoop are available in the Chicago market, and show several rides available in the vicinity of Bedford Park.

Figure F.2. Relative TNC Supply by Hour



TNC RUSH HOURS

In order to estimate the relative demand for vehicles and other aspects of TNC operations in and around Bedford Park, the team gathered data from a public Uber API every five minutes over the course of ten days.[33] Though this method does not provide information on actual ride volumes, it does produce insights on how demand varies over the course of the week. We use the ratio between the average price per mile over the course of a week, and the price per mile within each hour, to deduce when Uber has raised prices, which it does in response to higher demand in specific locations.

We aggregate these figures into weekday and weekend demand curves (**Figure F.3**). The data is in line with what we would expect from an area dominated by work-related travel. Demand is at its highest on weekdays, with peaks during the 6am and 4pm hours, and lowest over the weekend, rarely rising above the average price even at the weekend late-night times when demand is highest for TNCs in general.

Figure F.4 shows how demand varies hour by hour throughout the week, including Bedford Park origins (the red line), trips starting at nearby transit stations (green), and trips starting in downtown Chicago (blue). The differences between the demand patterns are clear, with downtown peaking later in the day. Using the same process, we were able to derive typical wait times for Bedford Park, nearby transit stops, and downtown locations across all of Uber's service offerings (**Figure F.5**).[34] Bedford Park itself had slightly longer waits for the cheaper services classes than the transit stations (which includes the Midway Transit Hub).

To get a sense of how the supply of nearby vehicles varies over the course of the week (in relative terms), we can compare the wait time in a given hour with the typical wait time at that location over the course of the week (**Figure F.6**). In Bedford Park and its nearby transit hubs, vehicle supply appears to be at its lowest in the weekday early mornings, as well as late in the day on weekends, when TNC activity are known to be concentrated on nightlife areas of the city, north and northwest of the Loop.[35]

Figure F.3. Estimated Relative TNC Demand by Hour

[33] We used an automated process to gather information on the block groups that make up the three census tracts that lie at least partially in Bedford Park, as well as for block groups in any tracts bordering those that lie in the Village. Since census units are largely based on population, most of the 48-point locations were outside of the village limits.
[34] Downtown locations saw average waits of less than 3 minutes for every class of service. While Bedford Park and its transit stops saw average waits of under 5 minutes for UberPool and UberX: Other service classes, especially the livery-based Black and Black SUV, saw longer waits, but the average wait was no longer than 10 minutes.
[35] SUMC. TCRP Research Report 195, Broadening Understanding of the Interplay Among Public Transit, Shared Mobility, and Personal Automobiles. Transit Research Board of the National Academies (2018).

Figure F.4. Estimated Relative TNC Demand by Hour

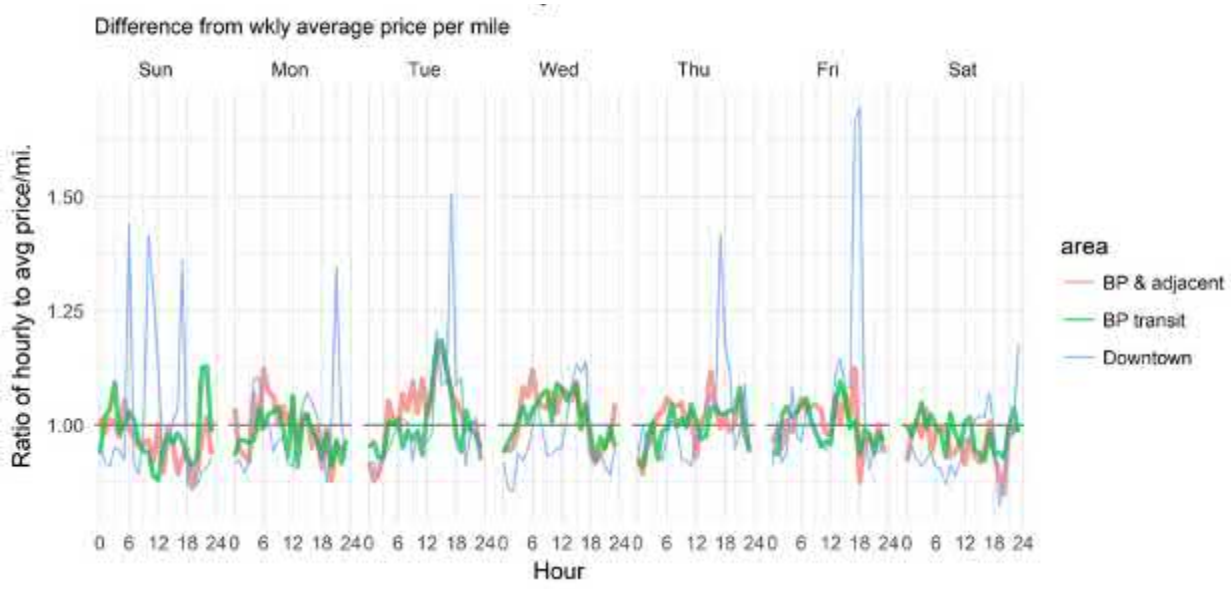


Figure F.5. Average Wait Times by Service Class and Area

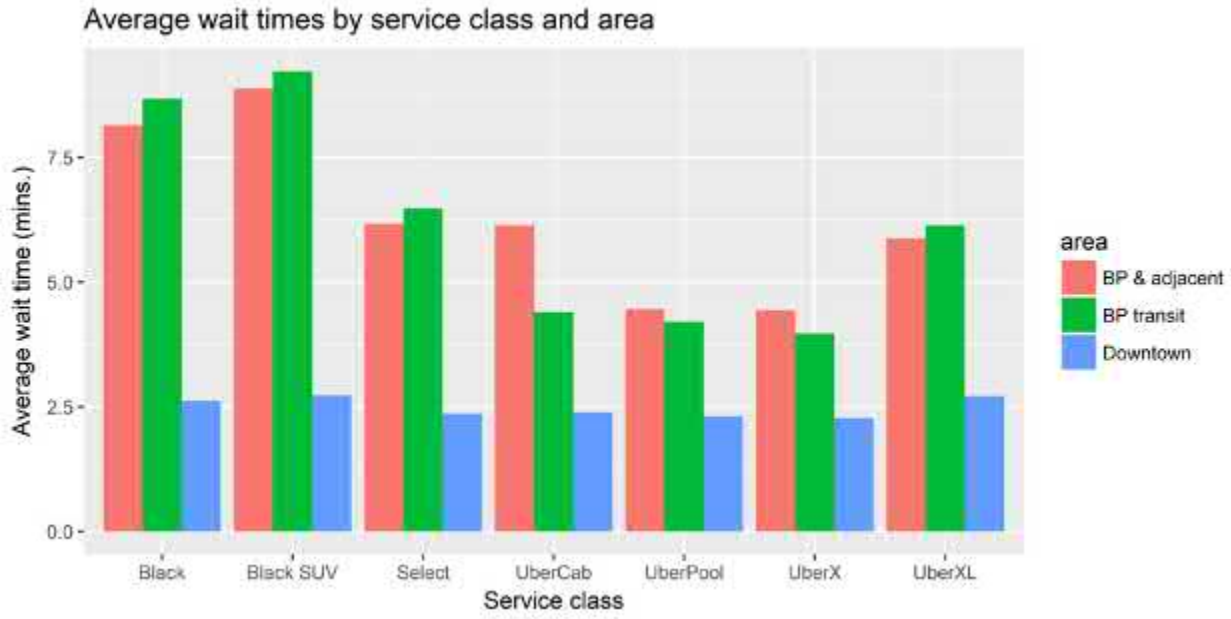


Figure F.6. Relative TNC Supply by Hour

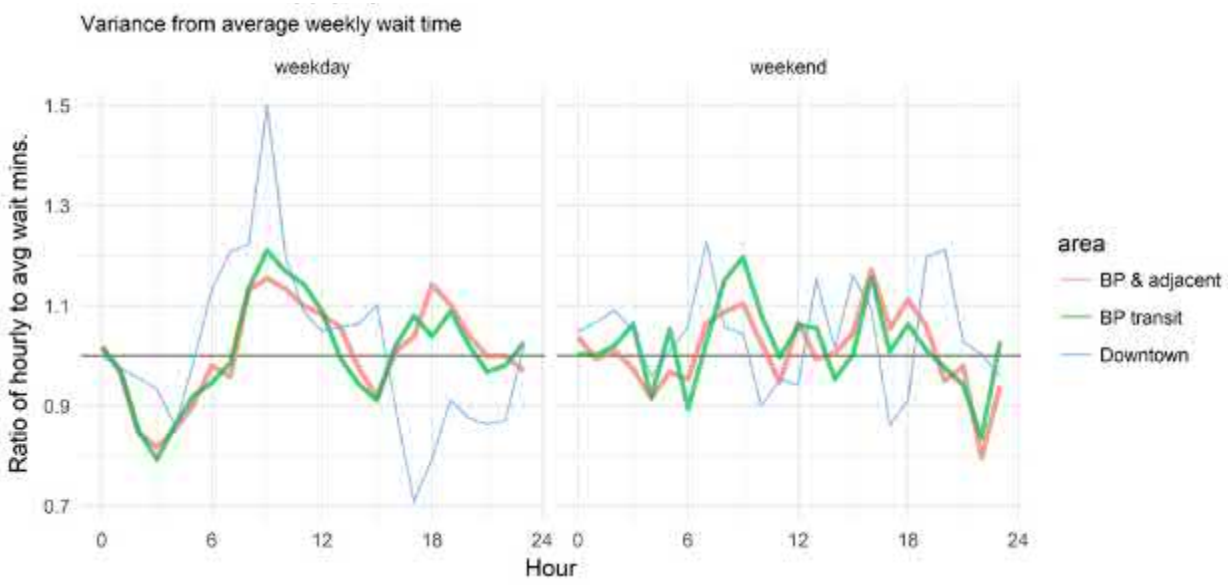
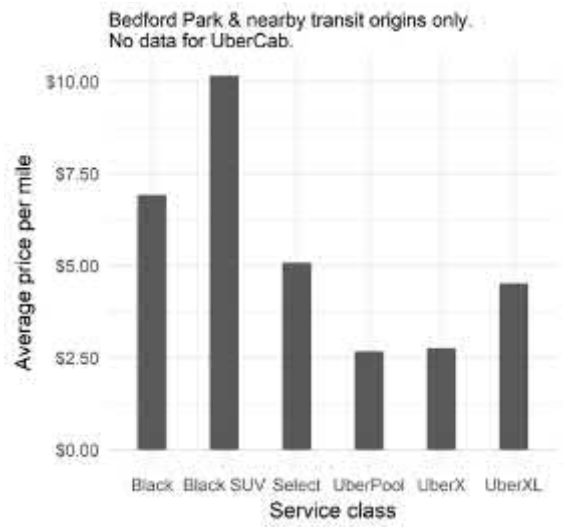


Figure F.7. Average Uber Trip Costs to Freqent Origins/Destinations

Figure F.8. Average Trip Price to Key Destination



To examine typical prices for trips between Bedford Park origins and key destinations (nearby transit stops as well as a trip to the central Loop), we looked at the three least expensive classes of non-cab service offered by Uber in the Chicago region :

- UberPool (shared rides for parties of up to two, which may be shared with other unrelated riders),
- UberX (unshared rides for up to four riders in a party), and
- UberXL (unshared rides for up to six riders in a party)

On both an overall (**Figure F.7**) and a per mile (**Figure F.8**) basis for typical trips, little price difference was observed between Pool and X rides.[36] Unsurprisingly, the Uber XL rides are more expensive than either Pool or X, but if the vehicles are filled close to their capacity (i.e. with more than four riders) they may be a more economical choice in terms of individual cost.[37]

[36] Less than a dollar difference between most Pool and X rides to transit stops in the local vicinity, but these small differences may add up over many rides.
[37] For trips between a workplace and a transit station where several riders share the origin and destination, this class of service might be useful to consider.

APPENDIX G: ADDITIONAL LAST MILE SOLUTION TOOLKIT RESOURCES

F.1. PEDESTRIAN NETWORK LAST MILE SOLUTIONS

1. Repair and Maintain Sidewalks
2. Expand the Sidewalk Network
3. Implement Targeting Crosswalk Improvements
4. Install Shared Mobility and Other Networks

F.2. BIKE NETWORK LAST MILE SOLUTIONS

1. Install Conventional Bike Lanes
2. Install Protected Cycle Tracks awnd Bike Trails
3. Expand Dock-Based Bike Sharing
4. Expand Dockless Bike Sharing and Other Micromobility Services

F.3. TRANSIT NETWORK LAST MILE SOLUTIONS

1. Optimize Transit Schedules and Routes
2. Formalize Transit Lanes and Transitways
3. Incentivize and Promote Transit
4. Expand Microtransit and Mobility on Demand Services

F.4. MOTORIST & FREIGHT NETWORK LAST MILE SOLUTIONS

1. Adopt and Implement a Complete Streets Policy
2. Utilize Integrated Corridor and Transportation Demand Management Strategies
3. Create Mobility Hubs
4. Expand Last Mile Carsharing/ Ridesourcing / Ridesharing Services

F.1. TOOLS FOR THE PEDESTRIAN NETWORK

Sidewalks are critical and serve as key corridors for people, goods, and commerce. In accordance with ADA accessibility guidelines, sidewalks should be provided on all streets in urban areas. Municipalities should ensure that sidewalks are without major gaps or deformities that would make them non-traversable for wheelchairs and other mobility devices.

1. REPAIR AND MAINTAIN SIDEWALKS

TREATMENTS + ACTIONS

- **Conduct A Village-Wide Sidewalk Assessment:** Assessing the amenities and state of current sidewalks through a collection of field observations, photos, and mapped results will inform the Village of priority maintenance and improvement projects. The assessment will help ensure that projects are consistent with the scope of work of pre-existing and future plans.
- **Identity and Repair High Priority Sidewalks:** Continuous, smooth, and level sidewalks should be provided throughout the Village. Sidewalks with cracks and spalling are tripping hazards and could cause injuries to pedestrians. Ensure that sidewalks are without major gaps or deformities that would make them non-traversable for wheel-chairs and other mobility devices.
- **Create Buffer Zones Where Feasible:** A minimum of 5-feet of unobstructed sidewalk space should be provided on both sides of roads (Figure 3-5). On busier streets, sidewalks should be 6- to 8-feet, if feasible, to provide a buffer from moving traffic. If the right-of-way permits, include a 4-foot wide grass buffer between sidewalks and streets. The Buffer Zone (See The Four Sidewalk Zones) should be at least 4' wide, 10' is preferred on roads with more traffic or with bus routes to accommodate shelters or benches and can include trees, green infrastructure, and other landscaping, though trees should not impede truck traffic. Sidewalk standards should accommodate higher anticipated pedestrian volumes and provide space for an expanded Frontage Zone (the section of the sidewalk that functions as an extension of the building), as well as other street furniture, such as trash cans, bus stops, signage, and bike share stations.

Sidewalk Assessment

Sidewalk Repair

Sidewalk and Buffer Zone

- **Improve Snow Removal Practices:** Snow covered sidewalks can force pedestrians onto streets in the winter months, impacting their safety. Snow Removal is critical for Winter Mobility, especially for those with mobility impairments. A snow shoveling policy should be enacted to ensure that sidewalks are cleared within a specified time after a snow fall.
- **Install Green Stormwater Infrastructure:** Street and sidewalk ponding can be a major impediment for pedestrians, especially those with mobility impairments. Green infrastructure best management practices (BMPs) mimic natural habitats and absorb excess rainwater. Green infrastructure is a cost-effective and resilient approach to managing stormwater that provides many community benefits and should be considered as part of any streetscape enhancement effort. Bioswales, stormwater bumpouts, and other BMPs can provide flood mitigation and improve the pedestrian environment.

A Snow-Covered Sidewalk Forces a Person with Limited Mobility Into the Street

Green Infrastructure Along Blue Island Avenue and Cermak Road

2. EXPAND THE SIDEWALK NETWORK

TREATMENTS + ACTIONS

- **Connect Gaps in Sidewalk Network:** A complete and connected network of sidewalks should be provided throughout Bedford Park. Where feasible, sidewalks should be provided on both sides of a street. Where it is not feasible, continuous sidewalk should be provided on at least one-side of a street and filling in gaps in the sidewalk along that street should be prioritized. Pedestrian "desire lines" can be used to identify high priority sidewalk gaps.
- **Widen Sidewalks and Create Buffer Zones:** Continuous, smooth, and level sidewalks should be provided, free of obstructions, such as utility poles, signs, trees, and benches. A minimum of 5-feet of unobstructed sidewalk space should be provided. On busier streets, sidewalks should be 6- to 8-feet if feasible to provide a buffer from moving traffic. The Clear Path Zone should be 1.8 to 2 meters so two people using wheelchairs can comfortably pass each other. Sidewalk design should go beyond the minimum in both width and amenities, especially for streets with high traffic volumes where pedestrians may avoid the area because they feel unsafe.

Pedestrian Desire Line Along W 75th Street in the South Corridor

A desire path (often referred to as desire line) is a path by foot traffic. The path usually represents the shortest or most easily navigated route between an origin and destination. Width and erosion severity can be indicators of how much traffic a path receives. Desire paths emerge as shortcuts where constructed ways take a circuitous route, have gaps, or are non-existent.

Buffer Zone

- **Install Mid-Block Crossing Where Appropriate:** Marked pedestrian crosswalks between intersections at mid-block where there is significant pedestrian desire line. Mid-Block crossings allow for safe crossings by pedestrians: they often incorporate raised crossings (to increase visibility), pedestrian islands (to cross two-way traffic), bulb-outs (to narrow the roadway), and yield-lines (to require motorized traffic to stop farther away).
- **Formalize Pedestrian Cut-Throughs and Improve Internal Parking Lot Circulation**: Pedestrian circulation to and from parking lots, bus stops, and mobility hubs to building entrances can be improved by installing sidewalks, painting crosswalks, and/or striping walking lanes. Formalized cut-throughs and shortcuts are paved or cemented to create a complete and safe network. Wayfinding and signage are used to establish the cut-through as an official route option. These areas should be clear of snow in the winter to increase pedestrian safety and comfort.
- **Provide High Quality Sidewalks:** Sidewalks are an essential part of the urban environment and are as a key corridor for people, goods, and commerce. They should be safe to navigate for all users, be free of barriers, and provide safe passage with adequate lighting, shade, and street level activity.

Mid Block crossing

Quality Sidewalks

Pedestrian Cut-Throughs and Parking Lot Circulation

3. IMPLEMENT TARGETED CROSSING IMPROVEMENTS

TREATMENTS + ACTIONS

Curb Ramps, Tactile Pads and Crosswalks

- **Install and Maintain ADA Curb Ramps, Tactile Pads, and High Visibility Crosswalks**: Curb ramps, detectable warning pads, and crosswalks should be provided at all intersections with sidewalks and multi-use paths. Curb ramps enable people in wheelchairs to cross streets and detectable warning pads direct people with visual impairments through an intersection at a crosswalk. All crosswalks not controlled by signals or stop signs should have longitudinal crosswalks, per the Manual of Uniform Traffic Control Devices (MUTCD)[37] . Crosswalks should be as wide as an approaching sidewalk.

- **Install Accessible Pedestrian Countdown Signals with Leading Pedestrian Intervals**: Pedestrian signals with a countdown timer indicates the amount of time pedestrians have available to cross a street. They are designed to reduce the number of pedestrians who start crossing when there is not enough time to complete their crossing safely. This treatment is particularly helpful for seniors and people with mobility impairments. Countdown pedestrian signals are required by the MUTCD for all new and rehabbed pedestrian signal installations. Signals should be set to allow pedestrians 3.5 feet per second to cross. A leading pedestrian interval (LPI) provides 3-7 seconds of lead time for pedestrians to enter a crosswalk before the start of a vehicle signal phase. They enhance pedestrian visibility in an intersection and provide pedestrians with the right-of-way overturning drivers. LPIs should be used at intersections with high pedestrian and vehicle turning volumes.

Pedestrian Countdown Signals

[37] There are several types of crosswalks, including: solid, standard, dashed, zebra, and ladder. Refer to the Manual on Uniform Traffic Control Devices for Streets and Highways for guidance on which (https://mutcd.fhwa.dot.gov/) style of crosswalk is appropriate for a given situation. Figure 3-10 shows a ladder style crosswalk.

- **Install Pedestrian Refuge Islands Where Appropriate:** Crossing islands, also known as pedestrian refuge islands, buffer and protect pedestrians and cyclists crossing wide or busy streets, enabling them to cross in two stages. Where possible, they should be wide enough to accommodate the length of a standard bicycle with at least one foot of clearance on either side, or about 7-feet. The width of the cut-through should equal the width of the pedestrian crossing or be at least as wide as the Clear Path Zone. Crossing islands should be paired with high visibility crosswalks, stop bars, bollards, pedestrian crossing warning signs, or other features to protect people waiting to cross. They are most appropriate for use at mid-block and unsignalized crossings on 4-lane roads. Guidance and acceptable uses will vary by roadway jurisdiction.

Crossing Islands

- **Create Bump-outs and Curb Extensions:** Bump-outs provide shorter crossing distances for pedestrians and improve sightlines for both drivers and pedestrians. In addition to improving sightlines, they can slow the speed of turning traffic, though careful attention should be paid to the design to accommodate turning truck traffic. They are most appropriate for use on local roads where they intersect arterial and collector streets. Benches, green infrastructure, and other streetscaping elements can be added to them, and if space permits, they can be used at bus stops to house amenities for riders.

Bump-Outs / Curb Extensions

- **Install Rectangular Rapid Flashing Beacons (RRFBs)**: Rectangular Rapid-Flashing Beacons (RRFB) are devices that use LED flashing beacons in combination with pedestrian and bicycle warning signs, to provide a high-visibility strobe-like warning to drivers when pedestrians and bicyclists use a crosswalk. RRFBs can supplement standard pedestrian crossing warning signs at mid-block and other unsignalized crossing locations. These user-activated beacons are FHWA-approved and promote increased yield rates and improved pedestrian safety. They are a low-cost alternative to a hybrid beacon and are warranted for use at locations that do not warrant a full traffic signal. RRFBs should be installed on each side of the road at a center island or median if applicable.

Rectangular Rapid Flashing Beacons

4. INSTALL SHARED MOBILITY AND OTHER PEDESTRIAN AMENITIES

Treatments + Actions

- **Create TNC Pickup and Drop-off Zones:** Transit Network Companies (TNC) need a safe curb-space to pickup and drop-off passengers. Curbside zones should be able to accommodate one to five TNC vehicles and safe for waiting passengers. Curbside zones could also include other pedestrian amenities such as a weather shelter, signage, lighting, and seating.
- **Install Pedestrian-Scaled Lighting**: Lighting creates safe and desirable streetscapes at night and during the daytime. Lighting selection can add character to neighborhoods and business districts. Pedestrian-scaled lighting illuminates sidewalks at the pedestrian level. It makes pedestrians more visible to drivers when crossing streets, provides a well-lit area for people waiting for transit, and provides a more hospitable environment after dark, which is especially beneficial for second- and third shift workers. Light poles can be mounted on sidewalks, where space permits, combined with streetlights, or coordinated with building and property owners to be mounted on buildings or on private property where poles would obstruct sidewalks.
- **Install More Seating and Weather Protection:** Benches and other seating areas are essential, providing comfortable places to rest, eat, socialize, or wait for transit. Where feasible, seating should be located under trees or covered to protect people from the elements. Benches should not obstruct sidewalks.
- **Install Pedestrian Scaled Wayfinding Signage:** Informational kiosks and wayfinding signage can be placed in key areas to direct pedestrians to businesses, the forthcoming event center, transit stops, and other destinations in Bedford Park. Bedford Park currently has motorist-oriented signage along the South Corridor, which could be expanded to include information useful for pedestrian, such as approximate walking distances and maps of businesses with large campuses.

TNC Pickup and Drop-off Zone

Pedestrian Scaled Lighting

Seating and Weather Protection

Wayfinding Signage in Bedford Park

F.2. TOOLS FOR THE BIKE NETWORK

Bikes provide people with a faster alternative to walking. Environmentally friendly, biking decreases congestion and emissions caused by increased vehicle traffic. Biking—by providing commuters a means to quickly access nearby transit stations—can also encourage more people to take public transit and is therefore becoming an increasingly popular last mile solution. Keeping bikers safe on roadways requires the integration of a network of bike lanes with clear signage, traffics signals, and a buffer or protection from road traffic.

1. INSTALL CONVENTIONAL BIKE LANES

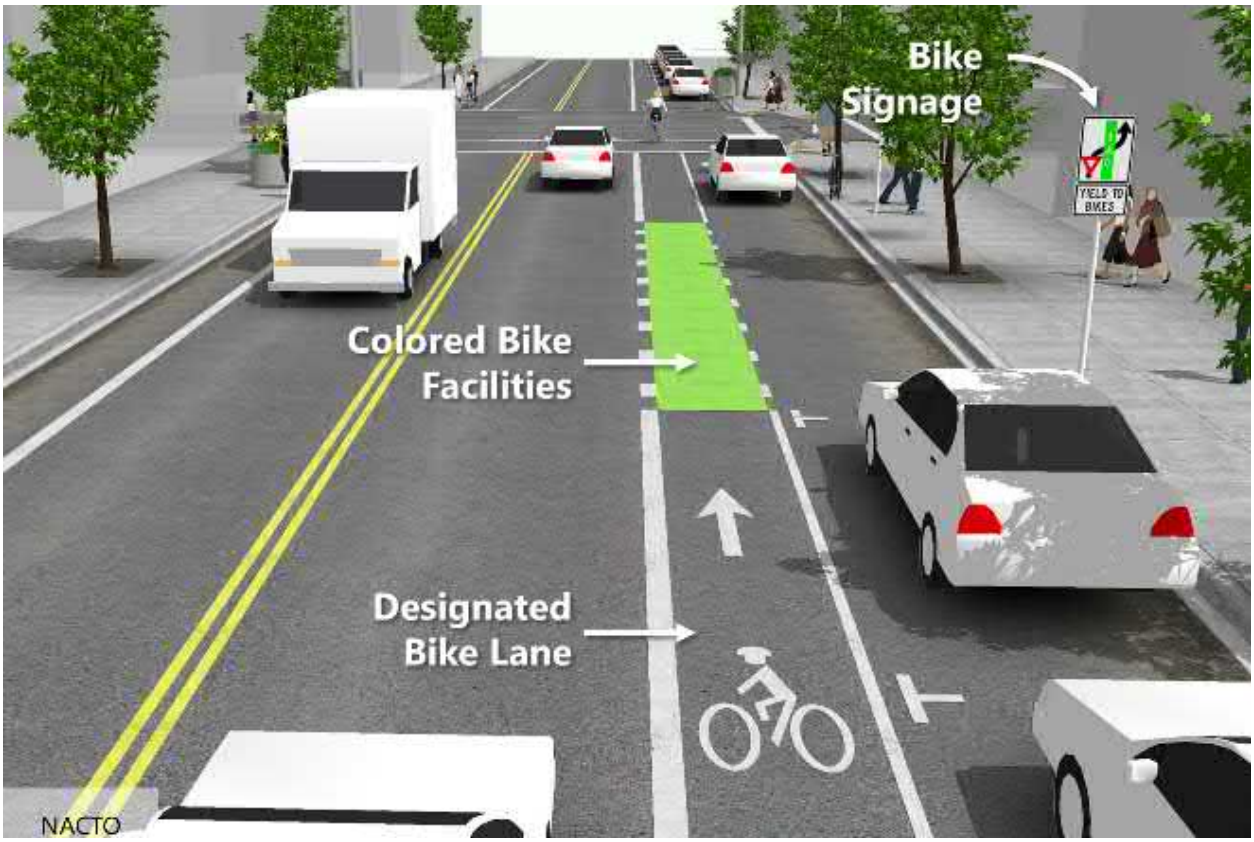
TREATMENTS + ACTIONS

Buffered Bike Lanes

Sharrows

- **Create Bikeways Using Sharrows, Marked Shared Lanes, and Buffered Bike Lane:** Bike lanes provide a dedicated space for cyclists on a road and encourage drivers and cyclists to behave predictably. They also reduce motor vehicle speeds and lower the risk of severe crashes. At minimum, bike lanes should be 5' wide. In absence of on-street parking, a bike lane provides separation between vehicle lanes and abutting sidewalks. Bicycle lane markings—word or symbol and arrow—should be used to define and designate a bike lane. Like designated bike lanes, buffered bike lanes provide a dedicated space for cyclists separated from vehicle traffic by a painted buffer. Buffers can be placed on the vehicle side of the bike lane, the parking side, or both. On roads with higher traffic volumes and/or speed limits, buffered bike lanes are more comfortable for cyclists than a standard bike lane. Buffered bike lanes should be at least 5' wide and each buffer should be 2' wide. Where buffers are used, bike lanes can be narrower because the shy distance function is assumed by the buffer. Marked shared lanes use a double chevron and bicycle marking, or "sharrow" (share-arrow), in the general-use lane to alert drivers to the presence of bicyclists and to encourage safe bicycle use. Chevron symbols direct bicyclists to ride in the safest location within the lane, outside of the door zone of parked cars and areas where debris is likely to collect.
- **Install Colored Bike Facilities**: Green pavement is painted onto the roadway to delineate a bike lane. It can be used to emphasize the presence and overall visibility of cyclists at intersections, driveways, crosswalks where multi-use paths cross streets, and other mixing zones.
- **Install Bikeway Signage: Bike** signage indicates designated bikeways, provides bike route wayfinding, cautions vehicles to yield to bikes, and alerts pedestrians to the presence of bikers.

Marked Designated Bike Lanes, Colored Bike Facilities, Bike Signage



2. INSTALL PROTECTED CYCLE TRACKS AND BIKE TRAILS

TREATMENTS + ACTIONS

Protected Cycle Track

- **Install Protected Cycle Tracks:** Protected cycle tracts provide dedicated space for cyclists separated from vehicle traffic by a curb or bollards. They should be at least 5' wide with a 2' wide painted with flexible delineator posts or curbed buffers. Removable delineator posts can be removed in the winter and replaced in the spring to make snow plowing and maintenance easier. This facility type is the most comfortable for cyclists, especially on roads with high traffic volumes, fast moving traffic, or heavy truck traffic. Protected bike lanes require careful design at intersecting streets and driveways, where motorists may not see bicyclists. They reduce the risk of injury from dooring and merging traffic, prevent double parking, improve comfort and safety, and have a low-implementation cost by utilizing pre-existing pavement and drainage.

- **Install Raised Cycle Tracks:** Raised cycle tracks are separated vertically from traffic by bringing bike lanes up to the sidewalk level or in between the street and sidewalk level. They help to visually reduce the width of the street and can encourage cyclists to choose riding in the bikeway rather than on the sidewalk. They're best used along higher speed streets with few driveways and cross streets. If constructed at the same level as a sidewalk, a buffer, such as landscaping, a change in pavement type, or striping, should be provided to prevent cyclists from riding on the sidewalk.

Installation of Chicago's First Raised and Two-Way Cycle Track on Roosevelt Road

- **Install Two-Way Cycle Tracks**: Two-Way Cycle Tracks allow bicycles to travel both directions on the one side of the road. Physically separated from vehicle traffic, they share the same design and benefit characteristics of One-Way Cycle Tracks, but may require additional planning considerations at street crossings and driveways.

- **Install Off Street Trails and Paths**: Multi-use paths run parallel to a road like a sidewalk and are shared by pedestrians and cyclists. They should be at 8' to 10' wide'. They should be used on streets with limited driveway and intersection crossings. Like sidewalks, multi-use paths should include a grass buffer. A sidewalk should still be provided on the opposite side of the road. Off-Street Trails can fill in gaps where a street network is incomplete or cannot accommodate a bike facility. Trails should meet the same design criteria as shared-use paths. They function best on exclusive rights-of-way, such as along waterways, utility corridors, or abandoned rail corridors. Although trails are more expensive to build than on-street facilities, they provide important connections to regional destinations and can often serve as commuter corridors.

Off Street Trail

- **Install Bike Racks and Corrals:** Bike racks and corrals should be placed in highly visible locations adjacent to building entrances or near the curb line on streets. Use u-shaped racks which are strong and deter theft. On corporate campuses, consider installing bike racks in a covered area to protect bikes from the elements. Bike corrals may also be installed at intersections to act as bump-outs. Bike racks and corrals can be installed as an additional buffer between sidewalk and road traffic. This treatment should be limited to low-speed, low-traffic volume roads to ensure safety. Corrals typically provide room for 12 or more bicycles in a space otherwise occupied by 1 or 2 cars.

- **Continue To Support The IandM Canal Trail Expansion Efforts:** The IandM Canal Trail is a 96-mile bike route along the Illinois and Michigan Canal. Both the Active Transportation Alliance and Trail Connect Chicagoland have been advocating for the IandM Canal Trail Expansion to close gaps in the regional trail network.

Bike Corrals and Racks

Illinois and Michigan Canal Trail

3. EXPAND DOCK-BASED SHARING

TREATMENTS + ACTIONS

- **Partner with Divvy:** Divvy's parent company was recently acquired by Lyft. There are plans to expand Divvy docking stations city-wide to every ward in Chicago, adding 175 stations and 10,500 bikes. Chicago's immediate adjacency to Bedford Park provides the opportunity to partner with Divvy so bike commuters have access to bikes and docking stations to and Bedford Park.

Divvy for Everone (D4E)

- **Promote Divvy for Everyone (D4E):** Eligible residents can partake the D4E program provided the Chicago Department Transportation (CDOT) that aims to all Chicagoans an affordable and accessible transit option. The D4E program includes a one-time five-dollar annual membership fee and available cash payment system for those individuals who do not have debit or credit card (typically required for a standard Divvy membership).

- **Identify Candidate Bike Sharing Station Locations:** Bike share stations or corrals should be placed in locations where demand is high, such as adjacent to major employers, transit hubs, and regional destinations. Transit bus is the most typical kind of connection, with 74.9 percent (2,531) of bike-share stations operating in the US located a block or less from a transit bus stop. Bike share bikes may have docking stations, like the Divvy bikes, or be dockless. See the Shared Mobility Network section for additional guidance.

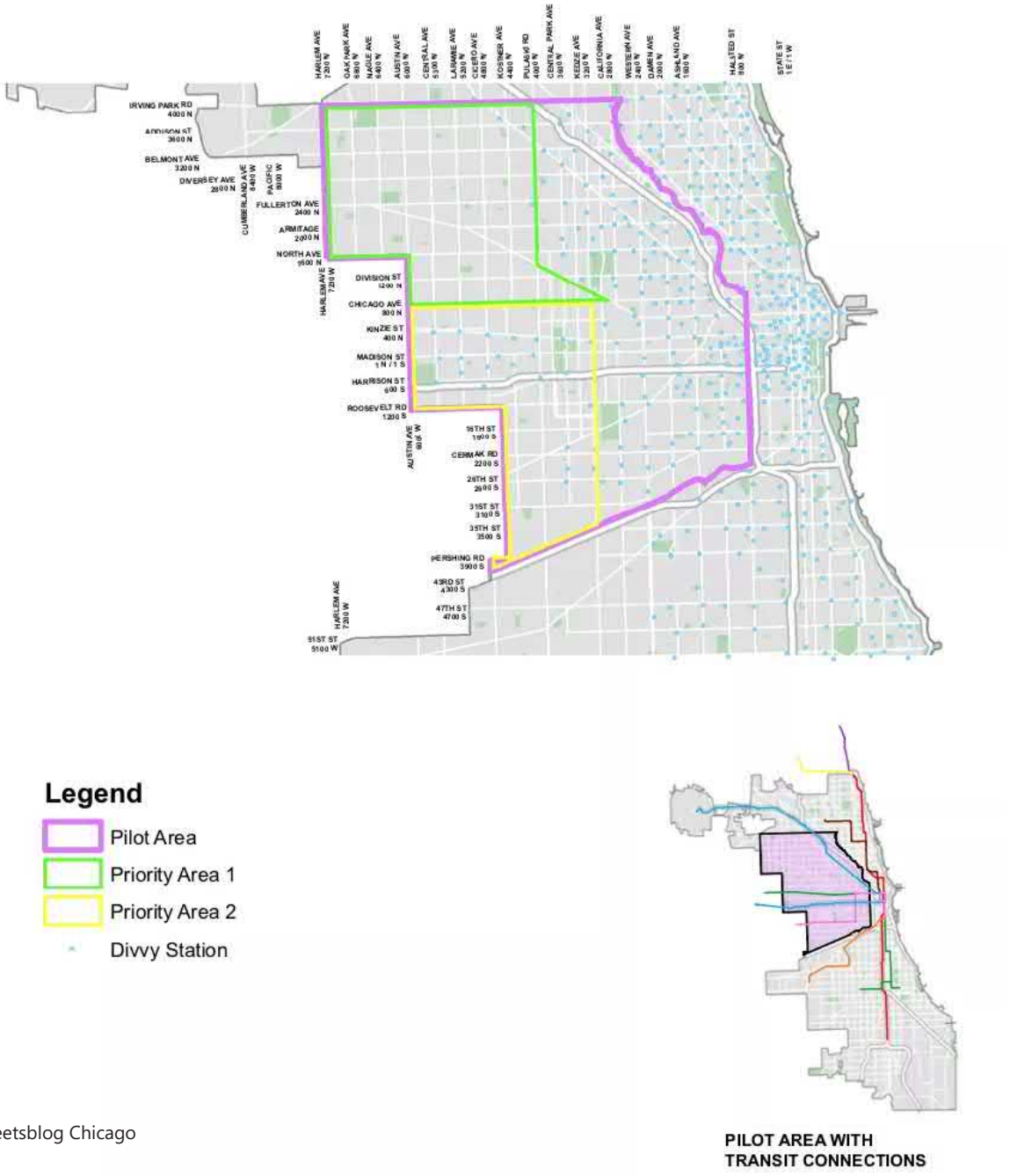
Divvy Bike Station

4. EXPAND DOCKLESS BIKE SHARING AND OTHER MICROMOBILITY SERVICES

TREATMENTS + ACTIONS

- **Partner with Micromobility Providers to Launch a Pilot Program (e.g Dockless Bikes, Dockless e-scooters):** In June 2019, neighboring Chicago launched the e-scooter micromobility pilot program as a first/last mile solution. The Village of Bedford Park could pilot a similar program of dockless bikes and e-scooters by partnering with micromobility providers (e.g. Divvy, Lime, Uber, Lyft, Bird, Spin).

Chicago E-Scooter Pilot Program



Streetsblog Chicago

Micromobility pilot programs are guided by set goals and priorities and offer accessible and affordable transit options. The Pilot program would test potential transit solutions through set parameters for the micromobility providers and users (e.g. pilot zones, parking restrictions, prohibit sidewalk use, user charge rates). Data collected is evaluated to determine an appropriate service model to scale up. Evaluation would review the challenges, barriers, and resolutions of the piloted program and provide preventable measures to mitigate challenges.

- **Scale Up Micromobility services**: If the pilot is successful and deems a demand for micromobility options, the Village of Bedford Park could scale up the micromobility services and network. Scaling up will allow for more possible first/last mile connections, more micromobility stations, and increase the availability of micromobility options.
- **Install Micromobility Supportive Infrastructure:** Supportive Micromobility Infrastructure includes parking, charging stations, bike racks and corrals, and other supportive infrastructure. Charging Stations, bike racks, and corals can double as micromobility parking spots and should be placed in highly visible locations adjacent to building entrances or near the curb line on streets. Use u-shaped racks which are strong and deter theft, should the dockless or personal bikes require being locked up. Charging stations can be located off the street in parking lots, garages, gas stations and other spots. Parking spots prevent micromobility transit (e.g. e-scooters and dockless bikes) from creating right of way hazards and blocking the sidewalk pedestrian traffic.

Micromobility Supportive Infrastructure

F.3. TOOLS FOR THE TRANSIT NETWORK

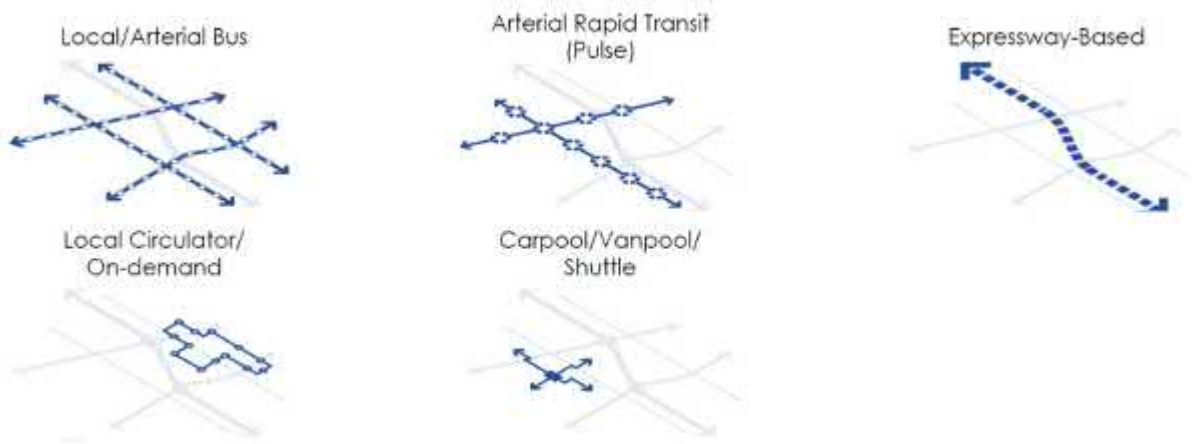
From fixed-route bus and rail services to small, on-demand paratransit services, transit offers a sustainable and efficient way to move people in urban areas.

1. OPTIMIZE TRANSIT SCHEDULES AND ROUTES

TREATMENTS + ACTIONS

- **Align Bus Schedules with Shift Changes:** Dense employment centers create a pool of consistent transit users. Understanding the employers in these employment hubs, along with their business operations and shift changes, can allow for better coordination with modes of transit that serve employees. By creating better alignment with common shift changes, maximum efficiency is ensured. Changes that can be made to align with shift changes include adjusting bus schedules, increasing bus capacity, and increasing the bus frequency during those popular times of day. Coordination across transit agencies is needed to ensure multimodal connections are efficient.
- **Optimized Routes and Services Types:** Because there is no track, rail, or other permanent infrastructure required to operate a bus, bus routes can be adjusted and refined to better serve existing riders and increase ridership overtime. Bus routes should be optimized to gain the highest number of riders, while also moving those riders at an efficient pace. This includes changes such as optimizing the schedule with shift changes and consolidating stops where low-ridership slows down median travel time. Riders will walk slightly farther to access higher quality service. Therefore, stops and routes can be spaced farther apart. The figure below illustrates several different types of service models that Pace currently provides, which include conventional fixed route bus service on local roads and arterials, as well as newer models for Arterial Rapid Transit, Expressway-Based, and other Mobility On-Demand models.
- **Provide Feedback to CTA and Pace Regarding Shift Change Times and User Requests**: The Village of Bedford Park can continue to gather insights from surveys and outreach to employers and employees regarding shift times and relay this information to CTA and Pace. For example, the CTA has suggested potential adjustments to the 65th Street bus to better accommodate work shifts.

Different Types of Transit Service Options



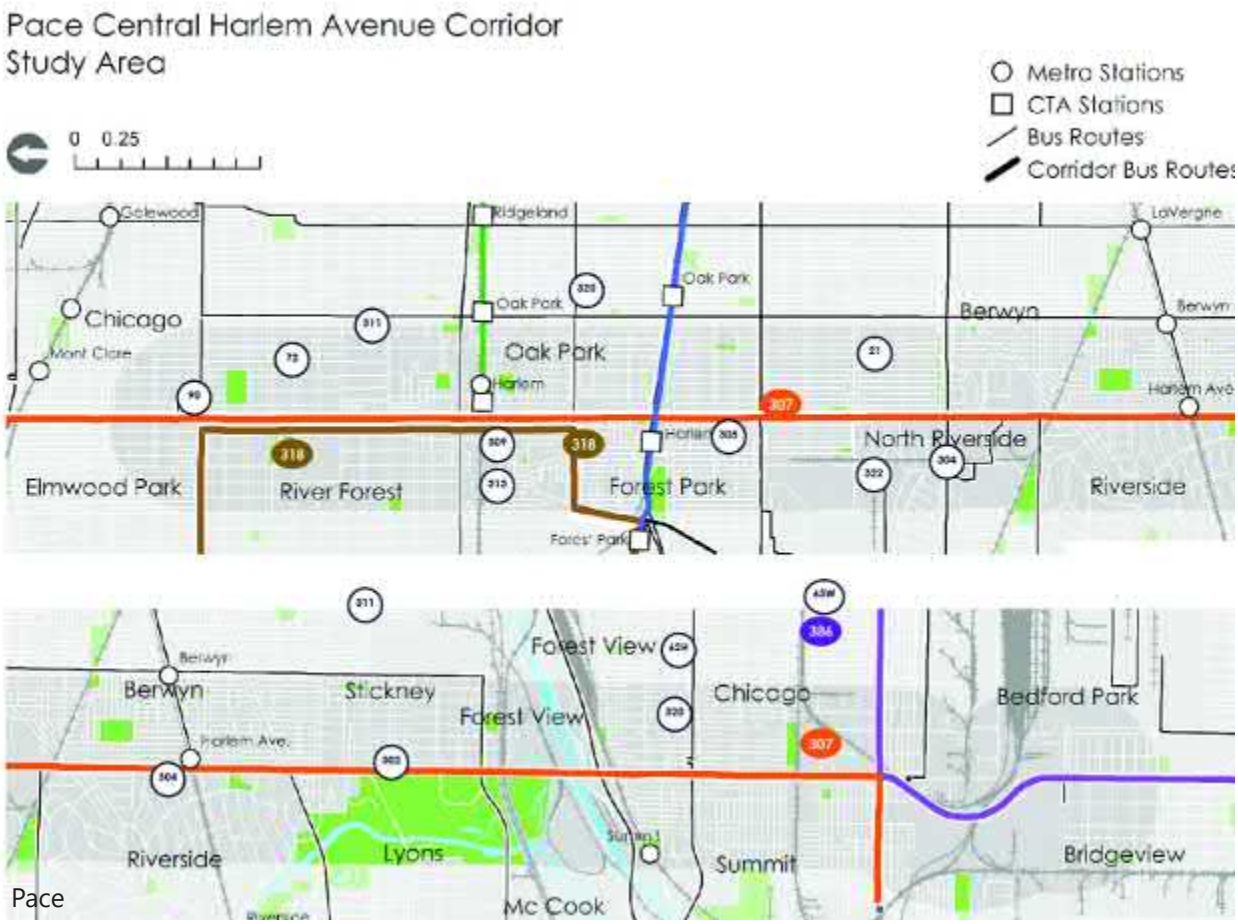
Pace

2. FORMALIZE TRANSIT LANES AND TRANSITWAYS

TREATMENTS + ACTIONS

- **Support the Implementation of Pace's Pulse Route on Harlem:** The Regional Transportation Authority (RTA) and Pace completed a corridor study along Central Harlem Avenue to advocate for a future Pulse Route. Pulse Routes are Pace's new rapid transit network, to provide express bus service that utilizes the latest technology and streamlined route design.

Pace Pulse Route on Harlem



- **Advocate for Bus Route Improvements that Support More Reliable Bus Service Including:**
  - Dedicated Bus Lanes: Dedicated Bus Lanes are reserved for bus transit; no other vehicles may enter or use these lanes. Transit lanes are created by repurposing general traffic lanes and parking lanes to accommodate transit use. The decision to create a transit lane is determined by transit volume and demand. Transit lanes are not physically separated from other traffic, instead markings, signage, and enforcement maintain the integrity of transit lanes. Signal prioritization can be included to further prioritize buses along key routes.

A Dedicated Bus Lane in Chicago

- **Bus Pull-Offs:** Bus pull-offs allow vehicles to pass stopped buses quickly and safely and with higher speeds typically 40-feet long mid-block points. on-street parking but without parking areas. because they may traffic. However, far- to cause delays, buses can re-enter traffic at the end of signal phase.

Bus Pull-off

NACTO

- **Peak-Only Bus Lanes:** Peak-only bus lanes may be implemented on streets where peak traffic flows impact the speed and reliability of buses. During peak hours, only buses can use lanes, which are otherwise allowed for all vehicles during non-peak hours. Improve Bus Stops, Stations, and Shelters including:

Peak Only Bus Lane

Source: LA Metro

Improve Bus Stops, Stations, and Shelters including:

- **Transit Shelter and Seating:** Transit shelters should be provided in any area prioritized for transit, especially adjacent to major employers. Transit shelters should be designed to fully shield waiting passengers from inclement weather; prevailing winds, and storm directions must be considered. Shelters should be at least 5-feet deep and long enough to provide space for three people to sit comfortably. Transit shelter placement should never reduce sidewalk clearance to less than 5-feet. Where bus shelters are not feasible, benches should be provided at bus stops. See the pedestrian section for additional detail.

Bus Stop Amenities

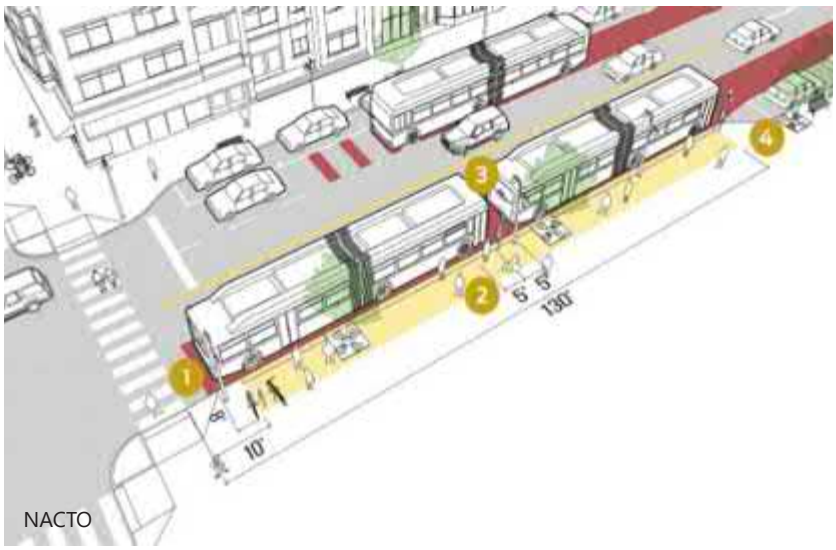
- **Bus Stop Signage**: Signs should be included at all bus stops. They should feature the route number(s) that serve the stop. Additional signs showing routes, schedules, and places served by the line should be provided where space permits.
- **Bus Stop Queuing Area:** Bus stops should be designed to facilitate comfortable, easy passenger access. Bus stop areas should be clear from obstructions, allowing adequate room for waiting passengers who may be carrying parcels or baggage, or who may be traveling with bicycles. The space directly adjacent to bus loading areas should be free of all street-level obstacles. If space is not available, these items can be placed outside the bus loading area between the curb and sidewalk. A clearance zone extending at least 4-feet from the curb is required so that street furniture does not block opening bus doors. 8-feet of clearance from the curb should be provided for a wheelchair lift.
- **Wayfinding, Time to Station Signage and Real Time Bus Trackers**: Bus shelters and informational kiosks can include route maps, wayfinding information, and schedules to give riders more information about upcoming routes and their expected time of arrival. These signs can be installed at transit hubs, bus stops, and at large places of employment where people congregate.

Bus Stop Signage

Source: Pace

Real Time Bus Trackers

Bus Stop Queing Area



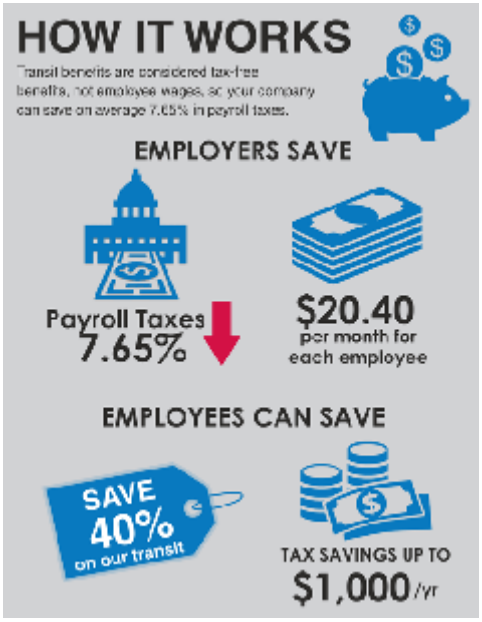
NACTO

3. INCENTIVIZE AND PROMOTE TRANSIT

TREATMENTS + ACTIONS

- **Promote Ventra's Pre-Tax Benefit Program:** Bedford Park employers can participate in pre-tax transit programs, allowing employee transit riders to pay for rides using pre-tax dollars up to $255 per month. Through this program, employers can directly deposit monthly passes or fixed dollar amounts onto employees' Ventra cards. This program can save employees up to $1000 per year. Employers can enroll in the program through Ventra Chicago.
- **Recognize Employers that Provide Subsidized or Free Transit Passes to Employees:** To encourage more employees to take transit to work, employers can subsidize employees' transit passes by providing either a monthly stipend or paying for a monthly pass.
- **Encourage Carpooling**
  - **Increased parking fees:** Some employers have had success reducing the number of single occupancy vehicle (SOV) trips to work by charging fees to park on-site. This approach should be coupled with increased transit service, new shared mobility options, and subsidies to encourage non-SOV trips to be successful.
  - **Gamification**: Gamification is the application of the typical elements of game play (e.g. competition, achievement, collaboration) to ordinary tasks and activities. The task of choosing a mode of travel can be "gamified" in a way that rewards sustainable travel behaviors, such as taking transit. Gamification can be combined with other strategies, such as loyalty and reward programs, to "nudge" people towards more sustainable travel behaviors.[38]

Employer Transit Pre-Tax Benefit Program

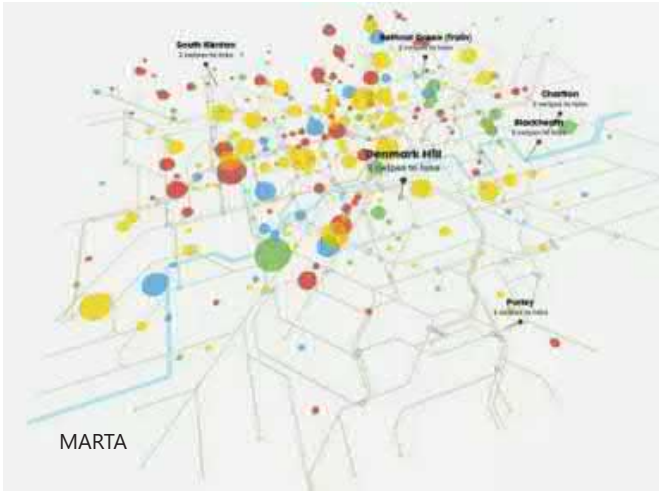


Source: www.transitchicago.com/transitbenefit/

Carpooling

Smart Commuter Metro North

Gamification



MARTA

[38] Richard Thaler and Cass Sunstein, Nudge – Improving Decisions about Health, Wealth and Happiness (Yale University Press, 2008).

4. EXPAND MICROTRANSIT AND MOBILITY DEMAND SERVICES

- **On-Demand Microtransit:** On-demand microstransit does not have fixed route or time. This allows for flexible and semi-fixed routes and operates on-demand basis. It includes individual and shuttle service rides to and from destinations via ride share platforms like Uber, Lyft, and Via.
- **First/Last Mile Service**: Provide options for commuters' First/Last Mile getting to/from transit stops to reduce long walks, improve transit usability, advance operations and maintenance, improve safety and security, provide legible signage, and offer ROW allocation and design.
- **ADA Accessible Services:** Pace provides ADA accessible transit options including ADA Paratransit, transferring to/from paratransit (including Dial-A-Ride), Pace Fixed Route Buses (accessible to those with disabilities), and a Dial-A-Ride program. Eligible riders can reserve a ride by making a pre-arranged trip via ADA Paratransit. Additionally, eligible riders can transfer to/from paratransit by receiving a Transfer Voucher when transferring between ADA Paratransit and/or Dial-a-Ride services and a fixed route bus. The Dial-A-Ride program would be in partnership with the Village of Bedford Park with specified boundaries and eligibility requirements.

On-Demand Ride Service Application Platform

ADA Accessible Services

F.4. TOOLS FOR THE MOTORIST AND FREIGHT NETWORK

Creating a successful road and freight network means creating a safer environment that also supports walking, bicycling, public transit, and economic vitality. Road planning supports the movement and flow of traffic safely. Elements from the timing of traffic signals, the width of a road, and the pavement of that road, all contribute to the maintenance of a quality transportation system.

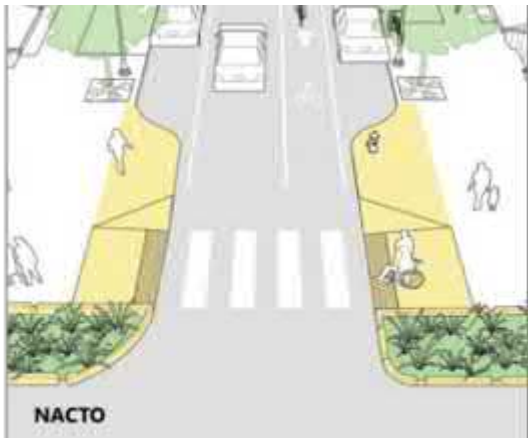
1. ADOPT AND IMPLEMENT A COMPLETE STREETS POLICY

- **Repair Roads and Create Complete Streets:**
  - Road Markings: Striping and markings play a critical role in roadway safety. They indicate the correct travel path for drivers on the road, alert drivers to the presence of pedestrian crossings, and calm traffic. The role of pavement markings is most important at night, where retroreflection comes into play. Truck routes and roads with high truck volumes will require frequent restriping and maintenance to ensure pavement markings are visible to drivers. Communities should develop a method to monitor, schedule, and replace markings that have deteriorated in a timely manner, ensuring that a minimum level of reflectivity is maintained, an approach consistent with the Manual for Uniform Traffic Control Devices (MUTCD). The Federal Highway Association's report number FHWA-SA-14-017 provides detailed guidance on the steps to evaluating and maintaining pavement markings.
  - **Potholes:** Potholes are challenging for all modes of travel and should be patched as soon as possible, either as an emergency repair or incorporated into regular maintenance. The Federal Highway Association's report number FHWA-RD-99-168 details methods and approaches recommended for repairing potholes. Bring existing driving and walking surfaces up to a state of good repair is a basic, but also critical step for addressing last mile challenges.

Two Views of Pavement Markings

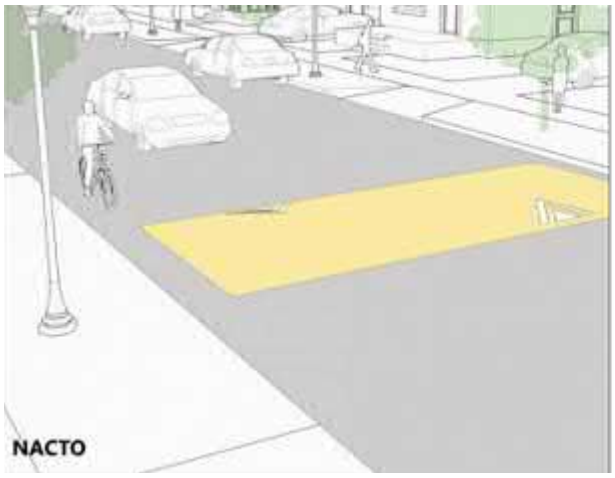
- **Adopt Traffic Calming Strategies**: Traffic Calming is a part of Complete Streets implementation.
  - **Horizontal Speed Controls:** Horizontal speed controls make drivers slow down by either visually narrowing a road or by curving a travel lane. There are two types of horizontal deflection that can be beneficial – chicanes and bump-outs. Chicanes are a series of curb extensions on alternating sides of a street that form an "s" pattern. This treatment is best for use on low-volume roads. Bump-outs or curb extensions extend sidewalks to be even with parking lanes. See the pedestrian treatments section for more information.

Horizontal Speed Controls: Chicane (left) and Bump Out (right)



  - **Vertical Speed Controls:** Vertical speed controls make drivers slow down by raising the pavement. There are two primary types of vertical speed controls – speed humps and speed cushions. Speed humps are usually 3-4-inches high and require drivers to reduce speeds to 15-20mph. Speed humps should be placed no more than 500-feet apart on streets with speed limits of 30mph or less. While they are the most effective tool for driver speed control, they must not exceed 4-inches in height to be safe for bicyclists to traverse. Speed humps may also be difficult for snow plows. Speed cushions are speed humps that include cutouts for buses, freight, and emergency vehicles to pass through without slowing down. This design still impacts car speeds. A speed cushion should be designed to reduce speeds to 9mph. Gaps for large vehicle wheels should be about 1 to 2-feet wide, and each lump should be about 6-feet wide.

Vertical Speed Controls: Speed Hump (left) and Speed Cushion (right)



- Interim Strategies: Many traffic calming devices can be implemented in the interim before costly, permanent investments are made. Horizontal speed controls can be installed using traffic paint and flexible delineators. This approach, which is sometimes implemented as a "Tactical Urbanism" project, allows communities to test and revise traffic calming approaches to ensure that they are effective and safe for all users of the road.

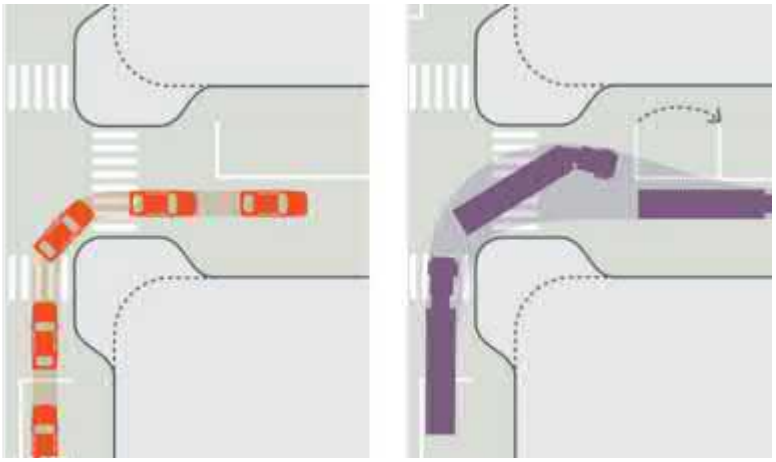
WHAT IS TACTICAL URBANISM?

Communities around the world are using flexible and short-term projects to advance long-term goals related to road safety, public space, and more. "Tactical Urbanism" projects are a type of low-cost, temporary changes to the built environment that are intended to improve local neighborhoods and community gathering places. Examples include highly-visible and formalized efforts, such as New York City's Plaza Program, or smaller-scale "demonstration projects" (typically lasting 1 to 7 days). Tactical Urbanism projects can be led by governments, non-profits, grassroots groups, or resident groups. Though the degree of formality may vary, Tactical Urbanism projects share common goal of using low-cost materials to experiment with and gather input on potential street design changes (Source: Tactical Urbanist's Guide).

A Tactical Urbanism Bike Lane Project

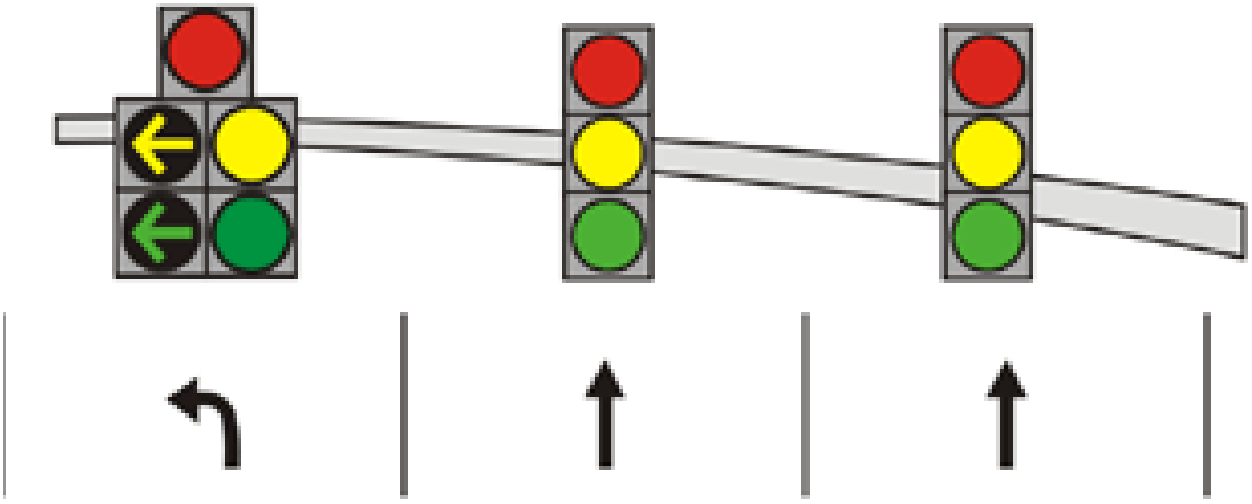
- **Intersection Enhancements:**
  - **Reduced Corner Radii:** The size of the corner relates to the length of a crosswalk and the speed of turning traffic. Smaller curb radii create a shorter crossing distance for pedestrians and encourage drivers to slow down when making right turns. Narrower turning radii can be challenging for truck drivers to navigate, but creative design solutions—such as shifting the stop line marking back—can make an intersection safer for pedestrians and accessible for both cars and trucks. Corner radii should be designed to limit turning speeds to 15mph.

Reduced Corner Radii



  - **Traffic Signals:** Traffic signals should be calibrated to both optimize vehicular through-put and provide pedestrians adequate time to cross. Signals should be upgraded to include pedestrian countdown timers. Install traffic signals, crosswalks and pedestrian crossing signals at accesses to sites that generate regular truck traffic. Use fixed-time signals rather than actuated signals to increase the predictability and ensure consistent opportunities for pedestrian to cross and traffic to pass.

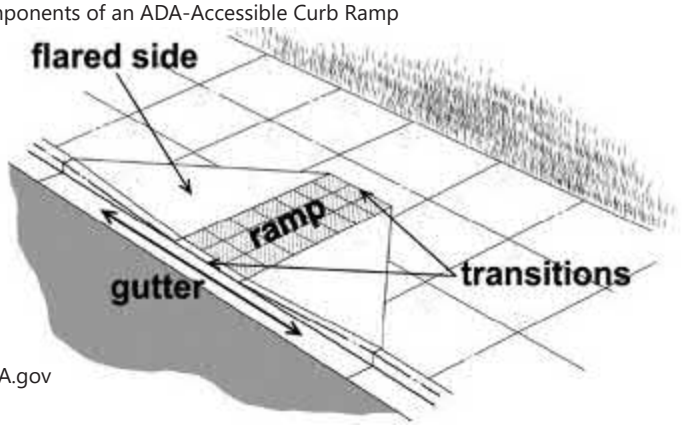
Protected Left Turn Phasing



  - **Protected Left Turn Phasing:** Left turn phasing can reduce conflicts between pedestrians and left-turning traffic by providing an exclusive left turn signal phase. Both oncoming traffic and pedestrian crossings are prevented during the protected left turn phase. A permissive left turn phase may also be included, e.g., the left turn phase continues through the signal cycle; however, this approach does not provide the pedestrian safety benefits.

- **ADA Curbs and Ramps:** Curb ramps enable people in wheelchairs to safely cross intersections without assistance. For more detail, see the Pedestrian Network section.
- **Pedestrian Refuge Island:** Pedestrian refuge islands enable people to cross multi-lane roads in stages. This treatment is most beneficial at mid-block and unsignalized crossings, though it can also be implemented at wide crossings with signals to reduce the distance pedestrians need to travel to reach a safe place. See the Pedestrian Network section for more detail.
- **Raised Crosswalks:** Raised crosswalks calm traffic crosswalk to the height section for more detail.
- **Leading Pedestrian** provides 3-7 seconds of lead before the start of a vehicle section for more detail.

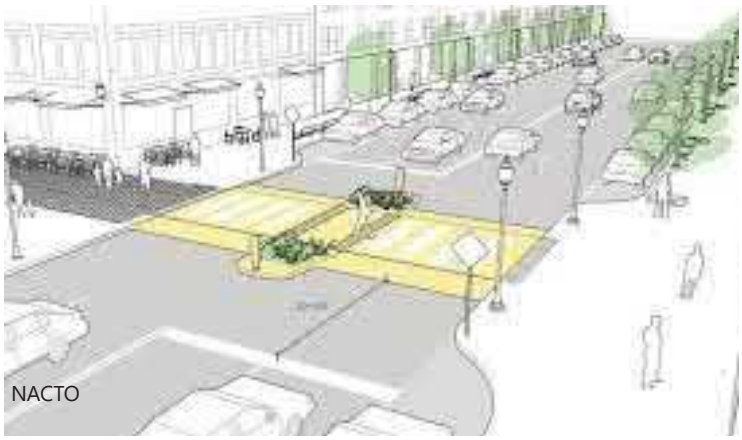
Components of an ADA-Accessible Curb Ramp



ADA.gov

- **Measure progress towards implementing Complete Streets:** To implement and measure Complete Streets success, the Village of Bedford Park should identify and adopt appropriate performance measure, benchmarks, and metrics. Performance measurements should relate to the desired outcome of First/Last Mile solutions: They should aim to evaluate multimodal transit level of service (including bicycle and pedestrian, not just car and freight traffic level of service); set targets for new infrastructure construction; set targets for commonly measured performance metrics (e.g. reduced bike and pedestrian crash incidents and increased micromobility and pedestrian trips); set targets for amount of budget and hours dedicated to Complete Streets policy implementation; and define evaluation process and performance measures with set intervals. Recommended Benchmarks include multimodal comfort, school access, safety for all, active transportation access, crash reduction, crime reduction, positive environmental impact, economic vitality. The Active Transportation Alliance has a full list of quantitative suggested metrics that can be utilized to measure progress of Complete Streets such as, but not limited to, number of blocks with new or repaired sidewalks, increase in transit ridership, miles of new bicycle facilities, etc.
- **Engage Stakeholders in on-going efforts to promote walking, biking, and transit:** Successful Complete Streets rely on good community engagement. Set Goals that reflect community priorities. Engaging stakeholders early and often will provide more support for Complete Streets plan implementation, growth in partnership opportunities, build relationships, and provide communication of the expectations and priorities of Village of Bedford Park.

Raised Crosswalk



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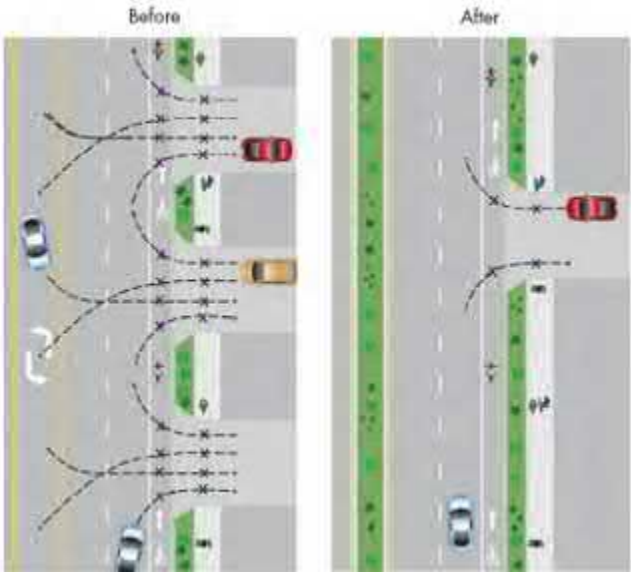
2. UTILIZE INTEGRATED CORRIDOR AND TRANSPORTATION DEMAND MANAGEMENT STRATEGIES

TREATMENTS + ACTIONS

- **Implement congestion-reducing corridor management strategies, such as:**
  - **Smart Intersections and Ramp Meters:** Smart intersections and ramp meters aim to increase driver safety and improve traffic flow. Ramp Meters regulate traffic flow with a two-section signal light (red and green) to reduce congestion and increase driver safety. Smart Intersections use short range communication system technology to detect 360 degrees of an intersection's road users, known as vehicle-to-everything (V2X) technology. The technology communicates to approaching vehicles the position and movement of each object via camera, radar, and Lidar sensors thereby reducing traffic collisions at intersections. This technology can also be retrofitted to older vehicle models.
  - **Active arterial management:** Arterial roads are high-capacity thoroughfares used by commuters and freight traffic that rely on efficient and safe passage. Active Arterial Management (AAM) maximizes safety and minimizes delays by efficiently managing traffic. AAM can be implemented through smart technology that monitors and responds to traffic, active signal retiming, and implementing CMAP's Smart Corridor concepts.
  - **Congestion Pricing and Managed Lanes:** Congestion pricing is an economic approach used in traffic mitigation that surcharges drivers utilizing roads that are subject to excess demand thereby charging more at peak hours to reduce traffic congestion without increasing the road supply.

Access Management



  - **Dynamic Parking Management:** Dynamic parking management allows for the management and tracking of available parking spots in parking facilities in real-time. This parking management approach can improve local traffic flow by reducing congestion and improving safety. It can include dynamic overflow transit parking (utilizing close vicinity overflow parking spots/ facilities), dynamic parking reservation (utilizing technology to reserve a parking space), dynamic wayfinding (real-time parking-related information based on space availability and location), and dynamically priced parking (parking fees vary dependent on demand and availability).
- **Implement Transportation Demand Management (TDM) Strategies and Policies:**
  - **Access Management:** A typical 4-lane road that intersects a 2-lane driveway has 11 points of conflict. Access management aims to consolidate driveways and limit left turns onto and

Truck Route Signage

off-of roads to reduce congestion and reduce the number of conflict points at an intersection. Where possible, driveways and parking lot access points should be controlled by a traffic signal if they intersect with an arterial or collector street, re-routed to a side street, and/or moved away from an intersection if they do not warrant a traffic signal. On streets with the space for a center median, the median should be raised and designed to prevent left turns out of parking lots, thereby reducing the number of conflict points and improving traffic flow.

□ **Truck Route and Wayfinding Signage:** Truck route signage indicates which streets heavy freight should use. Routes may include truck route signs, and trucks permitted, or trucks not permitted signs. Additional wayfinding signage should be installed to help truck drivers navigate side streets and identify appropriate access points and navigate through parking lots at their destination. Signs should be based on the importance of their information and present information when and where it is needed. Information should be given piecemeal to lower the amount given to the driver at any one time. Consistent coding, colors, and shapes of traffic signs should be used. Finally, the city should work with neighboring jurisdictions to create a network of clear and consistent way-finding tools for truck drivers traveling through the area.

□ **Transportation Demand Management:** Transportation demand management (TDM) is the application of strategies and policies intended to reduce travel demand, or to redistribute demand over space or in time. TDM includes many of the solutions included in this Toolkit but packaged as a formal policy or program. Managing demand (and congestion) can be a cost-effective alternative to increasing road capacity. A demand management approach to transport also has the potential to deliver better environmental outcomes, improved public health, stronger communities, and more prosperous cities. TDM techniques link with and support community movements for sustainable transport. The concept diagram in Figure 3-35 illustrates how TDM, various 'smart' infrastructure systems, and different transportation networks can be integrated within the framework of Integrated Corridor Management.

Integrated Corridor Management

3. CREATE MOBILITY HUBS

TREATMENTS + ACTIONS

- **Create a multimodal mobility hub that includes:**
  - **Dockless Bike Sharing:** Dock-based and dockless bike- and scooter-sharing, in which low-speed vehicles are available for short-term rental via a smart-phone app, provide an energy- and space-efficient last-mile solution appropriate for trips in the 0.5 to 3-mile range. In contrast to docked bikeshare systems like Divvy, dockless systems have much lower capital costs and infrastructure requirements and appear to have a lower unit cost overall. However, they may require greater attention to rebalancing (i.e. shifting bikes from areas with many bikes to areas with few bikes) and other operational details, including nightly charging for electric bikes and scooters. W; while the cost to the public for operating these systems may be zero, they do require more intensive regulation. In November 2018 the City of Chicago completed its Dockless Bike Share Pilot Project, in which Pace, Limebike, and Jump participated. In March 2019, the city introduced a new ordinance that established a definition for low-speed electric mobility devices (LEMDs), such as electric scooters and electric skateboards, and clarifies that e-bikes and LEMDs are legal transportation options within the Chicago Municipal Code. The City of Chicago appears poised to expand permitting for dockless bikes and scooters in 2019, providing an opportunity for policy or regulatory coordination soon.

A Selection of Dockless Bike Sharing Companies

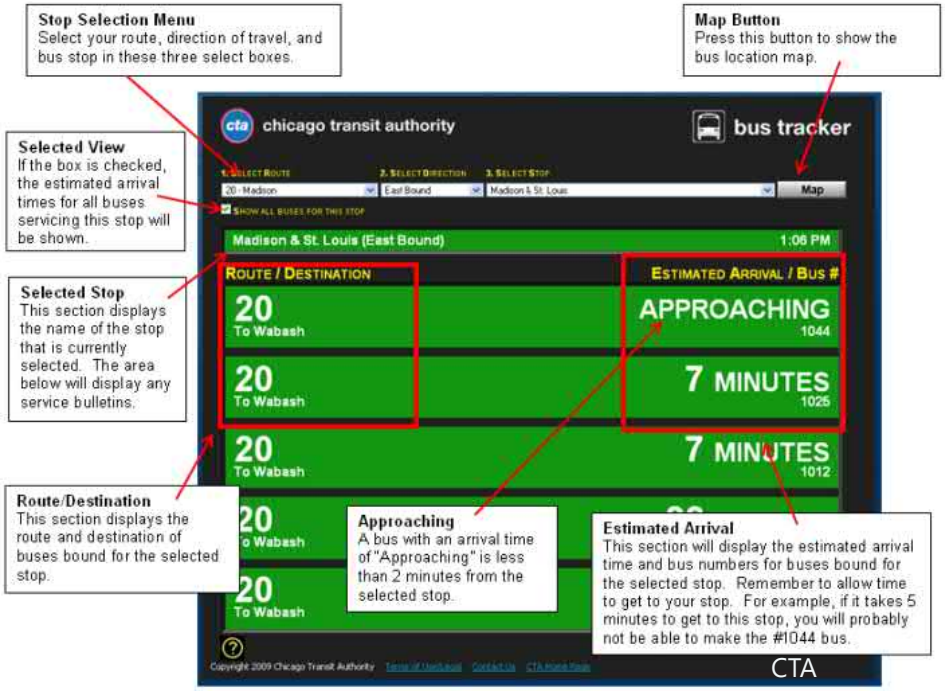
  - **Dock-Based Bike Sharing: Dock-based sharing requires a lock in station to start/end trips to/from and requires** a network of docking stations to make trips more convenient. Bikeshare works best as a first/last mile transportation strategy in mixed-use neighborhoods and near transit hubs in walkable corridors with high pedestrian traffic. Bikeshare stations should be no more than 1,000 feet apart (about a five-minute walk). The presence of good bike infrastructure, such as protected bike lanes, is a key determinant of success of bike sharing programs. One of the major operational challenges with dockless bike- and scooter share is the fact that riders can end their trip and leave the vehicles anywhere, often blocking sidewalks or the public right-of-way. In high-demand locations, many bikes or scooters may pile up quickly. Many jurisdictions have addressed this challenge by

designating areas of the public right of way (in parking areas or on sidewalks) specifically for parking dockless vehicles, increasing predictability for users, operators, and members of the public.

The Right Way and the Wrong Way to Manage Dockless Bike and Scooter Parking

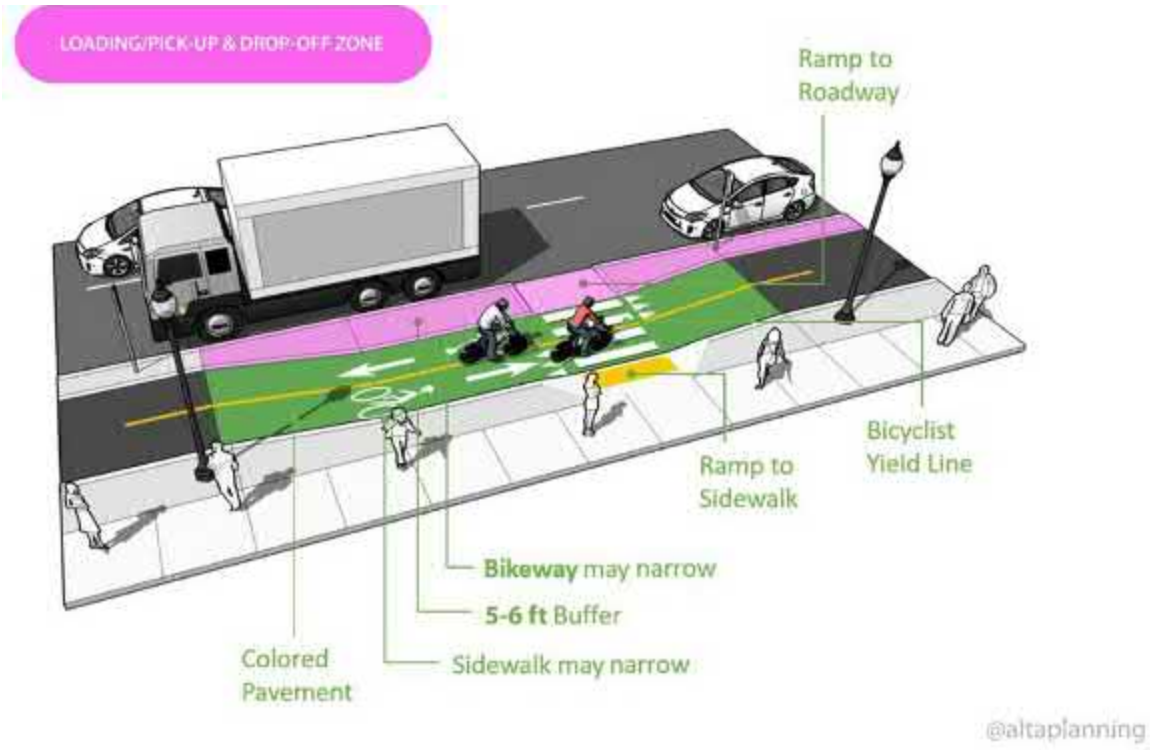
- **Real-Time Transit Info:** Transit authorities can provide riders real-time transportation information via mobile and web-enabled devices. Real-time transit information allows riders to adapt to unreliable or infrequent transit service.

Real-Time Transite Info



- **TNC Pickup and Drop-off Zones:** Transit Network Companies (TNC) need a safe curb-space to pickup and drop-off passengers. Curbside zones should be able to accommodate one to TNC vehicles and safe for waiting passengers. Curbside zones could also include other pedestrian amenities such as a weather shelter, signage, lighting, and seating.

PNC Pickup and Drop-off Zone



- **Electric Vehicle Charging Stations:** Electric vehicle demand is growing, and electric vehicle users are likely to drive to work. To plan for current and future demands, the provision of charging stations will enable drivers to commute by electric vehicle. The FHWA provides Surface Transportation Block Grant Program (STBG) for the construction of electric vehicle charging stations.

Electric Vehicle Charging Stations

- **Smart Parking:** Sensors and real-time data collection allow for Smart Parking: It provides real-time information on the number of available parking spaces in a specified vicinity. By optimizing parking space usage, it can reduce fuel emissions spent idling and searching for available parking. Smart Parking guides drivers to available park spots and simplifies parking. Additionally, automated parking payments can be made through web applications or mobile apps.

Smart Parking

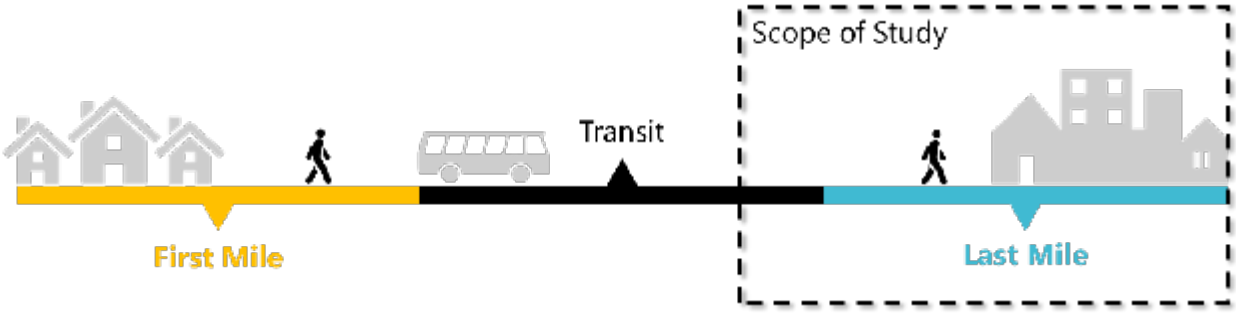
Source: Teks Mobile Australia

4. EXPAND LAST MILE CARSHARING/RIDESOURCING/RIDESHARING SERVICES

TREATMENTS + ACTIONS

- **First/Last Mile Service:** Provide options for commuters' First/Last Mile getting to/from transit stops to reduce long walks, improve transit usability, advance operations and maintenance, improve safety and security, provide legible signage, and offer ROW allocation and design

First and Last Mile



- **Late Night Service/Guaranteed Ride Home:** Commuters getting to and from work during later evening hours need a safe mode of transit and ride home. Employers and educational centers can provide a guaranteed ride home for late night commuters. Universities like UIC have implemented a Night Ride program for students, faculty and staff to travel safely and dependably during after-hours via on-demand shuttle vans.
- **Expand Car Sharing Services:** The Village could work with carsharing vendors already in the Chicagoland market (e.g. Zipcar, car2go, Maven) to expand their service areas or place vehicles in the Village. Harmonizing regulations, permitting, and reporting with those in place in the City of Chicago and other adjacent jurisdictions (or creating regulatory reciprocity) can help support this effort by reducing the administrative overhead required of vendors and increasing vehicle utilization.
- **Subsidy for TNC Services:** Opportunity for employers to provide a TNC program subsidy for routes within a set boundary zone and/or a flat rate fares to select locations. Subsidies could include a rideshare gift card to make the TNC services more accessible for those individuals without a credit card.

First and Last Mile

APPENDIX H: COST TABLES

Treatment	Unit Costs	Unit	Costs	Construction Duration	Safety Effectiveness
Pedestrian Crossing	$432.00	Each	$	Short	★★★★★
School Crossing	$564.00	Each	$	Short	★★★★★
Bollard	$876.00	Each	$	Short	★★★
Gateway Sign	$408.00	Each	$	Short	★★★★
Street Trees	$516.00	Each	$	Short	★★
Wheelchair Ramp	$972.00	Each	$	Short	★★★★★
Bench	$1,860.00	Each	$$	Medium	★★★
Gate	$1,092.00	Each	$$	Short	★★★★
Streetlight	$5,856.00	Each	$$	Medium	★★★★★
Trash/Recycling Receptacle	$1,704.00	Each	$$	Short	★★
Gateway Structure	$27,300.00	Each	$$$	Medium	★★★
In-Pavement Lighting	$21,144.00	Each	$$$	Medium	★★★★★
Snow Removal	$175.20	Hour	$$$	Short	★★★
Wheelchair Ramp	$14.40	Square Foot	$$$	Medium	★★★★
Pedestrian Railings	$120.00	Linear Foot	$$$$	Very Long	★★★
Fence/Gate	$156.00	Linear Foot	$$$$$	Long	★★★
Truncated Dome Curb Ramp	$50.40	Square Foot	$$$$$	Long	★★★
Sidewalks (both sides of street)	$90,000.00	Mile	$	Short	★★★
Striped Crosswalk (by foot)	$10.21	Linear Foot	$	Short	★★★★★
Striped Crosswalk (entire)	$924.00	Each	$	Short	★★★★★
Trees	$330.00	Each	$	Short	★★
Concrete Sidewalk	$38.40	Linear Foot	$$	Medium	★★★
Concrete Sidewalk-Patterned	$43.20	Linear Foot	$$	Medium	★★★★
High Visibility Crosswalk	$3,048.00	Each	$$	Medium	★★★★★
Multi-Use-Trail-Unpaved	$145,668.00	Mile	$$	Short	★★★★
Striped Crosswalk	$8.86	Square Foot	$$	Short	★★★★
Brick Sidewalk	$72.00	Linear Foot	$$$	Medium	★★★
Concrete Sidewalk-Stamped	$54.00	Linear Foot	$$$	Medium	★★★
Sidewalk Pavers	$96.00	Linear Foot	$$$	Medium	★★★
Sidewalk Unspecified	$54.00	Linear Foot	$$$	Medium	★★
Separate Alignment Shared Use Path	$930,000.00	Mile	$$$$	Long	★★★★
Sidewalks (both sides of street)	$936,000.00	Mile	$$$$	Long	★★★
Boardwalk	$2,663,124.00	Mile	$$$$$	Very Long	★★★★
Audible Pedestrian Signal	$960.00	Each	$	Short	★★★★★
Countdown Timer Module	$888.00	Each	$	Short	★★★★★
Furnish and Install Pedestrian Detector	$585.00	Each	$	Short	★★★★★
Push Button	$420.00	Each	$	Short	★★★★★
Signal Face	$516.00	Each	$	Short	★★★★★

Treatment	Unit Costs	Unit	Costs	Construction Duration	Safety Effectiveness
Signal Head	$660.00	Each	$	Short	★★★★★
Signal Pedestal	$960.00	Each	$	Short	★★★★★
Pedestrian Signal	$1,776.00	Each	$$	Medium	★★★★★
Flashing Beacon	$12,012.00	Each	$$$	Medium	★★★★
Rectangular Rapid Flashing Beacons (RR	$26,700.00	Each	$$$	Medium	★★★
Pedestrian Hybrid Beacon	$69,216.00	Each	$$$$	Long	★★★
Stop/Yield Signs	$360.00	Each	$	Short	★★★
Median Island	$8.71	Square Foot	$$	Short	★★★★★
Raised Crosswalk	$9,804.00	Each	$$	Medium	★★★★★
Bioswales	$18.00	Square Foot	$$$	Medium	★★★
Median Island (by foot)	$12.00	Square Foot	$$$	Medium	★★★
Median Island (entire)	$16,224.00	Each	$$$	Medium	★★★
Rain Garden	$19.26	Square Foot	$$$	Medium	★★★
Pedestrian Refuge Island	$72,000.00	Each	$$$$	Long	★★★★
Planter Boxes	$29.40	Square Foot	$$$$	Medium	★★★
Raised Intersection	$60,648.00	Each	$$$$	Medium	★★★★★
Bicycle Rack	$792.00	Each	$	Short	★★★
Signed Bicycle Route	$30,084.00	Mile	$	Short	★★★★★
Bicycle Lane	$159,804.00	Mile	$$	Short	★★★★
Bicycle Locker	$2,508.00	Each	$$	Medium	★★★
Bike and Docking Station	$5,400.00	Each	$$	Medium	★★★
Bike Boulevard	$144,000.00	Mile	$$	Short	★★★★
Bike Loop Detectors	$2,304.00	Each	$$	Medium	★★★★
Rail-Trail	$138,000.00	Mile	$$	Short	★★★★
Signed Bicycle Route with Improvement:	$287,328.00	Mile	$$$	Medium	★★★★
Advance Stop/Yield Line	$384.00	Each	$	Short	★★★★★
Gutter	$27.60	Linear Foot	$$	Short	★★★
Asphalt Paved Shoulder	$6.67	Square Foot	$$	Short	★★★★★
Asphalt Sidewalk	$42.00	Linear Foot	$$	Medium	★★★★
Concrete Paved Shoulder	$7.97	Square Foot	$$	Short	★★★★★
Curb	$25.20	Linear Foot	$$	Short	★★★
Curb and Gutter	$25.20	Linear Foot	$$	Short	★★★
Traffic Signal Priority	$36,000.00	Each	$$$	Medium	★★★★★
Island Marking	$2.33	Square Foot	$	Short	★★★★
Painted Curb/Sidewalk	$3.48	Square Foot	$	Short	★★★★★
Painted Curb/Sidewalk	$36.07	Linear Foot	$$	Medium	★★★★
Advance Stop/Yield Line	$12.00	Square Foot	$$$	Medium	★★★
Diagonal Parking	$78,000.00	Block	$$	Short	★★★
Speed Bump	$1,860.00	Each	$$	Medium	★★★★

Treatment	Unit Costs	Unit	Costs	Construction Duration	Safety Effectiveness
Speed Hump	$3,168.00	Each	$$	Medium	★★★★
Speed Table	$2,880.00	Each	$$	Medium	★★★★
Chicane	$11,952.00	Each	$$$	Medium	★★★★
Curb Extension/Choker/Bulb-Out	$15,600.00	Each	$$$	Medium	★★★★
Diverter	$31,248.00	Each	$$$	Medium	★★★★
Partial/Semi Diverter	$18,072.00	Each	$$$	Medium	★★★★
Speed Trailer	$11,412.00	Each	$$$	Medium	★★★
Roundabout/Traffic Circle	$102,444.00	Each	$$$$$	Long	★★★
Bus Shelter	$13,872.00	Each	$$$	Medium	★★★★
Bus lane in existing roadway	$3,240,000.00	Mile	$$$$$	Very Long	★★★
Shared Lane/Bicycle Marking	$216.00	Each	$	Short	★★★★
Pre-Fab Steel Bridge	$247,548.00	Each	$$$$$	Very Long	★★★★★
Wooden Bridge	$149,604.00	Each	$$$$$	Very Long	★★★★★
Separate Alignment Shared Use Path	$138,000.00	Mile	$$	Short	★★★★★
Share-Use Paths (both sides of street)	$228,000.00	Mile	$$$	Medium	★★★★★
Multi-Use-Trail-Paved	$577,368.00	Mile	$$$$	Long	★★★★
Rail-Trail	$834,000.00	Mile	$$$$	Long	★★★★
Shared-Use Paths (both sides of street)	$1,464,000.00	Mile	$$$$$	Very Long	★★★★