Pedestrian Infrastructure Audit Report

UP 494 – TRANSPORTATION PLANNING WORKSHOP

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EXECUTIVE SUMMARY

This report was compiled by the students of UP 494: Transportation Workshop at the University of Illinois at Urbana-Champaign. As part of this workshop course, the students engaged with the policies and design of pedestrian infrastructure around Pace bus stops in suburban communities of the Chicago Metropolitan Area. For the first portion of the course, the students designed a custom-made pedestrian infrastructure audit, tailored to the needs of the research as well as the infrastructure available at Pace stops. The class carried out the pedestrian audit in six communities of metropolitan Chicago: Aurora (Kane County), Crystal Lake (McHenry County), Harvey (Cook County), Joliet (Will County), Skokie (Cook County), and Waukegan (Lake County).

The Pedestrian Infrastructure Audit Development Report section is reflective of the team’s initial effort to understand the built pedestrian environment and challenges that inadequately built infrastructure may introduce into the pedestrian experience. The audit was developed and tested at the University of Illinois. The auditing process was completed over two weekends in Fall 2019 when students traveled to the selected communities and deployed the audit on foot. Groups of students utilized their mobile devices to capture information through the ArcGIS Survey 123 platform, allowing us to quickly and seamlessly analyze the findings in the lab. This report incorporates findings and conclusions about the state of pedestrian infrastructure within the six selected communities.

For the second portion of our workshop, the class focused on performing in-lab exercises and research that would allow us to better understand policies surrounding pedestrian planning and construction in suburban communities, as well as to strengthen our understanding of the assessed built environment. This was achieved through research and validation activities focused around 4 distinct topics: Pedestrian Infrastructure Funding, Pedestrian Infrastructure Standards in Municipal Codes, Pedestrian Infrastructure Engineering and Design Standards, and a Virtual Pedestrian Audit. This report will be separated into four sections, based on the four activity groups of our course, and will serve as the record of the research and policy recommendations that our team was able to gather and synthesize.

Pedestrian Infrastructure Funding looked into municipal, state, and federal policies that dictate and provide funding for pedestrian transportation and infrastructure projects. It explored the tools that planning agencies and public transportation providers may utilize to implement pedestrian infrastructure projects and improve the quality of the built environment, making it more pedestrian and transit-supportive pedestrian Infrastructure in Municipal codes team analyzed municipal codes of multiple municipalities in the Chicago MSA, in addition to the six originally selected sites. The focus of the research was to find areas of municipal codes that support pedestrian infrastructure, as well as to locate areas where pedestrian infrastructure is omitted, or vehicular infrastructure planning impedes pedestrian infrastructure planning.

The Pedestrian Infrastructure Engineering and Design standards team engaged with locally and nationally produced pedestrian design guidelines and reports. The goal of the research was to
learn how different agencies approach pedestrian infrastructure planning, to understand the pros and cons of different approaches, and to supplement Pace Transit Supportive Guidelines with additional design paradigms.

The Virtual Pedestrian Audit team performed a second round of pedestrian infrastructure auditing at sites in communities that were previously audited. The team utilized Google Street View imagery as well as an amended version of the original audit to validate and expand the results of the initial pedestrian audit. The goal was to identify and understand patterns of pedestrian infrastructure gaps and attempt to expand the statistical conclusions made during the first round of auditing.
# TABLE OF CONTENTS

**Chapter 1: Introduction**

- Background ............................................................................................................................................... 1

**Methods**

- Community Selection Criteria ............................................................................................................. 1
- Audit Route Selection Criteria .................................................................................................................. 2
- Pedestrian Audit Development Process .................................................................................................. 2

**Limitations** .......................................................................................................................................... 3

**Chapter 2: Audit Results**

- Overview .................................................................................................................................................. 4

**Pedestrian Audit Findings**

- Aurora, Illinois ......................................................................................................................................... 5
- Crystal Lake, Illinois ................................................................................................................................. 12
- Harvey, Illinois ......................................................................................................................................... 18
- Joliet, Illinois ............................................................................................................................................ 25
- Skokie, Illinois .......................................................................................................................................... 32
- Waukegan, Illinois ................................................................................................................................... 36

**Key Takeaways** .................................................................................................................................... 40

**Chapter 3 Relevant Text in Municipal Codes and Comprehensive Plans**

- Overview .................................................................................................................................................. 41

**Aim**

- Crystal Lake ............................................................................................................................................ 41
- Harvey ....................................................................................................................................................... 42
- Joliet ............................................................................................................................................................ 42
- Aurora ....................................................................................................................................................... 43
- Skokie ......................................................................................................................................................... 43
- Waukegan .................................................................................................................................................. 43

**Commonalities Between Cities** ............................................................................................................ 44

**Sidewalk Maintenance: Responsibility in Each City** ............................................................................. 44

**Chapter 4: Potential Financial Resources for Transit Supportive Pedestrian Infrastructure**

- Overview .................................................................................................................................................. 45

**Potential Funding Resources**

- CMAP ...................................................................................................................................................... 45
- County Wise Funding for Pedestrian Infrastructure ................................................................................... 46

**Limitations** .......................................................................................................................................... 50

**Key Takeaways** .................................................................................................................................... 50
### Limitations

Observations

**Chapter 7: Draft Policy Recommendations**

Overview

**Draft Policy Recommendations**

- Funding Structures
- Street Design
- Virtual Audits

**Chapter 8: References**

**Appendix**

- Appendix A: Field Audit
- Appendix B: Potential Funding Resources
- Appendix C: Chicago Metropolitan Agency for Planning Pedestrian
- Appendix D: South Suburban Mayors and Managers Association Complete Streets and Trails Plan
- Appendix E: Virtual Audits
LIST OF FIGURES

Figure 1: Audit Route 1: Lake Street, North Aurora .................................................................6
Figure 2: Crossing condition along North Lake Street, Route 1 ..............................................6
Figure 3: Transit area along North Lake Street near AMITA Health Mercy Medical Center, Route 1 .................................................................7
Figure 4: Street condition at the intersection of North Lake Street, South Lincoln Street and Sullivan Road, Route 1 .................................................................7
Figure 5: Pedestrian crossing along Spring Street, Route 2 ....................................................8
Figure 6: Marked Crosswalks in Downtown Aurora .................................................................8
Figure 7: Transit area near Aurora Metra Station, Route 2 .....................................................9
Figure 8: Sidewalk condition along North Randall Street, Route 3 ........................................10
Figure 9: Crosswalk condition at the intersection of Plum Street and North Randall Street, Route 3 ........................................................................................................10
Figure 10: Crosswalk condition at the intersection of Plum Street and North Randall Street, Route 3 ........................................................................................................11
Figure 11: Transit area near Commonwealth Avenue, Route 3 .................................................11
Figure 12: Field Audit Routes in Crystal Lake ........................................................................12
Figure 13: Sidewalk condition near McHenry Community College, Route 1 .......................13
Figure 14: Pedestrian crossing near McHenry Community College, Route 1 .......................13
Figure 15: Sidewalk and pedestrian crossing condition along Route 2 ................................15
Figure 16: Pedestrian crossing along Route 2 ........................................................................15
Figure 17: Sidewalk and pedestrian crossing condition along Route 3 ................................17
Figure 18: Transit areas along Route 3 ...................................................................................17
Figure 19: Field Audit Routes in Harvey, Illinois ....................................................................18
Figure 20: Sidewalk condition along Route 1 ........................................................................19
Figure 21: Pedestrian crossing and intersection condition along Route 1 .............................19
Figure 22: Transit area condition along Route 1 ....................................................................20
Figure 23: Sidewalk condition along Route 1 ........................................................................20
Figure 24: Pedestrian crossing condition along Route 2 ........................................................21
Figure 25: Transit area along Route 2 ...................................................................................22
Figure 56 Virtual Audit Routes in Crystal Lake, Illinois ................................................................. 72
Figure 57 Virtual Audit Routes in Skokie, Illinois ............................................................... 73
Figure 58 Virtual Audit Routes in Waukegan, Illinois ......................................................... 74
Figure 59 Virtual Audit Routes in Aurora, Illinois .............................................................. 75
Figure 60 Virtual Audit Routes in Harvey, Illinois ............................................................. 76
Figure 61 Virtual Audit Routes in Joliet, Illinois ................................................................. 77
Figure 62 Sidewalks Score Calculation Criteria .................................................................. 81
Figure 63 Crossings Score Calculation Criteria ................................................................. 83
Figure 64 Transit Area Score Calculation Criteria .......................................................... 85
Figure 65 Summary of the total average score of selected routes........................................ 87
Figure 66 Spider chart for routes in Waukegan of selected routes ..................................... 88
Figure 67 Spider chart for Waukegan average score of selected routes............................. 88
Figure 68 Spider chart for routes in Skokie of selected routes ............................................. 89
Figure 69 Spider chart for Skokie average score of selected routes .................................... 90
Figure 70 Spider chart for routes in Harvey of selected routes ........................................... 91
Figure 71 Spider chart for Harvey average score of selected routes .................................... 91
Figure 72 Spider chart for routes in Joliet of selected routes .............................................. 92
Figure 73 Spider chart for Joliet average score of selected routes ....................................... 93
Figure 74 Spider chart for routes in Aurora of selected routes .............................................. 94
Figure 75 Spider chart for Aurora average score of selected routes ................................... 94
Figure 76 Spider chart for routes in Crystal Lake of selected routes ................................ 95
Figure 77 Spider chart for Crystal Lake average score of selected routes .......................... 96
Figure 78: Bike Lanes and Trails in Cook County ................................................................. 106
Figure 79: McHenry County Bicycle and Pedestrian Plan .................................................. 107
Figure 80: Kane and Kendall County Bicycle and Pedestrian Plan ................................... 108
Figure 81: Transit availability in Kane and Kendall County ............................................. 109
Figure 82: 2040 Non-Motorized Transportation Plan for Lake County ............................. 110
LIST OF TABLES

Table 1 Sidewalk maintenance departments by location ................................................. 44
Table 2 Bike and Pedestrian infrastructure funding .......................................................... 46
Table 3 Total funds available for ped-bike infrastructure in Lake County ................. 49
Table 4 Total funds available for ped-bike infrastructure in McHenry County ........... 50
Table 5 Pace Bus Transit Supportive Guidelines Right-of-Way Width Recommendations ....... 54
Table 6 Boston Complete Streets Guidelines Sidewalk Design Recommendations .......... 56
Table 7 Roads Near Pace Missing Sidewalks .................................................................. 65
Table 8 Top 10 Roads with Missing Sidewalks near Pace Bus Stops ......................... 65
Table 9 Virtually audited survey points ........................................................................... 78
Table 11 Sidewalks Score Calculation Sample .............................................................. 82
Table 12 Crossing Score Calculation Sample ............................................................... 84
Table 13 Transit Area Score Calculation Sample .......................................................... 85
Table 14 Summary of the scores ..................................................................................... 86
Table 15 Route score for Waukegan .............................................................................. 87
Table 16 Route score for Skokie ................................................................................... 89
Table 17 Route score for Harvey .................................................................................. 90
Table 18 Route score for Joliet .................................................................................... 92
Table 19 Route score for Aurora .................................................................................. 93
Table 20 Route score for Crystal Lake ......................................................................... 95
CHAPTER 1: INTRODUCTION

BACKGROUND

Pace Bus is the local public transportation agency for the suburban communities of the Chicago Metropolitan Area. Like hundreds of suburban areas across the United States, the infrastructure focus tends to emphasize the importance of vehicular rather than public transportation. This translates into improperly designed, constructed, and maintained public transportation and pedestrian infrastructure, lowering the efficacy, accessibility, and quality of active transportation.

This study focuses on investigating both the quality of public transportation and pedestrian infrastructure, and the perception, needs, and wants of public transit riders and pedestrians. The scope of the study is centered on six suburban communities, varying in size, demographic composition, and infrastructure quality.

The goal of the study is to document existing conditions of pedestrian infrastructure, analyze those results and interpret them in coordination with the anecdotal findings collected through a series of focus groups, and determine policy and infrastructure suggestions that would yield a higher efficiency and quality suburban public transportation system.

Pedestrian infrastructure data was collected using a customized Pedestrian Infrastructure Audit (Appendix A), and the findings comprise the bulk of this report. The detailed analysis of the infrastructure across the six municipalities will inform the researchers about the current conditions which they will later use in engaging with the public transit riders and attempt to determine if and how their experience with riding transit is shaped by pedestrian infrastructure. In addition to connecting the recorded conditions to human experiences, the focus groups will also give the researchers a chance to document any other issues that the riders experience, as well as areas that we may have missed.

The final policy and infrastructure improvement suggestions are crafted with both the pedestrian audit and focus group results, hoping to represent the immediate needs and areas of crucial improvement accurately.

METHODS

Community Selection Criteria

To determine the best fit for our study, the researchers collected data on the population for multiple important population centers within each studied county. We collected demographic data, income and poverty data, commute information such as mode of transportation chosen as well as commute time, and the number of Pace Bus stops within a community. For each county, an optimal community was selected, varying across the counties. The goal was to select a wide variety of communities that would enable us to get an accurate picture of how different municipalities designed their pedestrian and public transportation network. In each county, one
community was selected based on some (but not all) of these criteria. In Cook County, Harvey and Skokie were selected. Harvey was selected as a recommendation of the steering committee, while Skokie was selected based on its diverse population, low poverty, and a high number of Pace Bus stops. In Kane County, Aurora was selected because of its ethnically and fiscally diverse population, as well as the high population in general. In Lake County, Waukegan was selected due to its diverse population, relatively high poverty of 14%, and the fact that it is the largest community within the county. In McHenry County, Crystal Lake was selected because it is the most populous municipality in the county, has high population density (relative to the surrounding communities), and an above-average (national) travel time to work. Lastly, in Will County, Joliet was selected since it had the highest population in the county, high poverty rates, as well as above-average travel time to work.

Audit Route Selection Criteria

Once all the communities were selected, the pedestrian audit route selection process began. Across each selected municipality, the students identified about two miles of audit routes in multiple neighborhoods. The goal of audit route selection was to create a wide variety of audit routes that best captured the pedestrian infrastructure image and pedestrian access to public transportation of the whole community. The selection process began with identifying where each Pace bus route within the community was located and identifying the surrounding land uses. For referencing the quality of pedestrian infrastructure within the communities, the CMAP Pedestrian Infrastructure dataset was used. This dataset documents the design and quality of sidewalks, categorizing them as both sides, one side, and no sidewalk. The routes were selected in a pattern yielding audit routes that were located within representative land uses located within the community, as well as varying levels of pedestrian infrastructure quality. As a result, the pedestrian audit routes were located within land-use areas ranging from single-family residential to commercial and downtown, paired with pedestrian infrastructure ranging from nonexistent to complete.

Pedestrian Audit Development Process

A customized pedestrian audit was necessary for accurate and tailored data collection to evaluate the quality of the pedestrian infrastructure and its influence on pedestrian public transportation access. An internal brainstorming session, which preceded the first working draft of the audit, gathered a range of questions critical to the understanding of the quality and effectiveness of pedestrian infrastructure in general, with a special focus on pedestrian infrastructure used to facilitate access to public transportation. Materials used to guide this session included the Pedestrian Road Safety Audits Guidelines and Prompt List published by the Federal Highway Administration Office for Safety and the One Page School Neighborhood Walk Audit published by Berkeley Safe Transportation Research and Education Center. The audit was separated into sections, focusing on various aspects and elements of pedestrian infrastructure, or the pedestrian experience at the analyzed site. Sections, intuitively titled based on the portion of infrastructure they are focused on, contained a variety of questions, ranging between multiple-choice, binary (Yes/No), and open-ended questions. The sections selected for the audit were: Sidewalk, Crossing, Transit Areas, Street, and Social aspects/Safety. The audit
was tested near the University of Illinois at Urbana–Champaign campus, in areas served by Champaign–Urbana Mass Transit District.

The width of the sidewalks on the pilot test was measured by the number of adjacent pedestrians the path could accommodate; this method assisted in conceptualizing sidewalk capacity. The sidewalks were also examined to determine the accommodative capacity for pedestrians who use wheelchairs and people walking beside them. The pilot test led to the first round of modifications to the Pedestrian Audit. The final version that was produced after the pilot testing was used in Skokie and Waukegan. This included the transformation of specific questions to yield less repetitive results, as the initial pedestrian audit had several sections that easily overlapped.

**LIMITATIONS**

The pedestrian audit form was developed and tested near the University of Illinois at Urbana–Champaign campus. Infrastructure on and around campus transit areas provides high-quality pedestrian access; for example, a recently reconstructed area of Green Street has level transit boarding platforms, high-visibility crosswalks, and a pedestrian scramble crossing. The audit pilot test was performed within a campus transit-rich area that did not reflect the suburban pedestrian and transit environment encountered in the Pace service areas. The students modified the audit procedures during the first-weekend visit to Skokie and Waukegan and revised the audit form to more appropriately reflect the conditions we expected to find in the second visit. Modifications were minor but did introduce some inconsistencies in data collection between the two visits.

Other limitations included the selection of pedestrian audit areas by researchers who were not familiar with the selected communities. Due to this, it is possible that the most optimal routes for the research may not have been chosen. Similarly, a particular route may be more important to the community in the local context than the one that was chosen by the researchers. However, the focus groups (later changed to phone interviews) that are planned for the later portions of the study should allow the team to gain a better understanding of the needs and wants of community members that do live in the analyzed areas.
CHAPTER 2: AUDIT RESULTS

OVERVIEW

All audits were performed by students of UP 494 – Transportation Planning Workshop on September 28, October 4, and October 5, 2019. The students were separated into multiple groups that walked the preselected routes within each community and recording their observations guided by the predeveloped Pedestrian Audit Form. Data collection was performed by using Survey123, a tool developed by ESRI and intended for the collection of georeferenced data. Survey123 is a tool that allows researchers to complete individual pedestrian infrastructure audits for each intersection, bus stop, or predetermined location. It is designed to work on mobile devices and utilizes the device’s GPS to geotag each form so that spatial patterns can be analyzed later. The pedestrian audit (Appendix A) was converted into a Survey123 form, and a single survey form was completed for each selected intersection on each route. The survey responses generated points on the ArcGIS enabled map tied to the survey form, each point on the map representing the intersection where the data was collected. The result was a map for each assessed community, containing all individual intersections as part of the selected routes, containing crucial infrastructure information. The narrative analysis that follows synthesizes observations about sidewalks, crossings, and transit areas for each pedestrian audit route in all six municipalities.
PEDESTRIAN AUDIT FINDINGS

Aurora, Illinois

Aurora lies within DuPage, Kane, Kendall, and Will Counties. Aurora is the second-most populous city in the state, with an approximate population of 200,965 in 2017. The population of Aurora is 57% non-Hispanic White, and 37% of the population speaks Spanish. 31% of residents aged 25 and older have at least a high school diploma, 20% have a bachelor’s degree, and 11% obtained a graduate or professional degree. The primary commute mode is driving alone at 89%, while 4% of the population uses public transportation for work trips. Aurora was chosen as the focus community for the pedestrian study for Kane County because of its relatively higher number of bus stops compared to other neighboring cities and diverse demographic profile.

Audit Route 1 – North Aurora – Lake Street

The audit for Route 1, with six survey points, was conducted in Aurora along North Lake Street, which is primarily a commercial area with strip malls and other outlets, along with a major hospital in the vicinity. The first survey started at the intersection of North Lake Street, South Lincoln Street, and Sullivan Road from the AMITA Health Mercy Medical Center located on one corner of the intersection, continuing south on North Lake Street until the intersection of North Lake Street and Sunset Avenue. Pedestrian infrastructure here is less connected and less continuous than the other two audit sites.
Sidewalks

Sidewalks were absent on at least one side of the street throughout the survey route. The width of the sidewalks was two to three persons wide, wherever present. The sidewalks were discontinuous throughout the audit route. In a 35-mph zone with speeding vehicles, it felt dangerous to walk on the sidewalk with no buffer between vehicular and pedestrian traffic. Some parts of the sidewalks had permanent as well as temporary obstructions such as fire hydrants, trash cans, light posts, and overgrown grass.

Crossings

Most intersections had only one or two out of four crosswalks marked, and curb cuts and ramps were present only on respective sides of the sidewalk. Crosswalks were in good condition in terms of marking, and the distance between the crosswalk line and stop line for vehicles. For example, Figure 2 shows a marked crosswalk and an unmarked crosswalk adjacent to it. Some intersections lacked pedestrian islands. Despite street parking being present in many locations along the survey route, intersections lacked curb extensions.
Transit Areas

Transit areas were mostly not accessible by wheelchairs or by visually challenged pedestrians, either with missing or steep curb ramps and missing detectable warning surfaces. There were multiple entrances to parking lots in proximity (less than 20 feet) to one of the surveyed bus stops. Most bus stops only had a bus sign, and only two of the bus stops had transit shelters. At one of the survey points adjacent to the hospital, the bus stop was not connected to any part of the sidewalk making it almost impossible for people in wheelchairs to access it.

Figure 3 Transit area along North Lake Street near AMITA Health Mercy Medical Center, Route 1

Streets

The streets were mostly auto-oriented, consisting of 4-5 lanes and high-speed limits (35-40 miles/hour). The streets lacked bike lanes and not much pedestrian activity was observed during the audit. There were hardly any pedestrians in this area at 10:00 AM on the weekend, and there were generally fewer eyes on the street, possibly due to the sparsely built environment. A smaller number of vacant or dilapidated buildings were present when compared to other audit sites in this route.

Figure 4 Street condition at the intersection of North Lake Street, South Lincoln Street and Sullivan Road, Route 1
Audit Route 2 – Downtown Aurora

The audit for route 2 was conducted in Downtown Aurora, which is mainly a commercial area with some Institutional (administrative buildings) land-use as well. In the vicinity is a transit hub with many connecting Pace routes as well as the Metra train station. This area of Aurora had the best quality of pedestrian infrastructure condition as compared to the other areas we surveyed in the city.

Sidewalks

Downtown had a good quality pedestrian infrastructure in terms of design, and maintenance. This area had a more robust pedestrian infrastructure available as compared to the other areas surveyed in the city. The audit routes in Downtown Aurora had sidewalks present on both sides of the street with the ability to accommodate 2-3 persons walking side by side at a time. Sidewalks were well lit, had pedestrian crossing signs, including signboards and pedestrian signals with timer and press buttons. Sidewalks were uninterrupted and had a green buffer (lawn) between vehicular and pedestrian traffic.

Crossings

Crosswalks were present at every intersection that was surveyed. They were clearly marked, 2-3 persons wide, and well lit. Curb extensions were missing, but no survey point had street
parking allowed. A few crossings lacked pedestrian signage, but others either had pedestrian signals or stop signs. All crosswalks had curb ramps and detectable warning surfaces present.

**Transit Areas**

None of the surveyed transit areas had covered shelter, rather they only had a bus sign. Due to the observations made regarding the slope of curb ramps, all of them seemed to be easily accessible by people on wheelchairs while boarding and deboarding. Overall, these were relatively good transit area conditions.

![Transit area near Aurora Metra Station, Route 2](image)

**Streets**

Street paving was found to be in good condition, and vehicles appeared to follow the speed limit. One of the streets adjacent to the fire station (under the bridge) was demarcated by a shared lane marking or a sharrow indicating bikes and vehicles could share this lane. High pedestrian activity was observed on the audit routes in Downtown Aurora. The routes were perceived as safe and walkable.
Audit Route 3 – West Aurora – Randall Street

Audit Route 3, consisting of 5 survey points, was an audit conducted in Aurora in a residential area with a school in the vicinity. Our survey site started at the intersection of N Commonwealth Street and Plum Street.

Sidewalks

This area, in general, had a relatively good pedestrian infrastructure in comparison to other surveyed areas in Aurora, except for one stretch on N Randall Road without sidewalks. Sidewalks were present only on one side of the street near the school zone. One main stretch (street adjacent to the school) of the route on N Commonwealth Street had missing pedestrian infrastructure including, but not limited to, sidewalks, crossings, bus stop signs.

Crossings

Crosswalks were clearly marked and were 2-3 person wide, wherever present. No pedestrian signals present in general, and stop signs were missing in most intersections.
**Streets**

Streets had two lanes, and vehicular traffic was moving at a comfortable speed (to pedestrians). It is critical to note that no pedestrian infrastructure is present along the school route.

![Figure 10 Crosswalk condition at the intersection of Plum Street and North Randall Street, Route 3](image1.jpg)

*Figure 10 Crosswalk condition at the intersection of Plum Street and North Randall Street, Route 3*

![Figure 11 Transit area near Commonwealth Avenue, Route 3](image2.jpg)

*Figure 11 Transit area near Commonwealth Avenue, Route 3*
Crystal Lake, Illinois

Crystal Lake is a city located in southeastern McHenry County. It is located 45 miles northwest of Chicago and is the most populated city in McHenry County. The total population of the city, according to the 2010 census, is 40,743, out of which 50.4% are women. The racial breakup consists of 93% white and 1.4% African American population. The pedestrian infrastructure audit for Crystal Lake was conducted on the afternoon of 5th October 2019.

The 2030 Comprehensive Plan for Crystal Lake City aims at ensuring safe and efficient pedestrian infrastructure along with reducing the dependency on privately owned vehicles and the development of public transport. Crystal Lake was chosen for this study based on its population (the most populous municipality in McHenry County) and the mean travel time to work for workers above the age of 16 – 31.9 minutes (higher than both the national and the county average). The findings of the audit are elaborated in the following section.

![Figure 12: Field Audit Routes in Crystal Lake](image)

The pedestrian audit in Crystal Lake included a total of 11 survey points. The availability and quality of pedestrian infrastructure differed in Crystal Lake by the type of land use surrounding the audit routes. The pedestrian audit in this city primarily focused on routes in institutional, commercial, and residential areas. Pedestrian infrastructure around McHenry County College was most developed in terms of the quality of pedestrian infrastructure. It was the only route that had a multi-use bicycle and a pedestrian path. A general observation throughout the city was the lack of bus stop signage in most parts of the city.
Route 1 – McHenry County College

This route was the most distinct from other areas in the city because of its proximity to the county college. The observational analysis of this route is as follows:

Sidewalks

The sidewalks in this area were integrated with bike lanes, which could potentially be a point of conflict for pedestrian traffic and compromise the safety of pedestrians. Sidewalks were not present on both sides of the road and only had partial tree coverage. The infrastructure had no deficiencies in terms of visibility of pedestrians, a separation between vehicular and pedestrian traffic, and ADA compliance. The sidewalks were continuous, with no obstructions.

![Figure 13 Sidewalk condition near McHenry Community College, Route 1](image1.png)

Crossings

The crossing infrastructure was varied at different survey points on the route. Generally, the crossings were wide enough, had no permanent or temporary obstructions, and were adequately lit. The crosswalks were visibly marked, ADA compliant, and provided end mile connectivity. Stop lines for vehicles were visibly marked; however, the crossing signages (push buttons, timers) and safety instruction signs for pedestrians were only present at some intersections.

![Figure 14 Pedestrian crossing near McHenry Community College, Route 1](image2.png)
**Transit Areas**

The transit areas were not marked, lacked shelter and information for transit users, with seating available only at some intersections.

**Streets**

The area provides an overall good pedestrian experience, apart from the conflict points due to shared bike and pedestrian infrastructure.
Route 2 – Terracotta Road

The residential area lacked sidewalks at most of the intersections. There were deficiencies in pedestrian infrastructure at most intersections, such as lack of sidewalks and discontinuity of sidewalks being the main issues. The observational analysis of this route is as follows:

Sidewalks

The area lacked sidewalks in most places; where sidewalks were present, they abruptly ended in the backyards and front yards of residential spaces. In some areas, the sidewalks were obstructed by trees and overgrown plants. The sidewalks, wherever present, had adequate width but were not adequately lit. The sidewalks on this route also lacked safety instruction signage.

Crossings

The crossings were not adequately lit in most places and absent in some areas. In some areas, the accessibility ramps were steep, the turning radius was not adequate, and tactile warning pads were absent. The availability of crossing signage was not uniform, as most places lacked signages. On the positive side, there were no permanent or temporary obstructions.

Figure 15 Sidewalk and pedestrian crossing condition along Route 2

Figure 16 Pedestrian crossing along Route 2
Transit Areas
The bus stops were not marked in most places, had no shelter, and provided no information for transit users. Three out of five intersections that were audited had transit areas that were not accessible for people in wheelchairs.

Streets
The streets had no observable deficiencies in infrastructure apart from a lack of separated bike lanes. The neighborhood provided a safe and secure environment for pedestrians, with the only constraint being the relatively high vehicular speed as compared to the speed limit on the main street.
Route 3 – Downtown Crystal Lake and Surrounding Area

This route consists of residential and commercial land uses places adjacent to each other. This route had a total of three survey points. The observational analysis of this route is as follows:

Sidewalks

Sidewalks were absent in some areas on this route. Some sidewalks were narrow and ended abruptly. Specifically, downtown, the sidewalk infrastructure was adequate and accessible except for lack of safety instructions signage.

Crossings

The crosswalks were poor in terms of ADA compliance. Some places did not have adequately marked crosswalks and lacked crossing signage for pedestrians. The quality of infrastructure in residential areas was reduced as compared to the adjacent downtown area.

Transit Areas

The bus stops were not marked, no shelter was available, and there was a lack of information for transit users. Two out of three areas were inaccessible to people in wheelchairs, due to lack of ramps, discontinuity of sidewalks, improper curb cuts, and lack of pavement.

Streets

The area provided an overall safe pedestrian experience apart from the aforementioned deficiencies in infrastructure.
Harvey, Illinois

Harvey is a suburb in south Cook County, about 18 miles south of the Chicago Loop. The population of Harvey was approximately 25,685 in 2017. The city of Harvey is a significantly disadvantaged population: 96% are people of color, and 30% of the population lives below the federal poverty level (compared to 13.1% of people in the Chicago Metropolitan Statistical Area). The community is served by the Metra Electric District and 13 Pace routes. The infrastructure audit for Harvey was conducted on the morning of October 4, 2019, between 10:00 and 11:30 am.

Figure 19 Field Audit Routes in Harvey, Illinois
**Route 1 – Downtown Harvey**

Route 1 was an audit conducted in downtown Harvey, which is mainly a commercial area with some institutional and residential land use as well. This area serves as a transit hub with many connecting pace routes as well as the Metra train station. This area of Harvey seemed to be in the best condition out of the areas surveyed.

**Sidewalks**

Sidewalks were present on both sides of the road for most of this area, with very few gaps. The sidewalks were generally in an acceptable state of repair, though a few areas of the sidewalks were poorly maintained, with large cracks and faults which could potentially impede a person in a wheelchair, as seen below.

![Figure 20 Sidewalk condition along Route 1](image)

**Crossings**

Two of the five intersections had broken/inadequate vehicle control, with there being a broken stoplight at one and a missing stop sign at another. This made crossing the road at these intersections unsafe and confusing. Only one of the crossings in this area had a marked crosswalk. Most of the crossings here were missing either a ramp or tactile warning pads or had ramps that were in poor condition.

![Figure 21 Pedestrian crossing and intersection condition along Route 1](image)
**Transit Areas**

The bus station in Downtown Harvey had good pedestrian access and passenger accommodations. Most of the stops in downtown Harvey had signs, and about half had a shelter. Over half the stops would be inaccessible to a person in a wheelchair, mainly from a

![Image](image.png)

**Figure 22 Transit area condition along Route 1**

**Streets**

Most of the streets in this area were two-lane roads. Park Avenue is the main north-south thoroughfare of downtown Harvey and had many speeding vehicles, which would impede access between the Pace bus hub and Metra station. Downtown Harvey was active with pedestrian activity and eyes on the street. However, there were several vacant buildings and lots that detracted from an otherwise active street scene.
Route 2 – 159th Street

Route 2 was an area surveyed along 159th street, which is a five-lane wide arterial route with heavy traffic and few crossings.

Sidewalks

This route had sidewalks on both sides of the street without buffers between traffic and pedestrians. Semi-trucks frequently passed by going around 40 mph along 159th Street, making walking here uncomfortable. Sidewalks were otherwise in good condition.

Crossings

There were very few crossings along this route as there is only one signalized intersection at Park Avenue and 159th St. This intersection had pedestrian signals and ramps but lacked marked crosswalks and tactile warning strips. Pace stops along 159th St. were at intersections with no crossings or stop-lights, making crossing the five-lane road very dangerous. The one marked crossing away from the signalized intersection was at 159th St. and Myrtle Avenue and featured a faded zebra crossing and pedestrian crossing warning signs. This crossing could potentially be used by children accessing a nearby playground and kindergarten, but the crossing is not adequate for crossing five lanes of heavy traffic, for Pace riders and certainly not small children (Figure 24 ).
Transit Areas

Transit areas along 159th St had shelters, seating and, signage, and had adequate loading areas for wheelchairs.

![Transit area along Route 2](image)

**Figure 25 Transit area along Route 2**

Streets

This street is 5 lanes across, making it very large, and had many speeding vehicles and semi-trucks. It also had very few intersections with stoplights, which would allow pedestrians to cross more safely. Pace stops at every intersection despite there being over a half-mile gap between signalized crossings. There were very few people walking in this area or eyes on the street, but generally, there were fewer vacant buildings than in downtown Harvey.
Route 3 – Wood Street

This route was along S Wood Street between 156th and 151st. The southern end of the route was in the areas of Ingalls Memorial hospital and featured robust pedestrian infrastructure, while the northern end was in a residential area and was missing sidewalks and crossings.

Sidewalks

Sidewalks along this route varied significantly. The areas to the south near the hospital featured wide, well-maintained sidewalks. The north end of the route saw missing sidewalks, numerous large gaps on both sides of the road, broken sidewalks, and obstructions. Most sidewalks in this area did not feature a buffer between pedestrians and traffic.

Crossings

Most crossings in this area either did not have any crosswalk markings, or they were very faded. Traffic signals did feature pedestrian signals, and some crossings had pedestrian warning signs. Some crossings were missing ADA ramps and tactile warning pads.

Transit Areas

There were bus signs for all stops in this area, and some stops had waiting shelters. The stops at the north end of the route did not have any sidewalks or paved waiting areas; one appeared to be muddy and flooded. The stops at the north end would not be usable by a person in a wheelchair. A north end stop is pictured below.
Streets

The street along this route was four lanes wide at the south end and two lanes wide at the north end. Traffic seemed to be going at a relatively fast pace. This area had people walking around, but there were not very many eyes on the street. There were several vacant buildings. Litter was present along the route, with many patches of grass-covered with bags, plastic containers, and other non-biodegradable materials.
Joliet, Illinois

Joliet is the most populous city in Will County and is located on the northern side of the County. It is located 30 miles southwest of Chicago. From the Chicago Street Corridor Plan of 2018, the current streetscape of Joliet is approximately four decades old and in need of an update to accommodate current and future businesses and residents. Joliet was strategically selected to be included in this study due to its interesting demographic and socio-economic characteristics. Joliet has an ethnically diverse population and the highest population density in the county and a high percentage of people living below the poverty line. The city has a higher average travel time to work compared to the national average.

Figure 28 Field Audit Routes in Joliet, Illinois
Route 1 – Northeast Joliet

The first route audited is located in the northeast of Joliet, which is in a residential area. Five transit areas within this route were audited. The audit locations are near Forest Park Individual Elementary School. The route starts from the junction of Garvin Street and California Avenue and then heads east to Cutter Avenue. The third location was located at the junction of Demmond Street and Gould Ave. Finally, it turned west on Woodruff road and ended at the junction of Draper Ave. and Demmond Street.

Sidewalks

Generally, most of the sidewalks along this route were missing. Only a few sidewalks exist on one side of the street, but they are not continuous and partially covered by trees. Additionally, one of the sidewalks is obstructed by grass. Further, safety instructional signs for pedestrians were not present.

Crossings

Generally, most intersections within this route did not have crosswalks, but the visibility of pedestrians was not obstructed. Only one intersection had crosswalks. Additionally, the intersections were not adequately lit. No curb extension was recorded along this route. As shown in Figure 30, no streetlight was provided at the intersection, and crosswalks were not marked either. Only one of the intersections was equipped with a crosswalk that included a curb cut.
**Transit Areas**

Bus signage was missing in most transit areas, and only one transit area was equipped with a full bus stop (sign, adequate boarding areas, etc.) The wheelchair-accessible ramps present near the transit areas were rather steep which would make it difficult for people on wheelchairs to board the bus.

**Street**

All the streets on the audit route consisted of two lanes and a speed limit of 25 mph. No speeding vehicles were observed during the audit. The streets lacked bike lanes. The residential area in Joliet was quiet. There were not a lot of people walking on the streets and seldom eyes on the street. There were some vacant buildings in this area, and the façade of some houses were broken.

![Figure 31 Sidewalk dead end along Route 1](image-url)
Route 2 – Cass Street – Downtown Joliet

Sidewalks

Within these five transit areas, both sides of the streets had 2 or more-person-wide continuous sidewalks, which were partially covered by trees. Most of the sidewalks were adequately lit. However, the safety instructional signs for pedestrians were not provided for most sidewalks. Also, three out of five sidewalks were obstructed by permanent obstructions such as streetlights, encroaching stores, and fire hydrant, shown in Figure 32.

![Figure 32 Sidewalk condition along Route 2](image)

Crossings

Most intersections on the audit route had crosswalks that were adequately lit. No obstructions that would compromise pedestrian visibility while crossing were observed. Some intersections did not have clearly marked crosswalks. The intersections lacked pedestrian islands and curb extension was present only on one of the crossings. One of the crosswalks did not provide access to meaningful destinations because there was no crosswalk across the main road. The ADA ramps exist along intersections, but some of them contain problems like a steep slope.

![Figure 33 Pedestrian crossing and transit area along Route 2](image)
**Transit Areas**

In most transit areas, bus stops were not marked. Only two out of five bus stops were marked with bus signs. People with wheelchairs can easily board the bus from most of the bus stops (3/5).

**Street**

Although the speed is around 30 mph, the vehicle speed was relatively fast. No bike lane was available although some people were using bikes. No buffer between pedestrian and vehicular traffic was provided. Since there is a high school within this auditing route, it was not safe for children to walk.
**Route 3 – West Joliet**

The third audit route was in the western part of the city which is in a residential area. Three transit areas were audited within this route.

**Sidewalks**

All the streets within this route had sidewalks, which were partially covered by trees, and adequately lit. However, two of three sidewalks were one-person wide and not continuous. One of them existed only on one side of the street. Moreover, pedestrians were not separated from vehicular traffic for most of the sidewalk length along the audited route. Also, the sidewalks were obstructed by both temporary obstructions, such as trash cars and parked cars, and permanent obstructions, like trees, light posts, and fire hydrants.

![Figure 34 Sidewalk obstruction and condition along Route 3](image)

**Crossings**

The crossing signage was present along this part of the audit. One of these three intersections did not have crosswalks. The width is great enough for existed crossings. All the crossings were adequately lit, and one of them had a pedestrian island. No curb extensions were available in this area. Only one out of these three interactions had accessible ramps and tactile warning pads.

**Transit Areas**

Two of these three transit areas were marked with bus signs. One of the transit areas did not have proper signage. Also, people with wheelchairs cannot easily board the bus from most of the bus stops (2/3).

![Figure 35 Transit area condition along Route 3](image)
**Street**

The street contains four traffic lanes. The vehicle speed on the street is too fast, even if the speed limit is 30 mph. Also, no bike lane was available on the street. There was some pedestrian activity in the residential area, but the vehicle speed traveling on streets seemed too fast compared to the speed limits. Pedestrian visibility might be obstructed at the corner of intersections.
Skokie, Illinois

The Village of Skokie is an inner suburb directly north of the city of Chicago. Skokie had an estimated population of 64,773 in 2017. The municipality is served by the CTA Yellow line, several CTA bus routes, and Pace bus service. We selected Skokie based on its relatively large concentration of non-white population (44%), 9% of the total population living below the poverty line, and 9% commuting to work by public transportation.

Figure 36 Field Audit Routes in Skokie, Illinois
Audit Route 1 – Westfield Mall

Sidewalks

The first route surveyed in Skokie had good sidewalk inventory with uninterrupted and obstruction-free sidewalks on both sides of the street. There was sparse to no tree cover for the length of the sidewalks on either side. The sidewalks are separated from the street by buffers which did not continue to the commercial area.

Crossings

Well-lit and adequately wide signalized pedestrian crossings were present, with ADA accessibility.

Transit Areas

No transit area was present along this route.

Street

The commercial area was situated near the 6-legged major intersection, where traffic moved relatively fast (approximately 45 mph), and pedestrians may be vulnerable due to the absence of a buffer.
Audit Route 2 – Church Street

Sidewalks
The second audit route was identical to the first point in terms of sidewalk inventory - uninterrupted and obstruction-free sidewalks on both sides of the street with no tree cover for the length of the sidewalk.

Crossings
There were well-lit signalized pedestrian crossings present, with timers and push-to-cross buttons. The crossings were ADA accessible and provided a means to reach the nearby shopping centers.

Transit Areas
The bus stop is marked by a bus sign with no covered shelter present. The sidewalk adjacent to the bus stop is in sub-par condition.

Figure 38 Transit area condition along Route 2

Street
The area is primarily used for commercial activities. The traffic movement is relatively fast (approximately 45 mph) at the asymmetric 4-legged intersection.
Audit Route 3 – Evanston Golf Club – Dempster Street

Sidewalks

The last route surveyed in Skokie also has a relatively good sidewalk inventory. Both sides of the route had continuous and sidewalks free of any obstructions, with ample separation between vehicular traffic and pedestrians. The sidewalks had partial tree cover.

![Figure 39 Street and sidewalk condition along Route 3](image)

Crossings

The pedestrian crossings were present at the corresponding intersection, albeit not well-lit; one or two distantly placed streetlights provide lighting for the entirety of the crosswalk. There were no curb extensions or pedestrian islands since the route is not very wide. There was no signage for crossings. The crossings had ADA accessibility; however, boarding a bus can prove to be difficult for commuters using wheelchairs.

Transit Area

The bus stop was unsheltered, demarcated by a bus sign.

Streets

The neighborhood had noticeable pedestrian movement, given the area is used for residential and commercial purposes. The speed limit in the area was approximately 35 mph, with vehicles moving relatively fast. A bike lane was present, separate from the sidewalk.
Waukegan, Illinois

The City of Waukegan is the largest city in Lake County and has the most Pace service in the county. Waukegan is a predominantly working-class city on the shores of Lake Michigan, located approximately 35 miles north of Chicago. The estimated population of Waukegan in 2017 was 87,999, according to the American Community Survey 5-year Estimates (2012-2017). Waukegan is connected to Chicago by Metra, with Waukegan station acting as the city’s transit hub, served by Metra’s Union Pacific/North Line. Waukegan is a natural choice for this county, given the outsized number of pace routes and stops for the county, as well as the high population of racial minorities and a significant population living below the poverty level as compared to other municipalities in the county.

Figure 40 Field Audit Routes in Waukegan, Illinois
Audit Route 1 – Larsen Nature Preserve – Jackson Street
The first route was primarily residential with the presence of a recreational and community center (HACES) towards the end of the route. The speed limit for Route 1 was 30mph.

Sidewalks
The route was partially covered with trees and had some overgrowth along with the sidewalk widths.

Crossings
This was the only route that we noted in our audit that did not have adequate distance between the stop line and the crossing. The bus stop sign was fixed on the grass patch.

Streets
Route 1 has the scant presence of trees, as compared to other residential areas we audited. The speed limit for the route was 30mph. Neighborhood watch signs were present; this indicated voluntary measures to maintain safety.

Figure 41 Sidewalk and transit area condition along Route 1
Audit Route 2 – Glenwood Elementary School – Glen Flora Avenue

Sidewalks

Similar to Route 1, this route had some overgrowth along with the sidewalk widths. The cracked pavement was prevalent in long stretches, although repairs were being undertaken. Route 2 had an obstruction in terms of dislodged/paved block. Route 2 had an obstruction in terms of a mailbox. This route comprises primarily of residential buildings, except for the presence of the school. The route adjacent to the school playground had an absence of a sidewalk.

![Figure 42 Sidewalk condition along Route 2](image)

Crossings

Marked crosswalks were present on this route, possibly since it has proximity with a school, which was an exception to all other audited routes.

![Figure 43 Crosswalk condition along Route 2](image)

Transit Area

This route had the bus stop in the best condition, in all our audited routes. The bus stop had the presence of seating, covered shelter, trash can as well as a timing chart. This was the only route that did not have ADA accessible ramps around PACE bus stops. The ramps were narrow with a steep slope. The speed limit was 30mph.

Streets

As the route had the presence of the school, its speed limit was 20mph, which was lowest as compared to all the audited areas. These routes have the presence of houses with windows towards the sidewalks. This provides some sense of safety, through eyes on the streets.
Audit Route 3 – Grand Avenue

Route 3 is mainly a commercial strip. This route has automobile repairs shops, restaurants, and shopping centers present on both sides of the route. Tree coverage was absent on this route.

Sidewalks

Route 3 had wider sidewalks, approximately 14 feet wide than the regular three people width sidewalks in other routes of the audit.

Figure 44 Sidewalk condition along Route 3

Crossings

This route had a major intersection. The intersection had had clearly marked crosswalk strips, crossing timer as well as push-button to cross button; this was an exception to all the other audited routes but route 3.

Figure 45 Crosswalk condition along Route 3

Streets

The speed limit, for this route, was 35mph. The vehicles felt relatively faster than the speed limit. The presence of shops and restaurants keeps the roads busy for peak hours of the day, but there are no eyes on the streets when the businesses close.
KEY TAKEAWAYS

Pedestrian infrastructure availability, design, and quality greatly varied across the communities that were audited. Outliers were found near the McHenry County Community college in Crystal Lake, where the pedestrian infrastructure included a dedicated separate wide sidewalk (trail) that was shared with bicycles, as well as in most areas in Skokie, where pedestrian infrastructure was present and properly labeled and protected. Other areas, such as Harvey and Waukegan, were documented to have pedestrian infrastructure issues such as inadequately labeled crossings, no sidewalks present, or improperly sheltered transit waiting areas along almost the full length of all routes that were audited. Areas that lacked adequate pedestrian infrastructure included issues such as improper separation between pedestrian and vehicular traffic, poorly maintained or non-existent sidewalks along streets, worn and unlabeled pedestrian crossings, and inadequate or non-existent transit waiting areas. Overall, pedestrian infrastructure networks in communities where issues were noted can be described as not contiguous, in disrepair, and poorly designed. It is important to note that near certain institutions in under-resourced communities, there were pockets of high-quality pedestrian infrastructure, such as near the Ingalls Memorial Hospital in Harvey, as well as near the Glenwood Elementary School in Waukegan. Generally, most audited areas would need some form of improvement and investment in pedestrian infrastructure to bring it up to a standard that can be observed in areas with complete street infrastructure and development principles.
CHAPTER: 3 RELEVANT TEXT IN MUNICIPAL CODES AND COMPREHENSIVE PLANS

OVERVIEW

After the initial infrastructure report, the researchers evolved the study into an analysis and research report. This report was examining the survey from the perspectives of municipal codes, possibilities of funding resources (such as LRTPs), and filling gaps through a virtual audit to improve the analysis of results. For this, we worked in groups and developed a compiled report including all the results. Our research analysis included contacting different municipalities, literature review of LRTPs, Universal Mobility Report by MPC, RTA’s financial guidelines, PACE’s design, and financial handbook, and understanding the importance of bike and pedestrian programs regionwide. To quantify the result, our virtual audit group worked on the CMAP inventory and compiled its results. They also used innovative spider charts to visualize these findings. Further, this pedestrian infrastructure review aided us in providing draft policy recommendations that overarched our process and considered the relationship between PACE, municipal governments, community needs, barriers, and potential solutions. This exercise helped us in diversifying the scope of our understanding of pedestrian infrastructure. We understood the impact of municipal governments and policy recommendations on transportation planning.

AIM

To assess the existing regulations, efforts, and goals of each municipality, a thorough review of existing ordinances, as well as comprehensive plans and other text, was conducted.

Crystal Lake

*Planning and Zoning Commission Minutes, October 18, 2017:*

The Commission discussed the future of transit in Crystal Lake. One Commission Member, Mr. Jouron, commented that although the City had Pace bus service, there were no sidewalks or shelters for people to stand, and asked if the addition of these should be part of the future transportation plans. Other members commented that they did not recall there being any mention of adding bus shelters or similar infrastructure in the current plan. Commission Member Hayden commented that it is important to prioritize these projects, but they also need to have an estimated cost before being implemented. He then said that it is possible that they could adjust the Crystal Lake Unified Development Ordinance to reflect these goals. As of 2019, no such change has been implemented.

*City of Crystal Lake Transportation Plan 2017:*

The planning and design standards and practice goals for the City of Crystal Lake include strengthening pedestrian facility standards to improve walkability and to update development standards to create pedestrian-friendly places in ‘key areas’. Pedestrian and transit
improvement goals include pedestrian improvements to existing Pace bus routes as well as for a proposed route that will terminate in Downtown Crystal Lake. The City also plans to coordinate with Pace to increase facilities for transit riders at important destinations. Crosswalks and sidewalks are planned to be built near McHenry County College as well as by commercial businesses at the intersection of US 14 and IL 176. The City also plans to incorporate design features for bus stops within the Unified Development Ordinance to make it easier to coordinate with Pace in adding more boarding facilities.

In the future, the City will implement a transportation-focused steering committee that will help guide transportation improvements aligning with the vision of the current transportation plan.

**Harvey**

*City of Harvey Municipal Code:*

The City of Harvey created the Transit-Oriented Development overlay district to promote mixed-use development close to the Harvey Metra Station and Pace Transportation Center and encourage pedestrian activity. This shows that the City values increased pedestrian infrastructure and walkability.

*Cook County Long Range Transportation Plan:*

Cook County plans to prioritize projects that complement infrastructure that already exists. This includes incorporating sidewalks, crosswalks, bus pads, and shelters along Pace Arterial Rapid Transit routes. It also plans to assist Pace in efforts to provide bus service on expressways and arterial roads, to fund transportation improvements such as sidewalks, and to assist local governments in identifying gaps in existing pedestrian programs and adopting bicycle and pedestrian plans.

**Joliet**

*Will County 2040 Long Range Transportation Plan:*

In Will County, where Joliet is located, it is reported that most residents worked in other counties and that only about 4% of the population utilized public transit. However, input from the public has frequently revealed a demand for increased regular public transit to Metra stations and between suburban communities. One of the most utilized Pace routes in Will County includes a route that connects Downtown Joliet and DuPage County.

One reason that public ridership is low maybe because many communities have limited or no access to transit. Currently, Pace is filling this gap by operating two On-Demand reservation-based shared ride services in low-density communities. As ridership demand grows, fixed bus routes may be implemented. Will County priorities for Pace include continuing to address maintenance and preservation activities across the Pace system, as well as to continue to implement the Pace Rapid Transit Network.
Aurora

Station Boulevard Transit-Oriented Development: Transportation Plan Update:
Similar to Will County, the City of Aurora will implement an On-Demand service to connect Naperville and Aurora for anyone who calls to reserve a trip at least an hour in advance within a designated service area. New regular Pace routes will be implemented adjacent to Station 9 Boulevard neighborhoods.

Kane County Long Range Transit Plan:
Current transit needs identified in Kane County include a need for increased hours of Pace service, particularly at night and on weekends, an increase in the frequency and reliability of service, and an increase in pedestrian amenities. Planned implementations to acknowledge these concerns include developing bus stop amenity design standards as well as a policy for where and at what level to add such amenities, and to develop a program of transit-supportive improvements, including transportation centers and hubs, bicycle and pedestrian facilities and bus stops at intersections.

Skokie

Village of Skokie Comprehensive Plan:
A growing number of households in Skokie have no vehicle. In 2000, almost 1 in 10 households had no vehicle, compared to 1 in 29 in 1960. There is also an increasing demand for public transit and several complaints about existing services. About 43% of Skokie residents had ridden a bus in the past year, and 18% thought that bus and rail service was either “fair” or “poor”. An additional 27% did not know how to rate the quality of transit services. Because of this, the Village is prioritizing pedestrian and transit within their development goals.

Skokie is currently collecting an inventory of Pace bus stop locations in its jurisdiction, as well as the level of amount of infrastructure, such as benches, signage, and shelter, and the amount of improvement needed at each stop. After this project is finished, the Bus Transit Plan will be amended to indicate the improvements to be made to each location.

Waukegan

Existing Conditions Report:
The Waukegan Pace bus system runs through Waukegan and connects to other northeastern Illinois suburbs. Waukegan has an average walkability score, and most residents view the City as car-dependent. Most streets have the pedestrian infrastructure, having sidewalks on at least one side of the roadway. However, access is limited to arterial roadways with high traffic. Although most of Waukegan is accessible through its sidewalk network, the City will review residential neighborhoods for pedestrian improvements.

Most survey respondents were satisfied with existing Pace services, although there is still a need for weekend services and increased punctuality. Moving forward, the City of Waukegan
will implement Transit Oriented Development policies, incentivizing development near transit hubs so that people are better able to access work.

COMMONALITIES BETWEEN CITIES
In general, municipalities saw a need to update and add sidewalks and other pedestrian infrastructure to make their jurisdictions more walkable. More bus stop infrastructure, such as benches, signs, and shelters, need to be added to increase ease of rider pick-up and to reduce confusion. Another recurring theme was a need for transit services during off-times, such as on the weekends or at night. Finally, almost all cities were dedicated to transit-oriented development, showing a prioritization for pedestrian access and public transit generally.

SIDEWALK MAINTENANCE: RESPONSIBILITY IN EACH CITY
In each city, private property owners are only responsible for sidewalk repair if they do something that will cause damage to public infrastructure. Typically, this is done to solve sewer issues and a permit is usually requested beforehand. There was some variation between which departments were responsible for the public repair of sidewalks. Departments Responsible for Sidewalk Maintenance are shown in Table 1.

<table>
<thead>
<tr>
<th>Crystal Lake</th>
<th>Engineering Department</th>
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<tbody>
<tr>
<td>Harvey</td>
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<td>Engineering Department</td>
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<td>Skokie</td>
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<td>Waukegan</td>
<td>Sidewalk Repair Division</td>
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CHAPTER 4: POTENTIAL FINANCIAL RESOURCES FOR TRANSIT SUPPORTIVE PEDESTRIAN INFRASTRUCTURE

OVERVIEW

We started by reviewing the federal and state funding for pedestrian improvement projects to understand the structure of transportation planning projects. Expanding and improving bicycle and pedestrian infrastructure means ensuring that a network of infrastructure is in place to make bicycling or walking viable modes of travel. Funding becomes a crucial element in ensuring that the infrastructure is safe and comfortable to use. This systematic documentation of funding and project listing helps in approaching projects in priority. Improved sidewalk infrastructure can promote health by providing an added opportunity for physical activity from transportation. This strategy is related to and supportive of the Safe Routes to School, Complete Streets, and Encouraging Bicycling and Walking programs.

POTENTIAL FUNDING RESOURCES

This chapter outlines the potential state, county, and municipal projects and programs that can fund pedestrian and bike infrastructure. This chapter can be seen as an add on to the outlined federal funding in the previous sections of the report. The projects and their respective funding are summarized county-wise as well as municipality-wise. One of our observations included the discrepancy in funding documentation. Each municipality has a different format of listing projects as well as a different timeline of their long-range transportation plan. This funding summarization tries to overlap the county-wise project categorization, funding, and the number of projects to provide a clearer sense, especially for nonprofits and advocacy groups, working towards better pedestrian infrastructure.

CMAP

Bicycle and Pedestrian Program

CMAP’s Bicycle and Pedestrian program is dedicated to helping make safe, accessible, and well-designed bicycle and pedestrian networks a reality in communities across the region. They are trying to achieve this through collaboration and interaction with partners and stakeholder coordination (most notably through the Bicycle and Pedestrian Task Force). This is being developed through the circulation of information, data, analysis, tools, and other resources designed to help communities, agencies, organizations, and individuals envision, plan, and create a pedestrian- and bicycle-friendly communities. A very good example of this step is the Sidewalk Repository, which has enabled a variety of analyses for policymakers and advocacy groups. Another step is through the development of, sponsorship, and participation in public programming and training events. Further, the development and management of the Congestion Mitigation and Air Quality (CMAQ).
Bicycle and Pedestrian task Force
This is comprised of advocacy organizations, community groups, businesses, as well as representatives of local, regional, and state governments seeking to improve walking and bicycle travel conditions in metropolitan Chicago. This is not a funding resource but it’s a crucial support system for identifying, assessing, and addressing bicycle and pedestrian travel issues and provide overall guidance for the development of the regional bicycle and pedestrian program. Examples of key issues include safety, convenience, economic development, and access for people with disabilities.

Improvement and Transportation Alternatives (TAP) programs
The locally programmed Transportation Alternatives Program (TAP-L) is a federally-funded program of surface transportation improvements designed to support non-motorized transportation. CMAP uses a competitive process to select bicycle facility projects to fund under this program

The Community Planning program provides funding and planning assistance to applicants for implementation and planning projects that benefit the community and the regional transit system. Eligible implementation projects include zoning code updates, developer discussion panels, pedestrian access improvement plans, and other innovative implementation approaches. Eligible planning projects include transit-oriented development (TOD) plans, and corridor, sub-regional, or local access improvement plans.

County Wise Funding for Pedestrian Infrastructure
The counties are selected based on the cities selected for pedestrian audits. A summary of the total number of projects that are proposed to fund ped-bike infrastructure is illustrated in Table 2. The summary includes already funds available for existing as well as proposed projects.

Note: There is a difference between the information of different counties as the information resources of those counties for pedestrian funding was limited. The timeline for all these projects are different, they don’t have a common timeline.

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Source: CMAP ([https://etip.cmap.illinois.gov/#tabs-4](https://etip.cmap.illinois.gov/#tabs-4))

**Cook County**

Cook County has adopted the Complete Street Ordinances which would ensure the design of streets in a way that accommodates pedestrian and bicycle infrastructure. The existing and proposed bike lanes and trails are illustrated in Figure 78. In 2016, as per the Illinois Transportation Taxes and Fees Lockbox Amendment, Cook County expanded its transportation funding by restricting the practice of diverting motor fuel tax funds to other uses. This ensured an additional fund of $45 million annually, which is utilized to fund the projects described in the Long-Range Transportation Plan. This fund would be utilized by the county to implement the following pedestrian and bike infrastructure projects:

- Prairie Path in Suburban Cook County
- Burnham Greenway Trail extension in South Cook County
- The 606 improved traffic flow (New Trail Project) – This project is located in the city of Chicago

**DuPage County**
The county has funds for pedestrian infrastructure under the ADA Transition Plan and 2020 Mobility Plan with RTA, which are yet to be published.

**Kane County**
The 2040 transportation plan for Kane County outlines the Bicycle and Pedestrian Plan that adopts a comprehensive strategy to address the respective infrastructure requirements. The strategy includes overlooking the adoption of plans and policies to improve bicycle and pedestrian infrastructure by municipalities. The 2011 Kane County Bicycle Planning Map proposes 380 miles of conceptual trails in the county.

**Kendall County**
The LRTP of Kendall County does not state any funding for bicycle and pedestrian improvement, the current & anticipated transportation funding based on the LRTP 2018-2038 highlights the funding as follows: Motor Fuel Tax, County Highway Fund, County Bridge Fund(supported by property tax), Federal Aid Matching Fund, Transportation Sales Tax Funds, Federal Funds (Due to its continual urbanization, Kendall County has recently been required by federal law to be included in a Metropolitan Planning Organization (MPO). *Kendall County is now represented by the Kane/Kendall Council of Mayors, under the umbrella of the Chicago Metropolitan Agency for Planning (CMAP). While Kendall County is a part of the CMAP MPO area, it is not a part of the Regional Transportation Authority (RTA) service area.*

Residents of Kane and Kendall County spend an average of 23% of their monthly income on transportation. Kendall County with the highest percentage of transportation costs as a portion of their monthly household budget. The data for this table was provided by the Location Affordability Index, which was created by the U.S. Department of Housing and Urban Development. Currently, in Kane County, approximately 88% of all trips made within the County are made via automobile. Around 7% of all trips are made by walking and only 0.1% of trips are made by bike. In Kendall County, 89% of all trips are made by automobile. Just under 3% of all trips are made by walking and 0.5% of trips are made by bike. These figures are according to the latest CMAP Travel Inventory Survey. To determine the quality and availability of pedestrian facilities, the Highway Capacity Manual has introduced a Pedestrian Level of Service (PLOS), which is an evaluation process that rates pedestrian facilities on safety, design, and infrastructure elements. This tool allows municipalities and roadway professionals a consistent method for evaluating pedestrian facilities.

**Lake County**
The 2040 non-motorized transportation plan prepared by the Division of Transportation, Lake County proposes improved pedestrian infrastructure. The 2040 plan for Lake County prioritizes non-motorized improvements based on the following factors:

- Number of Households and Jobs projected in 2040
- Connections to the existing non-motorized network
• Connections to transit
• Connections to school
• Connections to parks
• Located along a corridor planned for transit improvements

The priority is increased in areas that have intermodal connectivity, such as leading to Pace bus routes and Metra stations.

The plan outlines different institutions and programs that provide funding for the development and improvement of pedestrian infrastructure. The following sources of funding are available for improving non-motorized transportation infrastructure:

• Recreational Trails Program (RTP)
• Land and Water Conservation Fund (LWCF/ LAWCON)
• Illinois Bicycle Path Program
• Illinois Safe Routes to School Program
• Congestion Mitigation and Air Quality Improvement (CMAQ) Program

The plan proposes 310 miles of non-motorized infrastructure to be implemented in the county. The details about the funding sources are illustrated in Table 3.

**Table 3 Total funds available for ped-bike infrastructure in Lake County**

<table>
<thead>
<tr>
<th>Jurisdiction</th>
<th>Cost (In millions)</th>
</tr>
</thead>
<tbody>
<tr>
<td>LCDOT</td>
<td>$66</td>
</tr>
<tr>
<td>LCFPD</td>
<td>$27</td>
</tr>
<tr>
<td>Other Jurisdictions</td>
<td>$99</td>
</tr>
<tr>
<td><strong>Total cost for non-motorized improvements (2014 dollar)</strong></td>
<td><strong>$192</strong></td>
</tr>
</tbody>
</table>

*Source: Lake County 2040 Non-motorized Transportation Plan*
**McHenry County**

2040 Long Range Transportation Plan: 2040 McHenry County Bicycle and Pedestrian Projects

This includes prioritized trails and Side Path extension as well as construction projects throughout the county with a total investment of $63 Million. The detailed breakup of funding sources is illustrated in Table 4.

**Table 4 Total funds available for ped-bike infrastructure in McHenry County**

<table>
<thead>
<tr>
<th>Project</th>
<th>Funding/ Investment (in Million)</th>
<th>Investment Period</th>
</tr>
</thead>
<tbody>
<tr>
<td>2040 McHenry County Bicycle and Pedestrian Projects (2040 Long Range Transportation Plan)</td>
<td>$16 $63 $36</td>
<td>2015 - 2040</td>
</tr>
<tr>
<td>Bicycle, Pedestrian, and Transit Program (McHenry County 2019-2023 Transportation Program)</td>
<td>$8.40 $14.80 $2.60 $25.80</td>
<td>2019-2023</td>
</tr>
</tbody>
</table>

Source: McHenry County 2040 Long Range Transportation Plan

**LIMITATIONS**

Documenting the funding mechanisms for each municipality posed challenges. This chapter includes a list of potential sources that can be used to fund pedestrian infrastructure projects, plans, or policies. The sources of funding are summarized county-wise and municipality-wise. However, it was challenging to find municipal level funding sources since each municipality listed the projects differently. The chapter tries to provide a clear summary of potential funding sources available, however, there might be some discrepancies due to the data availability constraints. The initial research aimed at including only municipal-level funding sources for each municipality, however, county-level sources were included due to the lack of organized data available for municipalities.

**KEY TAKEAWAYS**

There is an inequitable distribution of funds, both across and within counties. The funding mechanisms are not uniform across the counties. We observed a lack of standardized funding opportunities across different counties.
CHAPTER 5: ENGINEERING AND DESIGN STANDARDS AND GUIDELINES FOR TRANSIT SUPPORTIVE PEDESTRIAN INFRASTRUCTURE

OVERVIEW

The Pedestrian Audit performed in the six suburban communities of Chicago served by Pace Bus provided insight into areas where improvements are needed to provide a safer environment for pedestrians and encourage more people to take advantage of existing public transportation lines. We conducted detailed research investigating engineering and design guidelines for complete streets and sidewalks, resulting in the creation of a composite sidewalk design matrix that should, in theory, better inform future pedestrian infrastructure projects.

Before we began the research process, we analyzed the Pace Bus Transit Supportive Guidelines. This document served as the baseline for our research process, since it was carefully tailored for the scenarios that may be encountered in the communities served by Pace Bus. Our research was based on finding other plans and communities around the country, whose guidelines may be used to complement the guidelines provided by Pace Bus. The research process began with an analysis of the Illinois Department of Transportation Bicycle and Pedestrian Accommodations design manual. Soon after we familiarized with the contents of this report, it was clear that local municipal planning has more influence over the pedestrian infrastructure, leaving the Illinois DOT to state route planning and design. This manual contained limited information and guidance on pedestrian realm planning. This finding prompted us to look at other Illinois and out-of-state municipalities and planning agencies and consider their complete street and pedestrian infrastructure design guidelines.

Documents that informed the creation of the matrix, as well as the policy recommendations, were gathered from multiple organizations: City of Boston, CMAP, SSMMA, and New York City Planning. Communities that are served by Pace Bus vary from urban neighborhoods adjoining Chicago proper to suburban and semi-rural communities located along the fringe of the Chicago Metropolitan Area. With so many different urban design paradigms shaping communities between the two, Pace’s service must shift its form to fit the infrastructure and ridership of each community. By referring to multiple guides on designing proper sidewalk infrastructure, we got a more balanced look at how different municipalities and regions deal with the same issues of vehicle-oriented streets, and what tactics they employ in recovering space for pedestrian activity. The guidelines that have been defined by these agencies can be used in full or partially. Implementing portions of multiple agency recommendations for pedestrian infrastructure might be the only way to effectively address all the needs within limits posed in each unique community that Pace serves.

When analyzing the documents, we looked at three pieces of pedestrian infrastructure design: engineering standards (e.g., the width of sidewalks and buffers), pedestrian realm stratification (the division of the pedestrian path and the street right-of-way), and land use context.
(influence of land-use on recommendations and their mutual interaction). By identifying each of the three analysis components in each of the documents that we analyzed (for ones that were structured in this manner), we were able to create the comparative matrix of pedestrian infrastructure design recommendations.

The matrix enables the reader to quickly and easily compare design recommendations across multiple planning agencies and organizations, applying recommendations graphically and visually displaying their differences. The matrix itself consists of a table created in Excel, supplemented by a graphic defining each sphere of the pedestrian realm, and displaying engineering characteristics. The matrix itself consists of a table created in Excel, complemented by a graphic outlining each sphere of the pedestrian realm, and displaying engineering characteristics.

GUIDELINES

Baseline Pace Transit Supportive Guidelines for Chicagoland

Pace Transit Supportive Guidelines\(^1\) is a document published by Pace Bus in 2013, striving to provide guidelines to local municipalities planning development, street design, and pedestrian infrastructure near Pace Bus stops and routes to better support Pace operations and rider access. Pace Guidelines include information on design guidelines both for the public and private realm, hoping to engage both local governments and businesses in fostering a transit-friendly built environment. This report does not only focus on the design of sidewalks but rather encompasses all transit-supportive infrastructure and uses and advises design guidelines for them. The portion detailing the public realm recommendations divides each level of criteria by the width of the street right-of-way. It bases the minimum and maximum widths dedicated to each mode of transportation based on that. As a result, the sidewalk recommendations are not necessarily based on the use of the street, but rather on its designed vehicular throughput. It is logical to assume that this report is the most closely tailored to the needs of communities served by Pace Bus, however other reports and recommendations should also be considered, supplementing the guidance provided by Pace itself.

For our research, Pace Transit Supportive Guidelines served as the baseline policy recommendation, a starting point that our study attempted to supplement with new solutions and information. This approach amends the policy status quo and emphasizes the flexibility that is necessary when planning pedestrian infrastructure for an area as large as the one served by Pace Bus. Although Pace’s guidelines are adequate for slow implementation of pedestrian infrastructure updates, in certain areas, the solutions proposed might not be ideal. This is not due to Pace’s work not being complete, but due to the sheer size of the area served by Pace and the variety in land use forms that one might encounter there.

Pace separates each transit trip based on five components that influence its flow: rider, development lot, public walk, transit stop, transit vehicle, and infrastructure. The analysis that

\(^1\) Pace Bus. (2013.) Transit Supportive Guidelines for the Chicagoland Region, *Pace Bus*.  
52 | UP 494: Transportation Planning Workshop
we performed explicitly focused on the public path, space through which pedestrians move on their way from their origin to their destination. The parameters that we are attempting to understand and further improve lie within this section of Pace defined pedestrian realm.

Pace separates its guidelines based on the width of the street that they are examining, and defines three groups of streets:

- **Local Streets (60’-75’)**, which can be found in urban and commercial areas, as well as local residential suburban areas
- **Collector/Minor Arterial Streets (75’-90’)**, which are commonly found in suburban areas and downtowns
- **Major Arterial Streets (90’+)**, which usually serve as suburban arterials, as well as high-speed rural and regional roadways
Table 5 captures the recommendations for the width of the right-of-way for each building segment of these streets, separated by their width.

### Table 5 Pace Bus Transit Supportive Guidelines Right-of-Way Width Recommendations

<table>
<thead>
<tr>
<th>Element/ROW</th>
<th>60'-75' (Local Streets)</th>
<th>75'-90' (Collector/Minor Arterial Streets)</th>
<th>90'+ (Major Arterial Streets)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Minimum</td>
<td>Maximum</td>
<td>Minimum</td>
</tr>
<tr>
<td>Sidewalk &amp; Parkway*</td>
<td>8.5'</td>
<td>10'-12'</td>
<td>8.5'</td>
</tr>
<tr>
<td>On-street Parking</td>
<td>8'</td>
<td>11' (when no dedicated bike lane is provided)</td>
<td>8'</td>
</tr>
<tr>
<td>Bike Lane</td>
<td>6' (if provided)</td>
<td>8', if other transit-supportive amenities have been maximized</td>
<td>6' (if provided)</td>
</tr>
<tr>
<td>Travel Lane</td>
<td>9'</td>
<td>10'</td>
<td>10'</td>
</tr>
<tr>
<td>Landscaped Median</td>
<td>NA</td>
<td>NA</td>
<td>8'</td>
</tr>
</tbody>
</table>
Boston Complete Streets Design Guidelines

The Boston Complete Streets report was published in 2013 and upheld by NACTO as one of the nationally accepted guidelines for sidewalk and pedestrian street space design in urban areas. This report separates the available sidewalk space into four distinct zones: frontage zone, pedestrian zone, greenspace/furnishing zone, and curb zone (City of Boston & Boston Transportation Department, 2013). The frontage zone is the area where the building edges rest against the edge of the sidewalk. Not every street will contain a frontage zone due to spatial constraints. Pedestrians usually shy away from building edge, reducing the effective width of this zone. The pedestrian zone is the area of the sidewalk where a free flow of pedestrians should be provided. The greenspace/furnishing zone is the area of the street where grass buffers, public seating, trees and lamp posts, street vending spaces, and other sidewalks features are located.

Additionally, this is the area within the street right-of-way where public utilities are located, either overhead or underground. The curb zone is the area of the sidewalk directly bordering the street. By dividing the sidewalk into these sections, careful use planning can be performed, and the streetscape can be altered to match the type of use and intensity of specific portions of a street.
The table below displays the distinct sidewalk zones and the policy recommendations for their preferred width.

**Table 6 Boston Complete Streets Guidelines Sidewalk Design Recommendations**

<table>
<thead>
<tr>
<th>Street Type</th>
<th>Frontage Zone</th>
<th>Pedestrian Zone</th>
<th>Greenspace/Furnishing Zone</th>
<th>Curb Zone</th>
<th>Total Width</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Preferred</td>
<td>Minimum</td>
<td>Preferred</td>
<td>Minimum</td>
<td>Minimum</td>
</tr>
<tr>
<td>Downtown Commercial</td>
<td>2'</td>
<td>0'</td>
<td>12'</td>
<td>8'</td>
<td>6'</td>
</tr>
<tr>
<td>Downtown Mixed-Use</td>
<td>2'</td>
<td>0'</td>
<td>10'</td>
<td>8'</td>
<td>6'</td>
</tr>
<tr>
<td>Neighborhood Main</td>
<td>2'</td>
<td>0'</td>
<td>8'</td>
<td>8'</td>
<td>6'</td>
</tr>
<tr>
<td>Neighborhood Connector</td>
<td>2'</td>
<td>0'</td>
<td>8'</td>
<td>5' (4')</td>
<td>5'</td>
</tr>
<tr>
<td>Neighborhood Residential</td>
<td>2'</td>
<td>0'</td>
<td>5'</td>
<td>5' (4')</td>
<td>4'</td>
</tr>
<tr>
<td>Industrial Street</td>
<td>2'</td>
<td>0'</td>
<td>5'</td>
<td>5' (4')</td>
<td>4'</td>
</tr>
<tr>
<td>Shared Street</td>
<td>2'</td>
<td>0'</td>
<td>Varies</td>
<td>5' (4')</td>
<td>N/A</td>
</tr>
<tr>
<td>Parkway</td>
<td>N/A</td>
<td>N/A</td>
<td>6'</td>
<td>5'</td>
<td>10'</td>
</tr>
<tr>
<td>Boulevard</td>
<td>2'</td>
<td>0'</td>
<td>6'</td>
<td>5'</td>
<td>10'</td>
</tr>
</tbody>
</table>
Chicago Metropolitan Agency for Planning (C MAP) Complete Streets Guidelines

The goal of this report is to deliver guidelines for future redevelopment of Chicago streets into complete streets (Chicago Department of Transportation, 2013). The guiding principle presented in the document itself is to ensure: “The safety and convenience of all users of the transportation system...” (C MAP, pg. 5). The guidance separates each public street into four zones: the pedestrian realm, the interstitial area, the vehicle realm, and the median. The pedestrian realm and the median are the areas where public transportation and pedestrian activity come into contact and are the primary areas of interest for our research.

Further, the pedestrian realm is subdivided into the frontage, pedestrian, and furniture zones. The sidewalk design recommendations for Chicago streets are based on the building form and function that they serve. For example, different frontage, pedestrian, and furniture zone widths are recommended for streets serving parks (0’, 6’, 6’, respectively) versus streets serving mixed-uses (1’, 6’, 5’, respectively). In addition to dictating widths of the rights-of-way, the C MAP Complete Streets Guidelines recommend placing stoops, cafes, trees, bike parking, etc. within the pedestrian realm.

The C MAP design guidelines are separated into four street types: neighborhood street, main street, connector, and thoroughfare. Further, for each street type, a function is assigned out of the seven available options: parks, residential, mixed-use, commercial center, downtown, institutional campus, and industrial. Together, these two parameters help policymakers and stakeholders decide what the optimal right-of-way width and design should be for each street segment. The complete C MAP policy can be accessed in Appendix C.

SSMMA Complete Streets and Trails Plan

The South Suburban Mayors and Managers Association (SSMMA) South Council of Mayors’ Complete Streets and Trails Plan includes policy and design recommendations for increasing the completeness of streets in south suburban communities of Chicagoland (C MAP, 2017). Chicagoland is defined as all the counties comprising the Chicago Metropolitan Area, while SSMMA serves an area of 22 municipalities in the South Suburbs of Chicago (in Illinois). This manual includes recommendations for pedestrian, bicycle, transit infrastructure as well as road dieting. The primary purpose of this set of guidelines is to maximize the utilization of existing infrastructure while also implementing policies that treat all participants of traffic more equitably. This report identified similar issues that we encountered, such as unsafe pedestrian crossings, lack of pedestrian infrastructure, safety issues, as well as the quality of pedestrian infrastructure. In addition to defining infrastructure improvements, it also identifies areas where transit-oriented development would be the most viable. This manual is valuable to our research, since Harvey is one of the communities that is served by SSMMA, and the design guidelines and policy recommendations are directly applicable to the issues observed there.

The most valuable part of this manual is the “treatment recommendation” table (Appendix C) that outlines multiple levels of improvements that can be implemented to increase the quality of pedestrian infrastructure without the need for major construction work. This is incredibly
valuable for communities like Harvey, but it is also applicable to all communities without complete streets that are attempting to foster a more walkable built environment without the need for immediate capital improvement projects.

**City of Northampton and Hampshire County Communities Urban, Rural, and Suburban Complete Streets Design Manual**

Unlike other guidance that was consulted, this manual includes recommendations for urban, suburban, and rural street networks (Alta Planning + Design, 2017). This report was interesting to us due to its open application of shared streets in areas where pedestrian and vehicular traffic is not of very high intensity. Even though Illinois and Massachusetts are very different states, the solutions proposed in this report seem valuable to areas of the Chicago Metropolitan Area that are not necessarily as urban as the rest of the MSA. As discussed previously, the area served by Pace is diverse in landforms and uses, and complete guidance like this one is necessary for developing solutions to all problems, not just ones that may arise in the urban street environment. Solutions proposed by this manual range in intensity from painted lines on the street demarcating the pedestrian areas, to raised crosswalks, and grade-separated sidewalks. Following a similar paradigm of separating the pedestrian area into three zones (frontage, pedestrian through, and furnishing/tree belt zones) that allow designers, engineers, and planners to better account for activities within the sidewalk. In rural and suburban areas, these manual gives significant emphasis to shared roadways, where all participants of the traffic utilize the same right-of-way.
COMPOSITE MATRIX

The Composite Matrix is formed by integrating the sidewalk design guidelines provided by Pace, Boston Complete Streets (NACTO), NYC Planning, and Hampshire County. A comparative analysis of these guidelines in juxtaposition yields inferences in addition to those obtained by analyzing the respective guidelines separately.

<table>
<thead>
<tr>
<th></th>
<th>Frontage</th>
<th>Pedestrian Throughway</th>
<th>Furnishing/Greenscape</th>
<th>Parking</th>
<th>Bike Lane</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Pace</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>60-75' (Local)</td>
<td></td>
<td>8.5-12 feet</td>
<td></td>
<td>8-11 feet</td>
<td>6-8 feet</td>
</tr>
<tr>
<td>75-90' (Collector/Minor Arterial)</td>
<td></td>
<td>8.5-20 feet</td>
<td></td>
<td>8-11 feet</td>
<td>6-8 feet</td>
</tr>
<tr>
<td>90' (Major Arterial)</td>
<td></td>
<td>8.5-20 feet</td>
<td></td>
<td>8-11 feet</td>
<td>6-8 feet</td>
</tr>
<tr>
<td><strong>Boston Complete Streets</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Downtown Commercial</td>
<td>0-2 feet</td>
<td>8-12 feet</td>
<td>1/6'-6 feet</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Downtown Mixed-Use</td>
<td>0-2 feet</td>
<td>8-10 feet</td>
<td>1/6'-6 feet</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Neighborhood Main</td>
<td>0-2 feet</td>
<td>8 feet</td>
<td>1/6'-6 feet</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Neighborhood Connector</td>
<td>0-2 feet</td>
<td>4-8 feet</td>
<td>1/6'-6 feet</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Neighborhood Residential</td>
<td>0-2 feet</td>
<td>4-5 feet</td>
<td>1/6'-4 feet</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Industrial Street</td>
<td>0-2 feet</td>
<td>4-5 feet</td>
<td>1/6'-4 feet</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Shared Street</td>
<td>0-2 feet</td>
<td>5+ feet</td>
<td>N/A</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Parkway</td>
<td>N/A</td>
<td>5-6 feet</td>
<td>5-10 feet</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Boulevard</td>
<td>0-2 feet</td>
<td>5-6 feet</td>
<td>5-10 feet</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>NYC Planning</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Downtown Commercial</td>
<td></td>
<td>15-20 feet</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Neighborhood Main</td>
<td></td>
<td>5-12 feet</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Residential Only</td>
<td></td>
<td>5-7 feet</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Hampshire County</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Suburban Roads</td>
<td></td>
<td>1-2 feet</td>
<td>5-6 feet</td>
<td>6+ feet</td>
<td></td>
</tr>
</tbody>
</table>

Figure 46 Composite Matrix

The primary reasoning behind the variations in the widths to be provided, as described by different manuals, is found to be a difference in the design philosophies of the guidelines. Pace describes sidewalks as ‘transit-supportive infrastructure,’ and thus, components of a transit trip, whereas the Boston Complete Streets manual conceptualizes sidewalks to be ‘the front steps to the city’ to activate streets socially and economically. NYC Planning considers sidewalks
as a ‘conceptualized room.’ The set of guidelines published by Hampshire County provides a valuable suburban context, which yields further insight into the design basis of sidewalks in the suburbs.

Furthermore, the classification of street types is varied in all the studied guidelines, based on either contextual use or widths of ROW. These differences are integrated into one complete matrix for better comparative representation.

**KEY TAKEAWAYS**

Each one of the policy recommendations can be applied to a multitude of scenarios across the Chicagoland Area, with variable results. By considering recommendations from multiple manuals, a more balanced solution for pedestrian infrastructure can be determined. Each of the five manuals evaluated by this research is tailored to specific elements of the built environment and represents best practices for municipalities. Pace Transit Supportive Guidelines are broad and can be applied to all scenarios but are ideal for suburban solutions since the street division methodology favors wide streets commonplace in the suburbs. Boston Complete Streets and CMAP Complete Street Guidelines would yield the best solutions in urban and semi-urban areas near Chicago proper since the focus of that manual is designed around the City of Boston and the City of Chicago, respectively. SSMMA Complete Streets and Trails Plan is ideal for the implementation of pedestrian improvements in suburban areas, with the useful table of improvements being one of the most valuable tools to identify adequate and fiscally-effective solutions to common problems. Hampshire County Communities Complete Streets Design Manual contains ideal solutions for low-density suburbs and rural areas served by Pace Bus, based on design guidelines designed for low-intensity roadways in rural areas.

Pace Transit Supportive Guidelines are incredibly useful for city officials, transportation planners, and business owners attempting to foster a more walkable environment throughout the Chicago suburbs, increase accessibility and connectivity for those not opting for personal vehicles, as well as those who are unable to drive. For pedestrian planning in Chicago's suburbs, Pace's guidelines may be the best suited to address deficiencies in the built environment If the guidelines are not applicable, best practices can be drawn from additional resources such as the Bureau of Design and Environment Manual (2019) published by Illinois Bureau of Design and Environment in 2019, and Standard Specifications for Construction of Roads and Bridges on Federal Highway Projects published by U.S. Department of Transportation in 2014.
CHAPTER 6: VIRTUAL AUDIT ANALYSIS AND CMAP SIDEWALK INVENTORY ANALYSIS

OVERVIEW
The objective of this analysis was to supplement the field pedestrian infrastructure audits documented in Chapter 3 of this report. The virtual audit analysis was included in the study to incorporate audit routes that were missed during the field audits. These routes were the routes that could not be included in the audit during field visits due to weather constraints. For instance, the research team was unable to complete the audit for one of the selected audit routes in Crystal Lake due to weather conditions on the day of the audit. The students also added a few more routes that would make the audit more comprehensive and provide a more reliable sample. This included selecting a wide range of audit routes with different levels of pedestrian infrastructure availability and quality. This process ensured that all kinds of areas are accounted for in each city.

METHODOLOGY
The virtual audit routes were selected using Google Maps and CMAP Sidewalk Inventory. The next step was to complete the audit route details for new virtual audit routes as well as fill in the details for any missing data for the field audit routes using Google Maps. The combined data from the field and virtual audits was used to score pedestrian facility conditions. The research team used spider charts to conduct a comparative analysis of the available pedestrian infrastructure in each city.

LIMITATIONS
The virtual audit was conducted using data from Google maps, so the most recent data available for some locations was from 2016. Sidewalks need not be present on both sides of the street in places where there is no access to any plot or building from one of the sides of the street. But, our system of data analysis and scoring does not consider such specifics and gives a lower score due to the absence of sidewalks on both sides of the street. Crosswalks in low-density residential areas with a low volume of vehicles on the street might not require them to be marked, which is not considered as an exception in our scoring methodology. Pedestrian islands are not required in narrower and smaller streets, and curb extensions are not needed in streets without street parking. These are not accounted for in the scoring process.

CMAP SIDEWALK INVENTORY ANALYSIS
The CMAP regional sidewalk inventory offers geographic information on the entire pedestrian network in Chicagoland, but only offers limited information regarding the quality of sidewalks. This data allows for analyzing the completeness of the sidewalk network along roads in different jurisdictions by using the ArcMap tool, Tabulate Intersection. This tool categorizes segments in the inventory shapefile by a variable in the dataset (i.e. how many sides of the road...
have a sidewalk) and then sums the length of segments within a given zone (i.e. by county). This analysis further refined the use of this tool by creating a 0.25-mile buffer around Pace bus stops to examine the completeness of the pedestrian network near transit in different jurisdictions.

Due to how aspects of the network are coded in this dataset, the values shown below represent a lower bound of sidewalk network completeness. For example, if a segment of roadway in the real world has sidewalk for 90% of the block, but has a gap for the last 10%, that segment of the roadway would be coded as having one or no sidewalks along it in the dataset, depending on the nature of the gap. This prevents the dataset from hiding gaps, but technically slightly underestimates the real length of sidewalks in the real world.
### County-level sidewalk analysis

The graph below summarizes the results of the analysis for the 6 counties served by Pace. The pedestrian network clearly varies across the region, with more central, urban counties having a more complete sidewalk network both counties wide and within 0.25 miles buffer of the Pace bus stops than outer, rural counties such as McHenry and Will.

![Sidewalk Status by County in Chicagoland](image)

**Figure 47 Sidewalk Status by County in Chicagoland**

*Note – In the above graph, near pace signified a 0.25-mile buffer around the Pace Bus Stops.*
Municipal Level Sidewalk Analysis

This analysis looked at the six case study cities to quantify the level of sidewalk coverage both across the municipality and within a 0.25-mile buffer of Pace stops. interestingly, Skokie, Joliet, and Crystal Lake had more roads without sidewalks near Pace than they have city-wide – bucking the regional trend. This demonstrates that these cities may have important destinations (for example an auto-focused commercial area) which Pace serves despite the lack of pedestrian infrastructure.

Figure 48 Sidewalk Status by Selected Municipalities in Chicagoland

Expanding the analysis to all municipalities allowed the identification of the best and worst performers in terms of sidewalk network completeness near Pace. None of the case study cities are on either list. Both of these lists can assist in identifying policies of cities who succeed in building transit-supportive infrastructure such as sidewalks, and also identifying cities that may
be struggling to prioritize sidewalks. The map on the following page was created using data for all of the municipalities which are located within the 0.25-mile buffer of all pace stops to show the level of sidewalk continuity near Pace services.

**Table 7 Roads Near Pace Missing Sidewalks**

<table>
<thead>
<tr>
<th>City</th>
<th>Miles of Roads Near Pace</th>
<th>Percent without Sidewalk</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bull Valley</td>
<td>1.3</td>
<td>100%</td>
</tr>
<tr>
<td>Crete</td>
<td>1.6</td>
<td>100%</td>
</tr>
<tr>
<td>Monee</td>
<td>0.6</td>
<td>100%</td>
</tr>
<tr>
<td>Pistakee Highlands</td>
<td>12.6</td>
<td>100%</td>
</tr>
<tr>
<td>Prairie Grove</td>
<td>3.8</td>
<td>100%</td>
</tr>
<tr>
<td>Fairmont</td>
<td>13.6</td>
<td>97%</td>
</tr>
<tr>
<td>Crystal Lawns</td>
<td>3.1</td>
<td>97%</td>
</tr>
<tr>
<td>Indian Head Park</td>
<td>12.2</td>
<td>96%</td>
</tr>
<tr>
<td>Beach Park</td>
<td>33.1</td>
<td>96%</td>
</tr>
<tr>
<td>New Lenox</td>
<td>1.7</td>
<td>94%</td>
</tr>
<tr>
<td>Sleepy Hollow</td>
<td>2.6</td>
<td>94%</td>
</tr>
<tr>
<td>Olympia Fields</td>
<td>4.9</td>
<td>91%</td>
</tr>
</tbody>
</table>

**Table 8 Top 10 Roads with Missing Sidewalks near Pace Bus Stops**

<table>
<thead>
<tr>
<th>City</th>
<th>Mi of roads near Pace</th>
<th>percent with no sidewalk</th>
</tr>
</thead>
<tbody>
<tr>
<td>Elmwood Park</td>
<td>22.1</td>
<td>0%</td>
</tr>
<tr>
<td>Norridge</td>
<td>7.0</td>
<td>0%</td>
</tr>
<tr>
<td>Berwyn</td>
<td>83.8</td>
<td>0%</td>
</tr>
<tr>
<td>River Forest</td>
<td>21.9</td>
<td>1%</td>
</tr>
<tr>
<td>Oak Park</td>
<td>83.7</td>
<td>1%</td>
</tr>
<tr>
<td>Phoenix</td>
<td>7.7</td>
<td>1%</td>
</tr>
<tr>
<td>Burbank</td>
<td>63.4</td>
<td>1%</td>
</tr>
<tr>
<td>Evergreen Park</td>
<td>22.3</td>
<td>1%</td>
</tr>
<tr>
<td>Kenilworth</td>
<td>9.9</td>
<td>2%</td>
</tr>
<tr>
<td>Westchester</td>
<td>30.5</td>
<td>2%</td>
</tr>
</tbody>
</table>
Figure 49 Percentage of Streets Missing Sidewalks near pace Bus Stops
VIRTUAL AUDIT EXAMPLE

The criteria of the virtual audit were based on CMAP sidewalk inventory. Virtual survey points 9 is utilized to show the procedure of virtual audit in the following part. The virtual survey points 8 is located at the junction of Lawndale Avenue and Golf Road in Skokie. The images of virtual point 9 from google street view are mainly from November 2018, which is relatively timely.

Sidewalk Example

At the virtual audit point, Google Street View is utilized to check the number of sidewalks on the street. According to Figure 50, Figure 51, and Figure 52, the number of sidewalks can be determined in different directions (East, South, West), which is two, one, and zero respectively. Since the sidewalks are not adequate to have access to the transit area, we decided to treat it as “No” for the question of sidewalks on both sides. Also, given the west and south sides of the survey point, sidewalks are not continuous. What is more, sidewalks are lit adequately because of the streetlight along the street. Either permanent or temporary obstructions can be observed in google street view. Plus, the sidewalks are separated from vehicle street by grass, which is in good condition. Therefore, the data for the virtual audit can be completed, which is shown in the data set.

Figure 50 Sidewalks on the east Side of the Survey Points
In accordance with the virtual audit, the number of sidewalks can be observed and demonstrated in Figure 53. The red line represents that the sidewalks are missing. The blue line means that there is only one sidewalk existing on one side of the street. The green line states that sidewalks exist on both sides of the street.
Crossing Example

Using Google Street View, crossing conditions are scored based on the presence of visible markings, lighting, pedestrian islands, curb extensions, visibility, and accessibility. In Figure 54, no crossing line is observed. Additionally, there are no pedestrian islands or curb extensions. Street lighting only exists on one side of the street. ADA accommodations are missing at this survey point. Although an ADA accessible ramp is present on one side of the intersection, that absence of accommodations on the other side impedes those using mobility devices. There are also no tactile warning strips for the visually impaired.
Figure 54 Crossing at the survey point
Transit area Example

The image in Figure 55 shows an example of a Pace bus stop at (location??), taken from Google Maps. This stop does not have a sign marking the bus route along this street. The stop is also lacking an ADA accessible path to the street, making it difficult for those using mobility devices to board transit vehicles at this location due to the existing parkway."

Figure 55 Transit area at the survey point
SELECTION RATIONALE FOR VIRTUAL AUDIT ROUTES

Virtual audit routes were selected to supplement areas that were intended for study in the original audit process but were not properly audited in person due to technology or time constraints. Each city was examined by how diverse the existing audit data were in terms of covering different land uses and areas with different levels of sidewalk coverage. Each city received a minimum of three virtual audit locations. Skokie had more due to larger data gaps from the in-person audit. More information on the selections is provided in each route description below.

Crystal Lake Virtual Audit Route

This virtual audit route in Crystal Lake consists of three survey points. Using Google Maps, three intersections along West Woodstock Street were evaluated. These intersections are located, at North Walkup Avenue (Point 0), North Dole Avenue (Point 1), and Peterson Pkwy (Point 2). The Crystal Lake virtual audit points were identified as part of the original audit plan but were not fully evaluated in the field due to time constraints.

Figure 56 Virtual Audit Routes in Crystal Lake, Illinois
**Skokie Virtual Audit Route**

This route in Skokie consists of ten survey points and was audited using Google Maps. Along Fargo Avenue, the intersections with Linder Avenue (Point 19), Long Avenue (Point 18) were evaluated. Along Niles Center Road (Point 17) and North Crawford Avenue, at the intersections of Greenwood Street (Point 4), Church Street (Point 5), and Golf Road (Point 6). Along Golf Road, at the intersections of Averse Avenue (Point 7), Lawndale Avenue (Point 8), and along Central Park Avenue (Point 9), at the intersections of Church Street and Skokie Blvd (Point 3).

The physical audit data for Skokie had several errors and missing data points which were filled in using the virtual audit (points 3, 4 and 5). The rest of the audit points were chosen to target routes that were in areas with low sidewalk coverage according to the CMAP sidewalk inventory.

![Figure 57 Virtual Audit Routes in Skokie, Illinois](image)
Waukegan Virtual Audit Route

This virtual audit route consists of 4 survey points in Waukegan. Using Google Maps the intersections along South Green Bay Road at Belvidere Road, Apple Avenue, Central Avenue, and Washington Street were evaluated. The Waukegan route was chosen for the audit due to the lack of sidewalks. The routes chosen for the in-person audit were primarily in the core of the city and had fairly complete sidewalks. This route provided a different land-use context for the municipality.

Figure 58 Virtual Audit Routes in Waukegan, Illinois
**Aurora Virtual Audit Route**

This route consisting of three survey points is a virtual audit conducted in Aurora using Google Maps along South Eola Road, at the intersections with Village Green Drive, South Oakhurst Drive, and McCoy Drive. The Aurora virtual audit points were chosen to expand data collection into areas of the city with less sidewalk coverage and newer, more auto-oriented development styles.

![Aurora Virtual Audit Route Map](image)

*Figure 59 Virtual Audit Routes in Aurora, Illinois*
Harvey Virtual Audit Route

The virtual audit for Harvey was conducted at three intersections along Halstead Street in the southeast portion of the city. Halsted is a four-lane arterial in an area with very few sidewalks. This route was chosen to expand data samples for the east side of Harvey. This area of Harvey is more isolated, and the route is a commercial strip surrounded by roads with low sidewalk coverage.

Figure 60 Virtual Audit Routes in Harvey, Illinois
Joliet Virtual Audit Route

The Joliet virtual audit was conducted on the northwest side of Downtown Joliet, in the area of Plainfield Rd and Theodore St. This is a busy, auto-oriented commercial area. The virtual audit selection was made to capture sidewalk conditions further away from the core of the city and near an auto-oriented commercial district.

Figure 61 Virtual Audit Routes in Joliet, Illinois
<table>
<thead>
<tr>
<th>City</th>
<th>Survey Point ID</th>
<th>Intersection Name</th>
<th>Number of legs at the intersection</th>
<th>Land-Use</th>
<th>Number of traffic lanes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crystal Lake</td>
<td>0</td>
<td>West Woodstock Street &amp; North Walkup Avenue</td>
<td>4</td>
<td>Residential</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>West Woodstock Street &amp; North Dole Avenue</td>
<td>3</td>
<td>Residential</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>West Woodstock Street &amp; Peterson Pkwy</td>
<td>4</td>
<td>Residential</td>
<td>4</td>
</tr>
<tr>
<td>Skokie</td>
<td>3</td>
<td>Church Street &amp; Skokie Blvd</td>
<td>4</td>
<td>Commercial</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>North Crawford Avenue &amp; Greenwood Street</td>
<td>4</td>
<td>Residential</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>5</td>
<td>North Crawford Avenue &amp; Church Street</td>
<td>4</td>
<td>Residential</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>6</td>
<td>North Crawford Avenue &amp; Golf Road</td>
<td>4</td>
<td>Residential</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>7</td>
<td>Golf Road &amp; Averse Avenue</td>
<td>3</td>
<td>Residential</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>8</td>
<td>Golf Road &amp; Lawndale Avenue</td>
<td>3</td>
<td>Residential</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Description</td>
<td>Category</td>
<td>Level</td>
<td></td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>--------------------------------------</td>
<td>---------------------------------</td>
<td>-------</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Golf Road &amp; Central Park Avenue</td>
<td>Residential</td>
<td>4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>Fargo Avenue &amp; Niles Center Road</td>
<td>Commercial</td>
<td>4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>Fargo Avenue &amp; Long Avenue</td>
<td>Commercial</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>19</td>
<td>Fargo Avenue &amp; Linder Avenue</td>
<td>Commercial</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Waukegan</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>South Green Bay Road &amp; Washington Street</td>
<td>Commercial / Residential</td>
<td>4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>South Green Bay Road &amp; Central Avenue</td>
<td>Commercial / Residential</td>
<td>4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>South Green Bay Road &amp; Apple Avenue</td>
<td>Commercial</td>
<td>4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>South Green Bay Road &amp; Belvidere Road</td>
<td>Commercial</td>
<td>4</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Aurora</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>23</td>
<td>South Eola Road &amp; McCoy Drive</td>
<td>Residential</td>
<td>4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>24</td>
<td>South Eola Road &amp; South Oakhurst Drive</td>
<td>Residential</td>
<td>4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>25</td>
<td>South Eola Road &amp; Village Green Drive</td>
<td>Residential &amp; Park (Recreational)</td>
<td>4</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## AUDIT DATA ANALYSIS

In this subsection, each survey point was analyzed using scoring criteria based on the presence and quality of sidewalks and crossings in transit area segments. Each criterion was assigned weights and the segments were scored. The data are displayed using three spider charts demonstrating the scores of each segment of the routes.

The method to assign a weight for each score is "Weighting by Ranking". In terms of the importance, ranks were assigned to each parameter descending, i.e., if parameter #1 is the least important factor, it will be assigned the smallest rank value, 1, as its value, and vice versa. Then, by dividing the rank value by the summation of total rank values, we can obtain the weighting of each parameter. Plus, the summation of total weighting values will be equal to 1. Refer to this website for more information on the methodology used to assign weights – Weighting by Ranking: http://www.gitta.info/Suitability/en/html/Normalisatio_learningObject1.html

First, the data were categorized by city, route, point, and section. Second, scores were assigned to each element (presence, condition, safety, etc) by section and survey point. Then, the weight was assigned so that the total scores for each survey point in different sections could be calculated. After scoring each section, we aggregated the data in a spider chart for each city, showing the score of each survey point in terms of the evaluated criteria. With the help of a

<table>
<thead>
<tr>
<th>City</th>
<th>Section</th>
<th>Location</th>
<th>Score</th>
<th>Category</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Harvey</td>
<td>20</td>
<td>Halsted St and 163rd St</td>
<td>4</td>
<td>Commercial</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>21</td>
<td>Halsted St and 165th St</td>
<td>4</td>
<td>Commercial</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>22</td>
<td>Halsted St and 167th St</td>
<td>4</td>
<td>Commercial</td>
<td>4</td>
</tr>
<tr>
<td>Joliet</td>
<td>10</td>
<td>Theodore St and Larkin Ave</td>
<td>4</td>
<td>Commercial</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>11</td>
<td>Theodore St and Larkin Ave</td>
<td>4</td>
<td>Commercial</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>12</td>
<td>Plainfield Rd and Cleary Ave</td>
<td>4</td>
<td>Commercial</td>
<td>4</td>
</tr>
</tbody>
</table>
spider chart, each route was compared and the results were used to formulate policy recommendations. Based on the audit data, the following scoring criteria were used:

**Sidewalks**

Sidewalks were scored based on three criteria; presence, condition, and safety of pedestrian infrastructure.

![Figure 62 Sidewalks Score Calculation Criteria](image)

**Presence (50% weight)**

For presence, if there are no sidewalks at a survey point, it was given a score of 0. If sidewalks exist continuously on one side of the street, it was given a score of 1. If the sidewalk on one side of the street was discontinuous, it was scored as having no sidewalk and given a score of 0 points. If the street had continuous sidewalks present on both sides of the street, it was given a score of 2. If the street had one continuous and one discontinuous sidewalk, it was considered to only have one sidewalk and was given a score of 1. If the street has discontinuous sidewalks on both sides of the street in such a way that every point on the street has sidewalks present on at least one side, then it is considered to have one sidewalk and was given a score of 1.

**Condition (33% weight)**

For scoring the condition section, a four-point grading system was used. If there were sidewalks with permanent obstructions like fire hydrants, street lights, utility poles, permanent or temporary obstructions, it was given a score of 0, and if the sidewalks are in a state of repair, it was given a score of 1. Some sidewalks were in good condition (with no permanent obstructions or repairs), but with temporary obstructions like garbage bins, they were given a score of 2, and if the sidewalk is free of permanent obstructions, temporary obstructions as well as repairs, then it was given a score of 3.
**Safety (17% weight)**

For scoring the safety section, two parameters are chosen - Sidewalk lighting and buffer between the sidewalk and vehicular traffic. Both these parameters were scored using a simple binary system based on a yes/no question. If the sidewalk is adequately lit, it was given a score of 1, or a score of 0 otherwise. If there is ample separation between vehicular and pedestrian traffic, either by a green patch, bike lane, or curb landscaping/trees, it was given a score of 1, or otherwise a score of 0.

The sample of score calculation for the section of the sidewalk is shown in Table 10.

**Table 10 Sidewalks Score Calculation Sample**

<table>
<thead>
<tr>
<th>City</th>
<th>Route</th>
<th>Point</th>
<th>Sidewalks</th>
<th>W1</th>
<th>Condition</th>
<th>W2</th>
<th>Safety</th>
<th>W3</th>
<th>Total Score</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Presence</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>city1</td>
<td>1</td>
<td></td>
<td>x1</td>
<td>0.5</td>
<td>y1</td>
<td>0.33</td>
<td>v1</td>
<td>0.17</td>
<td>z1</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>x2</td>
<td>0.5</td>
<td>y2</td>
<td>0.33</td>
<td>v2</td>
<td>0.17</td>
<td>z2</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td></td>
<td>x3</td>
<td>0.5</td>
<td>y3</td>
<td>0.33</td>
<td>v3</td>
<td>0.17</td>
<td>z3</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>x4</td>
<td>0.5</td>
<td>y4</td>
<td>0.33</td>
<td>v4</td>
<td>0.17</td>
<td>z4</td>
</tr>
</tbody>
</table>

where \( z_i = x_i \times W_1 + y_i \times W_2 + v_i \times W_3, i \{1, 2, 3, \ldots \} \)

After the weights are applied, the maximum score for each criterion is 1.

**Crossing**

Crossings were scored using five criteria: marking, lighting, presence of curb extensions/pedestrian islands, pedestrian visibility to drivers, and ADA accessibility.
Marking/Presence (37.5% weight)
For scoring related to the presence of crosswalk markings, if there are markings at 3 or more sides of an intersection, it was given a score of 1. If less than three sides of the intersection have markings a score of 0 was given. For this analysis, three marked crossings were required for the full score, since this condition enables pedestrians to access any corner of the intersection from any other corner along a marked crossing.

Lighting (12.5% weight)
For this scoring criteria, if adequate lighting is present, which was determined based on the number of light posts, its condition, and distance between any two of those posts, then it was given a score of 1. If this condition was not met, it was given a score of 0.

Curb extension and Pedestrian Island (12.5% weight)
Curb extension and pedestrian islands are also considered when scoring crosswalks. If the intersection/survey point has both curb extensions and pedestrian islands present, it gets a maximum score of 2 points. If only one of these is present, then it was given a score of 1. If neither were present it was given 0 points.

Visibility (12.5% weight)
Visibility of pedestrians to drivers is an important safety aspect of an intersection. Visibility was considered "good" and given a score of 1 if no blind curves or other obstructions to the line of

Figure 63 Crossings Score Calculation Criteria
sight are present. If the line of sight is obstructed by things such as trees, street lights, billboards, etc. then it was given a score of 0.

**ADA Accessibility (25% weight)**

ADA accessibility is an important criterion in scoring the crossing. It considers two parameters-the presence of Curb ramps and the presence of Detectable Warning Surfaces. If both curb ramps and detectable warning surfaces are present, it was given a score of 2. If only one of these is present, then it was given a score of 1. If neither the ramps nor detectable warning surfaces are present, it was given a score of 0. The presence or absence is determined once again based on the three-side rule. If the curb ramp/detectable warning system is present on 3 or more sides of the intersection, then it is considered to be present, otherwise absent.

The maximum score for each section is 1, which will then be multiplied by the weight assigned to each of these sections as mentioned against the section as 37.5%, 12.5%, 12.5%, 12.5%, and 25%.

### Table 11 Crossing Score Calculation Sample

<table>
<thead>
<tr>
<th>City</th>
<th>Route</th>
<th>Point</th>
<th>Crossing</th>
<th>Marking</th>
<th>W1</th>
<th>W2</th>
<th>W3</th>
<th>W4</th>
<th>W5</th>
<th>Total Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>city 1</td>
<td>1</td>
<td>x1</td>
<td></td>
<td></td>
<td>0.375</td>
<td>0.125</td>
<td>v1</td>
<td>0.125</td>
<td>q1</td>
<td>0.25</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>y1</td>
<td>y1</td>
<td>u1</td>
<td>u1</td>
<td>q1</td>
<td>z1</td>
</tr>
<tr>
<td></td>
<td>x2</td>
<td>0.375</td>
<td>0.125</td>
<td></td>
<td>v2</td>
<td>0.125</td>
<td>u2</td>
<td>0.125</td>
<td>q2</td>
<td>0.25</td>
</tr>
<tr>
<td></td>
<td>y2</td>
<td>y2</td>
<td>y2</td>
<td></td>
<td>v2</td>
<td>v2</td>
<td>v2</td>
<td>v2</td>
<td>q2</td>
<td>z2</td>
</tr>
<tr>
<td></td>
<td>x3</td>
<td>0.375</td>
<td>0.125</td>
<td></td>
<td>v3</td>
<td>0.125</td>
<td>u3</td>
<td>0.125</td>
<td>q3</td>
<td>0.25</td>
</tr>
<tr>
<td></td>
<td>y3</td>
<td>y3</td>
<td>y3</td>
<td></td>
<td>v3</td>
<td>v3</td>
<td>v3</td>
<td>v3</td>
<td>q3</td>
<td>z3</td>
</tr>
<tr>
<td></td>
<td>x4</td>
<td>0.375</td>
<td>0.125</td>
<td></td>
<td>v4</td>
<td>0.125</td>
<td>u4</td>
<td>0.125</td>
<td>q4</td>
<td>0.25</td>
</tr>
<tr>
<td></td>
<td>y4</td>
<td>y4</td>
<td>y4</td>
<td></td>
<td>v4</td>
<td>v4</td>
<td>v4</td>
<td>v4</td>
<td>q4</td>
<td>z4</td>
</tr>
<tr>
<td>...</td>
<td>...</td>
<td>...</td>
<td>...</td>
<td>...</td>
<td>...</td>
<td>...</td>
<td>...</td>
<td>...</td>
<td>...</td>
<td>...</td>
</tr>
</tbody>
</table>

where $z_i = x_i * W1 + y_i * W2 + v_i * W3 + u_i * W4 + q_i * W5, i \{1, 2, 3, \ldots\}$
Transit Area
Transit Areas were scored based on two criteria; the marking of the bus stop and ADA accessibility.

Figure 64 Transit Area Score Calculation Criteria

**Marking (50% weight)**
Marking of the bus stop is scored based on three levels. If the bus stop is not physically marked, then it was given a score of 0. If the bus stop is marked using a bus sign, then the transit area was given a score of 1. If the bus stop is marked with a bus sign along with a shelter, it was given a score of 2.

**ADA Accessibility (50% weight)**
Based on the ease for persons in wheelchairs to be able to embark or disembark from the bus at the bus stop, the accessibility is determined. If persons in wheelchairs are able to easily board and get off the bus, then it was given a score of 1. Otherwise, it was given a score of 0.

The maximum score for each section is 1, which will then be multiplied by the weight assigned to each of these sections as mentioned against the section as 50% and 50% each.

**Table 12 Transit Area Score Calculation Sample**

<table>
<thead>
<tr>
<th>City</th>
<th>Route</th>
<th>Point</th>
<th>Transit Area</th>
<th>Total Score</th>
</tr>
</thead>
</table>

85  | UP 494: Transportation Planning Workshop
where $z_i = x_i \cdot W_1 + y_i \cdot W_2, i \{1, 2, 3, \ldots\}$

**ANALYSIS RESULTS**

Based on the physical and virtual audit data, the scores were analyzed for each route. Table 13 compares the average scores for each section by city. The values highlighted in green represent the city with the highest score in each section, while those highlighted in yellow highlight the lowest.

<table>
<thead>
<tr>
<th>Table 13 Summary of the scores</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sidewalk Score</td>
</tr>
<tr>
<td>----------------</td>
</tr>
<tr>
<td>Waukegan</td>
</tr>
<tr>
<td>Skokie</td>
</tr>
<tr>
<td>Harvey</td>
</tr>
<tr>
<td>Joliet</td>
</tr>
<tr>
<td>Aurora</td>
</tr>
<tr>
<td>Crystal Lake</td>
</tr>
</tbody>
</table>
Spider charts were created for each city, displaying the score of each section. For the charts displaying scores for each route, spider lines in different colors represent different criteria analyzed. The blue spider line represents the sidewalks scores, the red represents the crossing scores, and the green represents transit area scores. The four radial lines represent four analyzed routes. The center of the circle represents a score of 0, and the outer edge represents a score of 1.

**Waukegan**

The result of the Waukegan audit analysis is tabulated below. Spider charts show the comparison of each route in terms of sections, and the average score of the whole audited routes in the city.

<table>
<thead>
<tr>
<th>Table 14 Route score for Waukegan</th>
</tr>
</thead>
<tbody>
<tr>
<td>Point ID</td>
</tr>
<tr>
<td>Route 1*</td>
</tr>
<tr>
<td>Route 2*</td>
</tr>
<tr>
<td>Route 3*</td>
</tr>
<tr>
<td>Virtual Audit Route</td>
</tr>
</tbody>
</table>
Where started Point IDs represent physical audit points.

Figure 66 Spider chart for routes in Waukegan of selected routes

Figure 67 Spider chart for Waukegan average score of selected routes
For Waukegan, the route according to the virtual audit is not as good as the other three physical audit routes. The scores for sidewalks, crossing, and transit areas are relatively lower than others. Therefore, according to the data analysis result, the infrastructure around the virtual audit area should be improved.

**Skokie**

The result of the Skokie audit analysis is tabulated below. Spider charts show the comparison of each route in terms of sections, and the average score of the whole audited routes in the city.

**Table 15 Route score for Skokie**

<table>
<thead>
<tr>
<th>Point ID</th>
<th>Sidewalks</th>
<th>Crossing</th>
<th>Transit Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>Route 1</td>
<td>8*, 9*, 3</td>
<td>1.00</td>
<td>0.88</td>
</tr>
<tr>
<td>Route 2</td>
<td>10*, 4, 5</td>
<td>0.94</td>
<td>0.50</td>
</tr>
<tr>
<td>Virtual Audit Route 1</td>
<td>6,7,8,9</td>
<td>0.55</td>
<td>0.38</td>
</tr>
<tr>
<td>Virtual Audit Route 2</td>
<td>17,18,19</td>
<td>0.78</td>
<td>0.38</td>
</tr>
</tbody>
</table>

*Where started IDs represent physical audit points.

**Figure 68 Spider chart for routes in Skokie of selected routes**

89 | UP 494: Transportation Planning Workshop
For Skokie, since the weather limited the physical audit, a virtual audit is used to finish the remaining work, and additional two virtual audit routes are added. According to the spider chart, route 1 has a relatively good infrastructure, while virtual audit route 1 is not as good as other routes. Additionally, the transit area in virtual audit route 2 needs to be improved.

**Harvey**

The result of the Harvey audit analysis is tabulated below. Spider charts show the comparison of each route in terms of sections, and the average score of the whole audited routes in the city.

**Table 16 Route score for Harvey**

<table>
<thead>
<tr>
<th></th>
<th>Point ID</th>
<th>Sidewalks</th>
<th>Crossing</th>
<th>Transit area</th>
</tr>
</thead>
<tbody>
<tr>
<td>Route 1</td>
<td>11*,12*,13*,14*,15*,16*</td>
<td>0.70</td>
<td>0.39</td>
<td>0.50</td>
</tr>
<tr>
<td>Route 2</td>
<td>17*,18*,19*</td>
<td>0.75</td>
<td>0.71</td>
<td>0.44</td>
</tr>
<tr>
<td>Route 3</td>
<td>20*,21*,22*,23*,24*</td>
<td>0.56</td>
<td>0.35</td>
<td>0.67</td>
</tr>
<tr>
<td>Virtual Audit Route</td>
<td>20,21,22</td>
<td>0.33</td>
<td>0.17</td>
<td>0.44</td>
</tr>
</tbody>
</table>
Where started Point IDs represent physical audit points.

**Figure 70 Spider chart for routes in Harvey of selected routes**

**Figure 71 Spider chart for Harvey average score of selected routes**
For Harvey, the crossing is the weak section. Among these routes, the virtual audit route is not as good as others. Although the transit area is in good condition, the pedestrian infrastructure is not adequate, which cannot provide access to the transit area.

**Joliet**

The result of the Joliet audit analysis is tabulated below. Spider charts show the comparison of each route in terms of sections, and the average score of the whole audited routes in the city.

**Table 17 Route score for Joliet**

<table>
<thead>
<tr>
<th>Route ID</th>
<th>Point ID</th>
<th>sidewalks</th>
<th>crossing</th>
<th>transit area</th>
</tr>
</thead>
<tbody>
<tr>
<td>Route 1</td>
<td>25*,26*,27*,28*,29*</td>
<td>0.32</td>
<td>0.28</td>
<td>0.07</td>
</tr>
<tr>
<td>Route 2</td>
<td>30*,31*,32*,33*,34*</td>
<td>0.70</td>
<td>0.69</td>
<td>0.34</td>
</tr>
<tr>
<td>Route 3</td>
<td>35*,36*,37*</td>
<td>0.36</td>
<td>0.56</td>
<td>0.33</td>
</tr>
<tr>
<td>Virtual Audit Route</td>
<td>10,11,12</td>
<td>0.41</td>
<td>0.40</td>
<td>0.56</td>
</tr>
</tbody>
</table>

Where started Point IDs represent physical audit points.

**Figure 72 Spider chart for routes in Joliet of selected routes**
For Joliet, route 1 is not as good as other routes. The virtual audit route is not good enough as well, however, the transit area in this route is relatively scored highly. Therefore, pedestrian infrastructures around route 1 should be emphasized to improve.

**Aurora**

The result of the Aurora audit analysis is tabulated below. Spider charts show the comparison of each route in terms of sections, and the average score of the whole audited routes in the city.

**Table 18 Route score for Aurora**

<table>
<thead>
<tr>
<th>Route</th>
<th>Point ID</th>
<th>sidewalks</th>
<th>crossing</th>
<th>transit area</th>
</tr>
</thead>
<tbody>
<tr>
<td>Route 1</td>
<td>38*,39*,40*,41*,42*,43*</td>
<td>0.40</td>
<td>0.71</td>
<td>0.61</td>
</tr>
<tr>
<td>Route 2</td>
<td>45*,46*,47*,63*</td>
<td>0.67</td>
<td>0.60</td>
<td>0.27</td>
</tr>
<tr>
<td>Route 3</td>
<td>48*,49*,50*,51*</td>
<td>0.89</td>
<td>0.78</td>
<td>0.67</td>
</tr>
<tr>
<td>Virtual Audit Route</td>
<td>23,24,25</td>
<td>0.67</td>
<td>0.58</td>
<td>0.22</td>
</tr>
</tbody>
</table>

Where started Point IDs represent physical audit points.
Figure 74 Spider chart for routes in Aurora of selected routes

Figure 75 Spider chart for Aurora average score of selected routes
For Aurora, the condition of each route is balanced. For route 1, even if the transit area and crossing are good enough, the sidewalks are not in good condition compared with other routes. For virtual audit route and route 2, the sidewalks and crossing are relatively good, while the transit areas are not as good as the other two routes. Route 3 is the best route in Aurora.

**Crystal Lake**

The result of the Crystal Lake audit analysis is tabulated below. Spider charts show the comparison of each route in terms of sections, and the average score of the whole audited routes in the city.

**Table 19 Route score for Crystal Lake**

<table>
<thead>
<tr>
<th>Point ID</th>
<th>sidewalks</th>
<th>crossing</th>
<th>transit area</th>
</tr>
</thead>
<tbody>
<tr>
<td>Route 1</td>
<td>52*,53*,54*</td>
<td>0.69</td>
<td>0.75</td>
</tr>
<tr>
<td>Route 2</td>
<td>55*,56*,57*,58*,59*</td>
<td>0.56</td>
<td>0.43</td>
</tr>
<tr>
<td>Route 3</td>
<td>60*,61*,62*</td>
<td>0.47</td>
<td>0.56</td>
</tr>
<tr>
<td>Virtual Audit Route</td>
<td>0,1,2</td>
<td>1.00</td>
<td>0.75</td>
</tr>
</tbody>
</table>

Where started Point IDs represent physical audit points.

**Figure 76 Spider chart for routes in Crystal Lake of selected routes**
For Crystal Lake, the transit area is the weak aspect for it, while sidewalks and crossing are relatively good. The virtual audit route is the best route among these four routes, while the other three routes are in similar condition.

LIMITATIONS

The scope of the physical audit is limited to the time and weather conditions.

The app, Survey 123, used to collect data for each survey point could not record some data. This missing data about sidewalks is accounted for through the virtual audit.

1. Google Street View was utilized to conduct the virtual audit with most of the images being captured in 2018. This may attribute to some discrepancies in the data and the current conditions in the field, though it was deemed sufficient for this study.

The audit does not have enough data to build a complete picture of infrastructure needs in each city, however, the samples are still useful for identifying issues.

OBSERVATIONS

As per the score summaries, the city with the greatest sidewalk score is Skokie, while Joliet has the lowest score. Although sidewalks in Joliet city exist in most areas, the condition and safety
of the sidewalks are lower due to the lack of separation between sidewalks and streets and permanent obstructions. For crossings, Crystal Lake has the best crossing score while Harvey has the lowest score among these cities. This is due to crossing walks not being marked adequately. For Transit areas, Harvey has the highest score, while Crystal Lake has the lowest score. In general, the transit area score is lower for all the cities studied since most of them are not marked adequately.

Each route is compared within each city. Each city meets a specific problem for each route, which is discussed in the "analysis result" section. This analysis builds on previous work by enhancing and completing the in-person audit information. The creation of our weighted scoring system allows the case study cities to quickly determine where they are falling short in providing adequate pedestrian access to transit.
CHAPTER 7: DRAFT POLICY RECOMMENDATIONS

OVERVIEW
The research team formulated policy recommendations based on the field audits, virtual audits, study of available guidelines and standards related to pedestrian infrastructure, municipal codes, comprehensive plans, and funding mechanisms for the selected municipalities. The policy recommendations are summarized in categories in the section below.

DRAFT POLICY RECOMMENDATIONS

Funding Structures

- Ensuring Coordination between Overlapping Jurisdictions - There is a need to ensure coordination between municipalities, respective MPOs, transit agencies, and other relevant organizations with overlapping jurisdictions such as park districts to take advantage of the available trail funding and public-private partnerships. Successful coordination would enable a more equitable distribution of funds across municipalities within the same county.

- Ensuring Regional Coordination - This can include simple necessities like wheelchair access to bus stops being absent in many suburban locations because stops lack the concrete pads necessary to board using a ramp. Furthermore, in many locations the local municipality or township has not provided sidewalks adjacent to the bus stop at all, preventing any kind of safe, meaningful access. This mismatch in infrastructure coordination can help establish the basis of geographic equity.

- Reevaluation Funding Allocation Formulae and Criterion used by Municipalities - During the analysis of funding mechanisms and inequitable distributions of funds was observed across municipalities within the same county. Revisiting funding allocation formulae and criteria to proportionately and equitably allocate funds for pedestrian infrastructure. For instance, utilizing tools such as the Two-Variable Cost Allocation Calculator to take advantage of the available funding.

- Rethinking the Purpose for Pedestrian Access - This includes working towards 100% completeness of sidewalk infrastructure around pace bus stops. For instance, this can be achieved by ensuring that there are sidewalks on both sides of all streets linking from a specific bus stop for the specified distance (either ½ or ¼ mile) depending on the location of the bus stop.

Street Design

- Pace service area-wide Complete Street Policy – This can be done by creating a unified policy on complete streets and pedestrian infrastructure, all municipalities could have the same template to work off of. This would yield more consolidated
results across the board. Similarly, if every municipality followed the same policy, correction implementation would be simplified as well – since most problems would become familiar after their first occurrence.

- **County-wide Complete Street Policy** – If the MSA-wide policy is not a viable solution, a county-wide one could achieve similar effects of reducing fragmentation among municipalities. Many small municipalities do not have planning departments large enough to support and maintain a complete street policy. A county-wide regulation would allow municipalities to have minimum standards while allowing larger municipalities to have their plans that may be more comprehensive.

- **Implement easy now, Pedestrian CIP later** – implement as many low-cost, cost-short term solutions (as proposed by the SSMMA report) and commit to including pedestrian improvements in upcoming fiscal year capital improvement plans. This could be required of each municipality comprising the Pace Service Area to encourage them to work both within the current and future time frames.

- **Municipal/subdivision code revision** – A Pace service area-wide municipal and subdivision code revision, to include minimum standards for future construction of infrastructure to include adequate pedestrian facilities. Often, subdivision regulation does not require new construction to include sidewalks. By creating local policies and codes that require new construction to be mode-inclusive, we could put a stop on new inadequate construction and strictly focus on bridging previous gaps.

- **Pace cooperation plan** – Pace could create a template municipal government cooperation plan. This would create a standardized set of expectations and guides, enabling easier construction, cooperation, and improvements to the pedestrian infrastructure. This would be of interest to both Pace and the municipalities that they serve, as adequate pedestrian infrastructure reduces congestions, increases ridership, and decreases traffic fatalities.

- **Unification and expansion** – Creating unified bike, pedestrian, and transit supportive guidelines by coordination between Metra, Chicago Transit Authority, and Pace Bus. This would not only expand the accessibility between suburban and urban areas of the RTA service areas but would give the agencies more cumulative leverage than before. Additionally, each one of the current transit agencies serves a separate purpose, and by integrating them, they could exchange expertise. For example, Pace is the leader in suburban transit, while CTA is in urban; both agencies have areas where they provide service that is not similar to their primary business model. By having a team of people that have experience in each one of the scenarios, problem-solving, maintenance, and future expansion would be simpler.
**Virtual Audits**

- Sidewalk Gaps - Suggest rewording to "Build regional partnerships to share best practices and grant opportunities for investments in pedestrian infrastructure"

- Lack of pedestrian arterials along major arterials - Work with county departments of transportation, IDOT, and municipalities to ensure pedestrian amenities are integrated into the planning, design, and construction of major arterials

- ADA noncompliance at crossings and transit waiting areas - Create plans which further audit and address ADA issues for pedestrians and transit users

- These issues identified, both common across all 6 cities, as well as specific to cities and routes, will help direct plans, design standards, and policies related to funding.
CHAPTER 8: REFERENCES


Chicago Department of Transportation. (2013). *Complete Streets Chicago.*


https://www.cmap.illinois.gov/documents/10180/408531/FY18-0024+SSMMA+PLAN.pdf/b1eba046-881b-42f5-b31d-55e06f630c4e


CNT. (2011). *Chicago’s South Suburbs Smart Growth in Older Communities.*


https://www.fhwa.dot.gov/environment/bicycle_pedestrian/funding/funding_opportunities.cfm
APPENDIX

APPENDIX A: FIELD AUDIT

TRANSPORTATION PLANNING WORKSHOP PEDESTRIAN AUDIT

Location: ___________________________________________

Sidewalk

1. Sidewalk Width
   a. 1 person
   b. 2 people
   c. 3 people
   d. More

2. Sidewalks General (Yes/No Matrix)
   a. Are sidewalks present on both sides of the street?
   b. Are the sidewalks continuous/uninterrupted?
   c. Is the sidewalk adequately lit?
   d. Coverage by trees or other overhead coverage?
   e. Are there any safety instructional signs for pedestrians?
   f. Is there ample separation between vehicular and pedestrian traffic?

3. ADA Accessibility
   a. Are there any permanent obstructions in the sidewalk? (garbage cans, trees, fences etc.)
   b. Are there any temporary obstructions in the sidewalk? (parked cars, advertisement boards, dustbins etc.)

4. If not sidewalk, is there any place to walk that is safe from traffic?
   a. Unpaved pathway
   b. Buffer
   c. Street shoulder
   d. Not applicable, sidewalk present

Crossing

5. Do crosswalks exist at this intersection?
   a. Yes
   b. No
6. Crossing Signage (multiple choice)
   a. Pedestrian signal
   b. Stop sign
   c. Yield to pedestrians’ sign
   d. No signage

7. If pedestrian signal present, is there a:
   a. Crossing timer
      i. Yes
      ii. No
   b. Push to cross button
      i. Yes
      ii. No

8. Crosswalks General (Yes/No Matrix)
   a. Are crosswalks present and properly marked?
   b. Are marked crosswalks wide enough?
   c. Is the pedestrian crossing adequately lit?
   d. Are there pedestrian islands?
   e. Are there curb extensions?
   f. Are there any obstructions that might block pedestrians from being visible to vehicles?
   g. Is the distance between the stop line and the crossing adequate?

9. ADA Accessibility
   a. Are there ADA accessible ramps?
   b. Are there ADA accessible tactile warning pads?

10. Does the crossing provide access to meaningful destinations?

Transit Areas

11. How is transit area marked?
    a. A bus sign
    b. Covered shelter
    c. No marking

12. If shelter is available, check all that apply:
    a. Seating is available
    b. Heating lamps are available
    c. Weather screening is available
    d. No shelter available

13. Transit service information
    a. Paper service schedule
    b. LED arrivals board
    c. Arrivals digital screen
    d. No transit service information available

14. Can people in wheelchairs easily board the bus from this stop?
    a. Yes
    b. No
15. Is the waiting area elevated to allow for level bus boarding?
   a. Yes
   b. No

16. Are there any parking lots nearby that might have access points that cross the sidewalk in an unsafe manner?
   a. Yes
   b. No

Social aspects - Safety

17. Safety (Yes/No Matrix)
   a. Are there eyes on the street? (Windows, houses, etc.)
   b. Are there people walking nearby?
   c. Are there breaks in the facade of the buildings nearby?

18. Is there a buffer/separation between pedestrian and vehicular traffic?
   a. Yes
   b. No

19. What is the perceived speed of vehicular traffic movement?
   a. Relatively slow
   b. Normal/comfortable
   c. Relatively fast
   d. Very fast/uncomfortable

20. Is the visibility of pedestrians walking along the sidewalk adequate?
   a. Yes
   b. No

21. Do you observe? (check all that apply)
   a. Run-down/vacant buildings
   b. Pollution/trash
   c. Graffiti

Street

22. How many traffic lanes on the street? __________
23. What is the speed limit on this street? __________
24. How many legs are there at this intersection? __________
25. What is the general use of this area?
   a. School
   b. Hospital
   c. Residential
   d. Downtown
   e. Commercial
   f. Mixed-use
   g. Other __________
26. What kind of bike lane is it on this street?
   a. On-street bike lane (buffered from traffic)
   b. On-street bike lane (paint only)
   c. Shared with sidewalk
   d. No bike lane

https://arcg.is/v0K8G
APPENDIX B: POTENTIAL FUNDING RESOURCES

Figure 78: Bike Lanes and Trails in Cook County
Figure 79: McHenry County Bicycle and Pedestrian Plan
ON TO 2050 Plans but Metra has not committed to the extension.

Pace Bus is another public transportation provider within the two counties, and helps thousands of residents reach their daily destinations. Pace serves municipalities throughout Cook, Will, DuPage, Kane, Lake, and McHenry counties. According to data provided by Pace staff, there are 38 Pace bus routes that have stops within Kane County. The longest route, Route 607, is 68 miles in length and provides service between I-90/Randall Road and the Pace Northwest Transportation Center in Schaumburg. For more information about the routes and station locations that Pace operates, visit their website; the link is provided in Appendix A.

Ride in Kane (RIK) is another public transportation option that specializes its services to disabled and elderly citizens. Ride in Kane provides curb-to-curb bus or taxi service to seniors 65-and-older and to disabled individuals in Kane County. The minimum fare for each ride is $4. This minimum fare applies to rides ten miles or less; riders will be charged $1.50 for every mile after the first ten miles. Ride in Kane is administered by the Association for Individual Development in partnership with Pace Suburban Bus, Kane County and local municipalities, townships and social service agencies operating as local sponsors. However, not all municipalities within Kane County participate in the service. For a full list of participating municipalities and more information on the program, visit the website, listed in Appendix A.

Kendall County is served by the Kendall County Area Transit system (KAT), which operates a dial-a-ride bus service. Kendall Area Transit services all locations within the county and some designated locations outside of the county; rides on the service must originate or end within Kendall County. KAT utilizes mini-buses and vans to transport its users to their desired destination. One-way fares for the service are $3.00 for trips within the county and $5.00 for trips that travel outside of the county. The service began in 2010, when it posted an annual ridership of just under 1,100 riders. In 2018, the service provided over 29,100 rides to its users. To learn more about the program, visit their website, listed in Appendix A.

Bike & Pedestrian Initiatives

Bicycle Friendly Communities and Businesses
The League of American Bicyclists is a non-profit organization that promotes bicycling for fun and fitness through advocacy and educational programs.
Figure 82: 2040 Non-Motorized Transportation Plan for Lake County
**APPENDIX C: CHICAGO METROPOLITAN AGENCY FOR PLANNING PEDESTRIAN**

**FIGURE 20.2**

**ROADWAY FORM AND FUNCTION**

*All dimensions are in feet*

<table>
<thead>
<tr>
<th>Building Form and Function</th>
<th>MS Main Street</th>
<th>Pedestrian Realm</th>
<th>Interstitial Area</th>
<th>Vehicle Realm</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Frontage</td>
<td>Pedestrian Zone</td>
<td>Curb Zone</td>
<td>Parking Area</td>
</tr>
<tr>
<td><strong>P Parks</strong></td>
<td>Target</td>
<td>0</td>
<td>1</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>Maximum</td>
<td>2</td>
<td>2</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>Constrained</td>
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<td></td>
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<tr>
<td><strong>M Mixed Use</strong></td>
<td>Target</td>
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<tr>
<td><strong>D Downtown</strong></td>
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<td><strong>IC Institutional Campus</strong></td>
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</table>

Complete Streets Chicago

Assemblage Table for Main Street
## Figure 20.3

**Roadway Form and Function**

*All dimensions are in feet*

<table>
<thead>
<tr>
<th>Building Form and Function</th>
<th>Pedestrian Realm</th>
<th>Interstitial Area</th>
<th>Vehicle Realm</th>
<th>Median</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Frontage</td>
<td>Pedestrian Zone</td>
<td>Furniture Zone</td>
<td>Curb Zone</td>
</tr>
<tr>
<td>P  Parks</td>
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<td>10</td>
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</tr>
<tr>
<td>C  Commercial Center</td>
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### Figure 20.4

#### Roadway Form and Function

**All dimensions are in feet**

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<tr>
<th>Building Form and Function</th>
<th>Pedestrian Realm</th>
<th>Interstitial Area</th>
<th>Vehicle Realm</th>
<th>Median</th>
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<tbody>
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<td>Frontage</td>
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<td>Furniture Zone</td>
<td>Curb Zone</td>
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<tr>
<td>C Commercial Center</td>
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<td>D Downtown</td>
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<tr>
<td>IC Institutional Campus</td>
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### Table 4. Recommended Complete Streets treatments by roadway type and context

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<th>Residential Avenue</th>
<th>Residential Boulevard</th>
<th>Business Main Street</th>
<th>Business Avenue</th>
<th>Business Boulevard</th>
<th>Community Street</th>
<th>Community Avenue</th>
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<td>2</td>
</tr>
</tbody>
</table>

1. Recommended, where space allows
2. Would enhance safety, but not necessary
3. Not necessary, would not be good investment
4. Recommended when trying to change the character of a street, or if further investigation calls for it
5. Not recommended without additional changes to the roadway, would be unsafe
APPENDIX E: VIRTUAL AUDITS

Virtual Audit images showing conditions of pedestrian infrastructure at survey point 0 in Crystal Lake collected using Google Street View

Crystal Lake Virtual Audit Survey Point 0 showing marked crossing

Crystal Lake Virtual Audit Survey Point 0 showing sidewalks on both sides
Virtual Audit images showing conditions of pedestrian infrastructure at survey point 1 in Crystal Lake collected using Google Street View

Crystal Lake Virtual Audit Survey Point 1 showing marked crossing

Crystal Lake Virtual Audit Survey Point 1 showing sidewalks on both sides

Virtual Audit images showing conditions of pedestrian infrastructure at survey point 2 in Crystal Lake collected using Google Street View
Virtual Audit images showing conditions of pedestrian infrastructure at survey point 19 in Skokie collected using Google Street View
Skokie Virtual Audit Survey Point 19 showing sidewalks on both sides

Skokie Virtual Audit Survey Point 19 showing unmarked crossing
Virtual Audit images showing conditions of pedestrian infrastructure at survey point 18 in Skokie collected using Google Street View

Skokie Virtual Audit Survey Point 18 showing unmarked crossing

Skokie Virtual Audit Survey Point 18 showing sidewalks on one direction
Virtual Audit images showing conditions of pedestrian infrastructure at survey point 17 in Skokie collected using Google Street View

Skokie Virtual Audit Survey Point 17 showing unmarked crossing

Skokie Virtual Audit Survey Point 17 showing sidewalks existing on one side
Virtual Audit images showing conditions of pedestrian infrastructure at survey point 3 in Skokie collected using Google Street View

Skokie Virtual Audit Survey Point 3 showing marked crossing

Skokie Virtual Audit Survey Point 3 showing sidewalks on both sides
Virtual Audit images showing conditions of pedestrian infrastructure at survey point 4 in Skokie collected using Google Street View

Skokie Virtual Audit Survey Point 4 showing unmarked crossing

Skokie Virtual Audit Survey Point 4 showing sidewalks on both sides
Virtual Audit images showing conditions of pedestrian infrastructure at survey point 5 in Skokie collected using Google Street View

Skokie Virtual Audit Survey Point 5 showing sidewalks on both sides

Skokie Virtual Audit Survey Point 5 showing marked crossing
Virtual Audit images showing conditions of pedestrian infrastructure at survey point 6 in Skokie collected using Google Street View

Skokie Virtual Audit Survey Point 6 showing sidewalks on both sides

Skokie Virtual Audit Survey Point 6 showing marked crossing
Virtual Audit images showing conditions of pedestrian infrastructure at survey point 7 in Skokie collected using Google Street View

Skokie Virtual Audit Survey Point 7 showing no sidewalks on the street

Skokie Virtual Audit Survey Point 7 showing unmarked crossing
Virtual Audit images showing conditions of pedestrian infrastructure at survey point 8 in Skokie collected using Google Street View

Skokie Virtual Audit Survey Point 8 showing unmarked crossing and one sidewalks in this direction

Skokie Virtual Audit Survey Point 8 showing unmarked crossing and sidewalks on both sides in this direction
Virtual Audit images showing conditions of pedestrian infrastructure at survey point 9 in Skokie collected using Google Street View

Skokie Virtual Audit Survey Point 9 showing marked crossing

Skokie Virtual Audit Survey Point 9 showing sidewalks on both sides
Virtual Audit images showing conditions of pedestrian infrastructure at survey point 16 in Waukegan collected using Google Street View

Waukegan virtual audit survey point 16 showing unmarked crossings and missing sidewalks

Waukegan virtual audit survey point 16 showing one marked crossing and continuous sidewalk on one side of the street
Virtual Audit images showing conditions of pedestrian infrastructure at survey point 15 in Waukegan collected using Google Street View

Waukegan virtual audit survey point 15 showing no marked crossings and no sidewalks

Waukegan virtual audit survey point 15 showing no marked crossings, no sidewalks, and no marked bus stop
Virtual Audit images showing conditions of pedestrian infrastructure at survey point 14 in Waukegan collected using Google Street View

Waukegan virtual audit survey point 14 showing no marked crossings and no sidewalks

Waukegan virtual audit survey point 14 showing no marked crossings, no sidewalks, and no marked bus stop
Virtual Audit images showing conditions of pedestrian infrastructure at survey point 13 in Waukegan collected using Google Street View

Waukegan virtual audit survey point 13 showing marked crossings

Waukegan virtual audit survey point 13 showing marked crossings, but no sidewalks
Waukegan virtual audit survey point 13 showing marked bus stop with a bus sign, but no sidewalks
Virtual Audit images showing conditions of pedestrian infrastructure at survey point 25 in Aurora collected using Google Street View

Aurora virtual audit survey point 25 showing no sidewalks and marked crossings

Aurora virtual audit survey point 25 showing one sidewalk present and no marked crossings
Virtual Audit images showing conditions of pedestrian infrastructure at survey point 24 in Aurora collected using Google Street View

Aurora virtual audit survey point 24 showing buffer b/w sidewalk and street

Aurora virtual audit survey point 24 showing only 2 legs of the streets having sidewalks and only 1 marked crossing
Virtual Audit images showing conditions of pedestrian infrastructure at survey point 23 in Aurora collected using Google Street View

Aurora virtual audit survey point 23 showing marked bus stop with a bus sign

Aurora virtual audit survey point 23 showing sidewalks and marked crossings
Virtual Audit images showing conditions of pedestrian infrastructure at survey points 20, 21 and 22 in Harvey collected using Google Street View

Harvey Virtual audit point 20 showing shelter, lack of crosswalks and obstructed/discontinuous sidewalk

Harvey virtual audit survey point 21 showing bus sign, lack of continuous sidewalks and crossing infrastructure.
Harvey virtual audit survey point 22 showing lack of curb ramps, crossings
Virtual Audit images showing conditions of pedestrian infrastructure at survey points 10, 11 and 12 in Joliet collected using Google Street View

Joliet virtual audit survey point 10 Showing lack of sidewalks and crossings.

Joliet virtual audit survey point 11 showing crosswalks and sidewalks, pedestrian island.
Joliet virtual audit survey point 12 showing sidewalks and limited crosswalks