UNIVERSITY OF
ILLINOIS
URBANA-CHAMPAIGN

WALKABILITY AUDIT 2021-22
University of Illinois Urbana-Champaign

A CAPSTONE PROFESSIONAL PROJECT
PREPARED BY

SUTAPA BANERJEE

FOR
UNIVERSITY OF ILLINOIS URBANA-CHAMPAIGN

WITH SUPPORT FROM
FACILITIES & SERVICES
TRANSPORTATION DEMAND MANAGEMENT, UIUC

FOR PARTIAL FULFILLMENT OF CAPSTONE REQUIREMENT
OF
THE MASTER OF URBAN PLANNING DEGREE

ADVISED BY

PROF. LINDSAY BRAUN

EXECUTIVE SUMMARY

INTRODUCTION

What is Walkability?
Walkability is a term used by the planning community to represent mixed land uses that have various public amenities in a high-density neighborhood resulting in high accessibility for taking waking trips. It also represents the overall aesthetic, maintenance and imageability of the built environment. The reason for improving the walking infrastructure abutting the streets is that sidewalk networks should be more than just transport corridors. It should be designed to facilitate an enjoyable, efficient and safe walking environment that is universally accessible.

The aspect of Walkability has become increasingly crucial for university communities in order to reduce automobile dependency and promote healthy lifestyles amongst the youth. Improving the walking infrastructure is directly proportional to higher walking trips. It increases social interaction, safety of pedestrians and decreases obesity rates. It is extremely important to address issues related to the walking infrastructure of a university community through periodical upkeep.

This report's main purpose is to develop a system to measure the Walkability Index of one such campus- The University of Illinois Urbana Champaign (UIUC), IL.

ABOUT

University of Illinois Urbana Champaign (UIUC) is one of the leading universities in North America, USA. It performs an audit of its sidewalk network every 10 years.

The 4 main objectives of the audit are to:
1. Increase walking and the walkability quality on campus,
2. Increase physical activity and promote healthy lifestyles,
3. Ensure the safety of those using walkways,
4. Achieve 100% ADA compliancy on campus property

This Audit is conducted by Facilities & Services Transportation Demand Management (F&S TDM) department of UIUC.

METHODS

This report objectively determines various assessment parameters that impact walkability through a thorough literature review and stakeholder input using which it creates 2 ways of measuring walkability: a broader general survey of the campus called the '2021 UI Campus Walkability Audit survey' and the more specific survey called the '2021 UI Campus Deficiency Reporting survey'.

The surveys are designed as a series of questions that ask volunteers to rate options based on a Likert scale. Each question of the survey was assigned a score in a 0-5 scale and weighted twice. The surveys are hosted in the ArcGIS Survey 123 App which enables volunteers involved in the audit to download and collect data in their own smartphones.
It uses an automated system to collect responses and records the exact coordinates of specific deficiencies present in the campus that might hinder the walking/rolling environment.

Volunteers of the audit were trained before collecting data. I created a Training manual for this audit (attached in the Appendix) that had step by step instructions for conducting both the surveys. F&S TDM and I conducted over 30 -virtual and in-person training sessions for all the volunteers of the project.

KEY FINDINGS

Findings of 2021 UI Campus Walkability Audit survey: This general survey of 40 questions assessed various parameters that showed that UIUC performed best in the following categories: Sidewalk Presence, Temporary and Permanent obstructions, Sidewalk Lighting, Curb Cut Presence, Curb Cut alignment, building entrances, Sidewalk Connectivity, Transit stop distance, Parking connectivity, Perceived Safety, Pedestrian Visibility along sidewalks and crosswalks, Landscaping and Walk Appeal.
However, it was also found that UIUC campus performed the worst in the following categories: Sidewalk buffers, Wheelchair Access, Pedestrian and Vehicular Conflicts.

It spatially located the highest scoring map blocks and the lowest scoring map blocks. As expected, the core of the campus that houses the majority campus buildings scored the highest as compared to the campus periphery.
The final walkability index of the campus was measured to be 76.2/100 which signifies that the campus as 'Very Walkable'.

The findings of the '2021 UI Campus Deficiency Reporting survey' shows us the highest deficiency categories as 'Sidewalk Maintenance' followed by 'Crosswalk Maintenance' and 'Accessibility Issues'.

RECOMMENDATIONS

The recommendations are based on the key findings of both the surveys. The priority for improvement projects should be to focus on resolving the vehicular and pedestrian circulation in high conflict areas through establishing more traffic calming measures, making the campus universally accessible by correcting vertical faults and cracks along the sidewalks through regular maintenance and upkeep.
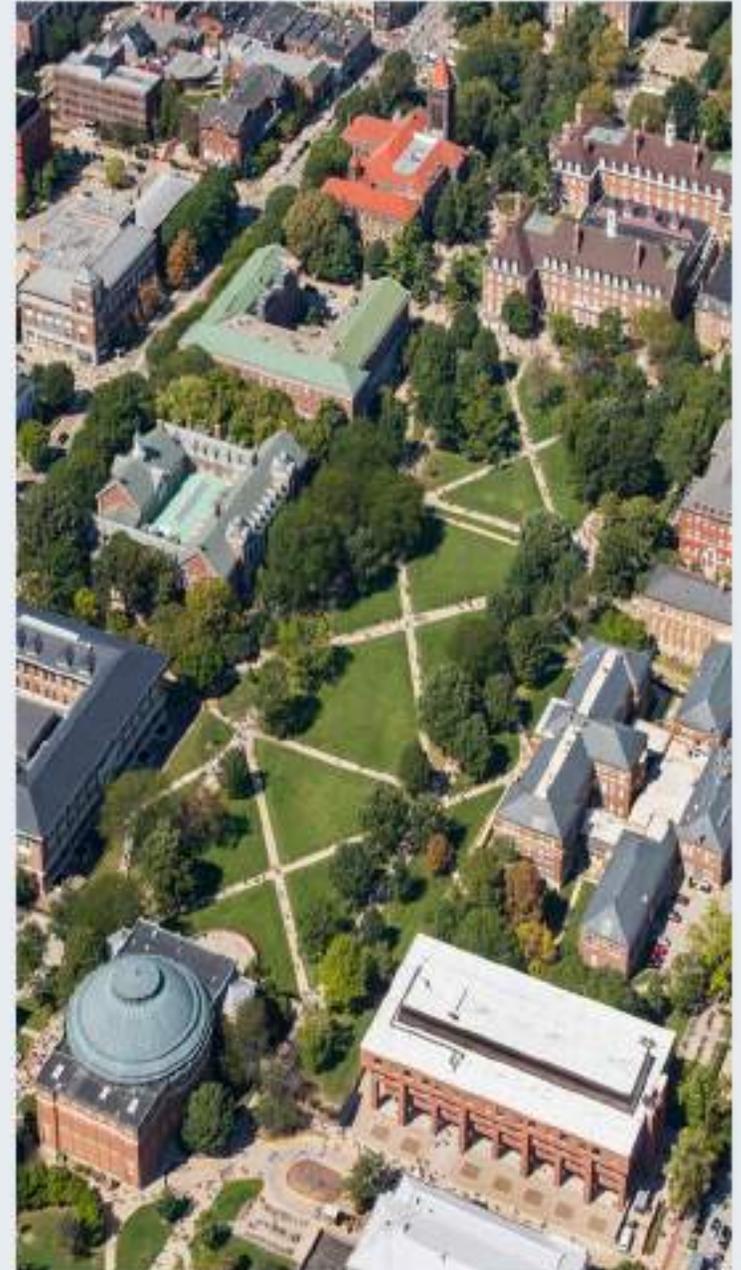
LIST OF TABLES AND FIGURES

CONTENTS

INTRODUCTION

2 INTRODUCTION

Every trip from an origin to a destination starts and ends with a walking trip. Walking is a universal mode of transportation that is free, supports healthy lifestyles and brings people closer together. It is extremely important to develop good walking infrastructure in university campuses since this is where students spend their formative years and develop habits that stay with them forever.

Calculating the 'Walkability Index' of an area is a way to measure how walkable its built environment is for its residents.
Walkability indices are based on systems that measure parameters that affect the probability of weather people would prefer walking as a mode of transportation or not. It ranges from a score of 0-100 where Walker's paradise lies between 90-100, Very walkable environments lie between 70-89, 50-69 is Moderately walkable and areas scoring between 25-49 are mostly car dependent with poor walkability.

The overarching goal of this project is to develop a system to determine the Walkability Index of the campus of University of Illinois Urbana Champaign.

The major objectives of this project are listed as follows:

1. increase walking and the walkability quality on campus
2. increase physical activity and promote healthy lifestyles
3. ensure the safety of those using walkways
4. achieve 100% ADA compliancy on campus property

This project is conducted by **Facilities and Services- Transportation Demand Management (F&S- TDM)** Dept. of UIUC. They are performing a walkability audit of the University District using two surveys:

01 **2021 UI Campus Walkability Audit survey:**
Assesses the general walkability of the map blocks

02 **2021 UI Campus Deficiency Reporting survey:**
Identifies specific deficiencies within a map block

Figure: Sidewalks and crosswalks in University of Illinois Urbana Champaign

The F&S is dedicated to planning, building, maintaining, and serving the campus's-built environment to support the strategic framework needs. The TDM dept. at F&S maintains and improves the transportation infrastructure network for all forms of campus travel, including walking, bicycling, transit, and motor vehicles. TDM also coordinates with university and regional partners on projects impacting the campus transportation network.

The Walkability Audit 2021-22 project will help us identify the areas that are ideal for walking and areas that may require improvement.
The 2 surveys will enable us to get a complete picture of the walking infrastructure needs and will help address issues at the macro and micro level.

University of Illinois Urbana-Champaign (UIUC) performs a walkability audit every 10 years in order to improve, regulate and fix the walking infrastructure needs of its students. This study is guided by ADA (Americans with Disabilities Act of 1990) compliance parameters for universal accessibility and follows CDC (Centers for Disease Control and Prevention) regulations to promote health and safety. The previous audit was performed by University of Illinois Wellness Center in the year 2010-11. It is important to perform periodical assessments of the walking infrastructure to identify current deficiencies and devise a consolidated plan to achieve the best walking infrastructure possible.

OBJECTIVES

OBJECTIVE 1 — INCREASE WALKING AND WALKABILITY QUALITY ON CAMPUS

OBJECTIVE 2 — INCREASE PHYSICAL ACTIVITY AND PROMOTE HEALTHY LIFESTYLES

OBJECTIVE 3 — ENSURE SAFETY OF THOSE USING WALKWAYS

OBJECTIVE 4 — ACHIEVE 100% ADA COMPLIANCY ON CAMPUS PROPERTY

ENTITIES INVOLVED

F&S TDM department is collaborating with the following entities for this audit:

• Department of Urban and Regional Planning
• Disability Resources & Educational Services
• Office of Access & Equity
• F&S Grounds
• F&S FIR
• F&S Sustainability
• Campus Landscape Architect
• Transportation iCAP Team
• Student Planning Organization (SPO)

STRUCTURE OF THE REPORT

This report first will briefly introduce the site of Audit which is our campus: University of Illinois Urbana Champaign and explain its context with respect to its surroundings.

The **Literature review** section will explain the concept of Walkability and Walkability index through various perspectives of different researchers and explain the importance of walkability.

The next section of **Background and Project context** will be introducing the site and the surveys in depth along with the various assessment parameters.

The **Methods** section builds on the theoretical concepts of the Literature review and applies them to various concepts to determine the Walkability index.

The **Data analysis** section comprises of the key findings gleaned from the 2 surveys. The analysis of the scores of various map blocks of the campus is performed quantitatively and also spatially through maps.

The **Recommendations** directly co-relate to the main themes and findings of the surveys followed by a specific list of next steps to take after the completion of the Walkability Audit 2021-22 of UIUC.

LITERATURE REVIEW

2 REVIEW OF RELATED LITERATURE

IMPORTANCE OF RESEARCH TOPIC

Investing in active transport infrastructure for cities/neighborhoods/communities has shown to have several health benefits for its residents. It provides a unique opportunity for people to develop healthy lifestyle, reduces obesity rates and chronic conditions like diabetes and cardiovascular diseases. Providing a good walking and cycling infrastructure is the first step to influence travel behavior among residents to change their choice of transport. Apart from having positive health benefits, it greatly reduces automobile dependency. This in turn reduces greenhouse gas emissions which help tackle climate change.

It is paramount to promote active transportation in places of education such as universities since university years are the formative years of the life of a student, and it is during these crucial years that they develop good habits which stay with them for a very long time. Influencing and changing travel behavior during this period has maximum impact. Universities also tend to have heavy foot traffic. It saves costs of providing more parking lots and wider roads to accommodate growing intakes.

This study also assesses where UIUC stands with respect to the Big 10 UI system schools. A graph of the comparative walkability indices is detailed in the image below:
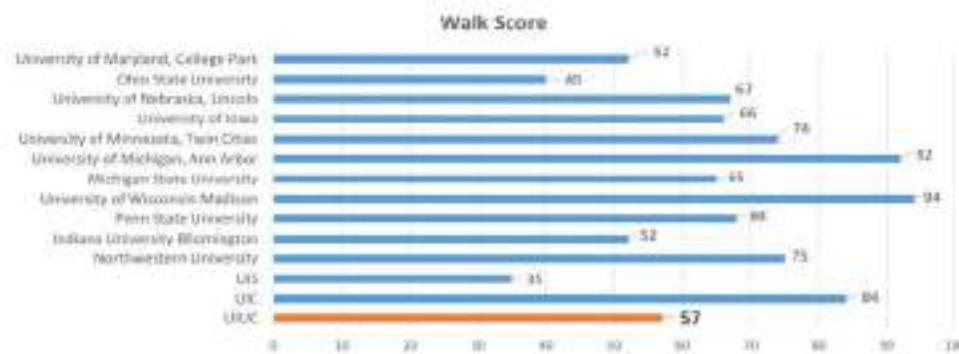
This data is from walkscore.com and the National Walkability index website which shows that our campus- University of Illinois Urbana-Champaign had a low walk score of 57/100 in the past.
However, several infrastructural development projects have been implemented since the study and it is said to have a much better walkability index.

WHY DOES WALKABILITY MATTER?

Walking is the most common way of transportation in the whole world. Every single vehicle trip starts and ends with walking. It is free and the carbon-free way to reach your destination. Walking is also a basic human right but several of our urban spaces are designed for vehicles instead of pedestrians' first.

This image by Swedish artist Karl Jilg aptly represents how cities have surrendered the majority of the public spaces to automobiles instead of their pedestrians. The image depicts "roads as chasms and crosswalks as rickety planks spanning them" (Stromberg, Vox, 2014). It makes us think about the disproportionate proportions of a street given to its users. The cities where streets are designed for cars, is a city where pedestrians risk their lives everyday to reach destinations and as a result are killed in road crashes.
1.3 million people are killed in road crashes each year. Amongst pedestrians, cyclists and motorcyclists all over the world traffic injuries are the leading cause of death. Traffic crashes are also the major cause of disability in the world's fastest growing cities deaths. (IDTP)

Image by Swedish artist Karl Jilg

Majority cities have a automobile-focused transportation investment system as a result of which driving is encouraged and supported through infrastructure whereas active transportation modes like walking and cycling get progressively dangerous or next to impossible to take on.
Truly walkable cities are the ones that put pedestrians needs first and automobiles later. Streets safe for pedestrians are also safe for automobiles. Lively street fronts with pedestrians walking to nearby destinations, gathering in spaces of congregation and using public infrastructure is an indicator of a vibrant, thriving city. Promotion of active transport in a city should always be connected with high quality public transit systems. Therefore, walking networks for short trips coupled by the larger transit network for longer trips in a city increases the accessibility and mobility of its citizens immensely.

IMPORTANCE OF WALKING
THROUGH MULTIPLE LENSES

Walking is good for health

Walking is beneficial for physical as well as mental health. The movement of the body while walking improves, lungs, muscles, bones, the heart etc. It also reduces excess body fat and reduces obesogenic cities that are heavily automobile dependent. It is proven to be effective in reducing depression, anxiety and loneliness.

Walking is good for the environment

Transportation contributes to 23% of the world's greenhouse gas emissions. Cities designed as high-density balanced tracts with mixed land uses influence travel behavior and encourage people to use walking as a means of travel. Walking is environmental friendly and a sustainable way to travel.

Walking is good for the economy

A sprawling neighborhood in a city that is automobile dependent will always be economically expensive to build and maintain than high density walkable neighborhoods.

Walking is good for resilience

The most reliable form of transportation is walking, and it delivers even during an important crisis. It enables safe and healthy access to our short origin-destination trips and is also a great way of leisure.

Walking is good for society

Walking to destinations gives pedestrians a chance to interact not only with the surroundings but also with fellow pedestrians and cities designed for walking also are designed to have more spaces of public congregation that is accessible for pedestrians. This consious sensitive design brings the people of society closer together.

Walkable cities are equitable cities

A successful city is a city where high income as well as marginalized populations, both use transit and active transportation as a part of their transportation needs. The cost of mobility around the city is a major expense and people from low income groups are more dependent on public transportation and walking to reach their destinations. They also shell out a higher percentage of their income for transportation purposes. Therefore, providing good walking infrastructure in a city improves accessibility of its residents while costing nothing.
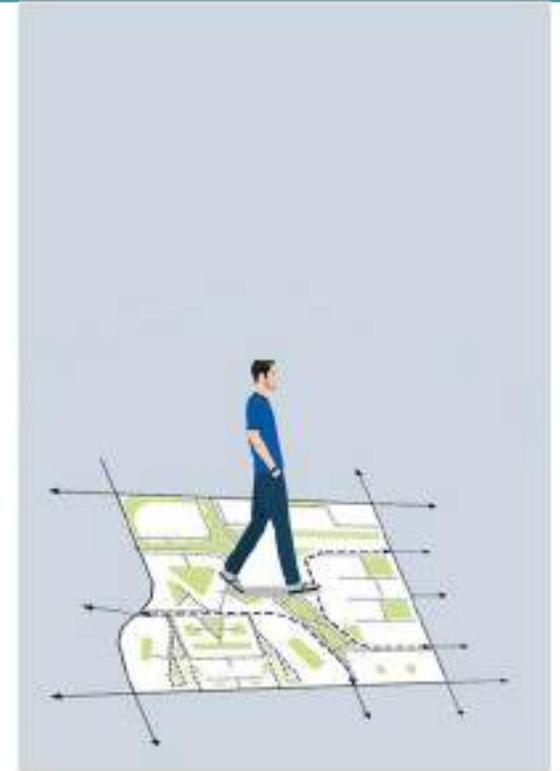
BACKGROUND AND PROJECT CONTEXT

2 BACKGROUND

ABOUT UNIVERSITY OF ILLINOIS URBANA CHAMPAIGN

The University of Illinois Urbana Champaign (UIUC) was established in 1867 as a public land grant university and is located in the twin cities of Urbana and Champaign. It enrolls over 51,000 graduate and undergraduate students every year and is one of the largest public universities. The university is known for its built infrastructure, architecture and landscape. It is regarded as a pioneer in the field of applied and basic sciences and is one of the most renowned universities in North America.

UIUC is part of the Champaign Urbana Urbanized Area Transportation Study (CUUATS), which also consists of Illinois Department of Transportation, Champaign County, the Cities of Champaign and Urbana, Village of Savoy, the Champaign-Urbana Mass Transit District (CUMTD). CUUATS is the local Metropolitan Planning Organization (MPO). Facilities & Services (F&S) Transportation Demand Management (TDM) represents UIUC at CUUATS Policy and Technical committees.

UIUC has excellent sidewalk connectivity within the campus and with its surrounding communities. **There are about 96 miles of sidewalks within our campus.** However, there is no Master Plan for the preservation and improvement of the existing infrastructure. Walking is one of the most sustainable, healthiest, and cheapest mode of transportation. Almost everyone (students, faculty and staff) walks/rolls every day in some capacity, however, investment in walking is usually not considered. University of Illinois Wellness Center at UIUC conducted a Walkability Audit in 2010-11, using the CDC Walkability Audit tool. They created an iWalk Toolkit, which talks about the health and environmental benefits of walking. However, their project did not emphasize on the preservation and improvement of the sidewalk network on campus, and it did not result in a master plan to improve walkability.

In spring 2021, the TDM department began the discussion about improving walkability of the campus, and the Campus Transportation Advisory Committee (CTAC) strongly supported a thorough Walkability Audit of the campus.

MODE CHOICE SURVEY RESULTS OF UIUC

FACULTY MODE SHARE RESULTS   STUDENT MODE SHARE RESULTS
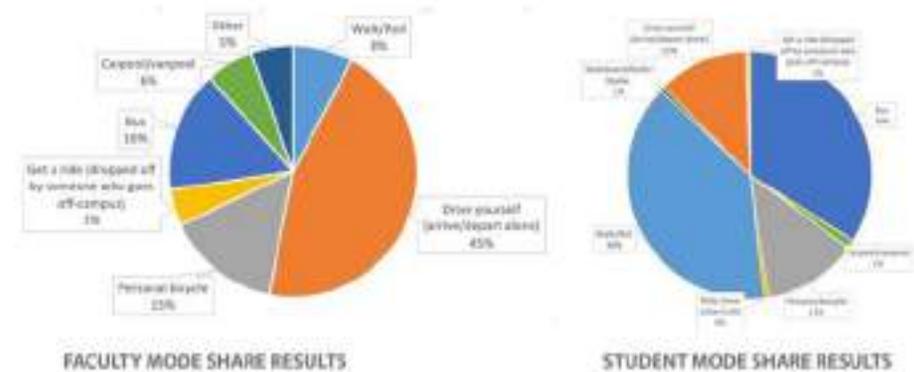
Figure: Preliminary results of the Mode Choice Survey conducted in 2022 by F&S TDM

A recent 'Mode Choice Survey' study was conducted by Facilities & Services (F&S) Transportation Demand Management (TDM) in 2022 for its students, faculty, and staff.

The main purpose of this survey is to assess our students' and employees' preferred mode of transportation. According to the survey results till date, 8% of Faculty of UIUC walk as their preferred mode of transportation whereas 39% of students walk/roll as their preferred mode to campus. It is therefore important to develop a robust walking network to support the university's faculty, staff, and students in their efforts to prioritize active transportation as their primary mode of travel.

Note: The results of the mode choice survey shown above are preliminary and the survey is ongoing, therefore, the percentages of students and faculty who walk to campus as their primary mode of travel might change.

CAMPUS CONTEXT AND ORGANIZATION

The UIUC Campus (site of audit) is located at the junction of the City of Champaign and City of Urbana. Roughly 1/3rd of land of UIUC belongs to Champaign city and 1/3rd belongs to Urbana city.

The north of the campus supports the core academic and research buildings. The core is organized around the Main Quad and the South Quad with educational buildings surrounding them. Housing zones are dispersed at various parts of the campus. The south of the campus houses the recreation, agricultural and open spaces along with the Research Park.

LEGEND

ARCHITECTURAL DISTRICTS

- CAMPUS CORE
- CAMPUS EDGE
- ATHLETICS/RECREATION
- HOUSING
- AGRICULTURAL
- RESEARCH
- SERVICE
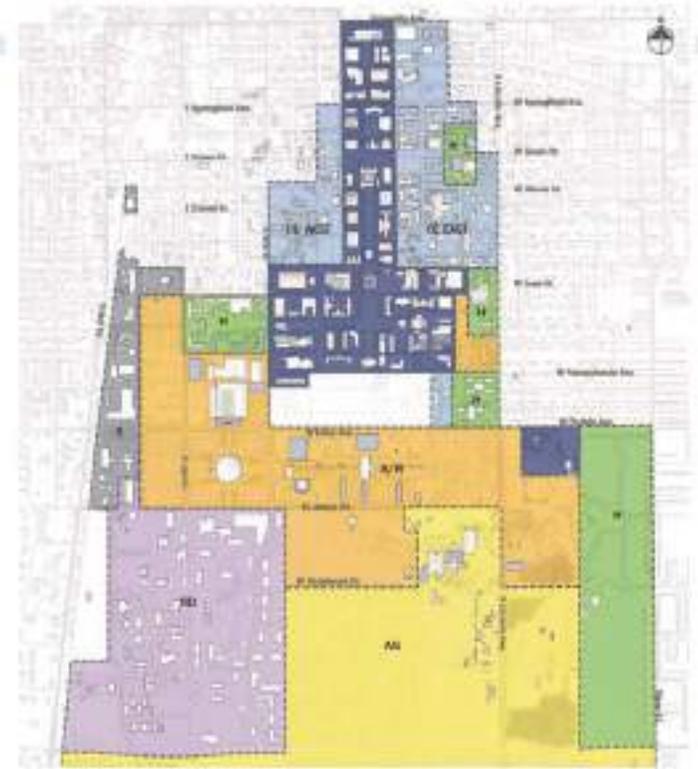
Figure: University of Illinois Urbana Champaign Zones

UIUC AT A GLANCE

96
miles of sidewalk network in the UIUC campus

51,000
number of students in UIUC campus

85%
of total students choose active transportation as their primary mode of travel

34%
of total students use public transit as their primary travel mode

39%
of total students walk/roll in UIUC Campus as their primary mode of travel

RELATED POLICIES AND
INITIATIVES OF UIUC CAMPUS
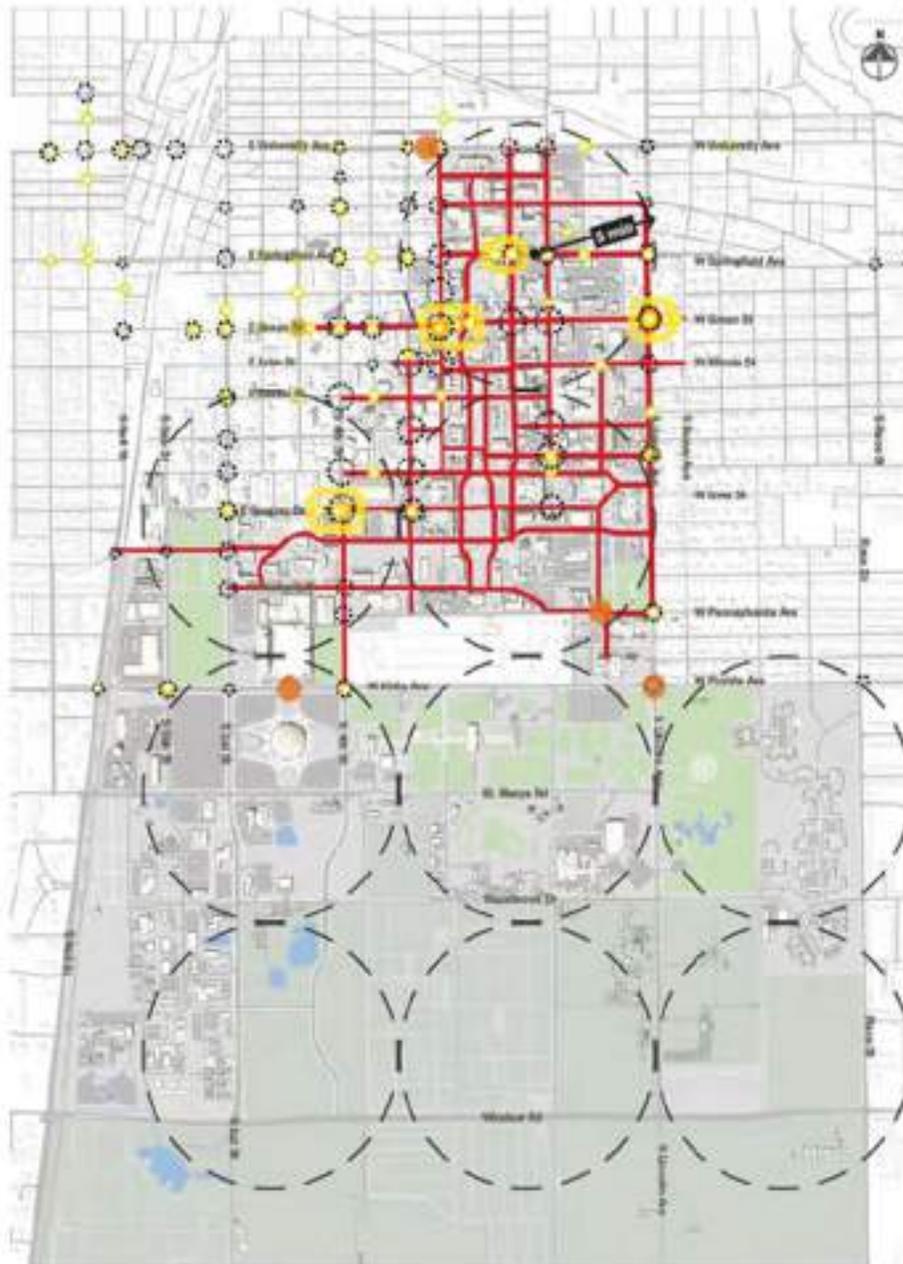
UIUC has initiated a Complete Streets policy within its campus areas.

The Complete Streets policy emphasizes pedestrian safety and accomodates the transit, bicycle, vehicle and pedestrian network to have efficient circulation without fatal encounters. It also prioritizes bicycle and pedestrian ways and gives them full consideration in the planning and development of transportation facilities.
Under the same policy, UIUC has implemented various traffic calming measures in high conflict zones of the campus and its intersections to improve pedestrian safety.

After studying the campus, four major high conflict zones have been identified. These areas of concern (as seen in the map) are:

1. Along Green Street: Between Wright street and Illini Union
2. Along Green Street: At Lincoln Avenue
3. At the corner of 4th Street and Gregory Drive
4. Along Springfield Avenue: Near Grainger Library

Areas of Concern (1) and (2) are addressed by the Multimodal Corridor Enhancement (MCore) project of the campus which was established in the year 2018. The MCore Project focuses on improving pedestrian safety along Green Street and Wright Street.

Area of Concern (3) has high pedestrian traffic due to students walking towards the housing and student residences from the core campus buildings.

Area of Concern (4) was addressed by installing several traffic calming measures visibility crosswalks and flashing beacons.

PEDESTRIAN CRASHES AND DAILY CROSSINGS

- 3 VEHICLE TO PED. CRASHES PER YEAR
- 2 VEHICLE TO PED. CRASHES PER YEAR
- 1 VEHICLE TO PED. CRASHES PER YEAR
- AREA OF CONFLICT (ILLINOIS STAFF + COMMUNITY IDENTIFIED)
- 1491 - 3204 PEDESTRIAN CROSSINGS
- 813 - 1490 PEDESTRIAN CROSSINGS
- 135 - 812 PEDESTRIAN CROSSINGS
- 0 - 134 PEDESTRIAN CROSSINGS
- AREA OF CONCERN
- MAIN PEDESTRIAN ROUTE
- 5 MINUTE WALKING RADIUS

Crash data from 2012, source: Sustainable Choices 2040: Long Range Transportation Study, 2015, Champaign Urbana Urbanized Area Transportation Study (CUUATS)

Pedestrian crossing data from 2016, source: 2016 Traffic Counts, Champaign Urbana Urbanized Area Transportation Study (CUUATS)

Figure: Map showing high conflict zones in UIUC campus

PROJECT CONTEXT

SITE OF AUDIT

Figure: University of Illinois Urbana-Champaign campus map

Figure: UIUC campus map divided into 29 map-blocks
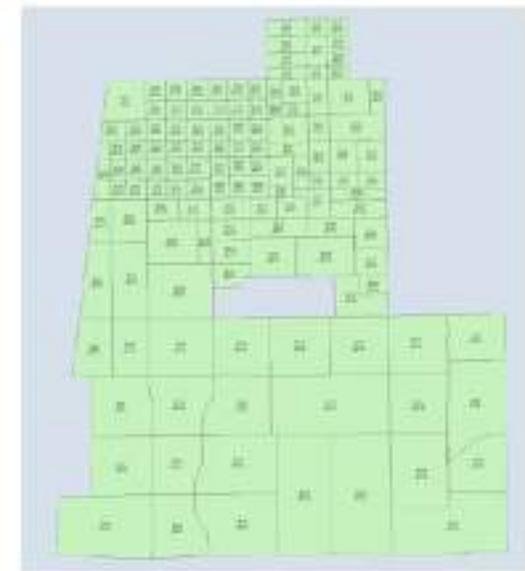
Figure: UIUC campus map divided into smaller mini-blocks for detailed analysis

The area covered in the audit encompasses the pedestrian walkways on UIUC campus, some parts of the cities of Urbana and Champaign located at close proximity to the campus.

This division of the site into smaller parts enables us to perform a detailed analysis since the experience of walking, quality of walking infrastructure and supportive amenities for pedestrians varies greatly from block to block. We use the term 'map blocks' to refer to parts of the campus which are numbered from 1-29 and sub blocks that fall under map blocks which are assigned alphabetical names. For eg., Map block 1 is divided into 3 sub-blocks called 1a, 1b and 1c. **Thus, the site of audit has been divided into 29 areas (called map-blocks henceforth) with eventual 120 subdivisions (called mini-blocks henceforth).**

Note: This division of the campus into 29 map blocks was adopted for a Bike Masterplan conducted earlier and therefore, it is chosen to delineate spaces for the Walkability Audit 2021-22 as well. This commanility in division would help future improvement projects to improve both active forms of transportation with a common framework.

SURVEY QUESTIONNAIRES

1

2021 UI Campus Walkability Audit survey:
Assesses the general walkability of the map blocks

2

2021 UI Campus Deficiency Reporting survey
Identifies specific deficiencies within a map block

As mentioned earlier, the data collection for the audit is done using 2 surveys: A general survey and a specific location based survey called the **'2021 UI Campus Walkability Audit survey'** and the **'2021 UI Campus Deficiency Reporting survey'** respectively.
Details about the 2 surveys will be explained later in the document.

TRAINING PROCESS

Preparation and distribution of **Training manual** to volunteers

+

Uploading surveys to **ArcGIS 123 Survey** App for Volunteer download and use

+

Conducting Virtual and In-person Training sessions for volunteers

=

Data collection by Volunteers

Figure: Graphic showing the steps of the Training process

ISince this audit was complex and specialised to the field of urban planning, it was important to train the volunteers who would be responsible for data collection. Therefore, I prepared an easy to understand and follow, consolidated Training Manual for the volunteers of this audit in order to explain the purpose of our project, the two surveys with questions and information about the map block divisions. This Training manual was essential to get the volunteers well versed with the technical terminologies used in the survey and to understand how to correctly collect data for the audit.

F&S and I conducted over **30 virtual and in-person training sessions** and trained our volunteers to use their own smartphones to collect data using ArcGIS Survey 123 app. The Training Manual is attached at the end of this report as an appendix.

METHODS

2 METHODS

In this project we develop a way to determine the Walkability Index of the campus of University of Illinois Urbana Champaign. The methods adopted to find the index can be divided into 3 major categories:
'***Understanding the site of Audit', 'Assessment parameters and scoring' and 'Quantifying Walkability'.***
The steps are explained in brief below and in detail in the following section.

SITE OF AUDIT

1 STUDY AREA AND EXTENTS
Study of audit area and mapping its extents (UIUC Campus)

CHAMPAIGN URBANA

UIUC CAMPUS
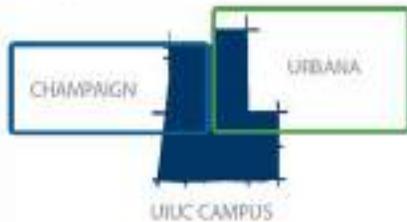
2 DIVISION OF SITE
Dividing the site of intervention for detailed analysis into 29 map blocks (120 sub-blocks)

SITE → MAP BLOCKS → SUB-BLOCKS
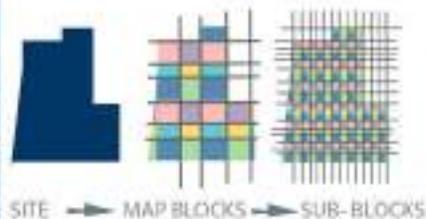
ASSESSMENT PARAMETERS AND SCORING

3 ASSESMENT PARAMETERS
Determining assesment parameters that impact walkability

PEDESTRIAN FACILITIES AND DESIGN CROSSWALKS PEDESTRIAN AND VEHICULAR CONFLICTS TRANSIT AREAS UNIVERSAL ACCESSIBILITY SAFETY WALK APPEAL
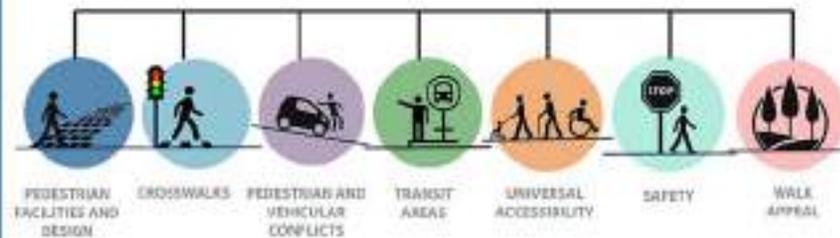
4 SURVEY QUESTIONNAIRE
Creating a balanced general survey questionnaire and adopting a 0-5 point scoring system (40 questions)

5 DETERMINING WEIGHTS
Assigning weights to assesment parameters based on impact
(High = x3, Medium = x2, Low = x1)

QUANTIFYING WALKABILITY

6 AVERAGING SCORES
Averaging scores weighted scores to calculate individual scores of each map block

7 FINAL WALKABILITY INDEX
Converting scores to a 0-100 scale to determine walkability index of UIUC Campus.

|		
1	**IDENTIFY STUDY AREA AND EXTENTS**	UIUC Campus is the chosen site for performing the Walkability audit. It has an area of 1,783 acres (722 ha). Improving the walking infrastructure in campus is important for supporting its students and therefore, a walk audit is conducted for the same every 10 years in UIUC. The first step of the audit was to map the site extents of the UIUC Campus.
2	**DIVIDE THE AUDIT SITE**	Since the campus site is rather large, it is important to divide it into smaller zones for being able to perform thorough analysis. Dividing the campus into smaller zones helps us identify areas that perform better vs ones that do not, in a much precise way. The UIUC audit site has been divided into 29 map blocks and further subdivided into120 sub-blocks.
3	**DETERMINE ASSESSMENT PARAMETERS**	An in-depth Literature review research was undertaken to identify the factors that affect the walkability of an area. It was divided into 3 types of parameters: ***Factors of the built environment, social factors and exogenous factors.*** Several WalkToolkits were studied and the most relevant factors that were relevant and important for a university were chosen. The selected parameters were finalized after taking stakeholder input during monthly iCAP and CTAC meetings. I also had weekly meetings with my F&S TDM supervisor throughout the duration of the audit project.
4 **5**	**PREPARE SURVEY QUESTIONNAIRE AND TRAIN VOLUNTEERS**	A general survey questionnaire of 40 questions were created that entailed the assessment parameters. Students and staff of the university were recruited as volunteers for data collection purposes of the walk audit. For the first phase of the data collection, the volunteers were divided into teams of 4 where 3 volunteers independently audited the same map blocks to obtain multiple perceptions of the same map block. A total of 350 general audit surveys were recorded. The volunteers were trained in virtual and in-person test data collecting sessions. They also had access to a Training Manual developed by myself.
6	**DETERMINE WEIGHTS**	Each survey question assessed a specific parameter and each parameter was given a weight of either High (x3), Medium (x2) or Low (x1). Stakeholder input was taken to finalize the weights assigned to each parameter. The results were weighted a second time based on CUUATS zones (Champaign Urbana Urbanized Area Transportation Study).
	AVERAGE SCORES	The survey questionnaire is a perception-based questionnaire which is why more than 3 records were collected for each map block. This was used to create an average weighted score of each map-block. Averaging scores from multiple volunteers enables us to get more realiable results.
7	**DETERMINE THE OVERALL WALKABILITY INDEX**	The final Walkability Index of the campus was determined with the help of averaging scores across all the map blocks on a scale of 0-100. Several other analyses were conducted using the same scores. Thematic as well as spatial outcomes of the scores were mapped and put into graphs. Each map block was also individually assessed to find the paramters it scored best and worst at.
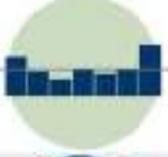
SITE → MAP BLOCKS → SUB- BLOCKS

ASSESSMENT PARAMETERS

The 2021 Campus Walkability Audit Survey comprises of 40 questions. Each question in the survey relates to and measures a specific assessment parameter. These parameters were identified after a thorough research of direct and indirect factors that affect Walkability. Several Walk toolkits and Walk audits were reffered to and parameters that made sense for a university community were chosen. The parameters along with the questions were discussed in several stakeholder meetings and the following were chosen as the final parameters for our audit. They are divided into several major categories. Each category and its parameters are explained in the following pages:

PEDESTRIAN FACILITIES & DESIGN

The design of walking infrastructure plays a crucial role in influencing travel behaviour.
Residents of a city are more prone to choose active modes of travel for either origin-destination trips or for leisure trips if there is adequate and well maintained infrastructure to support it. This infrastructure can be divided into the following factors of assessment.

SIDEWALK PRESENCE

More often than not, sidewalk networks are incomplete with paths only along one side of a street. This characteristic is often inconvinient for physically impaired users since it requires them to cross streets to access a walking or rolling surface to reach their destination.

PEDESTRIAN WALKING SURFACE

The walking surface of a route is a major determining factor for users to choose to walk along.
Regular maintenance is crucial for promoting active transportation lifestyles amongst residents.

SIDEWALK ALTERNATIVE

Sidewalk alternatives are unofficial areas that can be used for walking or rolling in areas that do not have a pre-designed sidewalk. It might include spaces like buffer parkways, street shoulders, unpaved pathways etc. It is not a convinient path to travel but provides an alternative.

SIDEWALK AMENITIES

Amenities that complement a walking trip for pedestrians are benches, trash cans, recycling bins, shaded spaces for rest, telephone helplines, transit schedules etc. These are important aspects that support pedestrians.

PEDESTRIAN FACILITIES & DESIGN

SIDEWALK WIDTH

The University of Illinois Urbana Champaign standard of sidewalk width is 6 feet (1.83 m).

Public congregation areas that are used by majority of the students have wider widths (> 6 feet). For eg. Main Quad and Bardeen Quad etc.

SIDEWALK CAPACITY

The width of a sidewalk network is determined by the peak hour capacity of use. In the case of our site of intervention which is the UIUC campus, peak hours are during class change times ie. 8:50, 9:50 am, 12:30 pm and 3:30 pm.

TEMPORARY/PERMANENT OBSTRUCTIONS

Temporary or permanent obstructions present along the sidewalk often disrupts the flow of pedestrians and can also pose as safety hazards. They make the path less accessible and therefore less walkable. Our study documents temporary as well as permanent obstructions in the 'Deficiency Reporting survey'.
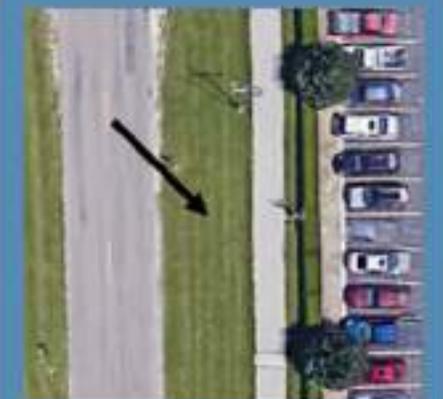
SIDEWALK BUFFER

A buffer is the area between the sidewalk and the street (signified by the arrow above). It can made up of a variety of materials, for eg. planting strips, street furniture or of any other material.

Sidewalk buffers signify the physical separation of pedestrian and vehicular traffic and promote safety while walking/ rolling.

CROSSWALKS

PEDESTRIAN AND VEHICULAR CONFLICTS

Crosswalks are one of the pedestrian facilities that act as transition spaces that connect the sidewalk network snd increase accessibility to destinations. Crosswalks are the point of contact between vehicles and pedestrians and therefore, they need to be designed and maintained well.

17% of all traffic fatalities in the US are pedestrians, 76,000 pedestrians die per year due to collisions with automobiles (NHTSA). Introducing traffic calming measures in high conflict zones is important to manage encounter free circulation of vehicles and pedestrians.

CROSSWALK SURFACE CONDITION

Zebra cross lines or parallel white lines are used to signify a crosswalk. It is important for crosswalks to be well maintained as a smooth transition space for pedestrians to cross over to different sidewalks.

CROSSWALK SIGNALIZATION

A variety of traffic and pedestrian signals are found at signalized crosswalks including traffic signals with standard pedestrian signal heads and, in some locations, traffic signals with pedestrian countdown signals which show pedestrians how much crossing time remains. Signalized crosswalks may also have pedestrian pushbuttons which are electronic buttons used by pedestrians to change the traffic signal timing.

ENCOUNTERS

High conflict zones between pedestrian and vehicular traffic are most prevelent in heavy foot traffic areas that are located along the streets. For eg., Green Street crossing.

It is important to design efficient crossings for conflict free cross over of vehicles as well as pedestrians.

TRAFFIC CALMING MEASURES

The primary goal of introducing traffic calming measures are to create safe streets and help to reduce the speed of motor vehicles, promote pedestrian, cycle and transit use simultaneously.

Measures like speed bumps, flashing beacons, narrow streets and curb extensions are all designed to slow down traffic flow to make it less dangerous for crossing pedestrians.

TRANSIT AREAS

Every vehicular trip starts and ends with walking. Therefore, the sidewalk network of a place needs to be well connected to its complementary transit areas for seamless transition for users. Transit areas also need to have certain amenities that aid users a wholistic experience.

TRANSIT STOP TYPOLOGY AND DISTANCE

Increased frquency of transit stops increases accessibility and connectivity of the transportation network.

TRANSIT STOP AMENITIES

The presence of amenities like Transit schedules, emergency helpline, trash and recycling bins, seating etc. supports user experience immensely.

PARKING CONNECTIVITY

Since each vehicular trip starts and ends with walking, it is important for parking facilities to be connected to the larger pedestrian network. This connectivity improves universal accessibility to a great extent.

BIKE INFRASTRUCTURE

Active transportation consists of bicycling as well as walking. Various types of bike infrastructure can be provided in order to support cycling. For e.g.- On Street bike lanes, off street bike lanes, bike sharrows etc.

UNIVERSAL ACCESSIBILITY

In addition to good design and safe accommodation, accessibility is an intrinsic part of planning, retrofitting, constructing, and maintaining pedestrian facilities.
The Americans with Disabilities Act (ADA) Title II requires public entities (state and local governments) to ensure that all public facilities and services are barrier free and readily accessible to and usable by individuals with disabilities.

WHEELCHAIR ACCESS

One of the goals of this walkability audit is to make our campus 100% ADA complaint. Most of the campus areas are designed to facilitate smooth wheelchair access.

 ADA signs also should be posted at every building entrance signifying which entrace is designed to cater to it.

CURB CUT PRESENCE

Curb- cuts are gradual slopes present at the junction of sidewalks and crosswalks that enable a smooth transition for users to move from one space to another, specially users with disabilities. It is often accompanied by a detectable warning detail like truncated domes or vertical strips.

CURB CUT ALIGNMENT

Misaligned curb-cuts defeat the whole purpose of constructing a curb cut in the first place. Its important for surfaces to be barrier free and have gradusl slopes without height differences for wheelchair users/ vision impaired users to walk or roll across them without tripping.

TEXTURE DIFFERENCES

Textural differences are often introduced along a section of the sidewalk that is adjacent to the street. It alerts visually impaired individuals of road proximity, textural changes and other potential hazards.

UNIVERSAL ACCESSIBILITY

ADA RAMPS

ADA ramps are gradual slopes that enable wheelchair users a convinient ramp to move from one level to another.

These are important additions at each building entrance to facilitate universal accessibility.

BUILDING ENTRANCES

Building entrances are zones of high traffic and the most used part of a building.

The surfaces of building entrances need to be well maintained and barrier free, ADA accessible and navigable by all users.

SIDEWALK CONNECTIVITY

The sidewalk network is not a standalone entity. It needs to be integrated with other landuses. Comfort, continuity and safety determine the success of a sidewalk. Well-planned sidewalks are continuous – not stopping abruptly mid-block or at road crossings – and provide space for pedestrians to move around, sit, shop, eat, meet and socialize.

SAFETY

More the number of people in a public space, the safer it feels.

EYES ON THE STREET

According to renowned author of 'Death and Life of American Cities' Jane Jacobs wrote that in order for a street to be a safe place, "there must be eyes upon the street, eyes belonging to those we might call the natural proprietors of the street."

The number of people using the sidewalk infrastructure along a street heightens the safety by increasing public vigilance.

PERCEIVED SAFETY

Poorly designed streets with several poorly lit corners and areas away from public eyeline encourages criminal or illegal activities. Perfectly usable sidewalks are often abandoned due to the anticipation of crime since they lack the sense of safety.

This survey assesses this as a perception based question and asks volunteers to document their sense of perceived safety.

PEDESTRIAN VISIBILITY ALONG SIDEWALKS

Inherent design of sidewalks or obstructions along a sidewalk can often conceal the movement of pedestrians from vehicle users.

This is an important factor to consider since pedestrian and vehicular encounters often occur due to lack of visibility of pedestrians.

PEDESTRIAN VISIBILITY ALONG CROSSWALKS

Inherent design of crosswalks or obstructions along a crosswalk can often conceal the movement of pedestrians from vehicle users.

Designing crosswalks to facilitate visibility of users is extremely important since crosswalks signify the physical point of intersection between vehicular and pedestrian traffic and are high conflict zones.

WALK APPEAL

Designing aesthetically pleasing and comfortable walking routes greatly increases the chance that more people will choose to walk as a form of active transportation. Active Living Research indicates that economic, social, and public safety benefits of specific street-scale, built environment features promote walking and biking. During the audit, participants observe whether features present nearby add to the comfort and appeal of an area or not.

LANDSCAPING

A wholistic built environment that encourages walking has aesthetically pleasing lansdcape elements to compliment the walk of a pedestrian.

SHADE

Shade is often derived from landscaped areas or from constructed sheds or overhangs. Shaded spaces along a sidewalk provide crucial rest and relief from harsh weather conditions. Pedestrians would be more encouraged to walk along shaded sidewalks as compared to their unshaded sidewalks.

AESTHETICS

A visually appealing walk spurs liesurely walking trips and often influences travel behaviour positively. The strongest of our 5 senses is vision. Therefore aesthetically pleasing sidewalks are bound to have more foot traffic versus a visually unpleasant/ barren one.

OVERALL APPEAL

Designing aesthetically pleasing and comfortable walking routes greatly increases the chance that more people will choose to walk as a form of active transportation.

All the aforementioned features (landscape, shade and aesthetics) come together to make a space appealing.

HEIRARCHY PYRAMID FOR NEEDS OF WALKABILITY

Figure: Heirarchy of walking needs (Alfonzo, 2005 & William Warren Riggs, 2011)

The hierarchy pyramid that specifies the needs for walkability on a pyramid essentially signifies that only providing walking infrastructure is not adequate to encourage walking. There exist several other factors that influence an individual's decision to walk. As shown in the image, there are six levels of needs for walkability, four of which directly relate to the built environment. Some of these factors are more fundamental to others.

Feasibility > Exogenous Factors>Accessibility > Safety > Comfort > Pleasurability

 Equity is a parameter that crosses boundaries and needs to be present as a part of each step of the pyramid to ensure universal access to walking.
Basic needs that are fundamental to walking need to be met before higher uncritical needs but both these influence higher levels individuals choosing to walk.
Travel is a derived demand and walk trips generally originate from a O-D (origin-destination) based travel. However, several individuals take walk trips for leisure and recreational purposes and therefore it is equally important for the walking infrastructure to not only be feasible but also interesting, diverse, comfortable and pleasurable.

This pyramid is adopted from the work of Alfonzo and William Warren Riggs.
The weights established in our walk audit of the UIUC campus directly co-relate to the pyramid and were adopted while deciding the weights of the scoring system.

Feasibility: If the walk is physically possible
Factors:
• Mobility
• Time
Can be identified in the form of:
• Sidewalk presence on both sides of the street
• Adequate crosswalks for optimum connectivity to destinations

Exogenous factors: Inpedendent variables that affect walkability
They can be factors specific to the region like:
topography, race and ethnicity, climate of the area etc.

Accessibility: If the walk is accessible to all strata of individuals
Indicating factors:
• Pattern, quantity, quality, variety, proximity of activities present
• Connectivity between uses
• Universally accessible infrastructure
Can be identified in the form of:
• Presence/completeness of sidewalk network
• Presence of the number of barriers
• Distance to destinations
• Frequency of destinations
• Availability of ADA accessible infrastructure

Safety: If the walk feels safe with respect to crime
Indicating factors:
• Design of spaces to combat crime and fear of crime
• Placement of land uses
• Number of people present
Can be identified in the form of:
• Presence of graffiti, abandoned buildings, litter etc.
• Presence of liquor stores or bars
• Presence of threatening individuals

Comfort: If the walk feels comfortable
Indicating factors:
• Design characteristics that affect the relationship between pedestrians and automobile drivers
• Sidewalk amenities and transit stop amenities available for pedestrian use
Can be identified in the form of:
• Presence of traffic calming measures
• Adequate width of sidewalk, length of blocks, presence of sidewalk buffers, presence of trees and shade
• Presence of street furniture, canopies, water fountains etc.

Pleasurability: If the walk is interesting or welcoming enough for pedestrians
Indicating factors:
• Diversity and complexity
• Street liveliness in the form of activity levels
• Aesthetic appeal of the street
Can be identified in the form of:
• Presence of diverse streetscape, mixed land uses, architectural elements or color presence
• Presence of public spaces for congregation

SCORING SYSTEM

WEIGHTED SCORING PROCESS

Each question of the general survey was assigned a score from 0-5 (5 signifying the best conditions vs 0 signifying the worst conditions). The overall scoring process for the entire walkability audit was weighted. This means that certain categories had a greater contribution to the overall score. In order to get the total walkability score for all map blocks, the total walk audit score was tallied for the entire walk audit area. **The scores from the high importance categories were added together and multiplied by three. The scores for the medium importance categories were added together and multiplied by two. The scored from the low importance category was multiplied by one.** All three sub scores were then added together to get the total walkability score.

HOW THE SCORES WERE DETERMINED

The ranking score was divided into high, medium, and low importance categories. The score was then weighted in terms of importance.

The **high** importance category includes crucial factors like: **Sidewalk presence, Pedestrian walking surface, Sidewalk alternative, Temporary/Permanet Obstructions, Pedestrian and Vehicular Encounters, Crosswalk condition, Detectable Warning Details, Wheelchair access, Curb cut presence, Curb cut alignment, Percived safety, Pedestrian visibility along sidewalks, Pedestrian Visibility Along crosswalks.**

The **medium** importance category includes: **Sidewalk width, Sidewalk capacity, Building entrances, Sidewalk connectivity, Transit stop distance, Parking connectivity to walkways, Bike infrastructure, Eyes on the street, Landscaping and Aesthetics.**

The **low** importance category includes: **Sidewalk amenities, Sidewalk buffer, Traffic Calming measures, Texture differences, Transit stop typology, Transit stop amenities, Parking, Shade.**

HIGH x 3

MEDIUM x 2

LOW x 1

OVERALL SCORE

To find the overall average walkability score of each map block the scores for each sub - blocks were added together and divided by the number of mini blocks in the larger map block.

PEDESTRIAN FACILITIES AND DESIGN		
SIDEWALK PRESENCE		H
PEDESTRIAN WALKING SURFACE		H
SIDEWALK ALTERNATIVE		H
SIDEWALK AMENITIES		L
SIDEWALK WIDTH		M
SIDEWALK CAPACITY		M
TEMPORARY/ PERMANENT OBSTRUCTIONS		H
SIDEWALK BUFFER		L

PEDESTRIAN AND VEHICULAR CONFLICTS		
PEDESTRIAN AND VEHICULAR ENCOUNTERS		H
TRAFFIC CALMING MEASURES		L

CROSSWALKS		
CROSSWALK CONDITION		H
DETECTABLE WARNING DETAILS		H

UNIVERSAL ACCESSIBILITY		
WHEELCHAIR ACCESS		H
CURB CUT PRESENCE		H
CURB CUT ALIGNMENT		H
TEXTURE DIFFERENCES		L
ADA RAMPS		H
BUILDING ENTRANCES		M
SIDEWALK CONNECTIVITY		M

TRANSIT AREAS		
TRANSIT STOP TYPOLOGY		L
TRANSIT STOP DISTANCE		M
TRANSIT STOP AMENITIES		L
PARKING		L
PARKING CONNECTIVITY TO WALKWAYS		M
BIKE INFRASTRUCTURE		M

SAFETY		
EYES ON THE STREET		M
PERCEIVED SAFETY		H
PEDESTRIAN VISIBILITY ALONG SIDEWALKS		H
PEDESTRIAN VISIBILITY ALONG CROSSWALKS		H

WALK APPEAL		
LANDSCAPING		M
SHADE		L
AESTHETICS		M
WALK APPEAL RATING		H

Figure: Parameters of walkability categorized into **High, Medium and Low** impact divisions.

MEASURING WALK SCORE

Walk Score measures the walkability of any address using a patented system. For each address, Walk Score analyzes hundreds of walking routes to nearby amenities. Walk Score also measures pedestrian friendliness by analyzing population density and road metrics such as block length and intersection density. The image below shows the map of the National Walkability Index of the twin cities of Urbana and Champaign.
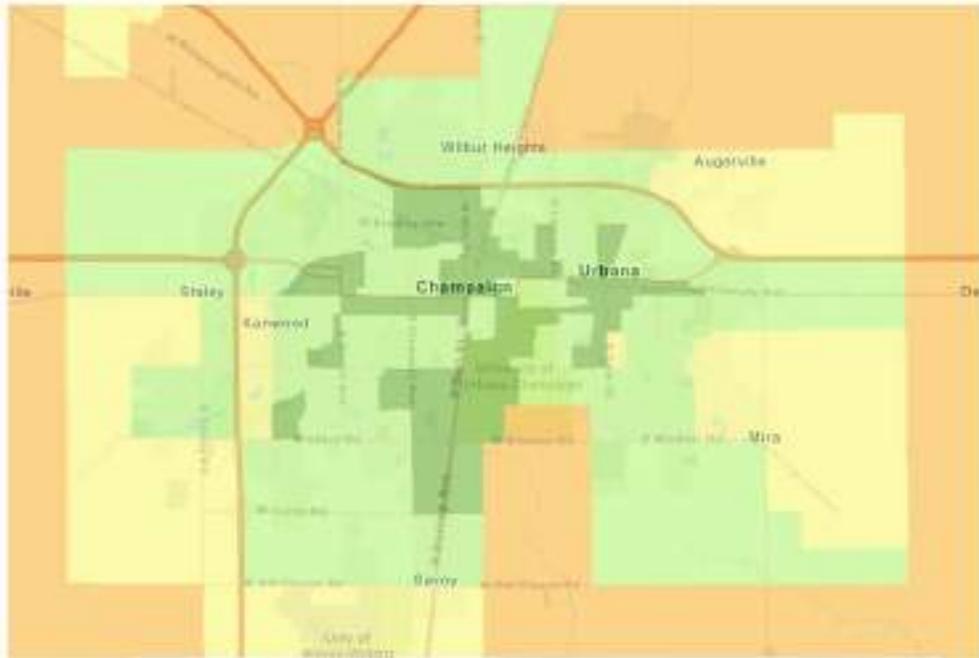

Figure: National Walkability Index Map of Urbana Champaign

NationalWalkabilityIndex

- 1 - 5.75 (Least Walkable)
- 5.76 - 10.50 (Below Average Walkable)
- 10.51 - 15.25 (Above Average Walkable)
- 15.26 - 20 (Most Walkable)

Urbana-Champaign has an average Walk Score of 51.
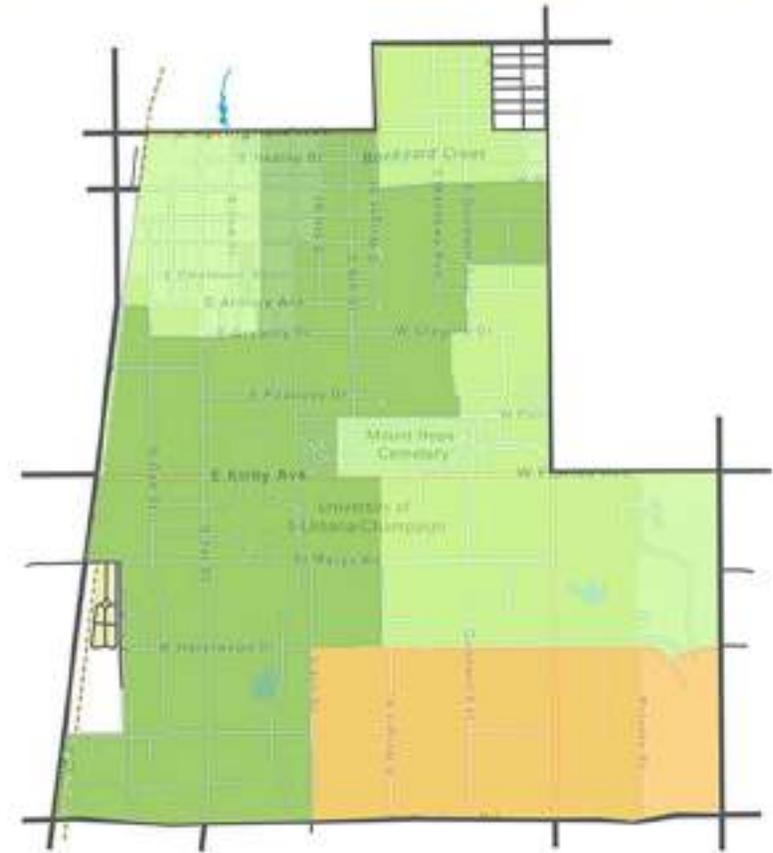
Figure: National Walkability Index Map over UIUC Campus

This map above shows the National Walkability Index map superimposed over the site of audit. Later in this document, as we find that our assessment of walkability in our campus closely matches the findings of the National Walkability index with the core campus areas being the most walkable (seen here in darker green colour) and the south of the campus being the least walkable (seen here in orange).

NATIONAL WALKABILITY INDEX VS WALKABILITY AUDIT 2021-22 UIUC
This national index gives us a basic idea of how walkable our neighborhoods are but the system that has been developed by this audit to measure walkability is much more exhaustive, considers many more parameters that affect walkability and gives us a much elaborate look at the spaces that are excellent for pedestrians versus the ones that are not. It also has a smaller units of analysis or divisions of the built environment to give us a clearer outcome.
In short, our audit is a deep dive or a micro analysis of the campus site.

SURVEYS

2021 UI CAMPUS WALKABILITY AUDIT SURVEY

The **2021 UI Campus Walkability Audit survey** is the first survey of the Walkability audit. It is designed to assess the general walkability of each map block. Each question is based on a specific assessment parameter and the training manual explains how to answer these questions.

The first few questions are surveyor specific questions that ask the volunteer how they choose to collect the audit data, which map block the data is being collected for etc., the second set of questions are contextual questions that assesses the land use of the map block and the type of built environment it has. The next section called 'Pedestrian Facilities and Design' section has several sub sections that are targeted to knowing the elements of the pedestrian network like Sidewalks, Crosswalks, Conflicts, Transit areas, Universal accessibility etc. The following sections assess the map blocks in a wholistic way for Safety and Walk Appeal. The last section called Other leaves room for a text answer for the volunteers where they can write a few lines about their concerns, or comment on the map block in a way they see fit.

This survey entails 40 questions divided into the following categories:

**Figure:** Sample graphic showing General Walkability Audit surveyin the ArcGIS 123 App
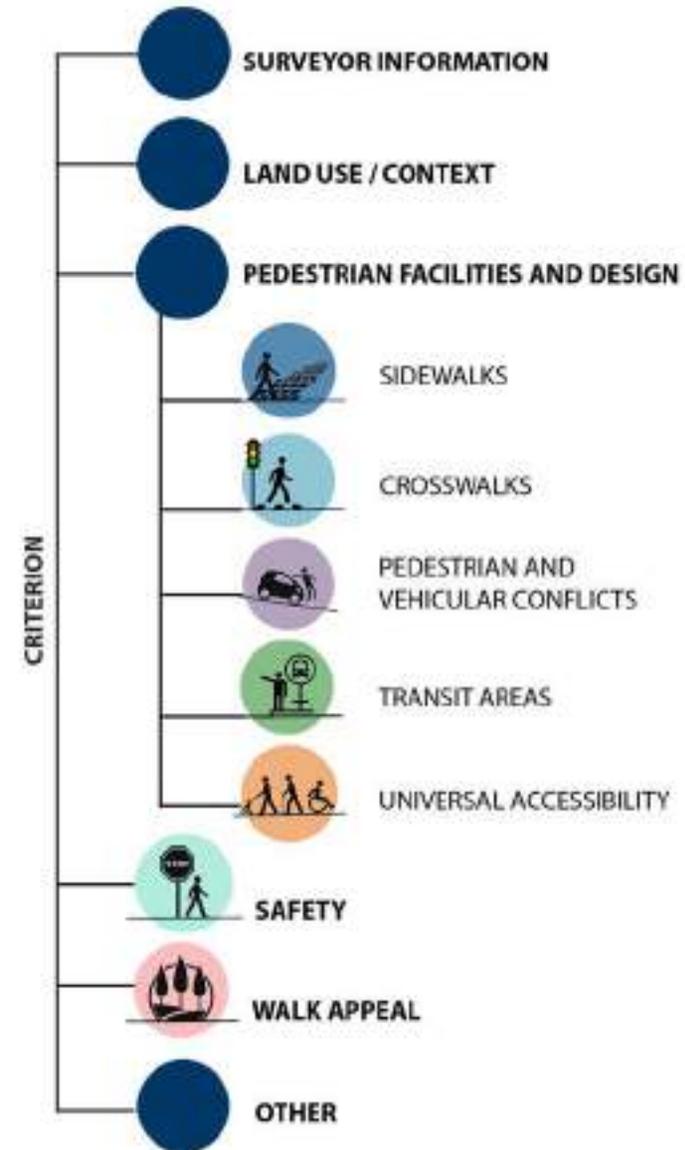
Figure: Sample graphic showing various categories of the general survey

2021 UI CAMPUS DEFICIENCY SURVEY

The **2021 UI Campus Deficiency Reporting survey** is the second survey of the audit. It is designed to assess the specific faults within each map block. The ArcGIS Survey 123 App automatically records the geo location of volunteers while entering details of deficiencies. Each deficiency falls within a specific category, which further opens a list of dropdown options to choose from.
This survey will create a crucial resource with not only multiple records of what kind of faults lie within our campus but will also provide specific coordinates of those faults.

Each recorded fault will also have an image attached to it for future reference.
This location based survey enables us to pin point the exact location of deficiencies in our sidewalk network and match it to which entity is responsible for maintaining it. This database of 2000+ records will be shared with our collaborators, entities responsible and other campus masterplan projects as a consolidated data list to refer to for future campus improvement projects.

The following are the various deficiency categories of the Deficiency Reporting survey:

A. SIDEWALK ATTRIBUTES

B. TEMPORARY OBSTRUCTIONS

C. PERMANENT OBSTRUCTIONS

D. SIDEWALK MAINTENANCE

E. CROSSWALK MAINTENANCE

F. ACCESSIBILITY

G. CONNECTIVITY

H. WALK APPEAL

I. OTHER
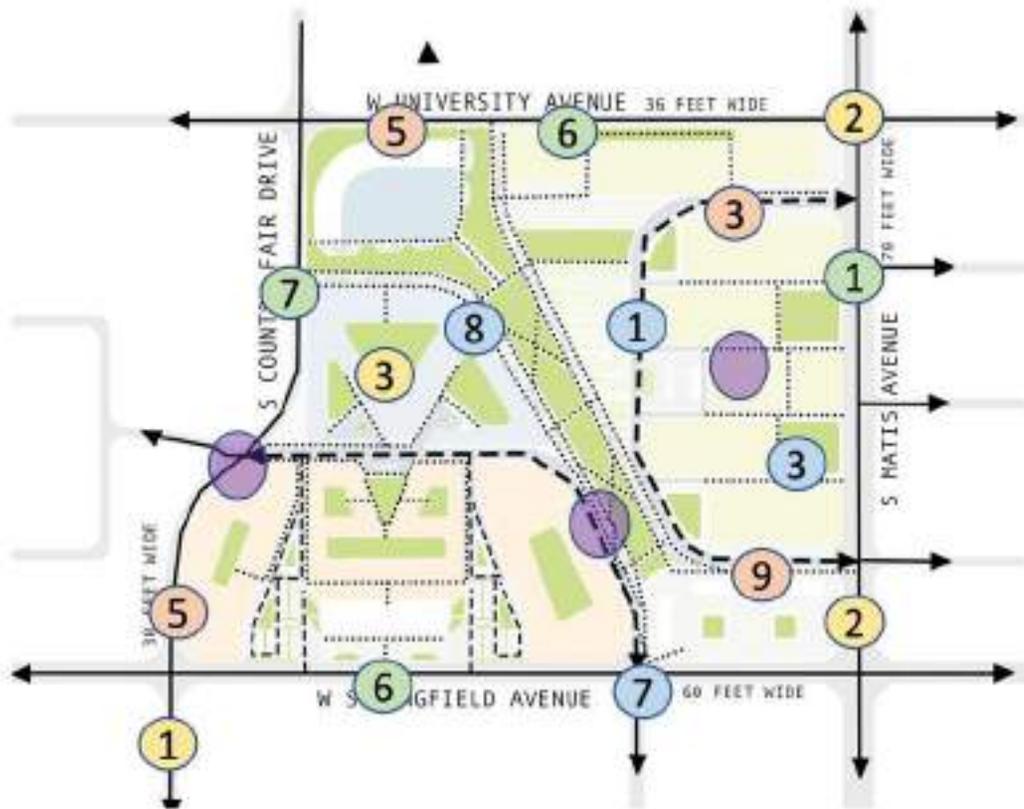
Figure: Sample graphic showing Deficiency reporting process on a specific map block

The following page shows the various lists of deficiencies that fall within the categories. The last category called 'Other' is where the volunteers can add deficiencies that are not listed.

DEFICIENCY SURVEY CATEGORIES

This page shows the list of possible deficiencies under the selected categories. All these lists are available as a drop down menu in the ArcGIS Survey 123 App for ease of access and faster data collection by volunteers.

SIDEWALK ATTRIBUTES

1. No sidewalk - a stretch of road that does not have a sidewalk
2. No buffer present - along a stretch of sidewalk
3. Insufficient lighting along sidewalk
4. Insufficient lighting at the intersection
5. Insufficient lighting throughout the crosswalk
6. Proximity to high-speed vehicular traffic
7. Sidewalk narrowing- sidewalk width reduces mid-block (< 6 ft university standard)

SIDEWALK MAINTAINENCE

1. Vertical fault (tripping hazard or more than ¼ inch)
2. Cracks (less than 4 ft of accessible sidewalk)
3. Cracks (more than 4 ft of accessible sidewalk)
4. Vegetation growth on the sidewalk like weeds (not obstructing the Sidewalk)
5. Ice / water pooling
6. Snow deposit
7. Sidewalk panel(s) have worn down and damaged causing obstruction

CROSSWALK MAINTAINENCE

1. Unmarked crossing
2. Crosswalk marking has faded
3. Potholes in the crosswalk
4. Loose pavement (top layer of crosswalk has deteriorated)
5. Insufficient timing of crosswalks
6. Lack of curb cuts
7. Detection warning details missing
8. No signage for pedestrian crossing
9. Driveway apron has maintainence issues (potholes, cracks, etc.)

ACCESSIBILITY

1. Lack of enclosed/covered MTD shelters – bus pads
2. Building entrances marked as ADA do not seem to be compliant
3. ADA ramps leading to the building are not easily located
4. Building's ADA entrance is not indicated
5. Inaccessible push buttons

TEMPORARY OBSTRUCTIONS

1. Parked cars
2. Sandwich boards
3. Trash/ recycling bins
4. Benches/ chairs
5. Construction
6. Veo bike (s)

PERMANENT OBSTRUCTIONS

1. Trees obstructing the sidewalk
2. Light poles or utility poles
3. Signposts
4. Overgrown vegetation- shrubs/grass (less than 4 ft of accessible sidewalk
5. Raised Manhole or utility in the sidewalk

CONNECTIVITY

1. Discontinuous sidewalk- A chunk of the sidewalk is missing
2. Sidewalk ends abruptly and does not continue
3. Sidewalk lacks connectivity to building entrances or parking facilities

WALK APPEAL

1. Insufficient shade as seasonally needed
2. Lack of aesthetically pleasing landscape
3. Presence of litter/ trash on ground
4. Presence of graffiti

DATA ANALYSIS AND RESULTS

RESULTS OF THE WALK AUDIT -IN BRIEF

The analysis of the results of the walk audit have been performed in several different ways. The results of the 2 surveys have been divided as follows:

- **RESULTS OF THE 2021 UI CAMPUS WALKABILITY AUDIT SURVEY**
First, the *'Overall Walkability index'* of the campus was determined as a consolidated weighted average of all the scores of the map block divisions. It was found to be 76.2/100. The result of this is represented in the form of a chloropleth map showing the darker areas which scored high and lighter areas that scored low.
After this macro analysis, a series of micro analyses were performed.
The section called the *'Individual category scores'* *was a section where results* were first assessed **thematically through graphs and tables and also spatially through a series of maps.** The scores were calculated not only across map blocks but also across assessment parameters to identify the best and worst performing categories.
The next major section of analysis was the *'Highest and Lowest scoring map blocks'.* This analysis pin-pointed the best and worst performing map blocks and listed their characteristics that contributed to their positions in detail.

- **RESULTS OF THE 2021 UI CAMPUS DEFICIENCY REPORTING SURVEY**
The result of this survey records each deficiency entered and colour codes it to show them on a map of the campus. More than 2000+ deficiency points were recorded and overlayed above the campus map. Each Deficiency category has a specific colour and the number of deficiencies of each category were recorded. In this way, we found which deficiency categories had the highest number of records - *'Highest Deficiency category'.* It was found that the campus had the most issues under 'Sidewalk Maintenance', 'Crosswalk Maintenance' and 'Accessibility Issues'. All these parameters were explored further and the results are expanded on in the following sections.

The next section of recommendations is directly based on the results of the walk audit mentioned above.

WALK AUDIT - AT A GLANCE

75

Number of volunteers
in the walk audit

350+

General walkability
audit records collected
of UIUC campus

2000+

Deficiency Reporting
records collected of
UIUC campus

30

In-person and Virtual
Training sessions
conducted for volunteers
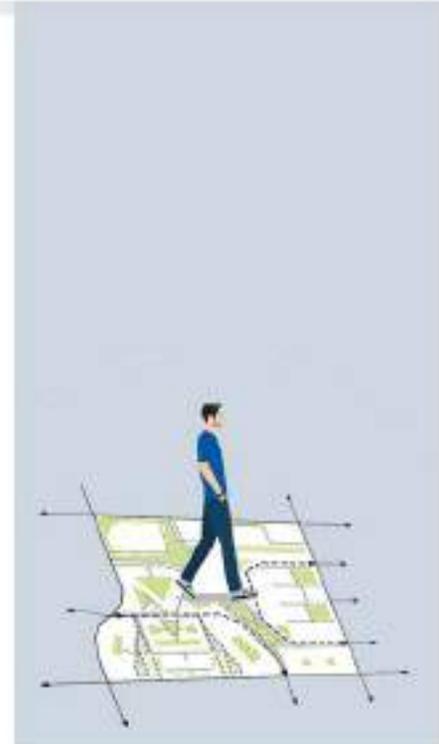
OVERALL WALKABILITY INDEX
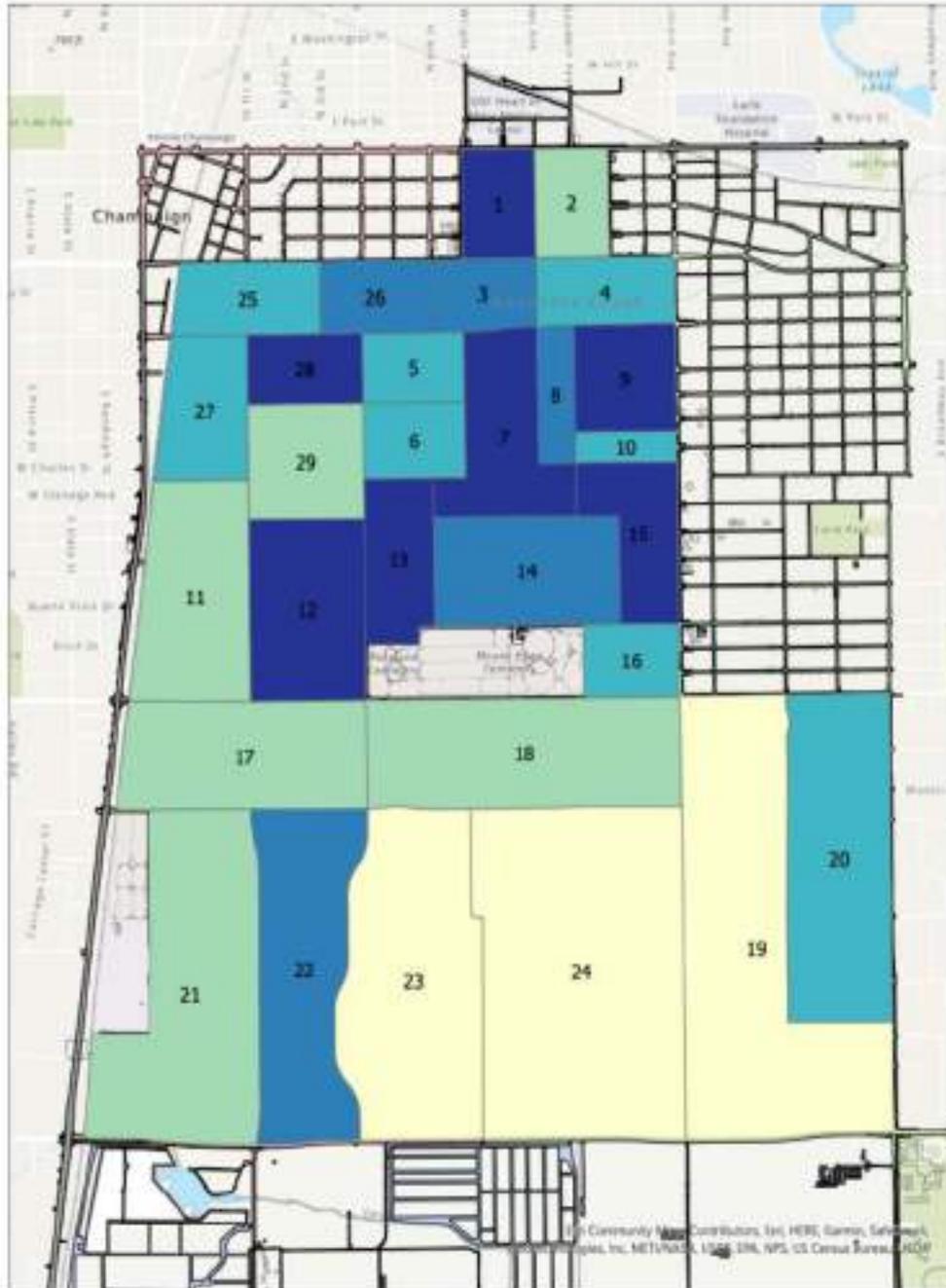
Figure: Map showing map blocks with high and low walkability scores in UIUC Campus

OVERALL WALKABILITY SCORE FOR UIUC CAMPUS

Overall, the University of Illinois Urbana Campus was found to be very walkable. The overall score of the entire campus was 76.2/100. See Figure for a visual representation of the UIUC campus.

The darker areas signify high scores and the lighter areas signify lower scores. The campus core areas with a higher density of campus buildings consistently performed better and received high average weighted scores whereas the peripheral campus areas which were mostly vacant with green space expanses near the south of the campus scored lower than average.

This map represents the culmination of all the weighted assessment parameters of the audit. **The highest scoring map blocks were: Map block 1, 7, 9, 13 and 15 and the lowest scring map blocks were 19, 23 and 24.**

Overall Walkability Index:
76.2/100

AVG SCORES

Poor Walkability	0-25	
Average walkability	25-49	
Somewhat Walkable	50-69	
Very Walkable	70-89	
Walkers' Paradise	90-100	

MAP BLOCKS	SCORES	MAP BLOCKS	SCORES
1	87.6	17	70.1
2	67.7	18	64
3	81	19	33.3
4	75.9	20	75.1
5	75.3	21	67.5
6	76.3	22	78.9
7	84	23	53.3
8	78.1	24	44.6
9	83.7	25	76.8
10	76.3	26	79.8
11	71.6	27	76.2
12	86.2	28	82.5
13	83.5	29	67.8
14	80	WEIGHTED AVERAGE	76.2
15	86.8		
16	74.2		

INDIVIDUAL CATEGORY SCORES

INDIVIDUAL CATEGORY SCORES:
Each individual category was analyzed to find the average ranking out of 5 for each map block for the entire campus. The ranking scale included: 1-poor/major issues, 2-some problems, 3-satisfactory or neutral, 4-good, 5-excellent.

The **highest** scoring parameters were that scored avove 3.8/5 were:
Sidewalk Presence, Temporary and Permanent obstructions, Sidewalk Lighting, Curb Cut Presence, Curb Cut alignment, Building entrances, Sidewalk Connectivity, Transit stop distance, Parking connectivity, Perceived Safety, Pedestrian Visibility along sidewalks and crosswalks, Landscaping, Walk Appeal

The **lowest** overall ranking parameters that scored below 3/5 were:
Sidewalk buffers, Wheelchair Access, Pedestrian and Vehicular Conflicts

The medium catory parameters were as follows:
Sidewalk Maintenance, Sidewalk Alternate, Sidewalk Width, Sidewalk Capacity, Crosswalk condition, Detectable warning details, Texture differences, ADA ramps, Bike Infrastructure, Shade, Aesthetics
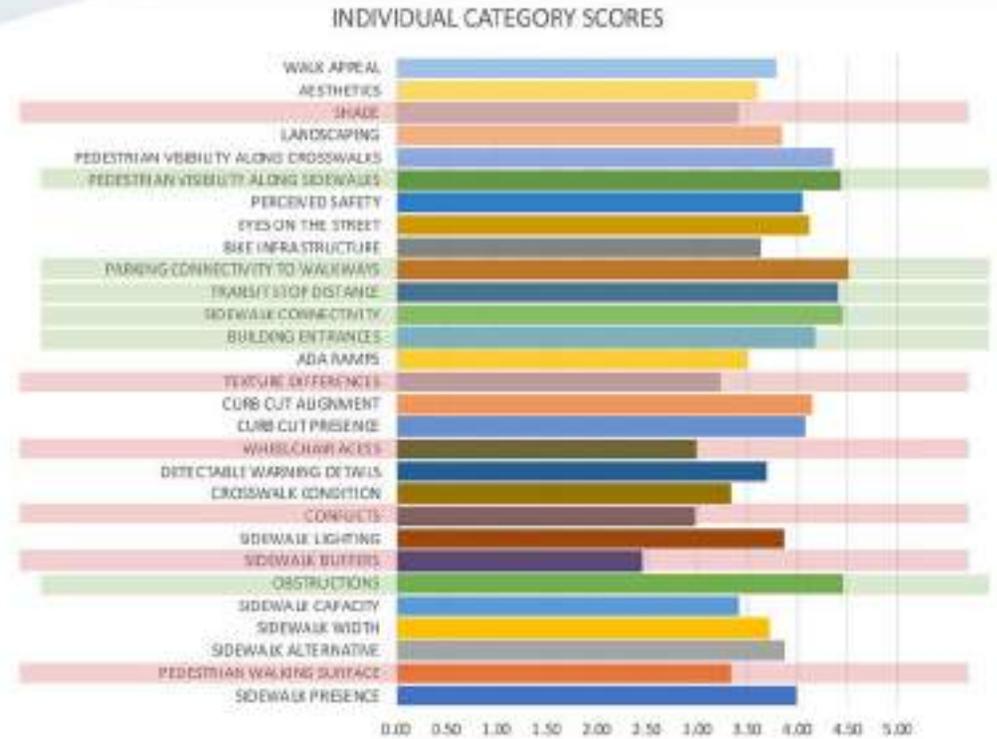

Figure: Graph showing individual category scores out of 5

The table below shows the average scores across each map block and averages across each assessment parameter of the audit.

Table: Average weighted score of each parameter of the walkability Audit

INDIVIDUAL CATEGORY SCORES- SPATIAL RESULTS

All the maps shown below are spatial representations of how various parameters performed across the UIUC campus.
The choropleth maps were created in Arc GIS Pro using 5 different class intervals. The darkest areas show higher scores whereas the lightest areas have the most need for improvement in their respective parameters.
The average scores of the campus with respect to each parameter is also mentioned above the map.
Although most categories were in good standing, there is room for improvement.

LEGEND

LOW   HIGH

| 3.9/5 | SIDEWALK PRESENCE | 3.3/5 | SIDEWALK MAINTENANCE | 3.8/5 | SIDEWALK ALTERNATIVE | 3.7/5 | SIDEWALK WIDTH |

| 3.4/5 | SIDEWALK CAPACITY | 4.4/5 | OBSTRUCTIONS | 2.4/5 | SIDEWALK BUFFERS | 3.8/5 | SIDEWALK LIGHTING |

Figure: Spatial results of the average weighted scores of various parameters of the walkability Audit

INDIVIDUAL CATEGORY SCORES- SPATIAL RESULTS 2

LEGEND

LOW — HIGH

| 2.9/5 | CONFLICTS | 3.3/5 | CROSSWALK CONDITION | 3.6/5 | DETECTABLE WARNING | 2.9/5 | WHEELCHAIR ACCESS |

| 4.0/5 | CURB CUT PRESENCE | 4.3/5 | CURB CUT ALIGNMENT | 3.2/5 | TEXTURE DIFFERENCES | 3.5/5 | ADA RAMPS |

Figure: Spatial results of the average weighted scores of various parameters of the walkability Audit

INDIVIDUAL CATEGORY SCORES- SPATIAL RESULTS 3

LEGEND

LOW — HIGH

4.1/5	BUILDING ENTRANCES
4.4/5	SIDEWALK CONNECTIVITY
4.4/5	TRANSIT STOP DISTANCE
4.5/5	PARKING CONNECTIVITY

3.6/5	BIKE INFRASTRUCTURE
4.1/5	EYES ON THE STREET
4.0/5	PERCEIVED SAFETY
4.4/5	PED. VISIBILITY ALONG SIDEWALKS

Figure: Spatial results of the average weighted scores of various parameters of the walkability Audit

INDIVIDUAL CATEGORY SCORES- SPATIAL RESULTS 4

LEGEND

LOW   HIGH

4.3/5 PED. VISIBILITY ALONG CROSSWALKS	3.8/5 LANDSCAPING	3.4/5 SHADE	3.6/5 AESTHETICS

3.8/5 WALK APPEAL

▲ Sidewalk Presence, Temporary and Permanent obstructions, Sidewalk Lighting, Curb Cut Presence, Curb Cut alignment, Building entrances, Sidewalk Connectivity, Transit stop distance, Parking connectivity, Perceived Safety, Pedestrian Visibility along sidewalks and crosswalks, Landscaping, Walk Appeal

■ Sidewalk Maintenance, Sidewalk Alternate, Sidewalk Width, Sidewalk Capacity, Crosswalk condition, Detectable warning details, Texture differences, ADA ramps, Bike Infrastructure, Shade, Aesthetics

▼ Sidewalk buffers, Wheelchair Access, Pedestrian and Vehicular Conflicts

Figure: Spatial results of the average weighted scores of various parameters of the walkability Audit

HIGHEST AND LOWEST SCORING MAP BLOCKS

HIGHEST SCORING MAP-BLOCKS
The overall campus was found to be moderately walkable but some areas performed better than others and the scores varied greatly. The core of the campus that has the major institutional buildings was found to have scored higher than the ones with fewer or no official campus buildings. It was **found that map blocks 1, 7, 9, 12, 13, 15 had the best walking conditions with scores ranging above of 80/100.** The University spent a great deal of time redeveloping multiple walking areas throughout the high priority map blocks between the years 2005 and 2010 in several initiatives like the MCore plan. This redevelopment could be directly related to the high scores found in map blocks 13, 1, 3, 7, 15. The City of Champaign and Urbana also executed considerable redevelopment projects to make the area more visually appealing and more walkable for pedestrians. Landscaping was improved, paths were widened, sidewalks are now in great condition, and the overall visual appeal of the area is very inviting. The redevelopment by the City of Champaign in high priority map blocks created an optimal environment to walk in. Areas near green street were found to be the most well scoring map-blocks.

LOWEST SCORING MAP-BLOCKS
Map blocks 19, 23 and 24 had extremely low average scores, which were an exception to the overall walkability score of campus. These map blocks were generally the parts of the campus that did not have important campus buildings but have a majority of vacant and green space expanses. Therefore, the sidewalks are often unpaved with walkways only on one side. These areas have low pedestrian traffic as well. These factors may have greatly affected the scoring since our surveys have questions were perception based and wary from volunteer to volunteer.

HIGHEST SCORING MAP-BLOCKS- MAP BLOCK 1

Clearly marked crosswalks

Shaded, visually appealing landscaped areas

Seating areas in spaces of congregation

After averaging the scores of each map block, it was found that map block 1 had one of the best walking conditions with a score of 87.6/100. Map block 1 scored high Sidewalk Presence (5/5), Sidewalk connectivity (5/5), Parking connectivity to walkways (5/5), Pedestrian Visibility along sidewalks (5/5), Walk Appeal (4.9/5).
 All average scores of the parameters of Map Block 1 were above (4.0/5).

Map block 1 is relatively smaller in size as compared to the rest of the map- blocks and houses the North quadrangle. It has multiple landscaped spaces with presence of shade and its streets have safe crosswalks with multiple traffic calming measures. It also has several transit stops that make it accessible and pedestrian friendly.
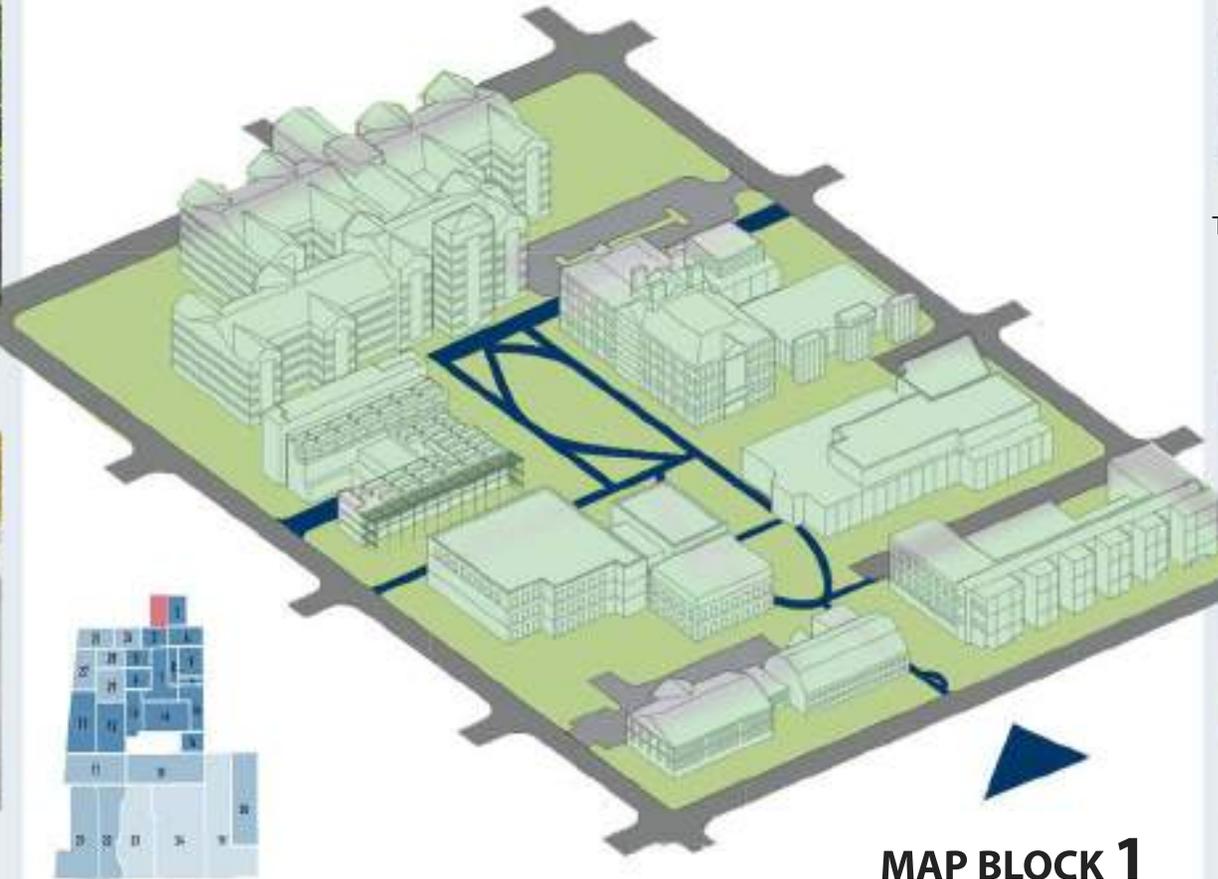
MAP BLOCK 1

Well maintained walkways in the North Quad along with landscaping elements

Transit stops with several amenities to support pedestrians

Well connected sidewalk network present on both sides of the street

HIGHEST SCORING MAP BLOCKS: MAP BLOCK 7

Well maintained, wide sidewalk network in the Main Quad.

Although the campus was found to be very walkable, the scores varied greatly amongst map blocks. **The average weighted score of map block 7 scored 84/100 and had one of the best walking conditions.** Map block 7 scored high in Sidewalk Presence (5/5), Pedestrian Visibility along crosswalks (5/5), Sidewalk Connectivity (5/5), and scores above 4.0/5 in almost all the parameters of assessment.

This map block represents the core of the campus with green open spaces for congregation at its center and has great accessibility of the sidewalk network. Since this area represents the face of the campus and is one of the most famous spots, it is maintained regularly. This area also witnesses peak pedestrian traffic between class changes and major events open to the all the university students.

The sidewalk network in the main quad is a design feature and also increases accessibility

Multiple transit stops with amenities that cater to pedestrians

Universally accessible building entrances

Multiple bike stands along major high traffic buildings

Multiple bike stands along major high traffic buildings

MAP BLOCK 7

Presence of enclosed transit stop shelters and amenities

Well maintained crosswalks and sidewalks throughout the map block

Seating areas in spaces of congregation

Map block 9 had one of the best walking conditions with a score of 83.7/100. Map block 9 scored high Sidewalk Presence (5/5), Building entrances (4.89/5), Parking connectivity to walkways (5/5), Transit stop distance (5/5), Pedestrian Visibility along sidewalks (5/5).

Map block 9 houses the Krannert center and has wide and well maintained sidewalks with shaded seating spaces, ADA ramps and curb extensions to ensure smooth transition for pedestrians. The buffers are excellently landscaped with sufficient lighting and pedestrian amenities. Since Krannert center is designed to cater to a large population it has several public congregation spaces that are connected through sidewalks and highly accessible.
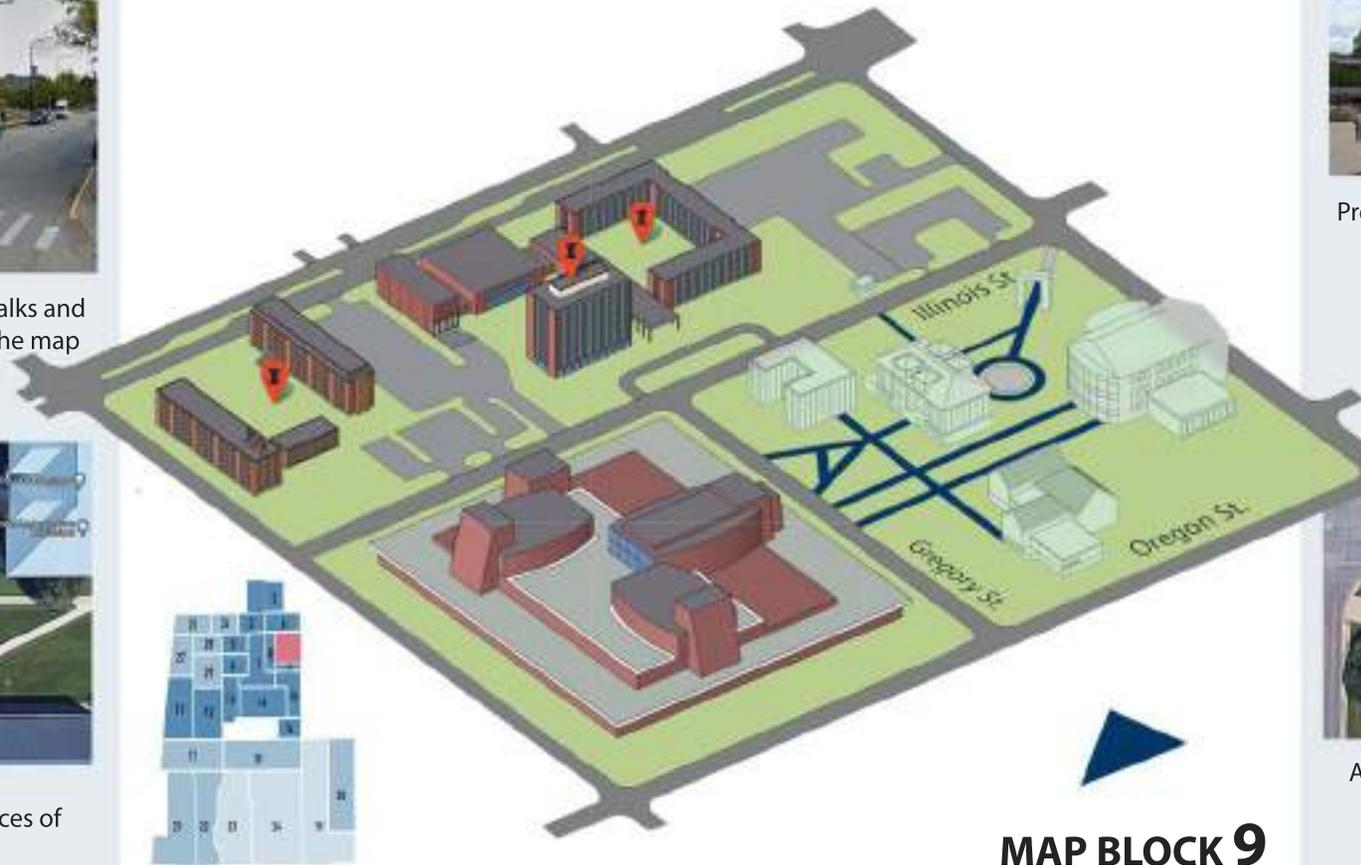
Presence of ADA ramps for wheelchair access

Presence of curb extensions at high traffic locations

Adequate buffer widths from street (Pedestrian and vehicular separation)

MAP BLOCK 9

HIGHEST SCORING MAP-BLOCKS- MAP BLOCK 12

Wide sidewalks to accomodate peak pedestrian traffic during games or concerts

Adequate buffers and bike lanes

Bicycle stands

Map block 12 had one of the best walking conditions with a score of 86.2/100.
Map block 12 scored high in the categories of Absence of obstructions (4.9/5), Sidewalk connectivity (5/5), Parking connectivity to walkways (4.6/5), Pedestrian Visibility along sidewalks (5/5), Walk Appeal (4.3/5).
All average scores of most of the parameters of Map Block 12 were above (4.0/5).

Map block 12 houses the Ikenberry commons residence halls and the Memorial Stadium and Campus Recreation center. The public spaces of this map block are well maintained and accessible. The sidewalks are also designed to handle peak pedestrian traffic during concerst or games in the Memorial stadium.

Well maintained walkways in the North Quad along with landscaping elements

Well shaded sidewalks

Well connected sidewalk network that increases accessibility

MAP BLOCK 12

HIGHEST SCORING MAP BLOCKS: MAP BLOCK 13

Although the campus was found to be very walkable, the scores varied greatly amongst map blocks. **This score found that map block 13 had the best walking conditions.** Map block 13 scored high in Pedestrian facilities and design(5/5), crosswalks (4/5), transit areas(5/5), universal accessibility (4.7/5), safety (4.5/5) and walk appeal(4.3/5).

The University spent a great deal of time redeveloping multiple walking areas throughout the high priority map blocks between the years 2005 and 2010. This redevelopment could be directly related to the high scores found in map blocks 13, 1, 3, 7. The City of Champaign and Urbana also executed considerable redevelopment projects to make the area more visually appealing and more walkable for pedestrians. Landscaping was improved, paths were widened, sidewalks are now in great condition, and the overall visual appeal of the area is very inviting. The redevelopment by the City of Champaign in high priority map blocks created an optimal environment to walk in. Areas near green street were recorded as the most well scoring map blocks.

Crosswalks with
detectable warning details
(Eg. truncated domes)
and textural differences

Parking connectivity
to sidewalks

Curb extensions along sidewalks to
enable safe pedestrian crossing
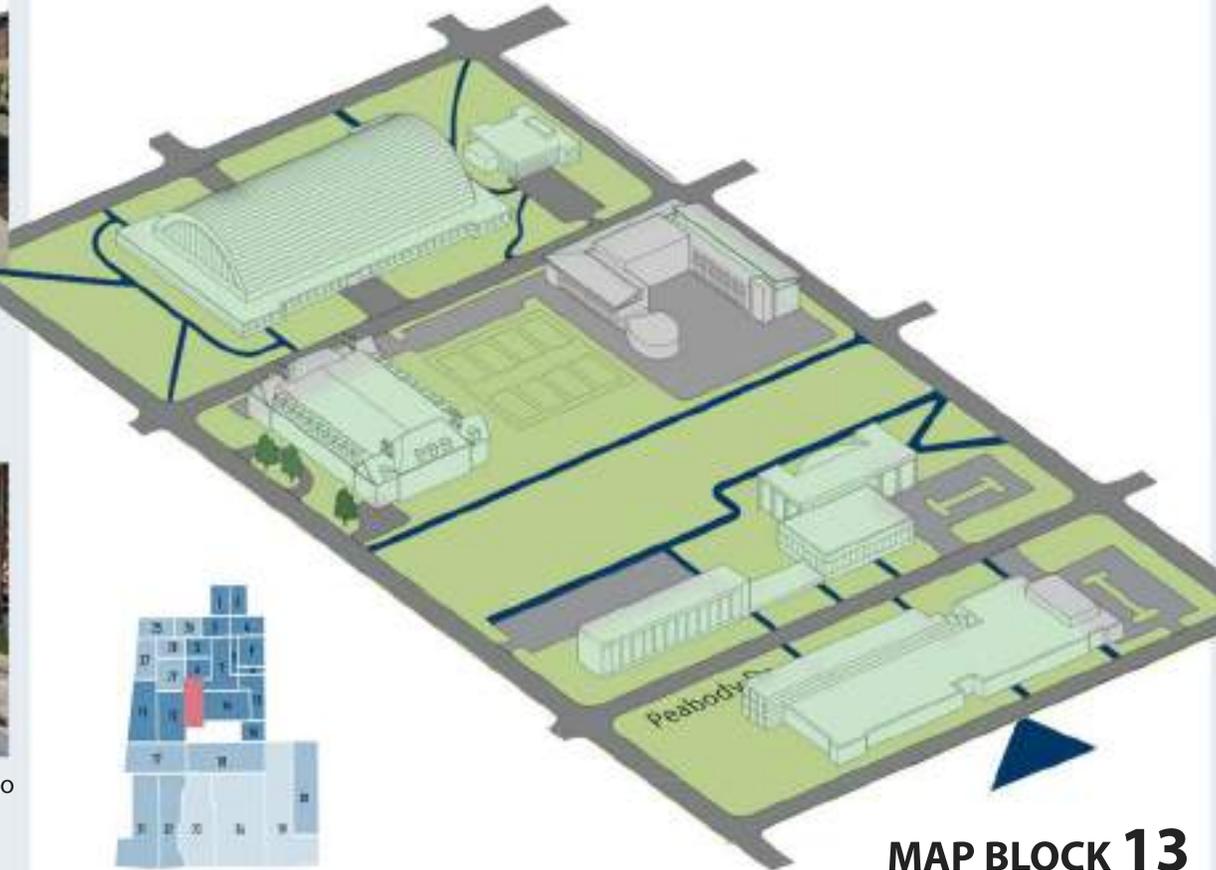
Traffic calming measures like
signalization, audio signals and
push buttons

Traffic calming measures like
signalization, audio signals and
push buttons

Shaded sidewalks with several
landscaped elements

MAP BLOCK 13

Higher frequency of transit stops

Shaded, visually appealing landscaped areas

Off street bike path and crossing

Map block 15 had one of the best walking conditions with a score of 86.8/100. Map block 15 scored high on Sidewalk Presence (5/5), Curb cut alignment (5/5)Sidewalk connectivity (5/5), Parking connectivity to walkways (5/5), Pedestrian Visibility along sidewalks (5/5), Walk Appeal (4.7/5).
All average scores of the parameters of Map Block 1 were above (4.0/5).

Map block 15 houses several key elements of the campus. It has a small water rentention pond the banks of which act as a natural congregation space, has several tennis courts and major campus buildings. It also houses a small forest area with Lincoln Avenue student residence halls and Campus Recreation center east and Freer Hall.

Presence of Traffic calming measures like Stop signs. Availability of Emergency phone booths

Natural spaces of congregation

Parking connectivity to sidewalks

MAP BLOCK 15

LOWEST SCORING MAP BLOCKS: 19, 23 & 24

Agricultural crop lands

Lack of sidewalks and crosswalks

Scattered and undefined landscape

Map blocks 19 , 23 and 24 had extremely low average scores, which were an exception to the overall walkability score of campus. Map block 19 an average of 33.3/100, Map block 23 had an average score of 53.3/100 and Map block 24 scored an average of 44.6/100.
These map blocks were generally the parts of the campus that did not have important campus buildings but have a majority of vacant and green space expanses. Therefore, the sidewalks are often unpaved with walkways only on one side. This might have greatly affected the scoring since our surveys have questions that are perception based.

ARBORETUM

VACANT LAND

DAIRY CATTLE RESEARCH UNIT

19

24

POLINATARIUM

23

MAP BLOCK 19 & 23, 24

Unpaved pathways

University of Illinois Arboretum and Japan House

Lack of curb cuts and detectable warning details

RESULTS OF DEFICIENCY REPORTING SURVEY

HIGHEST DEFICIENCY CATEGORIES

The 2021 UI Campus Deficiency Reporting survey was the location specific survey that helped us identify not only the type of shortcomings (or deficiencies) that are present in the sidewalk network of the campus but also automatically recorded their exact geo coordinates along with an image showing the precise fault. This data was collected through the Arc GIS 123 app by the volunteers and is available in the App store.

The total deficieny records collected by the volunteers was **2056 data points.** The highest number of deficiencies identified fell under :

1. 'Sidewalk Maintenance' with over 1335/2056 points recorded
2. 'Crosswalk Maintenance' with over 330/2056 data points
3. 'Accessibility issues' with 118/2056 points recorded.

These numbers signify the need for the university to focus on these 3 major areas where there is immense room for improvement.
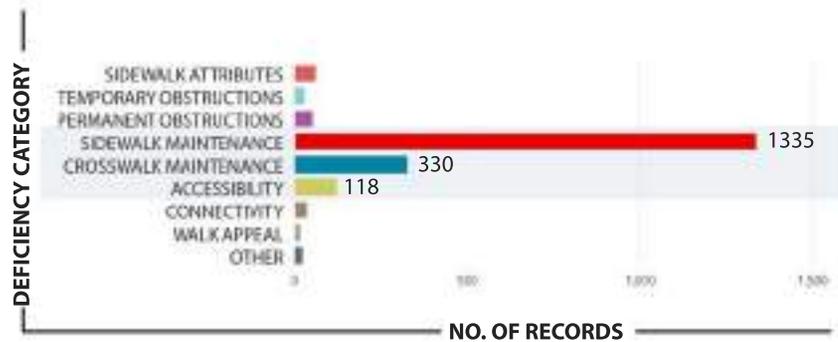
Figure: Bar graph showing Deficiency category count

LEGEND

A. SIDEWALK ATTRIBUTES
B. TEMPORARY OBSTRUCTIONS
C. PERMANENT OBSTRUCTIONS
D. SIDEWALK MAINTENANCE
E. CROSSWALK MAINTENANCE
F. ACCESSIBILITY
G. CONNECTIVITY
H. WALK APPEAL
I. OTHER

Figure: Colour coded Deficiency reporting points superimposed over campus map of Division of Responsibility

PREVALENT THEMES OF THE WALK AUDIT

HIGHEST DEFICIENCY CATEGORY: SIDEWALK MAINTENANCE

The most dominant form of deficiency identified fell under '**Sidewalk Maintenance' with over 1335/2056 points recorded.**

Within the Sidewalk Maintenance category we had several drop down options to choose from. The bar graph below clearly shows that cracks that leave more than 4 feet of accessible sidewalk and cracks that leave less than 4 feet of accessible sidewalk both, if combined, show over 600 records and are undoubtedly the highest fault experienced by the pedestrians of our campus.

This is closely followed by vertical faults in the campus that total a number of 518 records. These vertical faults hinder not only a smooth and efficient walking experience for pedestrians walking but greatly inconvinience wheelchair users the most.

Periodical upkeep of repairing the cracks and correcting vertical faults along the sidewalk network is of utmost importance. The bar graph below shows the counts of the Sidewalk Maintenance sub options.

Vertical Faults (Count: 518)
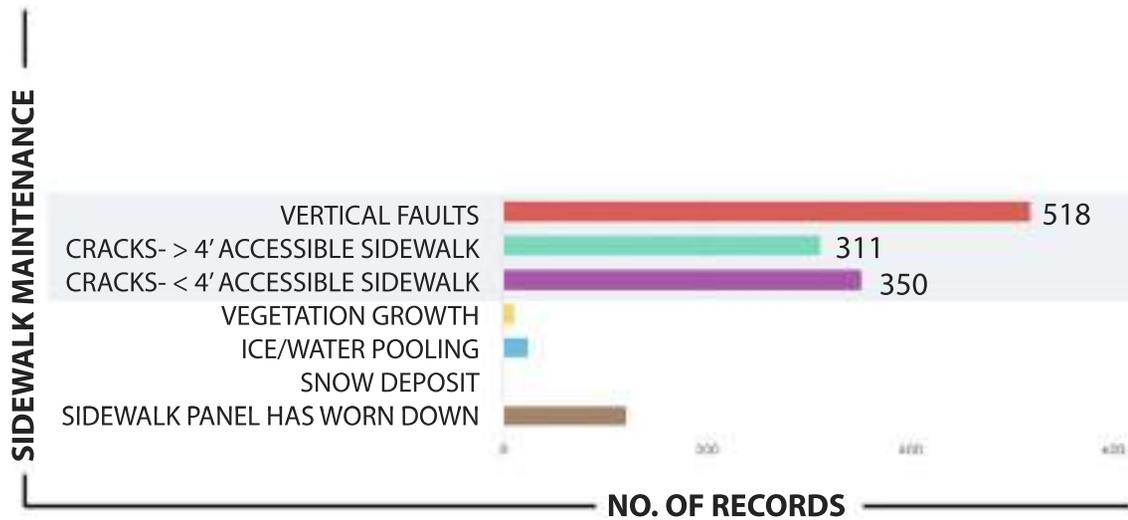
Bar graph showing 'Sidewalk Maintenance' Deficiency category count

Cracks- more than 4 feet of accessible sidewalk (Count: 311)

Cracks- more than 4 feet of accessible sidewalk (Count: 350)

CROSSWALK MAINTENANCE

Crosswalk maintenance was the 2nd highest Deficiency category identified. Within the category, the highest reported issues were:
Unmarked crosswalks, Lack of Detectable warning details and Maintenance issues in the Driveway apron.
Crosswalks are transition spaces that enable pedestrians to access various parts of the sidewalk network. These areas need to be maintained in order for lesser pedestrian and vehicular conflicts, safer crossings and higher connectivity between the public spaces of the campus.

CROSSWALK MAINTENANCE

	NO. OF RECORDS
UNMARKED CROSSWALKS	99
CROSSWALK MARKINGS HAVE FADED	
POTHOLES IN THE CROSSWALK	
LOOSE PAVEMENT	
INSUFFICIENT TIMING	
LACK OF CURB CUTS	
MISSING DETECTABLE WARNING DETAILS	56
NO SIGNAGE FOR PEDESTRIAN CROSSING	
DRIVEWAY APRON HAS MAINTENANCE ISSUES	52
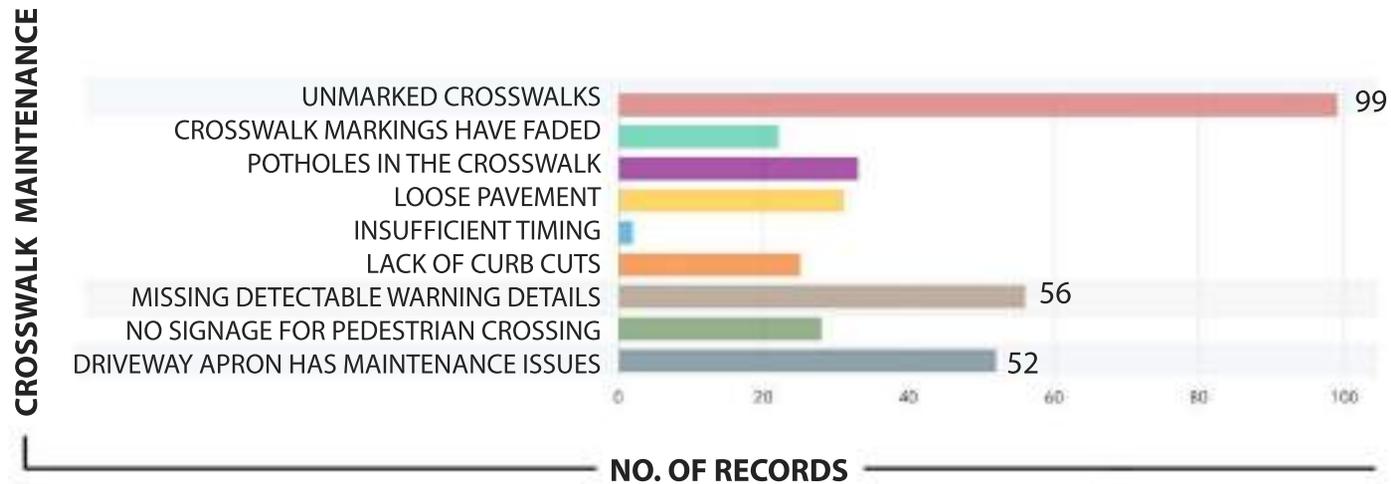
Bar graph showing Crosswalk maintenance Deficiency category count


Faded crosswalk markings

Unmarked crosswalks

Driveway apron has maintenance issues

ACCESSIBILITY ISSUES

Accessibility issues was ranked the third highest deficiency category and the top 3 sub categories that contributed to its ranking are : 'ADA entrance not indicated' with 75 records, 'Inaccessible push buttons' with 26 records and 'Building entrances are not ADA compliant with 14 records.
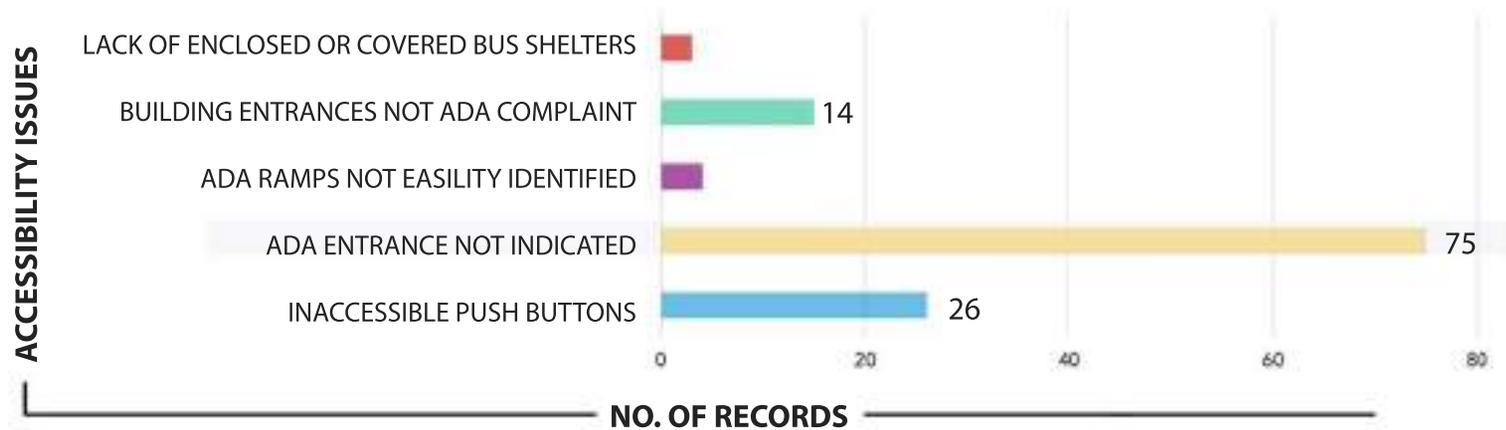
Bar graph showing Crosswalk maintenance Deficiency category count

Signs showing the location of ADA accessible entrance needs to be indicated at each entrace of every campus building

Push buttons need to be within hand reach of wheelchair users and also near the ground level so that it can be operated by users with disabilities

CONCLUSION

RECOMMENDATIONS

Several possibilities of recommendations emerged after assessing the results of the walk audit. The recommendations can be divided into short and long term improvement projects. The short term recommendations (marked with an S) are generally easier to accomplish with low budgets and a shorter timeline, whereas the long term recommendation (marked with an L) projects will take several years and would have a high costs associated with them. The following are a few major recommendations are listed below. They are separated into the Assessment categories and the ones that need to be addressed urgently are marked with an asterick (*).

PEDESTRIAN FACILITIES AND DESIGN

• Ensure sidewalk presence on both sides of the street
• Conduct periodical maintenance of sidewalk surfaces*
• Provide amenities along sidewalks at regular intervals to support pedestrian walking trips
• Determine sidewalk widths proportionate to peak hour traffic
• Remove temporary and permanent obstructions

UNIVERSAL ACCESSIBILITY

• Design each section of the sidewalk network (paths, building entrances, transit stops, parking etc.) to facilitate wheelchair access.
• Install curb-cuts with detectable warning details (truncated domes) at every crossing
• Make sure curb-cuts align and allow a smooth transition from the sidewalk to the crosswalk*
• Ensure presence of texture differences along sidewalks that abut streets
• Reassess ADA ramp slopes to be a maximum of 1:12
• Ensure clear width of new ADA ramps to be 3 feet (36")
• Install handrails along ADA ramps*
• Design building entrances to handle peak pedestrian traffic
• Repair vertical faults*

PEDESTRIAN AND VEHICULAR CONFLICTS

• Introduce traffic calming measures in high conflict zones*
• Separate pedestrian, bicycle and vehicular traffic by assigning paths for each*

CROSSWALKS

• Paint unmarked crosswalks*
• Repaint faded crosswalk markings*
• Start maintenance measures to tackle top-layer deterioration of crosswalks*

TRANSIT STOPS

• Increase frequency of transit stops in low scoring map blocks
• Increase the number of DRES transit stops across the campus*
• Improve transit stop amenities
• Complete the bicycle network across the campus

SAFETY

• Improve street vibrancy and liveliness by introducing multiplicity of spaces and mixed uses
• Introduce Traffic Calming measures in high conflict zones identified by the audit*

CONCLUSION AND NEXT STEPS

CONCLUSION

The macro and micro scaled surveys of this audit gave us direction to accurately analyse the state of the sidewalk network of our campus. The output of this study is the result of a much more exhaustive process of determining walkability as compared to the other Walk scores or Walkability indices that have limited variables and assessment paramters of analysis. It gives us a cross sectional view of the campus and its areas and interpoltaes it across several parameters. Compared to the Walkability Index of 72.3/100 assigned in the previous Walkability Audit in 2011 by the UI Wellness center, the current Walkability Index has increased to 76.2/100 (Note: the two studies mentioned here - 2011 and 2022 have varying parameters of analysis and weights). This practice of assessing the walkability index periodically should be continued in order for the university to track its walkability.

NEXT STEPS

The Creation of Surveys, Training, Data collection and Data Analysis phase of the Walkability Audit is complete. The next steps for the project would be to hand over the data collected from the 2021 Campus Walkability Audit Survey and the 2021 Deficiency Reporting survey to the Steering committee and the various entities responsible for upkeep and maintenance of the Campus sidewalk network. The results of this survey will be incorporated in the next Campus Master Plan. Using this information, they will be able to focus on areas that require immediate attention and the areas where short- and long-term plans need to be implemented.
This Walkability Audit report will be published in the iCAP portal of the university and the results will be used to create a Campus Walking Master Plan to preserve, maintain, and improve the sidewalk network of our campus- University of Illinois Urbana Champaign.

CLOSING REMARKS

This capstone project was a wonderful experience for me since I got to contribute to improving my university in a direct way. I was able to directly apply my past experiences of taking several Transportation planning courses in my previous semesters. Working with F&S TDM was an enriching experience since they allowed me to creatively contribute to the project methods and supported me with guidance and data whenever needed.
This project is a culmination of my interest in sustainable Transportation and spatial planning that demonstrates that travel behavior can be influenced by providing a responsive built environment to support it. I am grateful to have gained knowledge and experience from this project and feel confident to work on similar projects involving active transportation.

THANK YOU

ACKNOWLEDGEMENT

BIBLIOGRAPHY

1.Walkability Audit Report 2011, University of Illinois Wellness center – Michelle Johnson

2.Walk Score Methodology - https://www.walkscore.com/methodology.shtml

3.National Walkability Index map
https://www.arcgis.com/home/item.html?id=afd7bc8719b84fa897cd6a651c96d37b

4.AARP Walk Audit Tool Kit -
https://www.aarp.org/livable-communities/getting-around/aarp-walk-audit-tool-kit.html

5.University of Delaware Walkability Assessment tool-
chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/https://udspace.udel.edu/bitstrea
m/handle/19716/18445/walkability-assessment-tool-2016-web.pdf

6.Pedestrians first – Tools for a Walkable City, ITDP - https://pedestriansfirst.itdp.org/

7.University of Illinois Urbana Champaign Masterplan, 2018 -
chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/https://www.uocpres.uillinois.edu
/UserFiles/Servers/Server_7758/file/UIUC/mastrpln/uiucmp-forum-pres-201711.pdf

8.Book: Walkable city by Jeff Speck

9.Book: The Death and Life of American cities by Jane Jacobs

10. Walkability Checklist- FHA USDOT
-https://safety.fhwa.dot.gov/rsa/guidelines/casestudy7.htm

APPENDICES

I. Training manual of Walkability Audit 2021-22
II. 2021 Campus Walkability audit questionnaire with scoring system
III. Sample map block result of Deficiency reporting survey- Map block 11
IV. Sweatshirt design for volunteer incentive
V. Volunteer participation- list

APPENDIX I

Training Manual

WALKABILITY AUDIT 2021-22
University of Illinois Urbana-Champaign

TRAINING MANUAL

CONTENTS

INTRODUCTION

ABOUT THE PROJECT
Facilities and Services (F&S) is dedicated to planning, building, maintaining, and serving the campus's-built environment to support the strategic framework needs. **The Transportation Demand Management (TDM) department at F&S** maintains and improves the transportation infrastructure network for all forms of campus travel, including walking, bicycling, transit, and motor vehicles. TDM also coordinates with university and regional partners on projects impacting campus transportation network.

F&S TDM department at the UIUC is conducting a thorough walkability audit of the University District using the two surveys mentioned in the objectives.
This project will help us identify the areas that are ideal for walking and areas that may require improvements. The 2 surveys will enable us to get a complete picture of the walking infrastructure needs and will help address issues at the macro and micro level.

UIUC aims to perform at least one walkability audit every ten years in order to update the prioritization of these projects. The previous audit was performed by University of Illinois Wellness Center in the year 2010-11. It is important to perform periodical assessments of the walking infrastructure to identify current deficiencies and devise a consolidated plan to achieve the best walking infrastructure possible.

For this study, the UIUC campus has been divided into 29 map-blocks which are further divided into smaller blocks for detailed analysis.

This project will help us achieve the university's goal to :
1. increase walking and the walkability quality on campus;
2. increase physical activity and promote healthy lifestyles;
3. ensure the safety of those using walkways;
4. achieve 100% ADA compliancy on campus property.

TIMELINE
Data collection: The goal is to finish the data collection using the 2 survey questionnaires by Saturday, April 15, 2022.
Data analysis and creation of Campus walking masterplan: April 2022
Final report and presentation: May 2022

OBJECTIVE

The primary objective of this project is to conduct a thorough analysis of the University of Illinois Urbana-Champaign (UIUC) campus sidewalk network.

Two surveys will be used to assess the walkway infrastructure on campus:
1. 2021 UI Campus Walkability Audit survey:
     Assesses the general walkability of the map blocks

2. 2021 UI Campus Deficiency Reporting survey:
     Identifies specific deficiencies within a map block

This project will help us identify the areas that are good for walking and areas that require immediate attention. Data collected from this study will create a prioritization list of sidewalk preservation and improvement projects that will subsequently be used to create a Campus Walking Master Plan.

MAPS AND VOLUNTEER ASSIGNMENT

Figure 1 shows the campus map. We have divided the campus in **29 map blocks** (figure 2; view the map blocks: http://goo.gl/Cbq9Fj), and they are further divided into **120 smaller blocks** (figure 3; E.g. 1a, 1b, 1c, 2a, 2b, 2c…). These smaller blocks will help analyze the sidewalk infrastructure accurately. The map-blocks have been categorized in High, Moderate, and Low priority order.

Teams of volunteers will cover the entire campus and collect data by November 20, 2021. Each team will consist of 4-5 volunteers. The teams will coordinate amongst themselves to most effectively collect data. The teams will decide who amongst them will collect the general Walkability Audit survey and who will collect the Deficiency Reporting data. Every team will be assigned 2-4 map blocks.

Access this link : **http://goo.gl/Cbq9Fj** to understand your assigned map-blocks better. You can zoom in and out for better clarity.

Figure 1: University of Illinois Urbana-Champaign Campus map

Figure 2: UIUC campus map divided into 29 map-blocks

Figure 3: UIUC campus map divided into smaller mini-blocks for detailed analysis

GETTING TO KNOW YOUR AUDIT AREA

Each team will be assigned 4-5 volunteers and 2-4 map blocks. Use the maps provided for your specific walk audit area to familiarize yourself. Study the larger map, for contextual information. Identify likely pedestrian destinations, such as parking lots, nearby restaurants, parks, shops, building entrances, etc. and plan out your walking route.

DETERMINE EACH TEAM MEMBER'S ROLE

Each team will have 4-5 members. The teams will be responsible to assign the tasks. For any team:
1) 3 members will complete the survey questionnaire
2) 1 (or maybe 2) members will complete the Deficiency report
Volunteers can switch roles after consulting with their team, if needed.

MAKE SURE YOU HAVE ALL YOUR SUPPLIES BEFORE YOU CONDUCT YOUR AUDIT

You are responsible for bringing the following yourself:

- Fully charged cell phone
- Appropriate apparel for walking in the environment
- Water
- Sunscreen, if needed
- Masks, if needed
- Snacks, if needed

ACCESS TO ARCGIS SURVEY123 APP

Data collection will be done using ArcGIS Survey123 app in your own mobile devices. Please follow the steps to download the app:

App download links:

1. For android users:
https://play.google.com/store/apps/details?id=com.esri.survey123

2. For iOS users:
https://apps.apple.com/us/app/arcgis-survey123/id993015031

Once you have downloaded the app,

- Click on "Sign in using ArcGIS Online"
- On the next screen, use the following login information
  o **Username: FandSDataCollector**
  o **Password: 2022UIwalk**
- On the Top-right corner of the screen, click on the initials
- Click on Download Surveys
  o **Download the 2021 UI Campus Walkability Audit survey**
  o **Download the 2021 UI Campus Deficiency Survey**

CONTACT INFORMATION

Incase of any questions or queries, please contact:
Sarthak Prasad (sprasad9@illinois.edu, 217-904-5954)
Sutapa Banerjee (sutapab2@illinois.edu, 217-419-8078, 217-991-2570)

Access to ArcGIS Survey123 App
Data collection will be done using ArcGIS 123 Survey App in your own mobile devices. Please follow the steps to download the app:

Open the App store in your smart phone and search for **'ArcGIS Survey123'** App

Download ArcGIS Survey 123 App

Open the app and click on '**Sign in with Arc GIS Online**'

Click on '**ArcGIS login**'

Type
Username:
FandSDataCollector
Password:
2022UIwalk

Click on the blue
'**Sign in**' button

Click on
'**Download surveys**' at the bottom of the page, sometimes it can be accessed at the top right corner

Select either the ' **2021 Campus Walkability audit**' or the '**2021 UI Campus Deficiency Survey**' icon from the list and click on the download button
( )

Press back after downloading and start your survey!

SURVEYS

UNDERSTANDING THE WALKABILITY AUDIT SURVEY

SAMPLE

SAMPLE

SAMPLE

The **2021 UI Campus Walkability Audit survey** is designed to assess the general walkability of each map block. Each question is based on a specific assessment parameter and the training manual explains how to answer these questions. This survey entails 40 questions divided into the following categories:

1. **Surveyor information**
2. **Land-Use**
3. **Pedestrian facilities and Design**
   a. Sidewalks
   b. Pedestrian and vehicular conflicts
   c. Crosswalks
   d. Universal accessibility
   e. Transit areas
4. **Safety**
5. **Walk Appeal**
6. **Optional additional comment:**
   Anything else you would like to report for this map block

UNDERSTANDING THE DEFICIENCY REPORTING SURVEY

SAMPLE

The **2021 UI Campus Deficiency Reporting survey** is designed to assess the specific faults within each map block. Each deficiency falls within a specific category, which further opens a list of dropdown options to choose from. Study the categories before starting your audit.

The categories are:

A. **Sidewalk attributes**
B. **Temporary obstructions**
C. **Permanent obstructions**
D. **Sidewalk maintenance**
E. **Crosswalk maintenance**
F. **Accessibility**
G. **Connectivity**
H. **Walk Appeal**

I. **Other**

2021 UI CAMPUS WALKABILITY AUDIT

INSTRUCTIONS

After getting familiar with your assigned map block areas, plan out a route that covers all the sidewalks, pathways and building entrances within the map block. This includes routes to/from transit stops & parking areas.

Download the survey: **2021 UI Campus Walkability Audit**

Read all the questions of the questionnaire outlined below and get conversant with what to observe while walking along your route.

The best way to address the questionnaire is to stop after you have walked a small map block area (e.g. 1a or 1b), click on the "Collect Now" button. This will take you to the questionnaire. We expect it will take you 10-15 minutes to carefully walk a block and a further 6-8 minutes to answer every question in this the general walkability questionnaire.

Complete the survey questionnaire immediately after finishing each segment of your walk. Go to a quiet place where you can reflect on your observations. Don't wait to complete the questionnaire–it is important to do this immediately after you've walked your area while your memory is fresh and you can recall as much detail as possible.

QUESTIONS

1. Investigated by :

(ID: Unique number given to you)

2. Block number :

(Enter the small block ID here- e.g. 1a, 1b, 1c)

SURVEYOR INFORMATION

3. How are you collecting the audit information? (Select one)

A. Walking
B. Using a wheelchair
C. Using a bicycle
D. Other _____

LAND USE

LAND USE TYPOLOGY

4. Select the land-uses prevalent in this map-block. (Check all that apply)

A. UIUC campus institutional buildings
B. Residential buildings
C. Commercial or retail (shopping centers, restaurants, cafés)
D. Industrial buildings (warehouses, factories)
E. Parking lots or garages
F. Designated green spaces/parks
G. Underdeveloped land
H. Vacant land
I. Place of worship
J. Recreation spaces (eg. tennis courts, basketball courts)

RESIDENTIAL LANDUSE

5. What type of residential uses are present in the map block? (Check all that apply)

A. Single-family housing
B. Multi-family housing
C. Apartments or condominiums
D. Apartments above street retail
E. Retirement/senior living facility
F. Dormitory
G. Fraternity/sorority
H. Other
I. None

PEDESTRIAN FACILITIES AND DESIGN

SIDEWALK PRESENCE

6. In general, describe the sidewalks in this map-block (Select one)

A. Sidewalks present on both sides of the street throughout the map-block
B. Sidewalks generally present on both sides of the street but certain areas have sidewalks on one side of the street
C. Sidewalks generally present on just one side of the street
D. Sidewalks not present

Sidewalks present on both sides of the road

Sidewalk present on one side of the road

Sidewalks not present

PEDESTRAIN WALKING SURFACE

7. In general, your overall assessment of walking surfaces in this map-block:

A. **Poor -**No permanent walking surface, discontinuous walkways, or major maintenance problems
B. **Some problems –** Sidewalk on one side of the road with a few deficiencies or sidewalk on both sides with several deficiencies
C. **Satisfactory -** Sidewalk on both sides of the street, minor discontinuities and maintenance problems but does not present major obstacles for walking.
D. **Good -** Sidewalk on both side of the street, minor aesthetic deficiencies
E. **Excellent -** Continuous sidewalk on both sides of the street, well maintained and of sufficient width to accommodate pedestrian traffic.

SIDEWALK ALTERNATE

8. If no sidewalk is present, is there any other place to walk that is safe from traffic? (Check all that apply)

A. Yes – Sidewalk on the other side of the road
B. Yes- Unpaved pathways
C. Yes- Street shoulder
D. Yes – Buffer parkway
E. No
F. N/A- Sidewalk present on both sides of the street
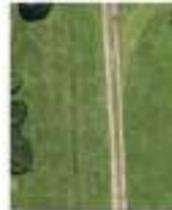
Unpaved pathways

Street shoulder:
The outer edge of the road and inner edge of the drains

SIDEWALK AMENITIES

9. Which of the following amenities are present along the streets and sidewalks of the map block? Only mark the ones easily identifiable by pedestrians. (Check all that apply)

A. Overhangs that provide shelter from inclement weather in public spaces
B. Trees
C. Green space
D. Kiosks or information booths
E. Benches or other places to sit
F. Bicycle racks
G. Recycling bins
H. Trash cans
I. Working drinking water fountain
J. Other
K. None of the above

SIDEWALK WIDTH

10. **What is the average path size, in general, in the map block? (Select one)**

A. No permanent walkway/sidewalk
B. < 3 feet wide
C. 3-5 feet wide
D. > 6 feet wide (University standard)

Width of sidewalk

Image source: Pedestrian liberation archive

SIDEWALK CAPACITY

11. **In general, Is the present width of the sidewalks adequate to handle pedestrian during class change (typically around noon on Tuesday or Wednesday) in this map block? (Select one)**

A. Yes
B. No, needs to be wider
C. Not observed during heavy foot traffic

TEMPORARY/ PERMANENT OBSTRUCTIONS

12. **In general, are there temporary or permanent obstructions present along the sidewalks of this map-block? (Check all that apply)**

A. No obstructions present
B. Yes, a few temporary obstructions
C. Yes, several temporary obstructions
D. Yes, a few permanent obstructions
E. Yes, several permanent obstructions

Permanent obstruction examples: trees, telephone poles, fire hydrants, lamp-posts, street lights, man holes etc

Temporary obstruction examples: overgrown shrubs, sandwich boards, parked cars, trash cans, traffic cones etc.

SIDEWALK BUFFER

13. **Mark the option that most closely matches your overall assessment of buffers in this map block (average amount of buffer):**

A. No buffer from roadway
B. Buffer is <3 ft wide
C. Buffer is 3-5 ft wide
D. Buffer is > 5 feet from roadway

Buffer: Area between the sidewalk and the street (signified by the arrow above: can be planting strips, street furniture or of any other material)

SIDEWALK LIGHTING

14. **In general, is the lighting adequate for the walking surfaces (including sidewalks, crosswalks, and intersections) of this map block?**

A. No, this map block does not have adequate lighting
B. Some parts of this map block require lighting improvement
C. This map block has adequate lighting

Different types of lighting present in the UIUC campus

PEDESTRIAN AND VEHICULAR CONFLICTS

PEDESTRIAN AND VEHICULAR ENCOUNTERS

15. **Mark the option that most closely matches your overall assessment of pedestrian conflicts in this map block:**

A. **Very High conflict potential –** very high multi modal activity (bus, cars, trucks, pedestrians, bicyclists, etc.) – E.g. Illini Union, Wright St.
B. **High conflict potential –** High multi-modal activity. E.g. – Springfield Ave by Grainger Library, Main Library on Gregory Dr.
C. **Moderate conflict potential –** limited motorized vehicular traffic and moderate to high pedestrian traffic
D. **Low conflict potential –** High pedestrian volume, low motorized vehicular traffic, low speed limit – E.g. Peabody by Law building
E. **Very low conflict potential –**High pedestrian volume, no motorized vehicular traffic or bicycle traffic

TRAFFIC CALMING MEASURES

16. **What type of traffic calming measures are generally present in the map block? (Check all that apply)**

A. No traffic calming measures
B. Mid- block marked crosswalks present
C. Traffic signals for dedicated vehicle turns
D. Pedestrian crossing signs
E. Push Buttons
F. Countdown signals
G. Audible walk signals
H. Pedestrian islands
I. Stop signs
J. Flashing beacons
K. Speed bumps
L. Chicanes or chokers
M. Curb extensions (– bump-outs)

Traffic lights

Pedestrian crossing and countdown signals

Mid-block marked crosswalks

Stop sign

Pedestrian island

Flashing beacon

Push buttons

Speed bumps

Curb extensions
visually and physically narrow the roadway, creating safer and shorter crossings for pedestrians

Chicanes/ chokers
offset curb extensions to slow traffic speed

CROSSWALKS

CROSSWALK CONDITION

17. Mark the option that most closely matches your overall assessment of the crosswalks in this map block:

A. **Poor –** Marked Crosswalks not present, obstacles present in the crosswalk, intersection is inaccessible, no curb cuts, insufficient crossing time, etc.
B. **Some problems –** Some crosswalks are unmarked, but fine to walk or marking has faded and there are other issues
C. **Satisfactory –** most of the crosswalks are marked, and there are some crosswalks with maintenance issues
D. **Good –** Crosswalks are marked, and there are very few deficiencies
E. **Excellent -** Crosswalks are clearly marked (or there are no intersections), and there are no tangible deficiencies

Marked crosswalks   Unmarked crosswalks   Curb cuts

Curb cuts: a small ramp built into the curb of a sidewalk to make it easier for people using strollers or wheelchairs to pass from the sidewalk to the road.

DETECTABLE WARNING DETAILS

18. Mark the presence of detectable warning details while entering or exiting the crosswalks? (Check all that apply)

A. No, none present
B. Yes, truncated domes
C. Yes, vertical strips
D. Other detectable warnings

Truncated domes: refers to the set of raised bumps along a curb cut or crossing which alerts visually impaired individuals of surface changes and other potential hazards.

Vertical strips: tactile intervention along sidewalks to signify surface change

UNIVERSAL ACCESSIBILITY

WHEELCHAIR ACCESS

19. Mark the option that that most closely matches your assessment of the ease of access for mobility impaired users.

A. **Poor -** Difficult or dangerous for people with disabilities -e.g., no curb cuts, ADA ramps not available or not easy to locate
B. **Good –** Accessible route available with some deficiencies
C. **Excellent -** Designed to facilitate wheelchair access

CURB CUT PRESENCE

20. Are there curb cuts present and accessible at each crossing in this map block?

A. Yes
B. No
C. At most crossing locations

(Refer to Q. 17 for curb cut definition and image)

CURB CUT ALIGNMENT

21. Do the curb cuts along the sidewalks of this map block align?

A. Curb cuts align with sidewalks and crosswalks throughout the map block
B. Curb cuts align with sidewalks and crosswalks in most areas
C. Curb cuts do not align with sidewalks and crosswalks in several areas
D. Curb cuts do not align with sidewalks and crosswalks throughout the map block
E. No curb cuts present
F. Other: _____

Required observation: Check if the sidewalk surface and the curb cuts are aligned to ensure a smooth transition.

TEXTURE DIFFERENCES

22. Are there texture differences along sidewalks for pedestrians with vision disability?

A. Texture differences present throughout map block
B. Texture differences present in a discontinuous way in the map block
C. No texture differences present

Texture differences along sidewalks alert visually impaired individuals of road proximity, surface changes and other potential hazards.

ADA RAMPS

23. In general, are the buildings in this map block ADA accessible and are the ADA ramps easily identifiable?

A. Yes, buildings are ADA accessible and ADA ramps are easily located
B. Yes, buildings are ADA accessible, but ADA ramps are not easy to locate
C. Some buildings are not ADA accessible
D. Most buildings are not ADA accessible
E. No, none of the buildings in the map block are ADA accessible

An ADA compliant ramp is a sloping route constructed with a slope greater than 1:20 for ease of access for wheelchair users

ADA ramp example in UIUC campus

(ADA: Americans with Disabilities Act)

BUILDING ENTRANCES

24. In general, are the entrances leading to the buildings well maintained in this map block?

A. Entrances to all buildings are well maintained and can accommodate peak pedestrian traffic
B. Entrances to all buildings are well maintained, but some buildings need wider entrances
C. Entrances to some buildings have few deficiencies, and they can accommodate peak traffic
D. Entrances to some buildings have few deficiencies, and they cannot accommodate peak traffic
E. Entrances to most buildings have several deficiencies, need immediate attention

SIDEWALK CONNECTIVITY

25. Are the sidewalks a part of a larger pedestrian network?

A. Yes, sidewalks are well connected to pedestrian facilities, adjacent neighborhoods, community- oriented destinations, multi-use trails/paths, transit stops
B. Sidewalk networks are not continuous or have gaps in connectivity
C. Sidewalks lack connectivity to pedestrian facilities, adjacent neighborhoods, community- oriented destinations, multi-use trails/paths, transit stops

TRANSIT AREAS

TRANSIT STOP TYPOLOGY

26. What type of transit stops are available in this map block?

A. MTD bus stops
B. DRES paratransit shuttle stops
C. Charter bus stops (Peoria Charter or others)

MTD Bus stop

DRES paratransit stop

TRANSIT STOP DISTANCE

27. How far do you have to walk to reach a transit stop in this map block?

A. Transit stop(s) present in the same block
B. Transit stop(s) present within 1-2 blocks
C. Transit stop(s) present within 3-4 blocks
D. More than 5 blocks

A block, in geographical terms, refers to the area of land between streets.

28. **What are the amenities present at transit stops of this map block? Only mark the ones easily identifiable by users. (Check all that apply)**

A. Covered bus shelter
B. Enclosed bus shelter
C. Benches
D. Transit schedule information – Kiosk
E. Bicycle racks
F. Recycling bins
G. Trash cans
H. Lighting
I.   Emergency phones
J.   None of the above

PARKING

29. **What parking facilities are present in this map block? (Check all that apply)**

A. None
B. On street parking (parallel or angled parking)
C. Small lot or garage (< 30 spaces)
D. Medium to large lot to garage

PARKING CONNECTIVITY TO WALKWAYS

30. **Are the parking facilities connected to the walkways?**

A. Yes
B. No
C. N/A

BIKE INFRASTRUCTURE

31. **What kind of bikeway infrastructure are prevalent in the map block? (Check all that apply)**

A. On street bike lane
B. Off-street bike path
C. In-street bike sharrows
D. No specified bikeway infrastructure

On street bike lane   Off street bike path   In street bike sharrows

SAFETY

EYES ON THE STREET

32. **Are there pedestrians walking nearby in this map block?**

A. Yes, several
B. Some
C. Very few
D. None

PERCEIVED SAFETY

33. **How safe did you feel walking in this map block?**

A. Very safe
B. Mostly safe
C. Somewhat safe
D. Lacked sense of safety (perception of high-speed traffic, low pedestrian visibility or crime)

PEDESTRIAN VISIBILITY ALONG SIDEWALKS

34. **Are the pedestrians walking along the sidewalks easily visible to vehicular traffic?**

A. Yes, easily visible
B. Low visibility
C. Not visible

PEDESTRIAN VISIBILITY ALONG CROSSWALKS

35. **Are the pedestrians entering/ exiting a crosswalk easily visible to vehicular traffic?**

A. Yes, easily visible
B. Low visibility
C. Not visible

WALK APPEAL

LANDSCAPING

36. **Are the landscaping and trees in this map block well maintained?**

A. Landscaping and trees are not well- maintained
B. Partially maintained landscape areas with a few unevenly placed trees
C. Well maintained landscape areas with even tree coverage
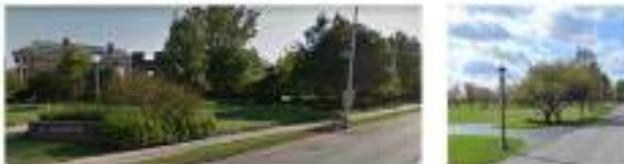
Landscaped areas at the UIUC campus

SHADE

37. **Mark the option that most closely matches your overall assessment of the available shade in this block:**

A. Absence of shaded areas throughout sidewalks
B. Somewhat shaded with a few trees and/or overhangs
C. Well-shaded with regular spacing of trees

Unshaded sidewalks   Shaded sidewalks

AESTHETICS

38. **Mark the option that most closely matches your overall assessment of the aesthetics in this map block:**

A. **Very Poor** -I will not walk in this area again!
B. **Below Average -** walkable but has immense scope for improvement
C. **Average**
D. **Above Average-** has minor deficiencies but a good area to walk around
E. **Excellent -** pleasant walk with good infrastructure, maintenance, landscaping, tree cover and architecture

WALK APPEAL RATING

39. **How pleasant was your walk in general?**

A. Excellent, pleasant walk with good infrastructure, landscaping, tree cover and architecture
B. Mostly satisfied
C. Somewhat satisfied
D. Needs considerable improvement
E. I will not walk in this area again!

FINAL COMMENTS

40. **[Text answer] –** Volunteers can add their final comments about the map block that they would like to report.

2021 UI CAMPUS DEFICIENCY REPORTING

Download : **2021 Campus Deficiency Reporting survey**

Only one deficiency per submission!

Volunteers will walk around their assigned map block, where they will cover the sidewalk network, entrances to the building, and ADA ramps.

Once the volunteer encounters a "deficiency" or issue, they will click the "Collect" button on their ArcGIS Survey123 app's 2021 UI Campus Deficiency Reporting survey which will take them to the following screen:

Figure: Sample Deficiency reporting questionnaire

DEFICIENCY CATEGORIES

The common deficiencies are categorized under the following 8 parameters:

SIDEWALK ATTRIBUTES

1. No sidewalk - a stretch of road that does not have a sidewalk
2. No buffer present - along a stretch of sidewalk
3. Insufficient lighting along sidewalk
4. Insufficient lighting at the intersection
5. Insufficient lighting throughout the crosswalk
6. Proximity to high-speed vehicular traffic
7. Sidewalk narrowing- sidewalk width reduces mid-block (< 6 ft university standard)

TEMPORARY OBSTRUCTIONS

1. Parked cars
2. Sandwich boards
3. Trash/ recycling bins
4. Benches/ chairs
5. Construction
6. Veo bike (s)

PERMANENT OBSTRUCTIONS

1. Trees obstructing the sidewalk
2. Light poles or utility poles
3. Signposts
4. Overgrown vegetation- shrubs/grass (less than 4 ft of accessible sidewalk
5. Raised Manhole or utility in the sidewalk

CROSSWALK MAINTENANCE

1. Unmarked crossing
2. Crosswalk marking has faded
3. Potholes in the crosswalk
4. Loose pavement (top layer of crosswalk has deteriorated)
5. Insufficient timing of crosswalks
6. Lack of curb cuts
7. Detection warning details missing
8. No signage for pedestrian crossing
9. Driveway apron has maintainence issues (potholes, cracks, etc.)

CONNECTIVITY

1. Discontinuous sidewalk- A chunk of the sidewalk is missing
2. Sidewalk ends abruptly and does not continue
3. Sidewalk lacks connectivity to building entrances or parking facilities

OTHER

If there is an issue not covered in the list above, please describe it in the other field.

SIDEWALK MAINTENANCE

1. Vertical fault (tripping hazard or more than ¼ inch)
2. Cracks (less than 4 ft of accessible sidewalk)
3. Cracks (more than 4 ft of accessible sidewalk)
4. Vegetation growth on the sidewalk like weeds (not obstructing the sidewalk)
5. Ice / water pooling
6. Snow deposit
7. Sidewalk panel(s) have worn down and /damaged causing obstruction

ACCESSIBILITY

1. Lack of enclosed/covered MTD shelters – bus pads
2. Building entrances marked as ADA do not seem to be compliant
3. ADA ramps leading to the building are not easily located
4. Building's ADA entrance is not indicated
5. Inaccessible push buttons

WALK APPEAL

1. Insufficient shade as seasonally needed
2. Lack of aesthetically pleasing landscape
3. Presence of litter/ trash on ground
4. Presence of graffiti

2021 UI CAMPUS DEFICIENCY REPORTING- EXAMPLE

STEP 1

Open the "**2021 UI Campus Deficiency Reporting**" survey on the ArcGIS Survey123 App

Make sure your location is on and accurate

Fill in the following details:
  i. Block ID (your assigned map-block no.)
  ii. Investigated by (Unique number given to you)
  iii. Data collected on (today's date) – This field is read only, so you don't have to enter the date.

Block ID*

Your assigned map block no.

Investigated By*

(ID: Unique number given to you)

Data Collected On

mm/dd/yyyy

STEP 2

When you come across a fault or deficiency during your walk around the blocks assigned to you, go through the 'Deficiency Category' section to identify which category it falls under

Deficiency Category*

For example: If you see vertical faults along a sidewalk in your map block, select 'Sidewalk Maintenance'

Sample deficiency identified:
Vertical faults along a sidewalk

STEP 3

After clicking on 'Sidewalk Maintenance', a list of options will appear with common sidewalk maintenance issues

Select 'Vertical faults'

STEP 4

Take a picture of the deficiency using the camera (📷) button.

Click on the check button (✓) on the bottom right corner once you are done to save your submission.

Repeat the same process for all other deficiencies of your map block

Picture of the issue *

In case the deficiency identified by you does not fall under any of the aforementioned category, please describe it in the "Other" field.
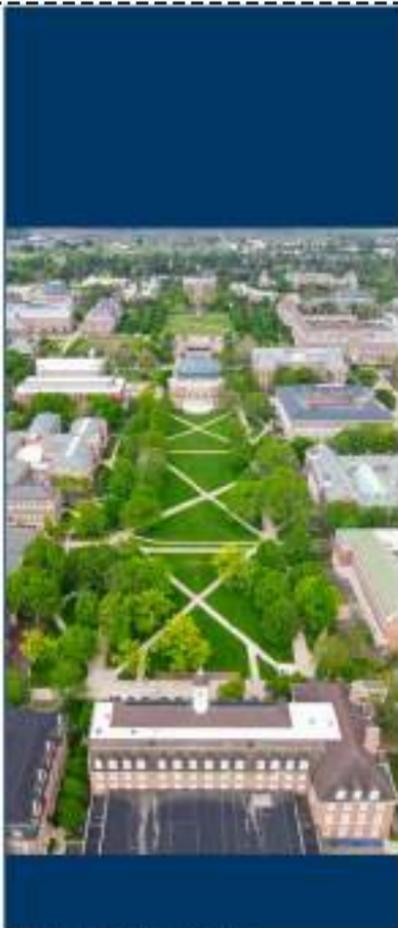
Thank you for your contribution!

**You have officially helped us improve
the campus walking infrastructure.**

We highly appreciate your time and effort!

CONTACT INFORMATION

Incase of any questions or queries, please contact:
Sarthak Prasad (sprasad9@illinois.edu, 217-904-5954)
Sutapa Banerjee (sutapab2@illinois.edu,
217-419-8078, 217-991-2570)