



Walkability of McMaster's Main Campus for Older Adults

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Acknowledgments

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1.0 Executive summary

Canada's population is aging. As a result, public institutions, including universities, are being called upon to ensure the built environment, alongside services provided by these institutions, are accessible to older adults. By ensuring campuses are physically accessible, there will be fewer barriers for older adults thereby increasing opportunities for healthy and active aging on campus.

One way to improve physical access to the university is to improve the walkability of the campus. This report, led by the McMaster Institute for Research on Aging (MIRA), outlines some key considerations for addressing the walkability of McMaster's main campus for older adults. Research for this project was conducted in the summer of 2018. The study was designed to understand older adults' perceptions of campus walkability. This study was carried out in two stages.

Stage I: The first stage of the study involved a walkability audit of campus. Data collection at this stage included completion of an audit tool (Appendix A) that was filled out by the older adult participants, and a semi-structured walk-along interview. The audit tool was developed following a robust review of the academic and grey literature and incorporated aspects of age-friendly outdoor spaces as identified by the World Health Organization (WHO).

Stage II: Following the walkability audit, the study participants engaged in a focus group (Appendix B) where their perceptions of the walkability and age-friendliness of McMaster University's main campus was explored.

Analysis of data from both stages led to a series of findings that can be used to improve McMaster's walkability of campus. These recommendations have been summarized into three main themes:

Navigation: A lack of signage on campus, including directional signs, maps, and easily readable building signs, was considered a primary concern for participants. Many participants noted that improved signage would encourage a sense of safety and increase their level of comfort and ability to enjoy their time on campus.

Safety: In general, most participants felt safe when walking on campus, but were concerned about some aspects of the campus' physical infrastructure. For instance, participants identified tripping hazards on certain pedestrian routes, lack of adequate lighting and ramps or accessible entrances to some buildings, and visual obstruction at crosswalks. Security assistance phones were seen as important, but their function was unclear to visitors.

Creating a welcoming environment: McMaster was perceived, for the most part, as an attractive campus with many natural elements and points of interest that participants wanted to further explore. Improving opportunities for public participation on campus and making it clear to visitors how to access various points of interest could address negative perceptions of McMaster which was described by some participants as 'intimidating.' Using the University's website to determine how to best access the main campus was not straightforward, which caused further challenges for some older adults with regard to participating in various activities.

2.0 Background and rationale



2.1 McMaster as an age-friendly university

The Age-Friendly University Network (AFU) was first established by Dublin City University (DCU) in 2012 to facilitate the implementation of age-friendly programs and policies in higher-education settings.¹ McMaster University joined the AFU in 2017 and, as such, committed itself to working towards AFU principles, which include encouraging the participation of older adults in education, research, health, and cultural activities.² To meet these goals, it is important to ensure that the campus is physically accessible and welcoming to older adults (among other groups), and to recognize that visitors to campus can have their own diverse expectations, strengths and challenges. By considering this diversity, the University will be better able to facilitate an open and welcoming environment for all visitors, including older adults.

2.2 Walkability

Walkability is one measure that can be used to determine whether an environment is accessible for people with various abilities.³ Both the Government of Canada and the World Health Organization highlight the importance of creating and maintaining safe and accessible outdoor areas, walkways, and public spaces in their guidelines for age-friendly communities.⁴ Walkability has been defined as the perception of features (e.g., infrastructure, safety, aesthetics) within a designated area's built environment that can influence an individual's ability to walk, use a wheelchair, or other mobility aids for transportation and/or recreation purposes.⁵ As highlighted in a number of similar studies, features that can affect walkability include:

- **Infrastructure:** physical elements in the built environment that influence an individuals' ability to walk or use a wheelchair. These elements include but are not limited to: continuity of paved pathways, sidewalk materials, sidewalk width, and/or the presence of wayfinding measures.
- **Safety:** physical elements that make people feel secure when moving in the environment. These elements include but are not limited to: handrails that can prevent trips and falls; features that promote safety from vehicular traffic including adequate crossing measures and buffers between sidewalks and roadways; and physical elements that affect one's sense of safety from crime.
- **Aesthetics:** the overall maintenance of the environment and natural elements, which can make an area a pleasant place to move through. This factor includes the presence of points of interest such as architecture and public art.

Older adults are more likely to experience age- and health-related functional limitations, such as reduced mobility. Mobility has been described as "fundamental to active aging and is intimately linked to health status and quality of life."⁶ Due to this potential increase, older adults are a particularly important group to consider when assessing walkability because they may require additional supports (e.g., benches, handrails) to navigate an environment.

2.0 Background and rationale



2.3 Walkability of university campuses for older adults

There are many advantages to considering the walkability of university campuses, which can promote the notion of 'active aging.' Active aging is a framework that has been adopted by the World Health Organization (WHO) which emphasizes the creation of "opportunities for [older adults'] health, participation and security."⁷ Improving walkability in post-secondary settings can ensure services and programs are accessible for individuals of all abilities, including older adults. If a campus is made more walkable and physically accessible, the aging population may be more inclined to participate in on-campus activities, such as research projects, educational programs and other intergenerational experiences, if they are available and advertised to them.⁸ Based on observations that have been made in current research on how age-friendly design supports social connectedness, accessibility to these opportunities could facilitate social participation and inclusion of older adults in campus communities.⁹

The WHO provides a list of recommended features that can enhance the age-friendliness of public spaces. Such features include, but are not limited to, the provision of benches, public washrooms, and non-slip pavement.¹⁰ Other examples within the built environment include adequate lighting and safe pedestrian crossings, which can encourage feelings of personal safety among older adults.¹¹ Availability of public transportation and design features of outdoor environments, such as traffic calming measures (e.g., speed reduction zones) and green space (e.g., gardens, landscaping), are also important for making an area more attractive.¹² By following WHO guidelines, as well as collecting feedback from older adults, the aim of this project was to understand the types of features within a post-secondary setting that can create a safe, comfortable campus space for people of all ages and abilities.

3.0 Assessing McMaster’s campus walkability for older adults



A working definition of walkability was developed for this project based on the results from a comprehensive review of academic and grey literature. Based on this research, an interdisciplinary research team developed a tool that could be used to measure this concept. The tool integrates measures of walkability from previously validated walkability tools — such as those used by Almeida to rate the walkability of streets in urban Portuguese centres from the viewpoint of older adults, Aidoust et al in walkability studies of the city of the Gold Coast, Queensland, Australia, and Age-Friendly Ireland to conduct a number of walkability audits throughout the country — as well as key age-friendly features, as identified by the WHO, for public buildings and outdoor areas.¹³

Using a mixed-methods design to collect data (i.e., qualitative and quantitative methods), older adults participated in the following project-related activities:

- 1) an audit of the walkability of McMaster University's main campus, which included a rating (audit) tool;
- 2) a walk-along semi-structured interview; and
- 3) a focus group discussion following their campus visit.

3.1 Audit tool

The audit tool (**Appendix A**) was developed following a review of existing methods for measuring walkability that have been outlined in the academic and grey literature by an interdisciplinary research team. This tool integrates measures of walkability from previously validated walkability tools, which had not yet been directly applied to post-secondary institutions, as well as a protocol used by Dublin City University to measure the walkability of their campus for older adults.¹⁴ Additionally, key age-friendly features, as identified by the WHO for public buildings and outdoor areas, were considered.¹⁵ The tool includes objective measures, such as identifying whether the environment includes specific physical features (e.g., a buffer between pedestrian and vehicle or bike lanes) as well as subjective elements, such as examining how older participants perceive their experience navigating particular spaces. By including objective and subjective elements, this tool captures the strengths of particular aspects of campus, but also areas that require improvements.

Participants rated their perceptions using a seven-point Likert scale in relation to key campus features:

N/A	1	2	3	4	5	6	7
Not applicable	Strongly disagree	Disagree	Disagree somewhat	Neither agree nor disagree	Agree somewhat	Agree	Strongly agree

Table 1: Sample seven-point Likert scale used in audit-tool

3.0 Assessing McMaster's campus walkability for older adults

3.2 Walk-along interviews

Semi-structured walk-along interviews were administered with older adults by trained student volunteers. These interviews provided an opportunity to further explore the perceptions of older adults about their experiences with navigating particular aspects of the built environment of McMaster's campus. Examples of questions included: "Have you noticed anything so far that might influence your ability or desire to walk on campus?" and "Do you feel safe being on campus?" The participants were also asked to have their student partner photograph any highlights that might positively or negatively impact campus walkability, which sparked further conversation. Some of their photographs are featured in this report.

3.3 Focus groups

Following completion of the campus walk-along interviews, most of the participants engaged in a focus group discussion. Participants were asked questions about their views on what elements are important for walkability, their confidence in navigating the campus, and their associated impressions to elicit information about their perceptions of the McMaster University campus and its walkability for older adults. This focus group guide has been included in **Appendix B**.

3.4 Routes and segments of campus

To determine routes and segments to analyze during the walkability study, criteria was developed which included:

- routes passed by at least one transit stop;
- routes were one kilometre or less and could be completed at an easy pace in 15 minutes without breaks. More time was allowed during the study for participants to rest (if needed) and fill out audit forms;
- each route contained three segments (segments are distinctive areas of the campus as determined by stakeholders);
- segments pass two or more popular destinations (e.g., a library, lecture hall, gym, etc.);
- at the end of each segment a bench is present for participants to sit and fill out an audit form.

Using the above criteria, a sample of geographic areas on campus that older adults were most likely to navigate were selected in advance of the study.

The routes and segments analyzed during this study are detailed in **Appendix C**.

4.0 Results of the audit

A total of four data collection sessions were conducted between July and August 2018. Of the 19 older adult participants, 12 participants (63%) were female and seven participants (37%) were male. They ranged in age from 66 to 89 years (average age was 72 years). Four participants reported using a mobility aid either some or most of the time, including participants each who used a nordic pole, a cane, and a walker. One participant used a white cane due to a visual impairment mobility issue.



What Makes an area walkable?

When participants were asked this question, elements they most frequently identified included:

- Aesthetics of the environment (e.g. trees, gardens, interesting buildings) were brought up in all four focus groups: "Well, I like [...] the scenery. If I'm going to go out walking, it won't be to a mall. It'll be somewhere where it's probably attractive and there's something to see and notice."
- A path or sidewalk that is in good repair: "A flat surface, [...] one that's not bumpy, one where I've got good footing, because I am afraid of falling, and I need good footing."
- A sense of security, including knowing where you are going and ability to navigate: "Good surfaces to navigate on but also feeling safe and knowing where you are going. So, you have a sense of security of where you are and what the circumstances are."
- Other elements that were raised included benches so one could rest or enjoy the space, accessibility for people with varying mobilities and devices, as well as buffers for pedestrians from vehicular traffic, and destinations to which it was "worth the trip."

4.0 Results of the audit



4.1 Navigation

A lack of information about how to get around campus safely and comfortably was seen as one of the main deterrents to visiting campus for most participants. Participants noted there was an absence of wayfinding measures and little explanation about what was available within buildings or how to enter buildings for those with accessibility challenges. These issues were exacerbated by the size of campus and confusion about where to park their vehicles.

4.1.1 Signage

Absent or poorly placed signage was an issue raised by almost all of the participants during their walk as well as in the focus groups.

The scarcity of signage was not limited to certain routes, but seen as a major issue across many areas of campus. The lack of signage was seen as a safety issue for some participants, one of whom (male, 72) stated in a focus group discussion "I wouldn't be able to find my way around, and I wouldn't like it if I feel unsafe if I don't know exactly where I'm going."

Statement	# of resp.	Rating								Average rating
		N/A or incomplete	1 (Strongly disagree)	2 (Disagree)	3 (Disagree somewhat)	4 (Neither agree nor disagree)	5 (Agree somewhat)	6 (Agree)	7 (Strongly agree)	
Signage was present and helpful for navigation	19	N = 4 (21%)	4 (21%)	3 (16%)	3 (16%)	0	3 (16%)	2 (10%)	0	2.5
Public and accessible washrooms were available and clearly marked	19	4 (21%)	6 (32%)	3 (16%)	4 (21%)	0	0	1 (5%)	1 (5%)	2.2

Table 2: Participant responses to questions regarding the availability of signage and public washrooms at McMaster University

4.0 Results of the audit



A study participant indicates to her student partner where signage could be placed beside the entrance to L.R. Wilson Hall.

4.1.2 Size of Campus Space

The large size of campus and its secluded nature were seen as both a positive and a negative by various participants. On one hand, the campus was seen as “park-like” and “an oasis” in the city whereas others saw it as a potential challenge to mobility. One participant, who used a walker during the audit, stated “When you’re restricted walking, anytime you have to walk an extra 200 yards is a bit of a pain.” There were no clear options for people who needed to be dropped off closer to the entrance of many buildings, as cars are restricted from entering campus.

4.0 Results of the audit

4.1.3 Parking

Statement	# of resp.	Rating								Average rating
		N/A or incomplete	1 (Strongly disagree)	2 (Disagree)	3 (Disagree somewhat)	4 (Neither agree nor disagree)	5 (Agree somewhat)	6 (Agree)	7 (Strongly agree)	
Parking lots were close to amenities and easy to find	19	N = 4 (21%)	2 (10%)	0	3 (16%)	2 (10%)	1 (5%)	6 (32%)	1 (5%)	4
Accessible parking spaces were conveniently located, well signed, and easy to find	19	3 (16%)	0	4 (21%)	3 (16%)	3 (16%)	1 (5%)	3 (16%)	2 (10%)	4

Table 3: Participant responses to questions regarding the availability and convenience of parking at McMaster University

Some participants felt that the cost and limited availability of parking was a deterrent to taking part in activities or events on campus. While it was generally acknowledged that parking cost and availability is an issue in most urban areas, it was still listed by some as a reason not to come to campus:

“The cost of parking. I always consider what is the fee? Am I going to be walking for an hour but spending 15, 20 dollars?”

– Focus group participant (female, 72)

A few participants were aware that people often park off-campus at local businesses or on residential streets and walk in, with one individual (male, 74) stating that “I can pay for the privilege to park over there on the street and walk in, it’s just about as far.” Issues were also pointed out with regard to accessible parking. In one location, for example, accessible parking was across the road from the pedestrian pathway.

4.0 Results of the audit



A study participant took this picture showing accessible parking that did not connect to a walking path directly. Individuals would have to cross the road or travel along it to get to nearby pedestrian walkways.

- It was important to participants that the cost of parking be reasonable for visitors. Incidentally, and not captured as a formal part of the study, one individual followed up to describe that as a result of having the cost of her parking covered as a participant, she ended up staying on campus to visit the McMaster Museum of Art and the new Bertrand Russel Archives building, which she likely would not have done if she had to pay full price for parking.

4.0 Results of the audit

4.2 Safety

Most participants reported feeling safe on campus. Participants also reported that the volume of pedestrian traffic was not overwhelming, which may affect their feelings of safety and may change during the academic term. Where safety issues were brought up, they were generally around infrastructure issues such as cracks or dips in pavement, as well as security assistance phones and a lack of signage.

Statement	# of resp.	Rating								Average rating
		N/A or incomplete	1 (Strongly disagree)	2 (Disagree)	3 (Disagree somewhat)	4 (Neither agree nor disagree)	5 (Agree somewhat)	6 (Agree)	7 (Strongly agree)	
Overall, I felt safe on this route	19	N = 2 (10%)	0	0	2 (10%)	0	1 (5%)	7 (37%)	7 (37%)	5.8

Table 4: Participant responses to questions regarding the overall safety of the main campus at McMaster University

4.2.1 Infrastructure

For the most part, participants felt that the walkways and paths throughout campus were in good repair and would be accessible for most people, including those who use mobility devices. On the questionnaire, the statement that was rated lowest was “There were places to shelter from the elements (sun, snow, rain, etc.)”. The statement “The path was flat or not too steep to walk comfortably” was rated the highest for infrastructure elements.

Statement	Average rating across all (9) segments
Sidewalks and paths are in good repair	5
There were places to shelter from the elements (sun, snow, rain, etc.)	3.8
The path was flat, or not too steep to walk comfortably	6.2

Table 5: Average participant response to questions regarding physical infrastructure at McMaster University

1= Strongly disagree; 2 = Disagree; 3 = Disagree somewhat; 4 = Neither agree nor disagree; 5 = Agree somewhat; 6 = Agree; 7 = Strongly agree.

A few problem areas were noted in various areas on campus. Some of these are elements, such as cracked pavement or dips in a pathway, that could increase the potential for trips and falls. This could be a major safety concern for older adults, especially those with unsteady balance. A study participant described this issue when he said: “Some of these small dips give people with balance a real challenge, because they’re walking along on what they think is flat ground, when all of a sudden, ‘whoop.’ They’re tipping over.” Other participants identified infrastructure issues including areas where curb cuts are not level with the road or wide enough for mobility devices, informal pathways, crosswalks that are not painted or otherwise easily identifiable to drivers, and visual obstructions at crossings. Additionally, participants discussed accessibility to buildings, amount of shelter available, and location of seating areas. Issues that were pointed out by participants are described in more detail in **Appendix D and E**, which shows the audit results for each segment.

4.0 Results of the audit



Some of the infrastructure issues noted by participants include informal pathways and cracked or uneven walking paths. While these might be minor issues for some older adults, those with mobility impairments, and balance issues may find them difficult to navigate safely and comfortably.



Security assistance phone in Faculty Hollow, as photographed by a study participant.

4.0 Results of the audit

4.2.2 Security Assistance Phones

Many participants did not notice security assistance phones, as they were walking their routes. Some felt that they should be more visible, while others thought the issue was that visitors would not understand what they were or to look for them if they were in an emergency situation. Several participants thought that in order to be useful for older adults, there needed to be more of these call stations placed throughout campus so that a visitor would not have to walk a long way to reach one. One focus group participant (male, 76), who audited route 2, stated: "There were some areas where there were lots of those red poles, but there were others where there were none."

Statement	Average rating across all (9) segments
Security assistance phones were visible and available throughout this area	4.5*

Table 6: Average participant response to questions regarding security assistance phones at McMaster University

1= Strongly disagree; 2 = Disagree; 3 = Disagree somewhat; 4 = Neither agree nor disagree; 5 = Agree somewhat; 6 = Agree; 7 = Strongly agree

* The lowest ratings were found on all segments on Route 3 (rated 4, 3.1, and 3.6) and Route 1 segments 1 (rated 2) and 2 (rated 3.7).

4.2.3 Other security measures

Some participants were interested in other security measures around campus, for example the use of CCTV cameras or security officers patrolling the campus.

Participants in one focus group were unsure whether there were security cameras on campus, because none of them had noticed any signage indicating their presence. While there are signs that notify people about the presence of cameras at the entrances to campus, those who are trying to navigate may miss the signs as well as for those entering campus by public transit. The participants believed that it was necessary to have high-quality security cameras around campus, and that more signage indicating their presence would provide them with an extra sense of safety as they visited the campus.

A few participants brought up the fact that they did not see security officers on campus. One participant thought security officers should be patrolling the area not just to help in the case of an emergency or negative event, but also so that there would be someone approachable to ask for information or directions. Others felt comfortable approaching students and other people they met on campus to get information, but during the time of the audits campus was relatively quiet compared with during the academic year, which may affect these perceptions.

4.0 Results of the audit

4.3 Creating a welcoming environment when visiting the McMaster campus

Many participants reported being pleasantly surprised with parts of campus, particularly the mix of classical and modern architecture and the presence of natural elements which made for an aesthetically pleasing walk in many areas. However, many also expressed feeling a level of intimidation or discomfort with being on campus. A participant (female, 79) described her perceptions of main campus: "I've always called it a fortress in the middle of Hamilton. And then you come in and see how nice it is. It's kind of disappointing that it is so blocked off from the people." Part of this discomfort comes from a lack of signage, as well as the fact that McMaster is a campus with only a few points of access which makes it feel removed from the rest of the city.

While the relative seclusion of campus can be considered a positive in many ways, it also means that effort needs to be made to ensure people feel like they are not only allowed on campus, but that their presence is welcomed and valued. Several participants had looked into what McMaster offers in terms of courses or programs in the past, but became discouraged by the lack of information available, including a focus group participant (male, 76) who remarked: "You don't seem to want people to come here. [...] To be part of the campus. I don't feel like I'm part of this." Another focus group participant (female, 76) stated "I think it's almost a cultural change. I think it's almost thinking about yes, this is a place where the public is also welcome."

4.3.1 Aesthetics

Statement	Average rating across all (9) segments
Natural elements are present which make this area pleasant to walk in	5.6**

Table 7: Average participant responses to questions regarding campus aesthetics and design at McMaster University

1 = Strongly disagree; 2 = Disagree; 3 = Disagree somewhat; 4 = Neither agree nor disagree; 5 = Agree somewhat; 6 = Agree; 7 = Strongly agree * Highest ratings were on route 2 (rated 6.7, 6.3, and 6.7)

Many participants found the campus to be a beautiful place to visit, describing it as "Almost like walking in a park," and as "An oasis in the middle of Hamilton." For many, this was an important part of walkability and a reason to return to campus.

While certain parts of campus received high praise for aesthetics, points of interest, and natural elements, others found to be lacking. Areas that were heavily paved, for example near L.R. Wilson Hall and MDCL, were not seen as enjoyable places to walk. One focus group participant remarked "The vast stretches of concrete in this place are discouraging. Aesthetically, it's just ugly." and "It's paved so we don't have to care for it. It says, industrial." Less care had also been taken in maintaining the planters and gardens in these peripheral areas compared with those in the centre of campus.

"All the things that were on the checklist are important; but what was really meaningful to me in terms of walkability was how much I enjoyed it. They obviously take a lot of pride in keeping the property looking nice. In terms of walkability, it's important to have safe, wide pathways; but how the environment impacts me is important and I thought, 'I think they're doing a very good job'."

– Focus group participant (female, 69)

4.0 Results of the audit



4.3.2 Public Access

Many participants were not aware that there was anything available for them on campus, or that they would even be allowed to be there. One focus group participant, reflecting on this sentiment, said “It’s always the impression that it’s the University property, and the general public can’t walk through it.” Another participant (female, 70) believed that this had to do with the fact that the points of access to campus were difficult to navigate, stating “The transit within the campus is such that cars stop here — that’s it, that’s all, you can’t go any farther — which gives you the impression that you’re not to come any further as well. So, it’s not a friendly welcoming.”

Availability of information and public access went hand-in-hand for many participants, who felt it was important for the University to be very clear about what people are able to do on campus.

“You have to let us know that we are welcome to come, and there’s something to come for. Why would I as ‘Joe Common Citizen’ want to come here? I don’t know that I’m welcome, I don’t know that there’s something I can come to that’s even of my interest, or my level of comprehension — whether it’s art, music, or an open lecture. I need to know what’s available to me and that I’d be made welcome when I got here, not just be stonewalled.”

— Focus group participant (female, age 70)

5.0 Recommendations

Participants identified a number of factors that affected their perception of the walkability of McMaster University's main campus. They offered a number of suggestions to improve the walkability and accessibility of the area over the course of this study. These recommendations provided valuable insight into the ways that older adults, and often first-time visitors, experienced the campus.

5.1 Navigation

5.1.1 Signage

Participants offered a number of suggestions in order to increase wayfinding ability on campus, which are detailed below. In summary, the main suggestions of participants included:

1. Considering first-time visitors when designing signage
2. Installing directional signs
3. Installing strategically-located maps on campus
4. Publicizing technology and mapping apps
5. Signs on significant buildings that outline purpose
6. Accessibility of the building

1. Considering first-time visitors when designing signage

First-time visitors should be the primary audience considered when implementing a wayfinding plan or installing new signage on-campus. Participants felt that the way campus was set up limited their ability, as people with limited experience, to find where they needed to be without asking for directions. It was noted that first-year students would also benefit from signage designed with visitors in mind as it would help them to navigate campus during what may be an already stressful time in their lives.

2. Installing directional signs

Directional signs should be erected along main campus paths which point the way to buildings, as well as bus stops, parking lots, and other key locations. These signs could also provide information on the approximate distance to these locations to support visitors to successfully navigate the campus.

To ensure these signs are age-friendly, it is recommended that the print is large and clear so as to be easily legible, as expressed by one focus group participant (female, 72): "They have to be bigger. They can't be those little scrawny things. You have to be able to see them clearly." Universal symbols could also be used on these signs to improve understanding and wayfinding ability across various populations.

First-time visitors should be the primary audience considered when implementing a wayfinding plan or installing new signage on-campus. Participants felt that the way campus was set up limited their ability, as people with limited experience, to find where they needed to be without asking for directions. It was noted that first-year students would also benefit from signage designed with visitors in mind as it would help them to navigate campus during what may be an already stressful time in their lives.

"I think somebody coming for the first time might have to stop people quite often and ask, 'where am I? How do I get from here to there?'"

– Focus group participant (female, 66)

5.0 Recommendations



Signs are present on The University of Lethbridge campus which signal the direction of key buildings and services, improving wayfinding ability.¹⁶



McMaster University does not have directional signage on its main campus. Many buildings are identified with large maroon signs with their names in white, bold font. These signs are located at the main front entrance of many, though not all, buildings on the main campus.

5.0 Recommendations

Street signs and navigation signs should also be installed, where streets are named, so that drivers can find their way to the parking lots more easily. For this study, instructions were given to participants which included a map as well as written directions to the parking lot. Some participants remarked that while the maps and directions indicated that the streets on campus had names, there were no signs that would allow people to confirm they were turning onto the correct road. For those parking in Lot M, this issue was compounded because the street signs that were available showed directions to Hamilton or to Dundas, but not to the parking lots. Because the parking lot is separated from the main campus by an overpass, it was unclear to the participants if they would be able to get to the parking lot if they turned there, or if they would be brought back onto Cootes Drive. One participant stated “the sign on the bridge says Dundas, so we turned around and went back and asked the bus driver. And he knew where it was.”



3. Installing strategically-located maps on campus

Many participants suggested there should be more large maps in key locations, which would give visitors an overview of the campus. Many people made connections to directory maps found in shopping malls that show you where you are on the map and indicate nearby points of interest. This style of map allows users to better situate themselves and develop a plan to reach their intended destination. These maps could include locations of accessible entrances to buildings, public washrooms, eating areas, and other points of interest. While there are some maps like this on campus, such as at the Sterling Street entrance, they could be placed in more key locations (e.g., at parking lots and bus stops). One participant, 76, remarked near the Sterling Street transit stop “the first thing that would happen if I was coming here, particularly in the winter, is I would get off the bus here. There is no map of the campus close to here. [...] So, I have to walk [...] until I can find a map.”

5.0 Recommendations



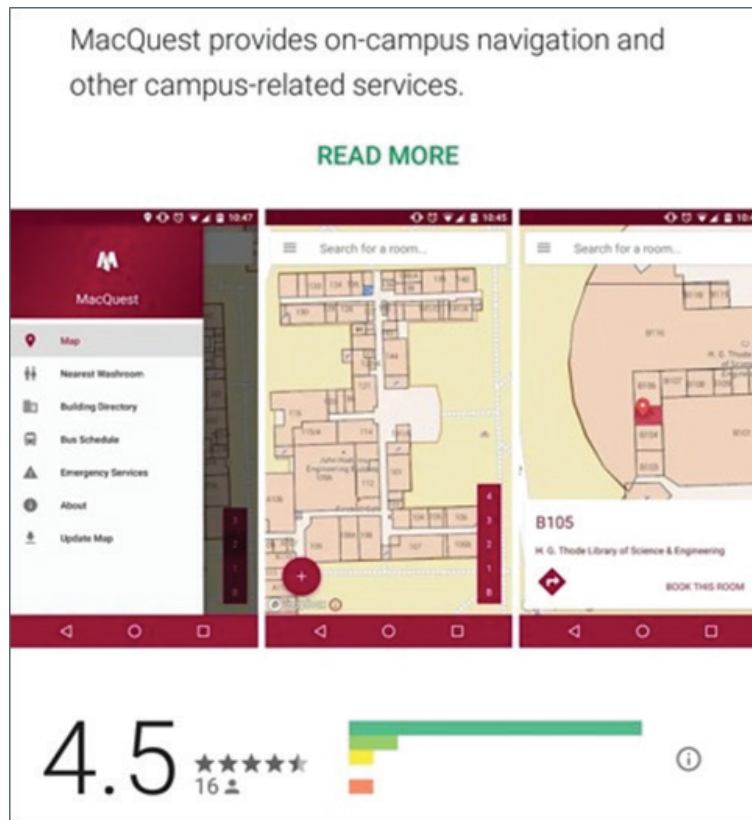
The number of and location of maps on campus was not considered adequate to participants.

In addition to large, permanent maps around campus, it was also suggested that paper maps and pamphlets be available that would serve as a portable guide with additional information about features on campus. For example, many participants did not know what the security assistance phones were, how they worked, or who was allowed to use them. This and other information could be provided to visitors in an informational pamphlet along with a campus map to help visitors maintain a sense of comfort as they explore the campus.

4. Publicizing technology and mapping apps

One of the focus group participants (female, 69) suggested that it may be helpful for visitors to have an app that connected with your phone's GPS to help guide you through the campus. There is such an app available called MacQuest, developed by the Wireless System Research Group (WiSeR) from the Department of Computing and Software.¹⁷ This information could be made available to campus visitors on the "How To Get To Mac" page. Another participant recommended this information be findable by a QR code that could be placed around campus.

5.0 Recommendations



5. Signs on significant buildings that outline purpose

The installation of larger, more noticeable signs on all sides of the buildings was suggested as an age-friendly improvement that would also improve navigation for everyone. Some of the building signs were small and situated on the ground, with landscaping around them which made them difficult to notice or read. It was noted that even high-traffic buildings, such as the McMaster University Student Centre (MUSC), were not signed. Standing in front of the McMaster Museum of Art (MMA), one participant remarked "Look at this building over here. From here, I don't know what that building is." The lack of signage on some buildings was contrasted by many participants to the large, high, clear signage on the MMA and the David Braley Athletic Centre (DBAC).

5.0 Recommendations



The McMaster Museum of Art and the David Braley Athletic Centre (photograph from one participant) were both considered by multiple participants to be examples of good building signage.



While the sign on L.R. Wilson Hall was large and higher up on the building, which participants liked, it is located on only one side of the building in a less visible location.

5.0 Recommendations



While the sign on L.R. Wilson Hall was large and higher up on the building, which participants liked, it is located on only one side of the building, in a less visible location.

Some participants felt that the signage on buildings should not stop at the building name, but rather include information about what is available in the buildings, for example public washrooms, cafes, faculty offices, and so on. A focus group participant (female, 76) felt that by knowing what was in the buildings, she could more easily ascertain where she'd be able to go: "I think there's an opportunity to, to really let the public feel this is not an enclosed academic space. This is a space where the public can come a certain part of the way." Another focus group participant (male, 76) remarked "I think the two things for me would be signage and washrooms. [...] They would be deterrents. Where are they? Well, I'm sure there are washrooms. We just couldn't see them."

5.0 Recommendations



A study participant indicates to her student partner where signage could be placed beside the entrance to L.R. Wilson Hall.

6. **Accessibility of the Building**

Many of the buildings passed by participants were not accessible due to a lack of ramps or visible automatic-open push-button doors. There were no signs indicating where one should go if he or she is unable to access the building through that entrance. Some of the buildings participants pointed out included Gilmour Hall (GH), Burke Sciences Building (BSB), and the Campus Store.

5.1.2 Size of Campus Space

Recommendations:

Study participants noted that the large size of campus made it aesthetically pleasing and peaceful but that it also could be a potential challenge to mobility.

- Participants in one focus group suggested the University could increase shuttle services throughout campus, in order to make it more accessible for people who could not walk long distances. Currently, shuttle buses are available from two of the parking lots, but these drop passengers off at the edges of campus.
- A study participant felt that being able to bring visually impaired people closer to a building or area they were looking for would decrease chances for confusion or accident. The World Health Organization (WHO) similarly suggests increasing the availability of drop-off and pick-up spots for those who are disabled and older adults, as part of a comprehensive age-friendly transportation plan.

5.0 Recommendations

5.1.3 Parking



A study participant took this picture showing accessible parking that did not connect to a walking path directly. Individuals would have to cross the road or travel along it to get to nearby pedestrian walkways.

Recommendations:

Study participants identified the cost and limited availability of parking on campus as a potential deterrent to individuals taking part in activities or events on campus.

- One focus group participant (male, 73) suggested building a large, multi-story parking garage as a way to resolve the parking issues on campus: "Parking is a problem here, and always has been. You've got half a dozen dinky little parking lots. If it were me, at some-point in time, I'd put a high-rise parking garage."
 - A few participants parked in the Stadium Underground Parking and were impressed that it was bright, with not too many turns, and the parking spaces were large enough to park comfortably compared to some parking garages.
- The WHO suggests implementing priority parking spaces for older adults near buildings and transportation stops, in addition to accessible parking for permit holders and drop-off and pick-up spots for disabled and older adults, as part of an age-friendly transportation plan. 4

5.0 Recommendations

5.2 Safety

Recommendations:

Participants generally felt safe on campus and did not offer any recommendations to improve their sense of safety on campus. Some study participants noted that security assistance phones were available on campus but that campus visitors would not be familiar with their purpose or how/when to use them. Providing additional information to first time visitors about safety features in general, or making this information more available to the public, would have improved their certainty about the safety and security of campus.

5.3 Creating a welcoming environment when visiting the McMaster campus

5.3.1 Aesthetics



Recommendations:

Participants were generally pleased with McMaster University's appearance and the care put into designing aesthetic and interesting spaces. It was recommended that McMaster University continue efforts to maintain a pleasant environment for walking, including incorporating gardens and trees and ensuring new buildings are architecturally interesting. In areas that are lacking these elements, making improvements that enhance a sense of relationship with the centre of campus and ensure all areas are pleasant for walking.

5.0 Recommendations

5.3.2 Public Access

Recommendations:

Participants expressed interest in learning what was available to them through the University, and had some suggestions about what they would like to see offered and how to make the information available.

Participants in three out of four focus groups brought up the idea of having campus tours on various topics that would be available to the public. Some people wanted to hear more about the history of the buildings and the University itself; and others wanted to know more about the facilities on campus and the work and research being done by various Faculties and individuals. As campus is quite large, these could also be split into separate parts of campus. It was suggested that these tours could either be done with a guide, or simply by printing a pamphlet so people could do a self-guided tour. Another option would be to take inspiration from the McMaster Museum of Art, which provides an audio tour of the sculptures around campus that people can download on their cell phones. Many people saw tours as a way to, as one focus group participant (female, 70) stated, make people “feel more welcome and to be willing to come on campus.”

Increase the availability of special interest courses available to older adults, and make sure they are easy to sign up for. One participant stated that when he tried to find a class to take, all he could see were vocational ones. While it is possible to apply for listener status for other courses, the courses available and application process is very difficult to navigate. Another participant described trying for three years to join an art class and being discouraged and giving up every time because the process was so complicated before finally asking a friend who worked at McMaster what to do. The friend provided a number for the department instead of going through the formal application process. This process could be streamlined, and more options opened up for older adults to continue in their lifelong learning goals.

- As the available spots in many courses are filled by traditional students, another option would be to offer general-interest programs catered specifically to older adults. Programming provided by Oxford University’s Department for Continuing Education, which includes a lecture series and online courses, could serve as a model. The Oxford Experience, for example, provides one week courses on a variety of topics for adults and an opportunity to live on campus during the summer (<https://www.conted.ox.ac.uk/about/oxford-experience>).¹⁸

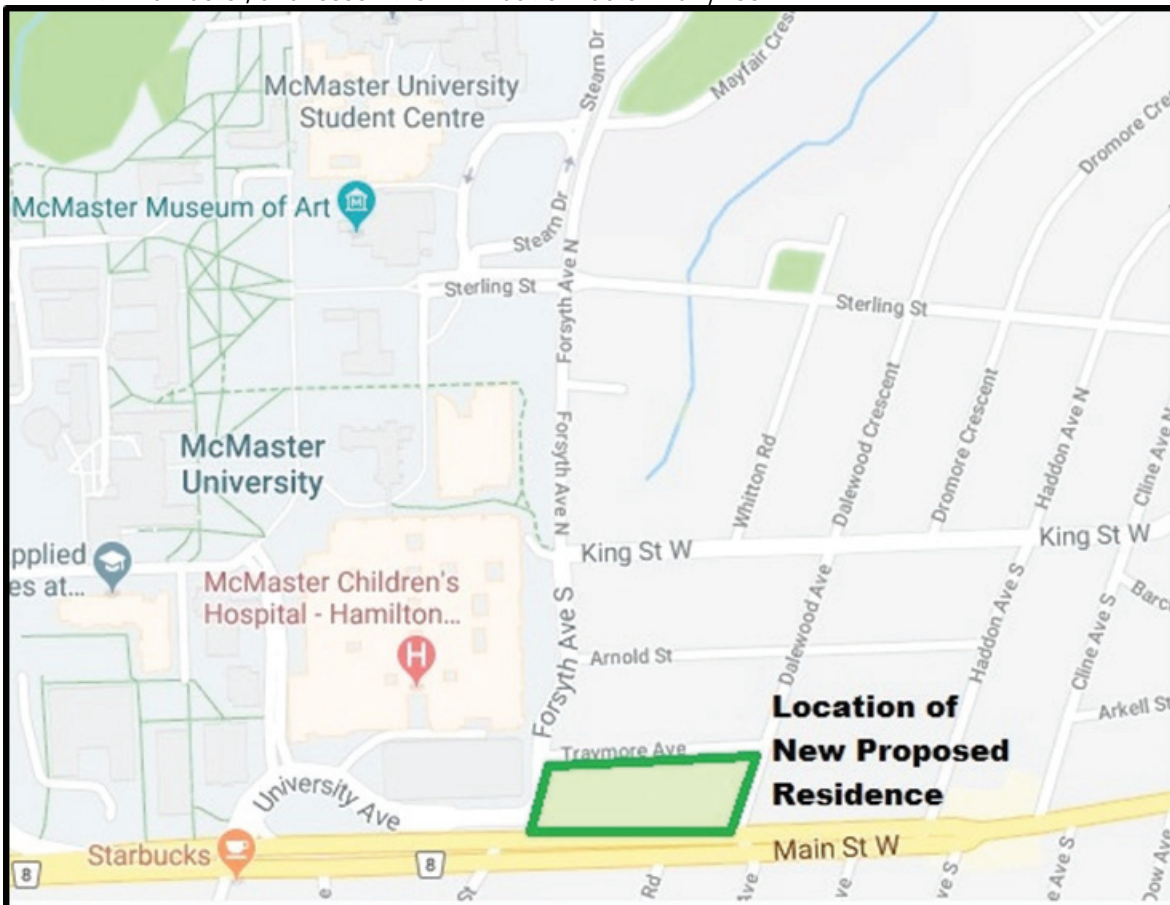
“You have to let us know that we are welcome to come, and there’s something to come for. Why would I as ‘Joe Common Citizen’ want to come here? I don’t know that I’m welcome, I don’t know that there’s something I can come to that’s even of my interest, or my level of comprehension – whether it’s art, music, or an open lecture. I need to know what’s available to me and that I’d be made welcome when I got here, not just be stonewalled.”

– Focus group participant (female, age 70)

5.0 Recommendations

Other suggestions to encourage access to campus for older adults include:

- Advertise the events and activities open to the public across a variety of mediums, including newspapers, social media, local event guides and tourist magazines.
- Place maps and pamphlets with information about McMaster and the campus in the Tourism Hamilton Visitor Centre to increase public awareness both for locals and visitors from out of town.
- A new residence and community space is currently slated for development on Main Street West and Forsythe Avenue. This space could serve as a gateway to the rest of campus, and a space where connections between community and the University are supported. Allowing members of the public to engage in a variety of activities on the edge of campus would increase familiarity with McMaster, and lessen the intimidation factor many feel.



Green-shaded area of the map indicates the area where the proposed residence will be situated

6.0 Limitations of the study of walkability

These audits were conducted in the summer, which means that conditions were more or less ideal, despite one session needing to be rescheduled due to a heat warning. The timing of the audits presents three key limitations to keep in mind when viewing the results:

- First, the population on campus was lower than it would be during a typical month in fall or winter academic sessions. Walking paths, parking lots, and campus in general were less congested than it may be at peak times. With an increase in students, staff, faculty and visitors on campus during the academic year, the results may differ.
- Second, winter conditions can affect mobility in significant ways, a point that was raised by many participants, one of whom stated: “I am coloured by the fact that it is not an easy place to walk around in winter. It is not one bit accessible.” In 2014, these difficulties were highlighted in an article in *The Silhouette* entitled “Winter accessibility an uphill battle on campus”.¹⁹ Students who rely on mobility devices describe missing more classes in the winter, taking longer to get between buildings than at other times of year, and being confronted with dangerous conditions around campus.
- Finally, in the winter it gets dark earlier. The audits describe here were all conducted during the day, so it is difficult to judge whether lighting would have been adequate after dark, or if participants would maintain a sense of safety and security at different times of day. As one focus group participant (male, 72) remarked, “you might get some very different perspectives” if the study were to be conducted after dark.

It would be beneficial to repeat the study in various conditions, including during winter months, during an academic term when there are more students on campus, and in the evening when it is darker. The results detailed in this report could serve as a baseline against which other audit results are compared.

Additionally, this study was not naturalistic, meaning that participants were given an audit form that listed things to look for, and participants were briefed about the concept of walkability before their audits. As such, their perceptions of campus might differ from visitors to campus who are not cued to certain features of the physical environment. Despite these limitations, many participants were positive about their experience visiting campus. Many indicated they wanted to return to attend events or participate in research. Some wanted a more formal tour of buildings and architecture, as many were interested in learning more about the history of McMaster University.

7.0 Summary of findings

Based on the findings from this study, the following key recommendations were identified:

- Improve signage around campus, including both directional and building signs.
- Make infrastructure repairs to reduce tripping hazards.
- Work towards making campus barrier-free for people with reduced mobility, including those who use mobility devices.
- Have options available for those with limited walking ability to make their way across campus, for example priority parking or shuttle services.
- Ensure parking is available, convenient, and not cost-prohibitive.
- Continue to invest in maintenance and upkeep of natural areas that make campus a pleasant place to visit. For areas where natural elements and points of interest are lacking, make improvements that increase a sense of congruence while walking through the campus.
- Increase the availability and visibility of public events and engage the public through various channels to notify them about what is available, for example, by providing campus tours that focus on points of interest and points of pride.
- Ensure information about visiting campus is available both online and in print format so visitors can make informed decisions before and during their time on campus.

7.1 Next steps

Going forward, it is necessary to develop a sustainable, user-centred approach to assessing the walkability of campus on an ongoing basis. This project could be included as part of an ongoing review by Facility Services, to ensure they receive feedback directly from community members. Individuals of all ages should be given the opportunity to assess walkability in real-time and identify barriers and facilitators they come across as they navigate campus.

One option for obtaining ongoing information about perceptions of campus walkability would be to have a process for members of the public and the McMaster community to provide positive and negative feedback at any time about campus walkability and the built environment. For example, researchers at the University of Manitoba used a software application called The Stanford Healthy Neighborhood Discovery Tool. This app allows people to take pictures of barriers and facilitators when on campus, as well as audio commentary explaining why the picture was taken. However, this app only allows users to follow and report on things found within a set path. Based on their experiences using this app, McMaster, as a co-member of the AFU, could explore the possibility of co-designing a mapping app that allows for more open reporting and could be adapted for a local context. This app could be monitored by Facility Services so that issues can be brought to attention immediately.

8.0 Conclusions, reflections and final thoughts



Walkability is an important part of the larger goal of ensuring an age-friendly university. If a University's built environment is age-friendly, it would also increase the capacity of people of all ages and abilities to access the resources that are provided. Through this study, we found that older adults in Hamilton and the surrounding communities are interested in learning more about McMaster University and taking part in the various services, activities, events, courses, and research opportunities. While some initially had negative perceptions of the campus, many enjoyed their time at the University during the project and hoped to be welcomed back. Improving access to campus for people of all age and abilities is important, which should be part of the university's efforts to ensure an equitable, inclusive and diverse university community.

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Appendices

Appendix A: Audit tool

Appendix A: Participant Demographic Form and Audit Tool

Campus Walkability for Older Adults
Dr. Janet Pritchard and Dr. Brenda Vrkljan

Date: _____ (MM/DD/YYYY)

Start time: _____

Weather conditions: _____

Demographic Information

1.0 Year of birth: _____

2.0 Gender:

- ☐ Male
- ☐ Female
- ☐ Other
- ☐ Prefer not to answer

3.0 Mobility aids. Check all that apply.

- ☐ I do not use a mobility aid to get around most of the time
- ☐ I use a wheelchair to get around most of the time
- ☐ I use another mobility aid: If yes, please state type: _____

4.0 Hearing and vision. Check all that apply.

- ☐ I do not have a hearing aid
- ☐ I have a hearing aid
- ☐ My eyesight, using glasses or contact lenses if I use them, is good
- ☐ My eyesight, even when using glasses or contact lenses, is poor or non-existent

5.0 Highest level of education:

- ☐ Some secondary school
- ☐ Secondary School Diploma or equivalent
- ☐ Some college or trade school
- ☐ College Diploma or Trade School Certificate or equivalent
- ☐ Some university
- ☐ University Degree, Bachelor's level
- ☐ Graduate Degree (e.g. Master's, Ph.D, M.D., J.D., etc.)

Appendices

6.0 Over the past 7 days, how often did you take a walk outside your home or yard for any reason? For example, for fun or exercise, walking to work, walking the dog, walking in a mall, etc?

- ☐ Never
- ☐ Seldom (1-2 days)
- ☐ Sometimes (3-4 days)
- ☐ Often (5-7 Days)

6.1 On average, how many hours per day did you spend walking?

- ☐ Less than 30 minutes
- ☐ 30 minutes – 1 hour
- ☐ 1 – 2 hours
- ☐ 2 – 4 hours
- ☐ More than 4 hours

Appendices

Segment [One]:

Rating Scale

N/A	1	2	3	4	5	6	7
Not applicable	Strongly disagree	Disagree	Disagree Somewhat	Neither Agree nor Disagree	Agree Somewhat	Agree	Strongly agree

Thinking about the section of campus you just walked, please rate your agreement with the following statements:

S1 Q1	Sidewalks/paths are in good repair (i.e. few or no cracks, grooves, or broken sections)	N/A	1	2	3	4	5	6	7
S1 Q2	There were low curbs that tapered off at the road	N/A	1	2	3	4	5	6	7
S1 Q3	Sidewalks were wide enough to accommodate people with mobility aids (such as wheelchairs or walkers)	N/A	1	2	3	4	5	6	7
S1 Q4	Walkways were continuous (i.e. no large breaks or places where sidewalk stopped)	N/A	1	2	3	4	5	6	7
S1 Q5	There were few or no informal pathways along the route	N/A	1	2	3	4	5	6	7
S1 Q6	There were no obstructions on the paths which made them difficult to maneuver	N/A	1	2	3	4	5	6	7
S1 Q7	Sidewalk/path materials are non-slip (i.e., if the path was wet it would not be slippery)	N/A	1	2	3	4	5	6	7
S1 Q8	The path was flat, or not too steep to walk comfortably	N/A	1	2	3	4	5	6	7
S1 Q9	Railings were present along stairs and ramps	N/A	1	2	3	4	5	6	7
S1 Q10	Security assistance phones are visible and available throughout this area	N/A	1	2	3	4	5	6	7
S1 Q11	There is a safe buffer (area between the roadway and path) between pedestrian paths and bike or vehicle lanes (e.g. a strip of grass between the sidewalk and the road)	N/A	1	2	3	4	5	6	7
S1 Q12	There are no visual obstructions that make it difficult to judge vehicle traffic at crossings	N/A	1	2	3	4	5	6	7
S1 Q13	Pedestrians have adequate time to cross at crosswalks	N/A	1	2	3	4	5	6	7
S1 Q14	Natural elements are present which make this area pleasant to walk in	N/A	1	2	3	4	5	6	7
S1 Q15	The location and number of benches/seating was adequate	N/A	1	2	3	4	5	6	7
S1 Q16	There were places to shelter from the elements (sun, snow, rain, etc.)	N/A	1	2	3	4	5	6	7
S1 Q17	If applicable (walking at night): The lighting in this area is adequate	N/A	1	2	3	4	5	6	7

Appendices

Route [One]:

Rating Scale

N/A	1	2	3	4	5	6	7
Not applicable	Strongly disagree	Disagree	Disagree Somewhat	Neither Agree nor Disagree	Agree Somewhat	Agree	Strongly agree

Thinking about your entire walk today, please answer:

R1 Q1	Public transit was close to amenities and easy to find	N/A	1	2	3	4	5	6	7
R1 Q2	Parking lots were close to amenities and easy to find	N/A	1	2	3	4	5	6	7
R1 Q3	Accessible parking spaces were conveniently located, well signed, and easy to find	N/A	1	2	3	4	5	6	7
R1 Q5	Signage was present and helpful for navigation (e.g. maps, building identifiers, etc.)	N/A	1	2	3	4	5	6	7
R1 Q6	Public and accessible washrooms were available and clearly marked	N/A	1	2	3	4	5	6	7
R1 Q7	Building entrances would be accessible by people using mobility aids, or signed to direct people to a nearby accessible entrance	N/A	1	2	3	4	5	6	7
R1 Q9	Pedestrians were given priority on all walkways and at crossings	N/A	1	2	3	4	5	6	7
R1 Q10	There were audible and visual signals at all major intersections	N/A	1	2	3	4	5	6	7
R1 Q11	At crosswalks, vehicles always stopped and yielded to pedestrians	N/A	1	2	3	4	5	6	7
R1 Q12	The volume of pedestrian traffic wasn't overwhelming	N/A	1	2	3	4	5	6	7
R1 Q13	The route was clean and clear of litter, broken glass, graffiti, etc.	N/A	1	2	3	4	5	6	7
R1 Q14	Overall, I felt safe on this route	N/A	1	2	3	4	5	6	7
R1 Q15	There were points of interest along the route (e.g. nice architecture, public art, aesthetically pleasing design)	N/A	1	2	3	4	5	6	7
R1 Q16	If applicable: snow was cleared, and walkways salted	N/A	1	2	3	4	5	6	7
R1 Q17	If applicable: Construction areas were easy to navigate	N/A	1	2	3	4	5	6	7

Appendices

Appendix B: Focus group guide

Focus group guide Campus walkability for older adults Dr. Janet Pritchard and Dr. Brenda Vrkljan

I) Introduction and instructions

Thank you for taking the time to participate in this focus group today. As a reminder, we are looking to hear your opinions about the walkability of the McMaster University campus. A focus group is a group discussion that helps us explore several perceptions about a topic. My name is Amanda Whalen and I will be moderating our conversation today to ensure we discuss all the issues we planned to discuss.

Before we begin our discussion, I want to spend a few moments talking about confidentiality and to go over some basic ground rules for our focus group discussion today:

- Everyone's views are welcomed and important. There are no right or wrong answers, only differing points of view.
 - The information which we will collect today will be attributable to you as a group.
 - We will not identify quotes or ideas with any one person of this group. Because of the nature of small communities or groups, it is possible that people could link participants in this room to quotes in the report. This is why we need to talk about confidentiality.
 - We are assuming that when we learn about one another's views, they remain confidential. In a small community like this, people are identifiable to some degree by their views and opinions.
 - Having said this, and having made these requests, you know that we cannot guarantee that the request will be honoured by everyone in the room.
 - So we are asking you to make only those comments that you would be comfortable making in a public setting; and to hold back making comments that you would not say publicly.
 - If you want to stop being in the focus group you can leave or stay and simply stop talking, but it will not be possible for you to pull out your data from the flow of the conversation because of the interconnected nature of the group discussion where one person's comments can stimulate the sharing of comments made by others in the group.
 - Anything heard in the room should stay in the room.
 - All voices are to be heard, so I will step in if too many people are speaking at once or to make sure that everyone has a chance to speak.
 - I may also step in if I feel the conversation is straying off topic.
 - You can expect this discussion group to last about one hour.
-
- As you will recall, this focus/discussion group will be recorded to increase accuracy and to reduce the chance of misinterpreting what anyone says.
 - All tapes and transcripts will be kept under lock and key by the researcher.
 - Names will be removed from transcripts. Participants will have coded numbers attached to their name which only I will know.
 - Only I and my co-researchers will have access to transcripts (with your personal names removed) of this focus group.
 - I'll also ask that when using abbreviations or acronyms, you say the full name at least once to aid transcription.

Appendices

To start, we'll have everyone introduce themselves using first names only.

[At this point, group members can quickly introduce themselves]

II) Interview

As I mentioned earlier, today we are looking to understand how older adults view the campus and its level of walkability. Walkability is a term used to describe how features of an environment influence walking or using a wheelchair for recreation or transportation. We want to hear your opinions about what features either limit or increase your ability to walk through campus to get where you are going. Think about things that make walking more or less possible, comfortable, pleasant or desirable.

Section 1: Walking on campus

1. From your perspective, what makes an environment or area walkable?
 - a. In general, what are some things that might increase your ability or desire to walk in any environment?
 - b. What do you need in order to make walking a positive experience?
2. What was your first impression of the McMaster University campus, whether that was today or at another time?
 - a. Have you been to McMaster before?
 - b. What do you think about McMaster's campus?
3. Thinking about the walk that you took on campus today, what would you identify as the element that would most prevent you from wanting or being able to walk?
 - a. What was something you didn't like about the campus?
 - b. Was there anything that might limit your ability get around on campus?
4. Thinking about your walk on campus today, what would you identify as the element that would most increase your ability or desire to walk on campus?
 - a. What was something you really enjoyed about the campus?
 - b. What is your favourite part of the campus?
5. If you were interested in participating in an activity or event on campus, do you feel confident in your ability to get where you need to be?
 - a. What information would you want to have in order to come to campus and participate in the event?

Section 2: Closing questions

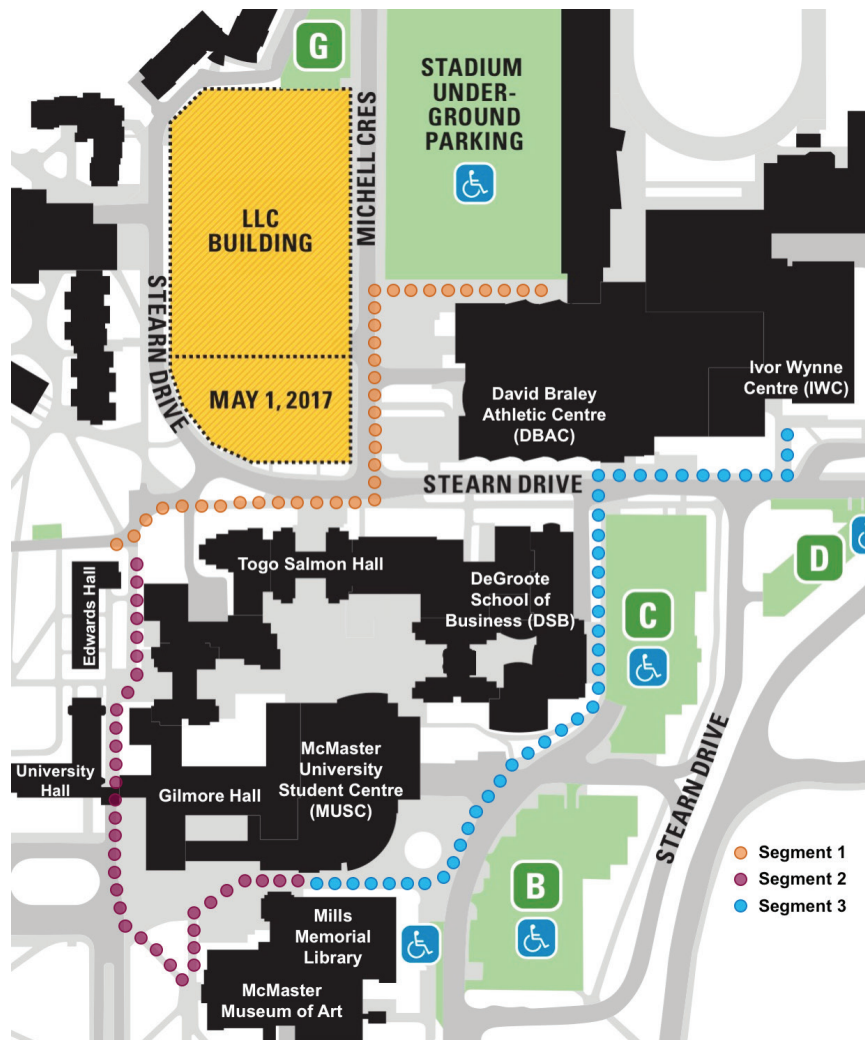
6. If the president of the university or the head of facility services were to ask you what needed to change in order to help older adults feel comfortable on campus, what would you tell them?
7. Is there anything else you want us to know about the walkability of McMaster's campus for older adults?

Appendices

Appendix C: Route maps, by segment

1. Route one

Route one begins at the Ron Joyce Stadium underground parking lot, which services the PACE centre, Ron Joyce Stadium, and David Braley Athletic Centre (DBAC) as well as providing overflow parking for smaller campus parking lots in the vicinity (e.g. lots B, C, and D).



Segment one brings participants from the stadium south on Michell Crescent, where construction of the Peter George Centre for Living and Learning is currently underway, and west on Stearn Drive.

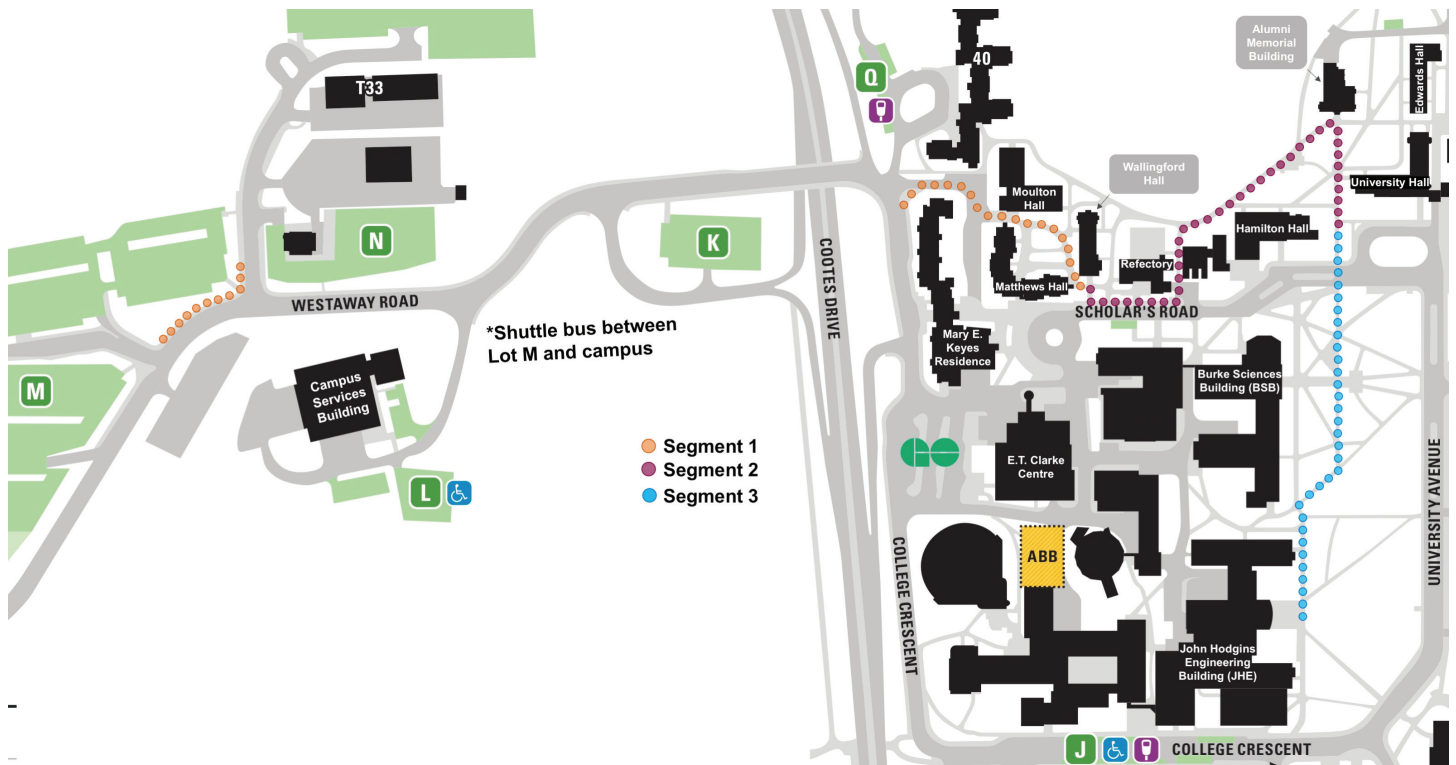
Segment two begins at Edwards Hall, travels south under the arch between University Hall and Gilmour Hall, and continues south on University Avenue. It then travels across a path in front of the McMaster Museum of Art, back along the ramp towards Mills Memorial Library, before travelling east between the Student Centre and Mills Memorial Library.

Segment three begins at the benches between Mills Memorial Library and the Student Centre and travels north along the sidewalk adjacent to parking lots B and C before crossing Stearn Drive at the David Braley Athletic Centre. The segment then follows Stearn Drive east to the roundabout in front to the Ivor Wynne Centre.

Appendices

2. Route two

Route two begins at Lot M, where many visitors are frequently asked to park, especially when the campus parking lots are full.



Segment one starts near the shuttle bus shelter at Lot M, where participants in this study took the bus to campus. The shuttle bus stops on the northwest corner of Mary Keyes Residence, where participants then travelled along the path between Mary Keyes, Bates Residence Building, and Matthews Hall.

Segment two continues east on Scholar's Road before travelling north on a path between the Refectory, which houses Bridges and the Phoenix restaurants, and the Biology Greenhouse. It continues along the Faculty Hollow paths to the Alumni Memorial Building before turning south toward Scholar's Road.

Segment three begins at the southwest corner of University Hall and travels south along lawn pathways in front of Burke Sciences Building (BSB). Following the path as it diverts south west and then south to pass in front of John Hodgins Engineering Building (JHE).

Appendices

3. Route three

Route three begins at Lot I, one of the largest on-campus parking lots, where hourly parking for visitors is available. This lot will be redeveloped as a transit hub, with construction expected to begin in 2019.¹⁴



Segment one travels between the Information Technology Building (ITB) and the Institute for Applied Health Science (IAHS) before turning north on Brockhouse Way. It then turns east onto College Crescent, finishing on University Avenue in front of the Health Sciences Centre. Some participants started at an alternate point, leaving the Arthur N. Bourns Building (ABB) and continuing on College Crescent to the Health Sciences Centre

Segment two travels along a path to the north of the Health Sciences Centre toward the Michael G. DeGroote Centre for Learning (MDCL). It continues along this path to L.R. Wilson Hall.

Segment three travels north from L.R. Wilson Hall toward Sterling Street, crosses Sterling Street, and continues west. There is a major bus stop on Stirling Street near University Avenue which represents the end of this segment and route.

Appendices

Appendix D: Raw audit tool results

Route questions

Statement	Average rating route 1 (Number of responses)	Average rating route 2 (Number of responses)	Average rating route 3 (Number of responses)
Public transit was close to amenities and easy to find	4.5 (2)	2 (5)	4.5 (6)
Parking lots were close to amenities and easy to find	5.8 (4)	3 (5)	4.8 (6)
Accessible parking spaces were conveniently located, well signed, and easy to find	4.5 (4)	4.2 (5)	3.9 (7)
Signage was present and helpful for navigation (e.g. maps, building identifiers, etc.)	4.5 (4)	3 (5)	2.2 (6)
Public and accessible washrooms were available and clearly marked	3.3 (4)	1 (5)	3.2 (6)
Building entrances would be accessible by people using mobility aids, or signed to direct people to a nearby accessible entrance	4.5 (4)	3.5 (4)	4 (8)
Pedestrians were given priority on all walkways and at crossings	4.3 (3)	2.3 (3)	5.1 (7)
There were audible and visual signals at all major intersections	5 (1)	2 (2)	3 (6)
At crosswalks, vehicles always stopped and yielded to pedestrians	5 (3)	N/A	5.8 (8)
The volume of pedestrian traffic wasn't overwhelming	6.5 (4)	6.6 (5)	6.4 (7)
The route was clean and clear of litter, broken glass, graffiti, etc.	6.5 (4)	6.6 (5)	6.3 (8)
Overall, I felt safe on this route	6.5 (4)	6.6 (5)	5.4 (8)
There were points of interest along the route (e.g. nice architecture, public art, aesthetically pleasing design)	6 (4)	6.6 (5)	5.5 (8)
If applicable: snow was cleared, and walkways salted	N/A	N/A	N/A
If applicable: Construction areas were easy to navigate	4.5 (4)	6.7 (3)	3.7 (3)

1= Strongly disagree; 2 = Disagree; 3 = Disagree somewhat; 4 = Neither agree nor disagree; 5 = Agree somewhat; 6 = Agree; 7 = Strongly agree.

Appendices

Route one – segment questions

Statement	Average rating segment 1 (number of responses)	Average rating segment 2 (number of responses)	Average rating segment 3 (number of responses)
Sidewalks/paths are in good repair (i.e. few or no cracks, grooves, or broken sections)	4.5 (4)	5.3 (4)	4 (4)
There were low curbs that tapered off at the road	5.3 (4)	5 (4)	4.5 (4)
Sidewalks were wide enough to accommodate people with mobility aids (such as wheelchairs or walkers)	5.3 (4)	6.5 (4)	5 (4)
Walkways were continuous (i.e. no large breaks or places where sidewalk stopped)	5.5 (4)	6 (4)	4.8 (4)
There were few or no informal pathways along the route	5.8 (4)	5.8 (4)	5.7 (3)
There were no obstructions on the paths which made them difficult to maneuver	5.8 (4)	6.3 (4)	5 (4)
Sidewalk/path materials are non-slip (i.e., if the path was wet it would not be slippery)	5.8 (4)	5.8 (4)	5.5 (4)
The path was flat, or not too steep to walk comfortably	6.0 (4)	6.5 (4)	6.3 (4)
Railings were present along stairs and ramps	6.7 (3)	6 (4)	6.5 (2)
Security assistance phones are visible and available throughout this area	2 (2)	3.7 (3)	5 (3)
There is a safe buffer (area between the roadway and path) between pedestrian paths and bike or vehicle lanes (e.g. a strip of grass between the sidewalk and the road)	5 (3)	4 (4)	4.3 (4)
There are no visual obstructions that make it difficult to judge vehicle traffic at crossings	4 (3)	6 (4)	5.5 (4)
Pedestrians have adequate time to cross at crosswalks	4.3 (3)	6.5 (2)	5 (4)
Natural elements are present which make this area pleasant to walk in	4.3 (4)	6 (4)	4.8 (4)
The location and number of benches/seating was adequate	3.8 (4)	5.8 (4)	5 (3)
There were places to shelter from the elements (sun, snow, rain, etc.)	3 (3)	4.8 (4)	4.3 (4)
If applicable (walking at night): The lighting in this area is adequate	5.5 (2)	6.5 (2)	6 (2)

1 = Strongly disagree; 2 = Disagree; 3 = Disagree somewhat; 4 = Neither agree nor disagree; 5 = Agree somewhat; 6 = Agree; 7 = Strongly agree.

Appendices

Route two – segment questions

Statement	Average rating segment 1 (number of responses)	Average rating segment 2 (number of responses)	Average rating segment 2 (number of responses)
Sidewalks/paths are in good repair (i.e. few or no cracks, grooves, or broken sections)	4.8 (6)	6 (6)	4 (6)
There were low curbs that tapered off at the road	5.7 (6)	5.8 (5)	5.7 (6)
Sidewalks were wide enough to accommodate people with mobility aids (such as wheelchairs or walkers)	6.5 (6)	6.8 (6)	6.5 (6)
Walkways were continuous (i.e. no large breaks or places where sidewalk stopped)	5.7 (6)	5.3 (6)	5.3 (6)
There were few or no informal pathways along the route	5.7 (6)	5.3 (6)	4.8 (6)
There were no obstructions on the paths which made them difficult to maneuver	6.2 (6)	6.8 (6)	6.3 (6)
Sidewalk/path materials are non-slip (i.e., if the path was wet it would not be slippery)	6.3 (6)	6.2 (6)	5.6 (5)
The path was flat, or not too steep to walk comfortably	5.7 (6)	6.7 (6)	6.5 (6)
Railings were present along stairs and ramps	3.3 (3)	5 (2)	N/A
Security assistance phones are visible and available throughout this area	4.5 (6)	6.8 (6)	6.5 (6)
There is a safe buffer (area between the roadway and path) between pedestrian paths and bike or vehicle lanes (e.g. a strip of grass between the sidewalk and the road)	4.2 (5)	5.7 (6)	5 (4)
There are no visual obstructions that make it difficult to judge vehicle traffic at crossings	6.5 (6)	7 (5)	5 (5)
Pedestrians have adequate time to cross at crosswalks	7 (3)	7 (2)	4 (2)
Natural elements are present which make this area pleasant to walk in	6.7 (6)	6.3 (6)	6.7 (6)
The location and number of benches/seating was adequate	5.5 (6)	6.5 (6)	6 (6)
There were places to shelter from the elements (sun, snow, rain, etc.)	4.2 (6)	5 (5)	4.6 (5)
If applicable (walking at night): The lighting in this area is adequate	2.5 (2)	5 (2)	5 (2)

1= Strongly disagree; 2 = Disagree; 3 = Disagree somewhat; 4 = Neither agree nor disagree; 5 = Agree somewhat;

6 = Agree; 7 = Strongly agree.

Appendices

Route three – segment questions

Statement	Average rating segment 1 (number of responses)	Average rating segment 2 (number of responses)	Average rating segment 2 (number of responses)
Sidewalks/paths are in good repair (i.e. few or no cracks, grooves, or broken sections)	5.2 (9)	5.1 (9)	5.3 (8)
There were low curbs that tapered off at the road	6.1 (9)	5.7 (9)	6 (8)
Sidewalks were wide enough to accommodate people with mobility aids (such as wheelchairs or walkers)	5.7 (9)	5.2 (9)	6.1 (7)
Walkways were continuous (i.e. no large breaks or places where sidewalk stopped)	5.7 (9)	4.4 (9)	6.3 (8)
There were few or no informal pathways along the route	3.9 (8)	4.3 (8)	5.6 (7)
There were no obstructions on the paths which made them difficult to maneuver	5.6 (9)	5 (9)	6 (8)
Sidewalk/path materials are non-slip (i.e., if the path was wet it would not be slippery)	5.6 (7)	5.8 (8)	5.5 (8)
The path was flat, or not too steep to walk comfortably	6.1 (9)	5.8 (9)	6.1 (8)
Railings were present along stairs and ramps	4.4 (5)	4.3 (4)	4.8 (4)
Security assistance phones are visible and available throughout this area	4 (7)	3.1 (8)	3.6 (7)
There is a safe buffer (area between the roadway and path) between pedestrian paths and bike or vehicle lanes (e.g. a strip of grass between the sidewalk and the road)	3.9 (9)	2.9 (9)	4.3 (7)
There are no visual obstructions that make it difficult to judge vehicle traffic at crossings	5.4 (7)	4.5 (6)	5.4 (7)
Pedestrians have adequate time to cross at crosswalks	6.1 (8)	5.5 (6)	5.9 (7)
Natural elements are present which make this area pleasant to walk in	5.6 (9)	5.1 (9)	5.1 (8)
The location and number of benches/seating was adequate	5 (9)	4.4 (9)	5.1 (8)
There were places to shelter from the elements (sun, snow, rain, etc.)	3.1 (8)	2.8 (8)	2.9 (7)
If applicable (walking at night): The lighting in this area is adequate	4 (1)	2.7 (3)	2.5 (2)

1= Strongly disagree; 2 = Disagree; 3 = Disagree somewhat; 4 = Neither agree nor disagree; 5 = Agree somewhat; 6 = Agree; 7 = Strongly agree.

Appendices

Appendix E: Audit results by segment

Route one, segment one



Walkability inhibitors:

- ⇒ When asked to rate their agreement with the statement "The location and number of benches/seating was adequate," participants gave this section the lowest rating compared to the other segments: an average of 3.8 on a 7-point scale.
- ⇒ This area is heavily paved with few trees to provide shade from the sun. Participants felt there were not enough areas to shelter from the elements and gave places to shelter a rating of 3 (Disagree somewhat) for this segment.
- ⇒ Security assistance phones were not noticed by participants in this segment.
- ⇒ The ramping and curb cuts would be difficult to maneuver around for people in wheelchairs or with mobility devices.

Appendices



The curb cut at Stearn Drive and Michell Crescent is difficult for those with mobility devices to navigate across due to large cracks and uneven paving.

Walkability facilitators:

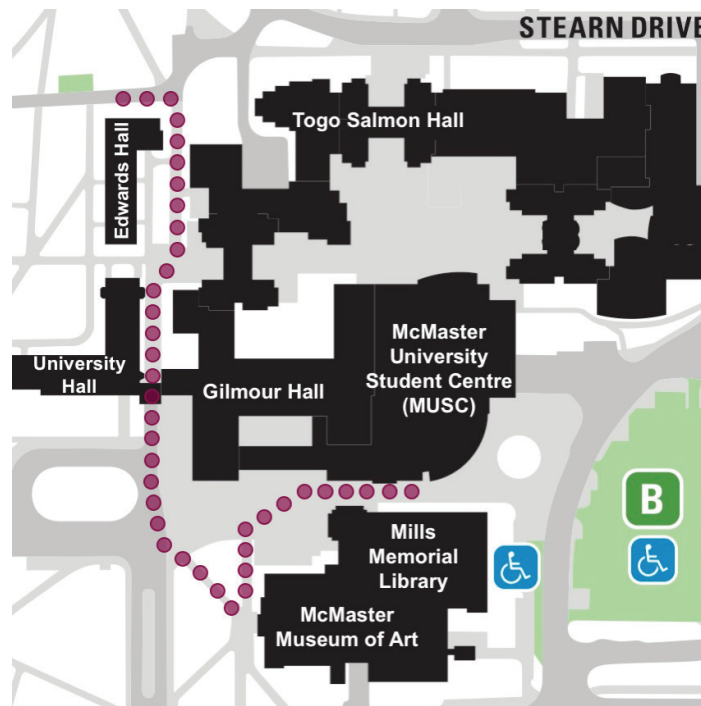
- ⇒ One participant was impressed with the football stadium, remarking: “Well, I’m not a football fan, but I really like the football stadium! I like the idea that there’s great facilities in our community.”
- ⇒ The construction on the new Peter George Centre for Living and Learning was easy to maneuver past, and seen as a positive because it meant that McMaster was continuing to grow.



Participants and students walking past construction on the Peter George Centre for Living and Learning.

Appendices

Route one, segment two



Walkability inhibitors:

- ⇒ There was no ramping to Gilmour Hall or the bookstore, nor any signage indicating where accessible entrances could be found.
- ⇒ The sidewalk in front of Gilmour Hall did not have any curb cuts, forcing people using mobility aids to walk on the road for several metres.



The entrance to Gilmour Hall, photographed by one participant lacks ramps, curb cuts, and signs indicating an accessible entrance. When talking about this entrance and the entrance to the campus bookstore, the participant remarked "I'm sure there's other ways into it, but it's not readily available."

Appendices

- ⇒ While most of the ramps and stairs in this segment had railings, the stairs leading to the entrance of Hamilton Hall did not.



Walkability facilitators:

- ⇒ Natural elements and points of interest, including some of the oldest buildings on campus such as Hamilton Hall and Edwards Hall, contributed to this section being highly rated, overall. One participant, stated: "Look at the old trees, that's amazing. I'm so glad that they've kept them. They're so pretty."



"It's well kept, but it's also attractive. And these old buildings have an ambiance that you don't get with a newer style of building. [...] I mean, look at the details in the windows and everything. Beautiful."
– Participant.

Appendices

- ⇒ Some participants were reminded of the McMaster Museum of Art as a place that was open to the public and were interested in reading about what events were taking place.

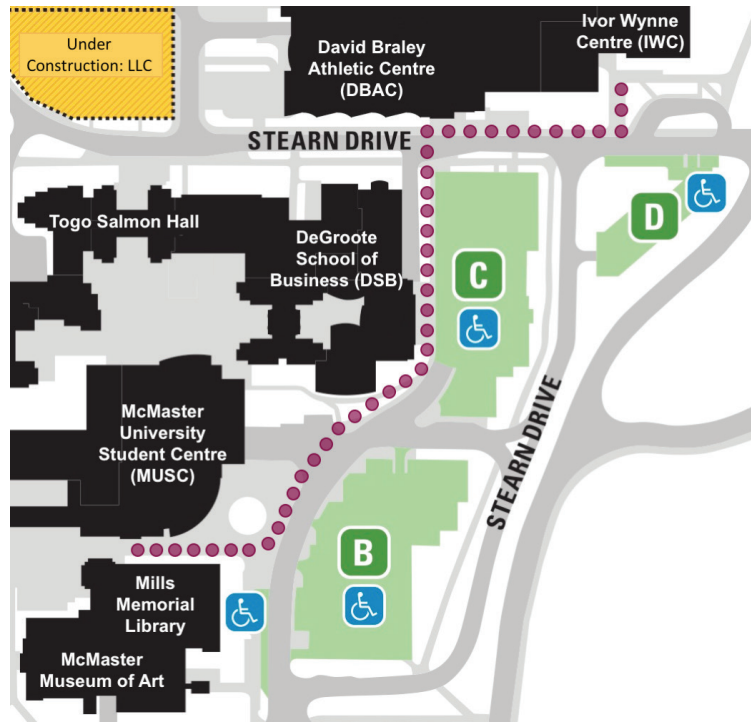


One participant was interested in reading more about the McMaster Museum of Art and liked that they had the information signs outside of the building.

- ⇒ There were benches and seating areas where people could rest, or eat a meal outside.

Appendices

Route one, segment three



Walkability Inhibitors

- ⇒ This segment was one of two that received the lowest average rating to the statement “sidewalks/paths are in good repair”: a 4 (neither agree nor disagree) on a 7-point scale by four participants. There are many areas with cracked or uneven sidewalks along this segment. This has clearly been identified, as participants noticed spray paint at these spots; however repairs have not been completed.



One participant photographed a section of the sidewalk that she felt was a tripping hazard, and noting the fading paint stated that “all along this area here it needs some repairs. And they know it. They just haven’t done it.”

Appendices

- ⇒ The crosswalk across Stearn in front of DBAC was not clearly marked (e.g. with painted stripes). The crosswalk in front of the Ivor Wynne Centre (IWC) did not have a curb cut that connected with the other side of the road.



One of the participants was concerned with the lack of visibility of the crosswalk on Stearn Drive outside of DBAC.



"The curb cut in front of IWC does not match up with the crosswalk, forcing pedestrians with mobility devices to walk in the road to access the sidewalk."

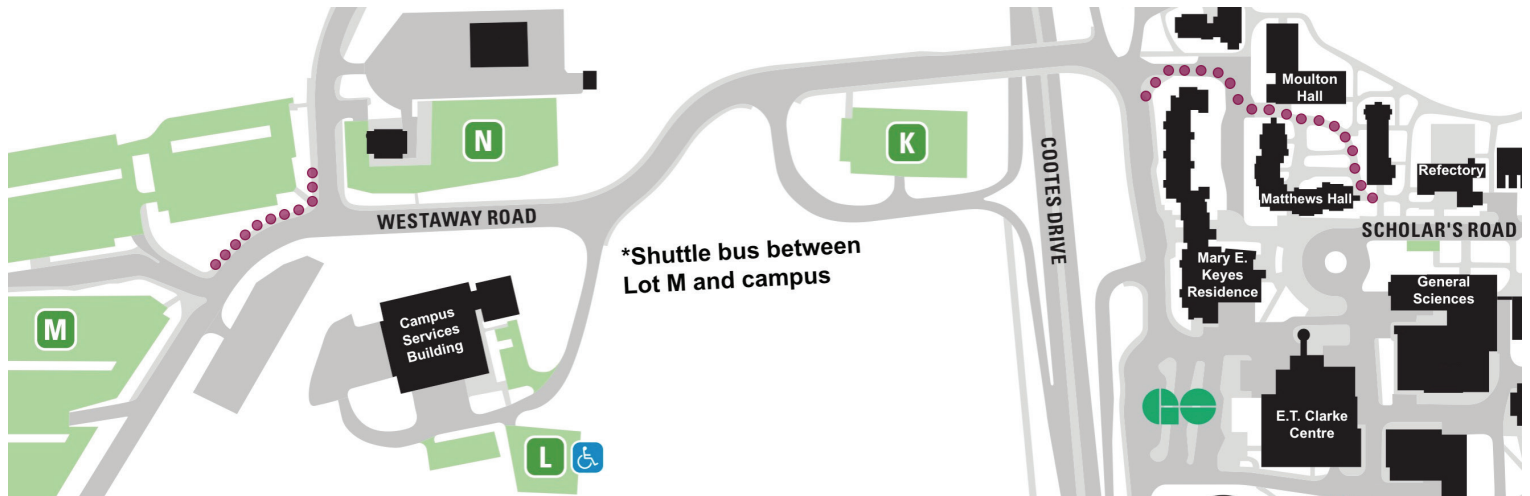
- ⇒ Benches were present near the student centre, but lacking in front of IWC.

Walkability facilitators

- ⇒ Participants noted more security assistance phones along this segment, especially in the parking lots, which made them feel a greater sense of safety.

Appendices

Route two, segment one



Walkability inhibitors

- ⇒ One of the security assistance phones in Lot M was out of order, making the distance between phones inconvenient in the case of emergency.
- ⇒ Areas with one or two steps had no railing. For example, in front of Matthews Hall had no railing.



- ⇒ Signage for drivers and pedestrians could be improved along this route so that people are better able to navigate to and from the parking lot and shuttle bus.
- ⇒ While the shuttle bus was seen as beneficial and necessary, some participants felt that it was not entirely age-friendly. First, it was a very bumpy ride. Second, the railing or handle on the bus was not high enough, and the steps were quite steep so not easy to manage without holding on to something.

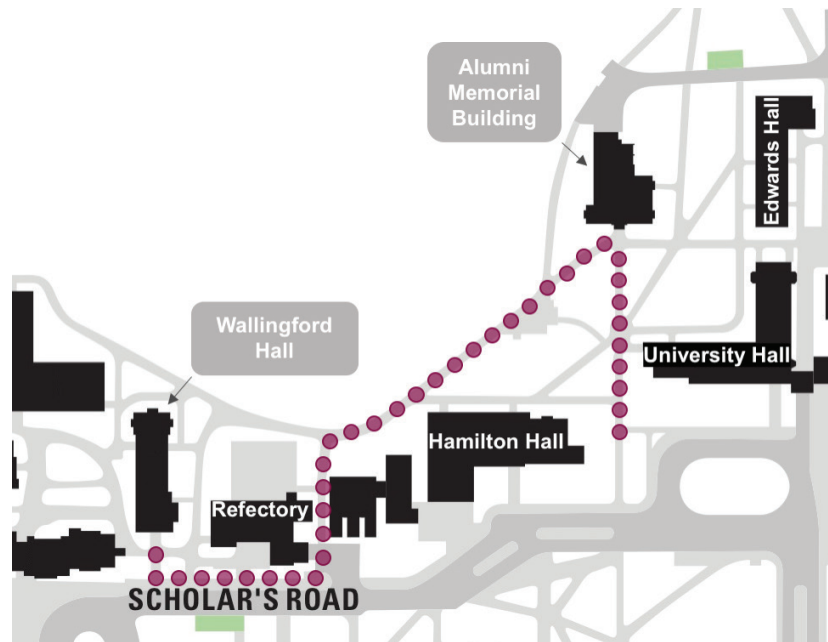
Appendices

Walkability facilitators

- ⇒ The shuttle bus that brings people between Lot M and the campus was appreciated, with several participants saying they would not have been able to manage the walk. However, they also felt it should be better signed at both points of departure, so visitors know it is available, where it stops, and how often it comes.
- ⇒ There was a sign for Tim Horton's on Mary E. Keyes Residence, which gave participants a sense that they would be able to go in there if they needed to shelter from the elements or use a washroom as opposed to other buildings where public access and availability of facilities was less clear.

Appendices

Route two, segment two



Walkability Inhibitors

- ⇒ While infrastructure and natural elements were rated very high on this segment, the lack of signage was noted as an issue, as it was in all areas of campus.

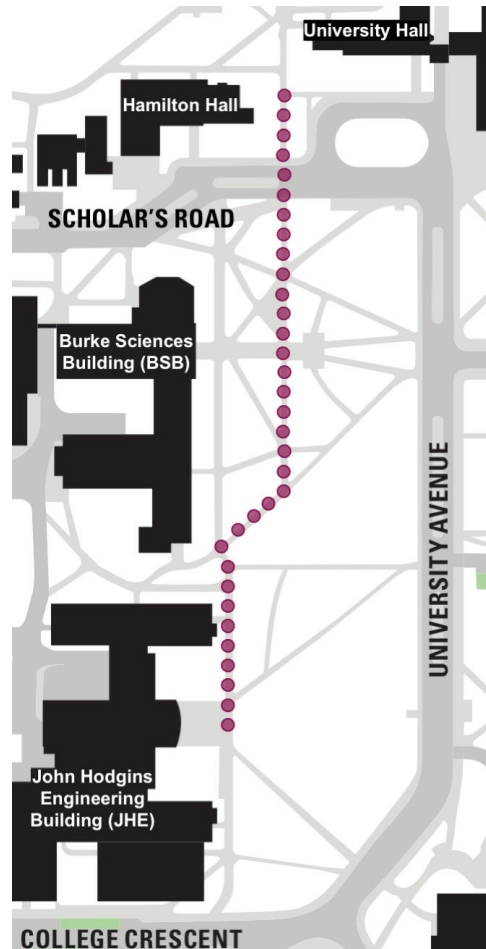
Walkability facilitators

- ⇒ This segment, which brought participants from Scholar's Road into Faculty Hollow, was given the highest average rating to the statement "sidewalks/paths are in good repair:" 6 (agree) on a 7-point scale, by six participants.
- ⇒ The presence of natural elements that make the area pleasant to walk in was also highly rated by participants, receiving an average score of 6.3 on a 7-point scale. Participants were impressed by the amount of care and attention that had gone into the gardens and maintenance in this area.
- ⇒ There were many benches available for people to rest or sit and enjoy this area.



Appendices

Route two, segment three



Walkability inhibitors

- ⇒ This segment was the second of two that received the lowest average rating to the statement "Sidewalks/paths are in good repair:" a 4 on a 7-point scale by six participants. The lawns area in front of Burke Science Building (BSB) and John Hodgins Engineering Building (JHE) has asphalt walkways with many cracks, potholes, and informal pathways that should be repaired to limit the potential for trips and falls. As with Route One Segment Three, the areas in need of repair have been indicated with spray paint but not fixed.

Appendices



One participant noticed informal pathways in the lawn in front of BSB and JHE.



One participant photographed areas where tripping hazards have been indicated with spray paint, but not repaired.

Appendices

- ⇒ Participants were unsure where it was safe to walk across Scholar's Road, as there was no crosswalk indicated. While this road is only for authorized vehicles, this was not clear to participants which may suggest a need for more signage. One participant was also concerned with the visual obstruction created by large plants and trees in the median of this road.



- ⇒ While the number of benches along this route was considered adequate, their location could be improved. Several participants felt that instead of being concentrated in certain areas and in the sun, benches, seats, and tables could be spread out, with some placed under the large trees in this area in order to take advantage of the shade they provide. One participant, for example, suggested that by doing so this lawn could be more of a destination, rather than just a way to get from one building to another.
- ⇒ Two participants noticed that the front entrances to some buildings did not have ramps (e.g. BSB), and that it was unclear where one would go if they needed an accessible entrance or were not able to manage the stairs.

Appendices



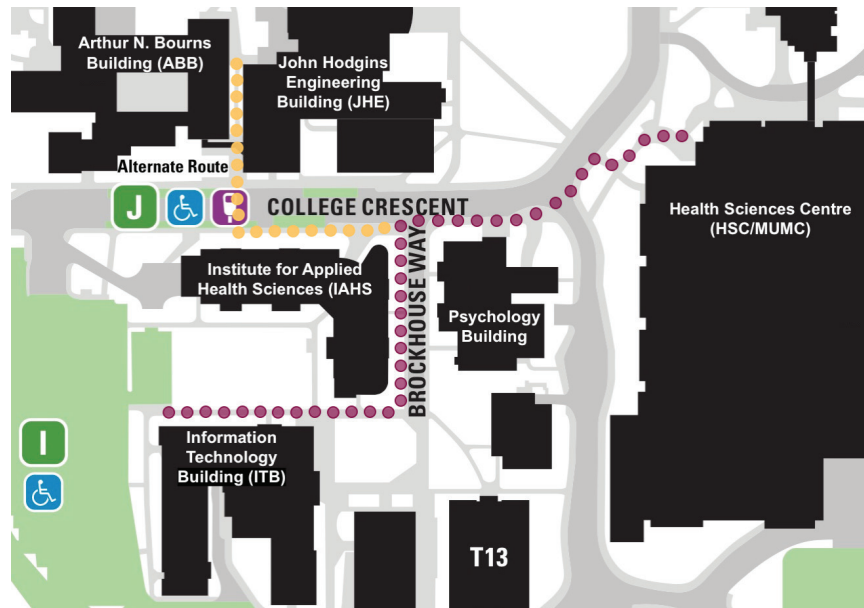
One participant questioned the absence of ramps in front of BSB.

Walkability Facilitators

- ⇒ Despite the aforementioned issues with the walking paths, the fact that many of them were arranged in diagonal patterns where people would naturally want to walk across the lawn to get from place to place was seen as a positive by many participants.
- ⇒ Having grass and large trees instead of a paved area was also viewed positively by participants. One participant remarked “Too often we pave stuff, and then it’s too late. But here, there’s obviously been an effort to keep all of the grass and pave only what’s required.”

Appendices

Route three, segment one



Two separate groups audited Route Three. The first group started in front of Arthur N. Bourns Building (ABB) instead of Parking Lot I, meaning that Segment One was slightly different for each group. The second group audited the segments in reverse order, starting at the Sterling Street transit stop and finishing at Lot I.

Walkability Inhibitors

- ⇒ The participants who began at ABB felt that the lack of maintenance and presence of informal pathways hindered walkability in this area. Informal pathways were also present in the lawn between IAHS and ITB. This section had the lowest average rating for informal pathways, scoring a 4 for those who started at ABB and 3.7 for those who finished at Lot I.

Appendices



Large informal pathways were noted outside ABB by one participant, who remarked “The space that was paved was made for a smaller group, maybe. The fact that more people are using it makes it look dishevelled.”

- ⇒ There is no buffer between pedestrian sidewalks and vehicle traffic on this route, specifically on College Crescent. When asked if there was a safe buffer between pedestrian paths and bike or vehicle lanes, nine participants rated this segment an average of 3.9 (neither agree nor disagree) on a 7-point scale.
- ⇒ While the sidewalks along College Crescent seemed new and in good repair, where they met with the paving stones, for example in front of the Health Sciences Centre, there were some uneven areas that were considered tripping hazards by some participants.



One participant noted that transitions between poured concrete and paving stones were not level, which makes them difficult to maneuver for some people.

Appendices

- ⇒ There is a large drop between the sidewalk and grass on Brockhouse Way, which could cause people to lose their footing.



One participant felt that the drop between the sidewalk and grass along Brockhouse Way could create the potential for falls.

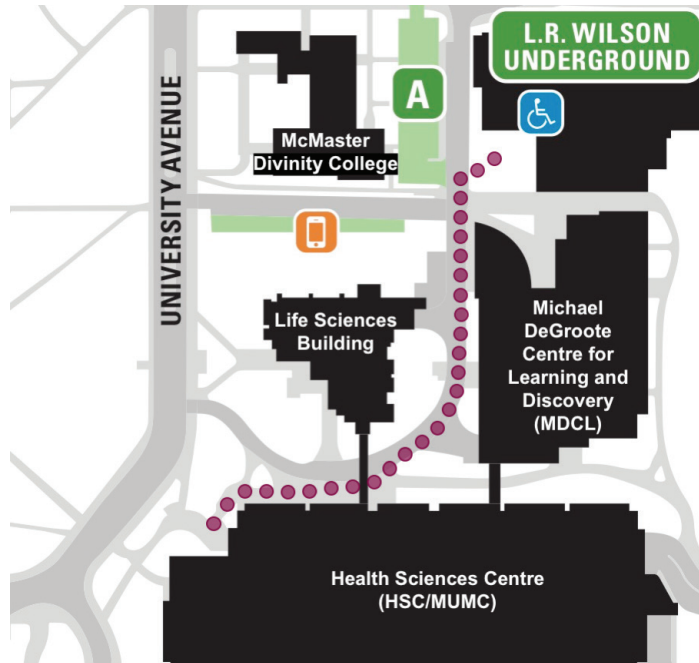
- ⇒ The crosswalks in this segment were rated highly; however, some participants believed that the distance between crosswalks on University Avenue would lead to jaywalking.

Walkability facilitators

- ⇒ The crosswalks in this segment were considered excellent. They were wide and smooth enough for people with mobility devices, and the curb cuts were level with the road and had a very gradual slope. They were well-marked and seemingly visible to pedestrians and drivers alike.
- ⇒ While there were some issues with the sidewalks, as noted above, they were considered to be in fairly good repair overall. The statement "Sidewalks/paths are in good repair" was given an average rating of 5.2 (agree somewhat) on a 7-point scale by nine participants.

Appendices

Route three, segment two



Walkability inhibitors

- ⇒ This segment encompasses a mixed-use path, with pedestrians, bicycles, and some vehicles (e.g. facility services and delivery trucks) sharing the road. There is a sidewalk that comes to an end near the Michael G. DeGroote Centre for Learning and Discovery (MDCL), which further confused participants about whether it was a pedestrian or vehicle area. One participant felt concern that having pedestrians crossing loading ramps was an “invitation to accident.” Another remarked “You have no way of knowing that this is a place you should feel safe walking down.” Unsurprisingly, participants rated the statement “There is a safe buffer between pedestrian paths and bike or vehicle lanes” very low in this section: 2.9 (disagree somewhat) on a 7-point scale.
- ⇒ Participants with reduced mobility found it difficult to walk on the paving stones along this route. One participant, who uses a walker, said of the paving stones: “They get uneven after a relatively short period of time. I think they look great, but looking great doesn’t work.”

Appendices



One participant pointed out that paving stones are difficult for some people to walk across, and where they meet with the concrete sidewalk is uneven, creating the potential for trips and falls. Other participants also felt concerned about this issue.

- ⇒ Informal pathways were present around the Health Sciences Centre, which was a concern not just because they were unattractive or inconvenient, but also because they would create muddy conditions on the formal pathways on rainy or snowy days.



One participant, 66, pointed out that this path was evidently used as a main route, and questioned why people with reduced mobility would have to walk around on a more indirect route to meet back up with the formal pathway on the other side.

- ⇒ Some participants would have liked to have seen more security assistance phones in this area. When asked if they were visible and available, participants gave an average rating of 3.1 on a 7-point scale.

Appendices

- ⇒ The benches in front of L.R. Wilson Hall are made of cement, which made them uncomfortable for some participants to sit on, and are also very low to the ground, making them difficult to sit down and stand up from. The City of Toronto has accessibility design guidelines which specify a bench height between 405 and 460 mm, and at their shortest point these benches measure approximately 360 mm.¹ They also do not have arm rests that would aid people in sitting down on and getting up off of the bench.



- ⇒ While the audits occurred during the day, one participant was concerned at the lack of lighting in this area, stating “I wouldn’t want to walk along here at night. There’s not that much in the way of lighting.”

1 City of Toronto. (2004). City of Toronto accessibility design guidelines. Retrieved from https://www.toronto.ca/wp-content/uploads/2017/08/8fcf-accessibility_design_guidelines.pdf

Appendices

Route three, segment three



Walkability inhibitors

- ⇒ The pathways on Sterling Street were cracked or broken in some areas, creating tripping hazards for pedestrians.
- ⇒ The large planters in the medians along University Avenue were considered to be a potential safety issue, as they created a visual obstruction for pedestrians crossing as well as drivers.
- ⇒ The transit shelter on Sterling Avenue was one of the only shelters that participants noticed on campus, and some were concerned that it was not large enough for the high volume of people who might need it or for people in wheelchairs to easily access it. One participant remarked "If you want people to use the transit system, which is something that's very much focused on, we have to make those places where people can wait for it." There was also quite a large gap between the sidewalk and the pavement in the shelter, making it difficult to access for people with mobility devices. The availability of places to shelter from the elements was given an average rating of 2.9 on a 7-point scale for this segment.

Appendices



⇒ Some people felt that the area near L.R. Wilson Hall was unattractive because it was paved with few natural elements present. The areas where there was potential for landscaping were not maintained. For example, planters were overgrown with weeds.



One participant was surprised by the ragweed and other weeds growing in the planter boxes near L.R. Wilson Hall and MDCL.

Appendices

- ⇒ The availability of security phones was again rated low on this segment, receiving an average rating of 3.6 on a 7-point scale.
- ⇒ At the crosswalk on Sterling Avenue outside of Mills Library, two participants walking on separate days had to pause for a cyclist who did not come to a stop or even slow down at the stop sign. One suggested there might be speed bumps that would force them to slow down and pay greater attention to pedestrians. Some maintenance was also suggested, for example the road had lots of cracks and the stop signs were at an angle.



One participant who is visually impaired, noticed many dips and uneven areas in the crosswalk on Sterling Street.

Walkability facilitators

- ⇒ Despite the inhibitors mentioned above, this section received generally high ratings overall. The presence of the McMaster Museum of Art and the lawn area with seating and public art in front of the Museum were points of interest that some participants were curious about exploring more.
- ⇒ While none of the participants made comments about the urban braille along this and other segments, its presence was noted by a public health nurse who was observing one of the audits. Urban braille is a system of tactile elements (e.g. grooves along the edge of the sidewalk) and high colour contrast (e.g. white cement with dark grey diamonds to signal building entrances) that provide blind and visually impaired people signals and cues that can be helpful for navigation and orientation.¹

¹ City of Hamilton. (2003). Appendix 11: City of Hamilton urban braille system. In City of Hamilton site plan guidelines. Retrieved from <http://www2.hamilton.ca/NR/rdonlyres/6DA-008DA-0BB6-48BB-B143-A3EB7EF07F83/0/SitePlanGuidelinesAp11.pdf>