



CROWD/4ACCESS

Urban mobility using wheelchairs



Insight SFI Research Centre for Data Analytics

January 2021



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Bianca Pereira. Urban mobility using wheelchairs. (Report) January, 2021. Insight SFI Research Centre for Data Analytics.

Urban mobility using wheelchairs

This document summarises the experiences shared by users of wheelchairs who participated during the Crowd4Access Experience Sharing workshops that happened on-line during July 2020.

The experiences shared were categorised according to the urban elements they refer to, including quotes from participants and examples of locations where such urban elements can be observed. Also, each participant was asked to vote on the top 3 elements that they would like to see featuring on a map. Note that the top 3 elements may not necessarily match the urban elements cited in this document. The main reason for this difference is that participants are familiar with multiple modalities of mobility (crutches, wheelchairs, etc.) and may have opted for urban elements related to any other modality.

Three wheelchair users participated in our workshops (3 female), with varied experiences using manual and power wheelchairs. Table 1 shows the urban elements that support mobility and Table 2 displays the urban elements that hinders mobility according to the participants' votes.

Table 1. Urban elements that support mobility and participants would like to see on a map

Urban elements that support mobility	Votes
Flushed kerbs	3
Even pavement	2
Wide footpath	1
Traffic lights (audible cues, vibration, arrow)	1
Linked network of footpaths	1
Smooth pavement surface	1



Table 2. Urban elements that hinder mobility and participants would like to see on a map

Urban elements that hinder mobility	Votes
No flushed kerbs (either inexistent or only lowered)	3
Position of disabled parking (lack of yellow box to open the door of the car, no flushed kerb)	2
Inclined pavement	1
Uncontrolled crossing at roundabouts	1
Bollards or railings	1
Presence of street furniture	1

Participants described their experience of moving around the urban environment in Ireland and expressed the importance of knowing a given path before going to a given location. Participants informed that they would prefer to have someone with them if they need to move through a given route for the first time.

"I prefer to stick to the routes that I know. And I don't tend to deviate from them."
(wheelchair user)

"I wouldn't be all that comfortable doing town on my own. I usually do with the PA [Personal Assistant] or with somebody, or friend or something. I would usually meet somebody in town."
(wheelchair user)

Having a map that contains the types of challenges or facilities available on a given route could, potentially, increase the confidence of wheelchair users in taking new routes in an



urban environment. Such a map and map-based apps may be used to improve the independent mobility of wheelchair users.

The goal of this document is to enlist the types of urban elements that affect the everyday life of wheelchair users from the perspective of those with the lived experience. Note that, this document does not aim to be a definitive guide on what urban elements should be mapped to facilitate the mobility of wheelchair users. Instead, it is an initial step in a broader discussion of accessibility of the urban environment in Ireland.

In the following, we enlist the urban elements cited by workshop participants during their experience sharing.

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Mobility in footpaths

The first category of urban elements that we review refers to the characteristics of footpaths.

Uneven (broken) pavement

An even pavement, i.e. a pavement that is not either uneven, broken or worn out, was cited by participants as one of the top 3 elements that enable mobility of wheelchair users in urban areas.

A wheelchair user relies on the correct alignment between the wheelchair wheels for comfortable and fast mobility. Footpaths that contain cracks, ups and downs, or any sort of uneven pavement, do not allow for the proper alignment of the wheelchair wheels. Such misalignment can cause constant shaking of the wheelchair, the movement of the wheelchair in a sideways motion, or even the turn of the wheelchair. Whereas constant shaking of the wheelchair may cause physical pain and discomfort to the user of the chair, the abrupt misalignment of the wheels may cause the user to be projected out of their wheelchair leading to injury.

When discussing uneven footpaths, a common complaint among participants in the workshop was the placement of cobblestones that are not properly aligned to each other, causing shaking and making it harder to push manually propelled wheelchairs.

"Cobble stones (...) are very hard on your back. (...) when the chair shakes, you shake."
(wheelchair user)

"If you are pushing yourself [in a manual wheelchair] the cobblestones would make it hard to push"
(wheelchair user)

The Shop Street in Galway city was cited as one location of hard access for wheelchair users due to the stones used in its pavement.¹

"[There were] cobble stones all around Shop Street and Quay Street [in Galway]"

¹ Note that the workshops took place in July 2020 during the covid-19 lockdowns. Therefore, participants have expressed their opinions based on their knowledge of the locations they have visited before the first lockdown in March 2020. Consequently, this report may not contain views on footpaths that have changed since participants last visited the location.



(wheelchair user)

The inclination of the pavement also causes difficulties to the mobility of wheelchair users, in particular those using manually propelled wheelchairs. The higher the inclination the more strength the wheelchair user needs to move the wheelchair. Depending on the angle of inclination, the movement would just require too much strength or it would lead to a fast acceleration of the wheelchair. In both cases, participants informed that the user may lose control of the wheelchair, resulting in injury.

"[if there is too much of an incline] forward you could fall off of
your chair"
(wheelchair user)

"If I am going up very steep inclines [with a manual wheelchair],
the chair would go backwards. So I would never go on a steep
incline on my own (...). I would always have somebody behind
me."
(wheelchair user)

An example of such inclination cited by one of the participants happens on a bridge leading to Croke Park in Dublin.

"When I go up to the Croke Park is not enjoyable (...) because I
have to get off and go on the road. There is a footpath and I can't
go on it going over the bridge to Croke Park. That path is very
high and very steep."
(wheelchair user)

Footpath width

Footpaths are usually placed in cities and towns by using a high kerb that separates it from the road. Because of that, it is not trivial for wheelchair users to move out of a footpath in an independent manner at locations with high kerbs. When moving along a footpath, wheelchair users need to have enough space to maneuver their chair, so participants cited how important it is that footpaths are wide enough to enable the simultaneous movement of wheelchair users and other footpath users, while also being free of any barriers.

"[if footpaths are wide] I don't have to worry about bumping into
people"
(wheelchair user)



Wheelchair users who participated in the workshop demonstrated concern about not being able to allow others to use the footpath safely. Raising the concern that if the footpath is too narrow and there is someone else coming in the opposite direction, the person coming in their direction needs to be the one to move out of the way and possibly into the street. If footpaths are wide enough for two footpath users to pass simultaneously, then this would not be a source of concern.

"[if footpaths are wide enough] if there is another wheelchair, a person with a buggy coming along, or a person with a bike, there is room for both to go."
(wheelchair user)

In addition, even when a footpath is constructed with a width that facilitates mobility, it may be made too narrow for wheelchair users by how different people use the footpath. For instance, car drivers and shop owners may create unnecessary obstructions in the footpaths by parking, or placing chairs and tables on top of footpaths.

"Some footpaths (...) are very narrow, so it can be difficult to [navigate around] cars parked on footpaths and chairs outside restaurants"
(wheelchair user)

Flushed kerb

Flushed (or dropped) kerbs that are at the level of the street were cited by workshop participants as the most important urban element for the mobility of users of wheelchairs. Its presence enables mobility and its lack would impair their mobility.

"Levelled kerb [i.e. flush kerb] is the most important thing"
(wheelchair user)

"When I go to Dublin I find O'Connell Street very pleasurable because the footpath is flushed and (...) it is wide. You can go from top down to the bottom of O'Connell Street and over almost to Stephen's Green without much problems."
(wheelchair user)



Most wheelchairs are built to move on flat and even surfaces. Therefore, if there is a step in a given route, that would make the route inaccessible for most wheelchair users. When the step is small (2 or 3 centimeters, for instance), some wheelchair users would still manage to move across, either by having someone else's support or by having a motorised wheelchair (also known as power wheelchair). However, users of manually propelled wheelchairs that want to move independently in an urban environment would see even small steps like these as a non transposable barrier.

In addition, one of the participants explained that unexpected small steps may cause an imbalance on the wheelchair and may lead to injury.

"[Some kerbs at street crossings] look quite levelled [with the road], but when you actually go down you get quite a bump. I would have to take my chances that I wouldn't fall."
(wheelchair user)

"There is a really bad kerb [in Passage West, Cork]. I nearly came straight out of my chair because I just went straight and did not realise there was a kerb there. (...) Luckily there was someone who was able to dive forward and rescue me"
(wheelchair user)

Raised kerbs (of several centimeters) and kerbs that are dropped but not totally flushed with the road make footpaths inaccessible to wheelchair users. By not having access to footpath, users of wheelchairs are forced to move in the middle of the road together with cars and bicycles.

"Some of the footpaths are high. Sometimes I need to go out in the middle of the road to get by."
(wheelchair user)

"You have to go on the road to get onto the footpaths at some places. (...) If there are cars, it is not fair to be on the way of drivers as well in the middle of the road."
(wheelchair user)

One of the common issues described by the participants refers to street crossings where there is a suitable flushed kerb on one side of the street, but no flushed kerb on the other side.



"Sometimes there is a lowered footpath on one side of the road and when you get to the other side there is a high footpath"
(wheelchair user)

"I need to get on the road (...) because there is a dropped kerb on one side and then no dropped kerb on the other"
(wheelchair user)

"In some street crossings, [the footpath] is flushed with the street on one side and when you cross to the other side there might be about an inch to get up, so my two front wheels won't do that so I have to turn around and go backwards. (...) The [traffic lights] are turning green to the cars to go and I am delaying the cars, so it is dangerous."
(wheelchair user)

Also, when flushed kerbs are not present, wheelchair users are denied access to stores and other amenities served by these.

"When I go up to the Croke Park that is not enjoyable (...) because I have to get off and go on the road. There is a footpath and I can't go on it going over the bridge to Croke Park. That path is very high and very steep."
(wheelchair user)

Last, even when the footpaths are built taking into consideration the proper position of flushed kerbs, the attitude of road and footpath users may still make these footpaths inaccessible. For instance, drivers may park their vehicles in front of flushed kerbs, and other footpath users may add mobile furniture (e.g. chairs, sandwich boards, etc) that block access to the flushed kerbs.

"It drives me mad when a car parks where the dropped curbs are meant to be (...) you suddenly find yourself stuck on a footpath because the car is parked in the one place and you need to get off"
(wheelchair user)

Street crossings

When it comes to street crossings, the main concerns of participants were: the presence of flushed kerbs, and the availability of traffic lights.



The presence of flushed kerbs was cited not only as a required feature for footpaths in a street crossing, but also for cases where there is a refuge island in the middle. One participant informed that there are cases where both sides of the street have flushed kerbs but not the refuge island in the middle. This type of situation makes it dangerous for wheelchair users at street crossings, where the refuge island is supposed to protect pedestrians from the incoming traffic.

"[In the presence of islands] there's no dropped curbs to get on to them. So you end up having to go around them and go on the road."
(wheelchair user)

When discussing cases of footpaths where the street is raised to the level of the footpath, participants were also not totally happy with that arrangement. The main reason for discontent is when such raised crossings are too narrow, have an angle that makes it hard to drive the wheelchair across, or have a small step between the road and the footpath.

Users of wheelchairs may also have other types of physical disabilities that may not allow them to control the speed of their wheelchairs in rhythm with incoming traffic. In such situations, uncontrolled street crossings that require negotiation between pedestrians and drivers can be particularly hard to navigate. An example of such a problem happens at street crossings in roundabouts, where wheelchair users need to measure their speed against the high speed of incoming traffic. In such cases, the best type of street crossing cited by participants are street crossings managed by traffic lights. In particular those with audible cues in case the wheelchair user also has some type of visual impairment.

Segregated Cycle lane

People who use wheelchairs may not be able to perform a fast maneuver to avoid collision with an incoming bicycle at shared footpaths. Therefore, participants cited that footpaths that are designed to be shared with cyclists need to have a width that allows for both footpath users and, ideally, should have a clear separation between the area for bicycles and the area for other footpath users.

"[Once] there was someone coming walking and then I had to get out of their way, but there was a bike coming, you know? So it is difficult to get out of their way"
(wheelchair user)

"If you are going over to Board Gáis Theatre there in Dublin, going over that bridge, there is a very wide footpath and there is a cycling lane. There is plenty of room for everybody (...). The rest



of the footpaths are too narrow for both the pedestrians and the cyclists to be together."
(wheelchair user)

Linked network of footpaths

Participants in the workshop agreed on how important it would be to know that they can arrive at a place of their choice without having to face any inaccessible patch of footpath in between. For instance, knowing that they can leave home and go to a supermarket, store or work, without needing other people's help due to a part of the footpath that is inaccessible to them for any particular reason.

Mobility in the presence of street furniture

This category of urban elements refer to items that are added on top or around the footpaths. These items are usually called 'street furniture'. Street furniture can be fixed to the location such as light poles, rubbish bins or letter boxes, or they can be mobile such as tables, chairs or restaurants' sandwich boards.

Benches

Participants in the workshop cited that the few benches they have found in public spaces are positioned in locations that do not impose a barrier for their mobility. In addition, they cited how important it is to have benches where they can stop their chair besides it. Such benches can be used to have outdoor conversations with people who are accompanying them on a given journey.

"Sometimes [public seat] is very handy because if there is somebody with you they can sit down there in the open beside you."
(wheelchair user)

Trees and overgrown shrubberies

Mobility using wheelchairs depends on a clear and flat path for mobility. Improperly placed trees as well as overgrown shrubbery may impose a challenge or an impediment for the mobility of wheelchair users.



The roots of trees may damage the pavement surface leaving cracks and an uneven surface, which may cause wheelchair users to have to choose another path or risk falling off their chair. Also, overgrown shrubbery may cause injuries at face level, in particular if wheelchair users cannot avoid it or are not able to maneuver before hitting it.

"The hedge coming out or the tree coming out at you, hitting off you when you are going along."
(wheelchair user)

Mesh and grid covers

Covers for ventilation or used on top of the roots of trees are usually not a challenge for wheelchair users if properly placed. Depending on the surface of the grid, however, they may shake the wheelchair when it passes on top of it or it may cause the wheel to get stuck between the grid spaces.

"[Mesh Grids] around the trees.. It is just that they are bumping when you go over them (...) and your wheels could get stuck on those."
(wheelchair user)

Bollards

The main type of fixed street furniture cited by the workshop participants were bollards. Although they protect the footpath against cars parking on top of it, they may also block the mobility of footpath users by either: (i) making the footpath too narrow for certain types of wheelchairs, or (ii) by blocking access to key footpath elements such as flushed kerbs. The ideal is that the planning for placement of bollards takes these two elements into consideration.

"Sometimes the bollards are a problem because there is not enough space between the wall of houses and the bollards to get through."
(wheelchair user)



Mobile furniture (sandwich boards, tables, chairs, wheelie bins)

Mobile street furniture tends to be a big challenge for the people using wheelchairs. They can block the footpath and, as the furniture may have their location changed on a daily basis, it is hard to plan mobility around them in advance.

"Cars parked on the footpath, [wheelie] bins being on the footpath"
(wheelchair user)

Even when users of wheelchairs are able to detect the presence of mobile furniture in advance, avoiding them is still a challenge. The position of sandwich boards, tables, chairs and wheelie bins placed in the footpath may still not allow wheelchair users enough space for proper maneuvering around them due to narrow footpaths or hard to navigate spaces.

"I find Opera Lane is really accessible, Patrick Street is grand, but it's side streets like Oliver Plunkett Street and all of them, that can be a bit of a challenge because there is billboards in the way, sandwich boards, and tables out in the streets, especially now with Covid"
(wheelchair user)

Mobility using private vehicles

This category of urban elements focuses on mobility using private vehicles. As the mobility using manually powered wheelchairs may become too tiring and there are also multiple footpaths hard to navigate, the use of cars becomes very important for those who use wheelchairs as a mode of footpath mobility.

Designated car parking (disabled parking)

Cars that are built (or adapted) to the transport of wheelchairs need extra space around them for the safe and comfortable exit of wheelchairs. Because of that, the existence of designated disabled car parking becomes an important urban element to allow mobility of wheelchair users around Irish cities.



The key elements cited by participants in the workshop regards the: (i) quantity of available designated car parking spaces, (ii) their location, (iii) the presence of flushed kerbs near the parking space, and (iv) the area around the parking space.

Workshop participants cited the importance of placement of more disabled parking spaces close to amenities and near the centre of cities.

"There should be more disabled spots on Patrick Street [in Cork] and the main streets in Cork."
(wheelchair user)

"It is hard to get a parking space in Galway city"
(wheelchair user)

"Often towards the cities all wheelchair parking is away from the city centre"
(wheelchair user)

"When you have a mobility problem [designated car park spaces] are quite far away from Patrick Street [in Cork], the main shopping areas that you want to get to."
(wheelchair user)

One participant also cites that when street markets or outdoor seatings are organised, the disabled spaces have been removed. Although it is a common practice to use publicly available parking spaces for the organisation of street markets, it is important to note that while some parking spaces may be categorised as a luxury, designated disabled car parking spaces are a necessity for people with reduced mobility. Without such spaces, the market itself may become inaccessible for people with reduced mobility.

"[in Cork] there were [designated car park spaces] by the outposts, but whenever there is a market at the centre on the weekend, or Christmas, they put stalls there where the wheelchair parking is."
(wheelchair user)

"[A hotel in Cork], for example, has gotten rid of four disabled spots and put outdoor tables in the space. (...) All this outdoor space is being taken up and the disabled spots have been taken off. I don't think is fair"
(wheelchair user)



When designated car parking spaces are made available, participants also point out that they are not always built in the same manner. In some cases, for instance, there are no flushed kerbs to be used to go up on the footpath near the parking space. Therefore a wheelchair user needs to move along the road in the middle of the cars until finding a flushed kerb.

"When you park near to the footpath, there is no flushed [kerb] to get off for ages. You need to go either down or up the street to find one."
(wheelchair user)

Depending on how the car is parked (parallel or not) and how is the exit of wheelchairs from the car (either through the side of the car or the back), exiting a parking spot without extra space around the car can create discomfort as well as safety issues for wheelchair users. Therefore, someone may leave the car: (i) in the direction of the footpath or directly on top of the footpath, (ii) in the direction of the incoming road traffic, or (iii) in the direction of other vehicles parked.

When exiting the car directly onto the footpath, one participant expressed discomfort by the fact that the footpath would be temporarily blocked for other footpath users.

"Sometimes when you park parallel to the street and you open the door, there is no room for anybody else to pass. You are blocking the footpath for other people."
(wheelchair user)

When exiting the car in the direction of incoming traffic, the physical safety of wheelchair users need to be taken into consideration. Participants informed that there are cases where the wheelchair user exits the car already in the middle of the incoming traffic, without the ability to maneuver out of it. It poses a danger for the person exiting the car parked and the drivers passing by. Furthermore, it will block the incoming traffic until the wheelchair user has successfully left the parked vehicle.

In all the cases above, as well as leaving the car in the direction of other cars parked, the easiest solution would be to have enough space around the designated disabled car parking spaces for the safe and comfortable exit of wheelchair users. Although there are guidelines for the provision of such spaces, the experience reported by the workshop participants indicates that either the guidelines are not being followed in some cases or they may need some revision.



Car parking payment machines

The use of wheelchairs may be temporary or long term. For most people who use it long term, a blue badge is provided to allow for free disabled parking. However, there are cases where such badges are either not available or they may not be used. In such cases, drivers who use a wheelchair need to be able to have access to car parking payment machines.

One participant cited that sometimes, even when payment machines are provided, their displays and controls are just too high to be used by wheelchair users.

"If you want to pay for the parking, some of the [payment machines] are high. You can't reach them."
(wheelchair user)

Mobility using public transport

This last category refers to urban elements that promote mobility using public transport such as taxis, buses and trains.

Bus

The experience of using a public bus may be different depending on the type of wheelchair used. Participants pointed out that power wheelchairs tend to be bigger and heavier due to their engines and wheels, whereas manual wheelchairs tend to be smaller and lighter. Also, the way they can be maneuvered may differ.

Whereas power wheelchairs may make it easier to move into inclines or with less physical strength, manual wheelchairs may make it easier to maneuver into the narrow interior of buses. For bus companies, it is important to further investigate how accessible the bus interior is for users of different wheelchair types.

"You can do more with a power chair, but I find it easier if I get on the bus [using a manual wheelchair]. It is easier to maneuver into a narrower space."
(wheelchair user)



Luas

The ability to enter and exit from a Luas in an independent manner was the key point cited by participants in the workshop. One participant cited two specific Luas stations in Dublin as good examples of accessibility for wheelchair users for having flushed kerbs and good pavement around the stations.

"If you have to get it at O'Connell Street, it is very easy to get on and off there and across the road and go down to the other Luas on Abbey Street."
(wheelchair user)



Conclusion

In this document we report the experience shared by wheelchair users who participated in the Crowd4Access experience sharing workshops organised during July 2020. This document also highlighted some of the urban elements that make mobility easier or harder for wheelchair users, while also listing the types of urban elements that users of wheelchairs would like to see featured in a map of the urban environment.

The fixed urban elements cited in this document were used by the Crowd4Access project to plan our data collection about the accessibility of Irish cities. Such data collection was done through a citizen crowdsourcing initiative at the end of 2020.

Note that we have interviewed a very small number of wheelchair users, who were kind to share their experiences in the context of this project. Therefore, we do not claim that this document is a definitive guide for the mobility of wheelchair users or that it represents the whole range of experiences of wheelchair users around Ireland. Instead, we acknowledge that this is one step towards understanding the challenges in mobility using wheelchairs. Finally, we invite other initiatives to build upon this work and explore the accessibility of the urban environment for people using different modes of mobility.

This report was sponsored by:



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Bianca Pereira. Urban mobility using wheelchairs. (Report) January, 2021. Insight SFI Research Centre for Data Analytics.