



How laws of universal design discriminate between different types of disabilities - Lessons learned from Norway

[Anja Fleten Nielsen](#)

Institute of Transport Economics Department of Mobility, Gaustadalleen 21, NO-0349, Oslo, Norway

Received 22 November 2023, Revised 9 April 2024, Accepted 10 May 2024, Available online 14 May 2024, Version of Record 14 May 2024.

[What do these dates mean?](#)



Show less

Outline | Share Cite

<https://doi.org/10.1016/j.jth.2024.101821>

[Get rights and content](#)

Highlights

- The Act on Equality and Discrimination covers only physical design, excluding groups in need of service-oriented PT solutions.
- Visual disabilities like mobility and visual impairments seem to be prioritized in the regulation documents.
- Visibility seems more important than prestige to explain discrimination between groups.

Abstract

Introduction

Different diseases and disabilities have varying levels of prestige in the society. Is this variance also visible in the legal documents about universal design in the transport sector?

Methods

Based on a document analysis of 42 legal documents and guidelines in Norway, we have examined (1) how the laws define universal design and (2) what groups they include when talking about disabilities. Both a qualitative and a quantitative analyses are conducted to answer the research question: do the legal documents discriminate between different types of disabilities – and if this is the case, is this due to difference in prestige or visibility?

Results

Findings suggest that there is a biased focus on physical environment in the definitions of universal design and that visible disabilities, especially mobility impairments and visual impairments, are prioritized over other types of disabilities.

Conclusion

Disease prestige does not seem to explain the difference in terms of inclusion in legal documents to the extent that visibility does.



Keywords

Disability; Disabilites; Legal rights; Universal design; Accessibility

1. Introduction

A disability may be defined as a disease with a chronic component where the person's ability to perform daily activities is reduced (Ingstad 2007). This definition is a *biomedical* one, where the individual's diagnosis is the focus. There is also a *social* perspective on disabilities whereby the environment itself is causing the individual to be excluded. Both the medical and the social models have their limits, as one of them reduces the individual to their disease, while the other one doesn't consider the biological factors of the disability that can be detrimental to the individual (Lid 2013). A third model, the *relational* model, is concerned with the individual's interaction with the environment – making disabilities something that exist only in certain situations (Lid 2013). Hence a person with anxiety might function well 95 % of the time, however when using the public transport system, the environment may cause anxiety. In addition, there are large cultural differences when talking about disabilities; what is considered to be, and who is considered to have a disability depend on the values and attitudes of the society (Ingstad 2007). Kleinman's (1988) term “sickness”, or how society relates to a certain diagnosis, is also relevant regarding different types of disabilities. He states that in each culture and historical period we have different ways of talking about different symptoms – and hence there will be differences in how society responds to a person's different symptoms. In relation to this, different diagnoses have different levels of prestige in society (Album 1991). A survey among physicians and medical students identified a hierarchy of different diseases (Album and Westin, 2008). Diseases associated with chronic conditions located in lower parts of the body or having no specific bodily locations, with less visible treatment procedures are considered low prestige diseases. Mental illnesses like depression and anxiety are, hence, low ranking, as well as diseases affecting elderly patients (ibid.). The diseases on the bottom ranking are also typically diseases affecting women. A survey among professionals in the disability field showed a similar pattern (Grue et al., 2015). Also, a study done by Horne and Ricciardo (1988) identified a hierarchy of disabilities where physical disabilities were most acceptable, followed by sensory, psychological, and social disabilities. This makes it clear that diseases and disabilities are affected by the cultural context they are part of.

The focus of this paper is to examine how different disabilities are prioritized in legal documents; hence, the bio-social model is highly relevant as an analytical framework of the paper. However, grouping types of disabilities also includes the biomedical perspective, as it is hard to group disabilities in any of the other models. The paper will examine both (1) how universal design is defined in the documents as well as (2) which groups are mentioned most. After this we will (3) look at possible explanations of biases in terms of prestige ranking and visibility.

In Norway, research on disabilities has mainly focused on mobility impairments and visual impairments, and to some extent hearing impairments. Most user involvement also includes the same groups of disabilities (Nielsen et al., 2022). These groups are considered “classical disabilities” (Grue et al., 2015). Based on above mentioned former research, reasons for this focus could be.

(1) the more visible nature of some disabilities causes other people to have more sympathy towards their problems as their barriers are visible.

(2) influenced by differences in disease status linked between the different types of disabilities.

(3) NGOs for these disabilities are more active.

(4) gender related

The third explanation has been used by Grue et al. (2015) as a reason for the difference in prestige between disabilities and diseases. Nielsen et al. (2022) also found that NGOs representing “classical disabilities” were more involved in user participations according to transport actors and PTAs in Norway.

This paper will test the first and second hypothesis mentioned above as we expect to find similar trends in the legal documents. Nielsen and Skollerud (2018) found that the few selected documents (2) they examined focused on technical barriers and physical disabilities. An extensive examination of legal and regulatory documents has, however, never been conducted. Our hypothesis in the paper is that laws and regulations

discriminate between different types of disabilities based on visibility of the disability (1) and disease status (2). The third and fourth hypotheses are not possible to test as we have no data for these.

As a background of this study, we have used UNs definition of universal design, as this is in line with the relational model of disabilities: “Universal design” means the design of products, environments, programmes and services to be usable by all people, to the greatest extent possible, without the need for adaptation or specialized design. “Universal design” shall not exclude assistive devices for particular groups of persons with disabilities where this is needed.”

To operationalize the categories of disabilities we have used the following division (Table 1) based on the research done within the transport sector in Norway (Nielsen et al., 2022).

Table 1. Description and examples of disabilities/impairments.

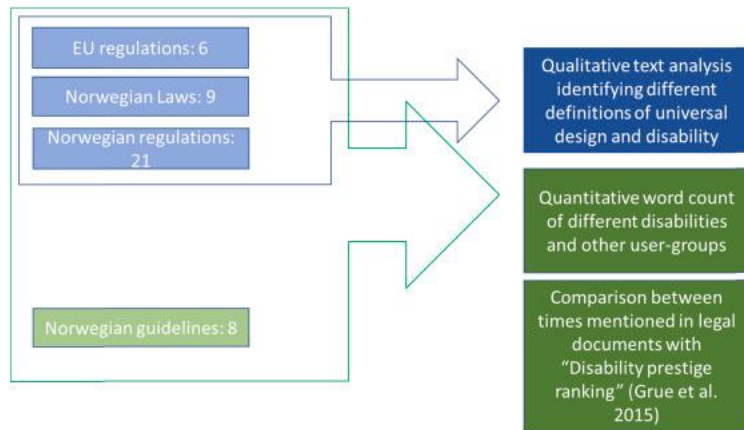
Disability/Impairment	Description with examples
1 Visual impairments	Various forms of visual impairment <i>Color blindness, blindness, tunnel vision, etc.</i>
2 Mobility impairments	Problems with moving all or parts of the body due to paralysis, pain, exhaustion, or other physical/mechanical limitation. <i>Paralysis, musculoskeletal diseases, pain disorders, obesity etc.</i>
3 Hearing impairments	Different degrees of reduced hearing <i>Deafness, age-related hearing loss, tinnitus etc.</i>
4 Developmental impairments	Reduced intellectual, cognitive and social development. Sometimes referred to as intellectual disability. <i>Down syndrome, Fragile X syndrome and Rett syndrome, etc.</i>
5 Psychosocial impairments	Mental disorders and behavior-related disorders <i>Anxiety, depression, personality disorders, bipolar disorder, PTSD, ADHD, Asperger's, etc.</i>
6 Cognitive impairments	Learning difficulties and memory problems. <i>Aphasia, dyslexia, dementia, Alzheimer's etc.</i>
7 Respiratory problems and other environment-related impairments	Reactions in the respiratory tract (etc.) due to lung damage, pollution or other environmental stresses <i>Asthma, allergy, COPD etc.</i>
8 Seizure-related impairments	Seizure illness, but also illnesses that can cause seizures of various kinds <i>Epilepsy, migraine, diabetes, heart disease</i>
9 Digestive and urinary tract impairments	Diseases that affect bowel/bladder function <i>IBS, overactive bladder, Crohn's, Ulcerative Colitis, various forms of cancer, food allergies</i>

2. Methodology

A document study was conducted in order to investigate whether laws and regulations discriminate between different groups of disabilities.

The qualitative part of the study is based on 6 European regulations, 9 Norwegian laws and 21 Norwegian regulation documents, where 2 of them are also international standards. The laws and documents included are the ones used by the transport industry in Norway. The complete list of documents was sent out to the main transport actors in rail, road air and mixed – including waterborne, as well as some governmental actors working with universal design to do a quality control of potential missing documents. In this manner we get detailed knowledge on one

country only, but no direct knowledge on other countries in Europe.



[Download](#) : [Download high-res image \(417KB\)](#)

[Download](#) : [Download full-size image](#)

Some of the laws do not mention universal design nor disabilities but were included as some of the regulations that deal with the topic have their basis in the corresponding law. There are additional guiding documents for universal design that are also being used by municipalities etc., however, this part of the analysis only includes legally binding documents. In the qualitative part, the documents were examined in terms of how universal design and disabilities were defined. As we have not gone through all guiding documents, it is possible that there are errors in terms of which groups are the main focus. However, as the other documents are built upon laws and regulations, this is unlikely.

In the quantitative analysis, the most used guidance documents for universal design in transport were also included (8 additional documents used by the transport operators and municipalities), giving a sample of 42 documents. Here, the focus was to examine how many times different groups of disabilities were mentioned in all the documents and how many of the documents mentioned the different groups. As this is done manually by searching for each individual word and not by machine-reading, there might be counting errors in the documents – however if there are, these are expected to be equally distributed in each direction, not effecting the conclusions. For mobility impairment, “wheelchair” was also included in the word search as many of the measures to improve universal design refer to the wheelchair itself. However, as we will discuss later, mobility impairments are not only related to people using wheelchairs.

The quantitative findings are also analyzed in relation to the list of “Disease and impairment prestige” by [Grue et al. \(2015\)](#). Although there are also other studies on disease and disability prestige ([Tringo 1970](#); [Album 1991](#), [Album and Westin, 2008](#)), [Grue et al. \(2015\)](#) focused on a Norwegian context and during a relatively similar time period, making it more relevant. Only diseases and disabilities related to problems directly linked with barriers in traveling/transport are included in our analysis. Also, diagnoses where measures in the transport system could possibly improve the outcome of a journey are included. For example, myocardial infarction is included as access to defibrillators, and training of transport personnel are both measures that could possibly prevent death for travelers in this situation. However, some types of cancers, AIDS, or anorexia etc., included in [Grue et al. \(2015\)](#), are not included in this analysis as there are no known transport-related measures that can improve the travel experience for these groups.

In addition to word search for each group of disability, a separate analysis of words related to measures to improve universal design for the different groups was conducted, i.e., sound, contrast, air quality, lighting conditions, auditive, visual, tactile, toilets, etc. This was mostly used as a control search, and only the main findings of this analysis are presented in the results section.

3. Results

The laws and regulations for universal design and accessibility in the Norwegian transport system are shown in [Table 2](#).

Table 2. Laws and regulations for universal design and accessibility in the Norwegian transport system.

#	Law	Def. of UD	Def. of disability	Mentions UD	Mention disabilities
1	Regulation (EC) No 1107/2006 of the European Parliament and of the Council of July 5, 2006 concerning the rights of disabled persons and persons with reduced mobility when traveling by air (European Parliament and Council, 2006)	No	Yes	No	Yes

#	Law	Def. of UD	Def. of disability	Mentions UD	Mention disabilities
2	Regulation (EU) No 1177/2010 of the European Parliament and of the Council of November 24, 2010 concerning the rights of passengers when traveling by sea and inland waterway and amending Regulation (EC) No 2006/2004 Text with EEA relevance (European Parliament and Council, 2010)	No	Yes	No	Yes
3	Regulation (EU) No 181/2011 of the European Parliament and of the Council of February 16, 2011 concerning the rights of passengers in bus and coach transport and amending Regulation (EC) No 2006/2004 Text with EEA relevance (European Parliament and Council, 2011)	No	Yes	No	Yes
4	Regulation (EC) No 1371/2007 of the European Parliament and of the Council of October 23, 2007 on rail passengers' rights and obligations (European Parliament and Council, 2007)	No	Yes	No	Yes
5	Regulation (EC) No 392/2009 of the European Parliament and of the Council of April 23, 2009 on the liability of carriers of passengers by sea in the event of accidents (European Parliament and Council, 2009)	No	No	No	No
6	DIRECTIVE 2001/85/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of November 20, 2001 relating to special provisions for vehicles used for the carriage of passengers comprising more than eight seats in addition to the driver's seat, and amending Directives 70/156/EEC and 97/27/EC (European Parliament and Council, 2001)	No	Yes	No	Yes
7	The Act on prohibition of discrimination based on ethnicity, religion, etc. (Anti-discrimination act) (Norwegian Ministry of Culture and Equality, 2017)	Yes	No	Yes	Yes
8	The Norwegian Planning and Building Act (<i>Plan- og bygningsloven</i>) (Norwegian Ministry of Local Government and Regional Development, 2008)	No	No	Yes	No
9	The Norwegian Ship Safety and Security Act (<i>skipssikkerhetsloven</i>) (Norwegian Ministry of Trade/Industry and Fisheries, 2007)	No	No	No	No
10	The Norwegian Maritime Code (<i>sjøloven</i>) (Norwegian Ministry of Justice and Public Security, 1994)	No	No	No	Yes
11	The Public Procurement Act (Norwegian Ministry of Trade/Industry and Fisheries, 2016a)	No	No	Yes	No
12	The Norwegian Road Act (<i>Vegloven</i>) (Norwegian Ministry of Transport, 1963/2021)	No	No	No	No
13	The Norwegian Professional Transport Act (<i>Yrkestransportloven</i>) (Norwegian Ministry of Transport, 2002)	No	No	No	Yes
14	The Norwegian Aviation Act (<i>Luftfartsloven</i>) (Norwegian Ministry of Transport, 1994c)	No	No	No	No
15	The Norwegian Railways Act (<i>Jernbaneloven</i>) (Norwegian Ministry of Transport, 1993)	No	No	No	No
16	International Maritime Organization MSC/Circ. 735 Recommendation on the design and operation of passenger ships to respond to elderly and disabled persons' needs (International Maritime Organization, 1996)	No	No	No	Yes
17	Regulation on Construction of Ships (u/MSC) (Norwegian Maritime Authority, 2014)	No	No	Yes	Yes
18	Regulation on inspection, construction, and equipment of passenger ships in domestic service (FOR-2000-03-28-305) (u/MSC) (Norwegian Maritime Authority, 2000)	No	Yes	No	Yes
19	Regulations on the construction, equipment and operation of high-speed craft used as passenger craft or cargo craft (u/MSC) (Norwegian Maritime Authority, 1998)	No	No	No	Yes
20	Regulations on technical requirements for construction works (<i>Byggeteknisk forskrift</i>) (Norwegian Building Authority, 2017)	No	No	Yes	Yes
21	Regulation for universal design of information and communication technology (ICT) solutions (Norwegian Ministry of Local Government and Regional Development, 2013)	Yes	No	Yes	No
22	Web Content Accessibility Guidelines (WCAG) 2.0 (World Wide Web Consortium, nd)	*	*	*	Yes
23	Regulation on universal design of motor vehicles in licensed transport (Norwegian Ministry of Transport, 2009)	No	No	Yes	Yes

#	Law	Def. of UD	Def. of disability	Mentions UD	Mention disabilities
24	Regulation for tramways, underground railways, suburban railways (<i>kravforskriften</i>) (Norwegian Ministry of Transport, 2014)	Yes	No	Yes	Yes
25	Regulations on Vehicles on the Railway Network (<i>kjøretøysforskriften</i>) (Norwegian Ministry of Transport, 1994b)	No	No	No	No
26	Regulation on national technical requirements, etc., for railway infrastructure on the national railway network (<i>jernbaneinfrastrukturforskriften</i>) (Norwegian Ministry of Transport, 2011)	Yes	No	Yes	No
27	COMMISSION REGULATION (EU) No 1300/2014 of November 18, 2014 on the technical specifications for interoperability relating to accessibility of the Union's rail system for persons with disabilities and persons with reduced mobility (European Commission, 2014)	No	Yes	Yes	Yes
28	Regulation on the appeals board for passenger transport (<i>transportklagenemndforskriften</i>) (Norwegian Ministry of Transport, 2012)	No	No	No	Yes
29	Regulations on the universal design of airports, and on the rights of disabled people and people with reduced mobility in air transport (Norwegian Civil Aviation Authority, 2011)	Refers to Anti-discrimination act	Refers to EF. Nr 1107/2006	Yes	Yes
30	Regulation on conditional parking for the public and enforcement of private parking regulations (<i>parkeringsforskriften</i>) (Norwegian Ministry of Transport, 2016b)	No	No	Yes	Yes
31	The regulation on public procurement (<i>anskaffelsesforskriften</i>) (Norwegian Ministry of Trade/Industry and Fisheries, 2016b)	No	No	Yes	Yes
32	Guide to the rules on public procurement (Norwegian Ministry of Trade/Industry and Fisheries, 2018)	Yes	Yes	Yes	Yes
33	Regulation on the technical requirements and approval of vehicles, parts and equipment (<i>kjøretøysforskriften</i>) (Norwegian Ministry of Transport, 1994a)	No	No	No	Yes
34	Regulation on bus passenger rights (Norwegian Ministry of Transport, 2016a)	No	No	No	Yes

3.1. Universal design

The first 6 documents are European regulations. None of these mention the term universal design at all.

Documents 7–15 are the laws related to universal design in transport. Only the Anti-discrimination Act (document 7) has defined universal design specifically:

“designing or accommodating the main solution with respect to the physical conditions, such that the general functions of the undertaking can be used by as many people as possible, regardless of disability.”

This definition only mentions physical environment and focuses on disabilities.

Three of the regulation documents (documents 21, 24 and 26) define universal design in a similar way as the Anti-discrimination Act: “Designing or accommodating the main solution in the physical environment so that the general function of the business can be used by as many people as possible.”

In document 21 the term “information and communication technology” is used instead of “physical environment”. In all three of these documents, however, the last part of the definition from the Anti-discrimination Act, about disabilities, is left out – making it broader in terms of who it includes.

The “Regulations on the universal design of airports, and on the rights of disabled people and people with reduced mobility in air transport” refers directly to the definition from the Anti-discrimination Act.

In the guidance documents for the “Guide to the rules on public procurement” (document 32) the definition does not specify the physical environment, and it also states that it should be possible to be used by all – hence being more in line with the UN definition; “Universal design must ensure that solutions are accessible and that they can be used by everyone regardless of functional ability”.

Universal design is also mentioned by some of the documents without defining it.

3.2. Disabilities

The use of terms in relation to disabilities differs between different legal documents. Some use the term “disabled person” while others use the term “passenger with reduced mobility” which is wider and includes other user groups in addition to people with disabilities.

All the European regulations mention disabilities. For passengers’ rights, the regulations for bus, boat, train and air travel all have the same definition (document 1–4):

‘disabled person’ or ‘person with reduced mobility’ means any person whose mobility when using transport is reduced due to any physical disability (sensory or locomotor, permanent or temporary), intellectual disability or impairment, or any other cause of disability, or age, and whose situation needs appropriate attention and the adaptation to his or her particular needs of the service made available to all passengers.

“DIRECTIVE 2001/85/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of November 20, 2001 relating to special provisions for vehicles used for the carriage of passengers comprising more than eight seats in addition to the driver's seat, and amending Directives 70/156/EEC and 97/27/EC” (document 6) uses the term reduced mobility as the following:

“Passenger with reduced mobility” means all people who have difficulty when using public transport, such as disabled people (including people with sensory and intellectual impairments, and wheelchair users), people with limb impairments, people of small stature, people with heavy luggage, elderly people, pregnant women, people with shopping trolleys, and people with children (including children seated in pushchairs);

The “REGULATION (EC) No 392/2009 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of April 23, 2009 on the liability of carriers of passengers by sea in the event of accidents” (document 5) only mentions the right to compensation if equipment of people with reduced mobility is damaged.

None of the Norwegian laws (document 7–15) mention disabilities. Of the Norwegian regulations, only 4 documents define disabilities (document 18, 22, 27 and 32).

The TSI-PRM (document 27) has the following definition:

“Person with disabilities and person with reduced mobility’ means any person who has a permanent or temporary physical, mental, intellectual or sensory impairment which, in interaction with various barriers, may hinder their full and effective use of transport on an equal basis with other passengers or whose mobility when using transport is reduced due to age.”

This is a quite broad definition of disabilities and also includes age.

In the “Regulations on the inspection, construction and equipment of passenger ships in domestic traffic” (document 18), both the term reduced mobility and disability are used:

“people with reduced mobility: people who have particular problems using public transport, including the elderly, people with disabilities, people with reduced sensory abilities, wheelchair users, pregnant women and people accompanied by small children”.

Here, reduced mobility is used as an umbrella term that covers, among other things, disabilities.

Web Content Accessibility (WCAG 2.0) (document 22) uses the term “Accessibility” rather than universal design. The document mentions a number of different impairments:

«make content accessible to a wider range of people with disabilities, including blindness and low vision, deafness and hearing loss, learning disabilities, cognitive limitations, limited movement, speech disabilities, photosensitivity and combinations of these”.

In addition, the document mentions measures against seizure-related illness, which is not mentioned anywhere else in the legislation. Older people are also mentioned, as well as readability, which should not be more difficult than secondary school level.

In the guidance document for the “The regulation on public procurement” disabilities are defined as:

“persons who, based on the nature or extent of their impairment, cannot work under normal conditions. This could, for example, be people with a long-term physical or mental impairment”.

Here, a disability is related to the ability, or lack thereof, to work, which is a quite narrow definition. However, it does include diagnoses of both mental and physical character.

3.2.1. Quantitative results

As we have seen in [Table 2](#), there are many documents that mention different groups of disabilities. We have done a separate analysis, the results of which are shown in [Table 3](#), on the number of documents that mention the different groups, a total count of the number of times groups are mentioned in all the documents, and a comparison with the “Disability prestige ranking” from [Grue et al. \(2015\)](#). The “disability prestige ranking” was derived by asking NGOs to rank different diagnosis on a scale of prestige in terms of what they believe most professional in their field would rank them ([Grue et al., 2015](#)).

Table 3. Results of legal text analysis and disability prestige ranking.

Rank		Number of times mentioned in the documents (N=42)	Number of documents mentioning group (N=42)	Relevant diagnosis/disability	Rankin in Grue et al. (2015)
1	Mobility disabilities	739	27	Multiple sclerosis	12
				Spina bifida	15
				Arthritis	16
				Bechterews disease	17
				Cerebral Palsy	22
				Muscle disease	24
				Dysmelia	26
				Sciatica	32
				Myalgic encephalomyelitis (ME)	33
				Restricted growth	36
				Fibromyalgia	37
2	Visual disabilities	190	14	Blindness	9
				Cataract	18
3	Hearing disabilities	47	12	Deafness	14
4	Respiratory disabilities	43	6	Lung cancer	4
				Asthma	10
4	Cognitive disabilities	31	9	Brain tumor	2
				Huntington's disease	22
				Dyslexia	26
				Aphasia	33
6	Psychosocial disabilities	13	9	ADHD	18
				Autism	18
				Schizophrenia	30
				Depression	30
				Anxiety neurosis	35
7	Developmental disabilities	5	2	Down syndrome	24
7	Seizure related disabilities	5	1	Myocardial infarction	1
				Epilepsy	13
9	Digestion and urinary tract disabilities	0	0	Colon cancer	5
				Ovarian cancer	6

For this analysis we have added eight additional documents used in the Norwegian transport sector.

1. Universal design in planning
2. universal design for outdoor areas
3. Guidance document for universal design in maritime transport
4. Guidance document on mapping accessibility and universal design in township
5. Universal design of roads and streets (v129)

6. Road and street design (n100)
7. Guidance document for public procurement
8. Guidance document on universal design of bus vehicles

As we can see, persons with mobility disabilities are mentioned in many more documents than other impairments or needs. Disabilities related to digestion and urinary tract, seizures, and developmental impairments are not or barely mentioned in any of the documents. Psychosocial impairments are mentioned in a relatively high number of documents (9), but are mentioned very rarely (13) compared to other groups. This is because mental health is often included in definitions of disabilities, but it is rarely linked to actual measures. Based on the number of times groups are mentioned in the documents we see even more strongly how the focus is largely on impairments related to movement and vision.

When placing the relevant diagnosis in relation to the disability group, some diseases might have been placed in several of the groups. Multiple sclerosis, for example, causes impairments in both cognitive and physical skills. It can also cause problems with bladder and bowel functions, vision as well as anxiety and depression.

As we can see from the last two columns when comparing relevant diagnoses from the “Disease and impairment prestige”, we see that the spread is quite high in the first category of mobility impairments.

Blindness is ranked in the top 25 % of diagnoses and is also mentioned frequently in the documents. Cognitive disabilities are included in both the top 25 % and bottom 25 %. Psychosocial disabilities, ranked 6 in the document study, contain several diagnoses that score within the lowest 25 %. For the bottom two disability groups we find several of the top 25 % ranked diagnoses.

The separate word search analysis showed that most measures were related to visual, mobility and hearing disabilities. Toilets were one word that was also mentioned frequently; however, it was only used in relation to design of HC toilets to fit a wheelchair. There was no guidance or demands for installing toilets. One of the documents (document 8) actually recommends *not* installing HC toilets in buses as this will take up too much space.

Table 4 shows the different disabilities related to visibility and prestige. Here the cut-off-point for prestige is set at 19, the 50 % mark. If most diagnoses for the respective group are ranked 1–19, it is placed in the high prestige category. If most diagnoses for the group are in place 20 or above, it is ranked as low prestige. For visibility, some disability groups could have both high and low visibility. For mobility disabilities some people are using walking aids, while others may have diagnoses that are not as visible – for example pain-related diagnosis. For developmental disabilities some have visual features linked to the diagnosis, while others do not. This could be true for some of the other groups as well, as you may have people with visual disabilities who does not use a cane nor have an assistance dog. Grouping disabilities as highly visible is based on however there are people in the group using of visible walking aids – like a wheelchair, walker, cane, assistance dog etc. Numbers in brackets refer to rank order of times mentioned in documents.

Table 4. Comparison of disability prestige and visibility.

	High visibility	Low visibly
High prestige (1–19)	Visual disabilities (2)	Hearing disabilities (3) Respiratory disabilities (4) Seizure related disabilities (7) Digestion and urinary tract (9)
Low prestige (20–38)	Mobility disabilities (1)	Cognitive disabilities (4) Psychosocial disabilities (6) Developmental disabilities (7)

4. Discussion

4.1. Definitions of disabilities

The main finding of this study in terms of defining disabilities relates to how the use of ‘person with reduced mobility’ differs. In legislation documents, mobility impairment is often defined as reduced ability to move between A and B, rather than reduced mobility in the body. In other words, mobility impairment can include disabilities of both a physical and/or mental nature. “Impaired mobility” does also sometimes

include pregnant women and people traveling with children, as we see in the "Regulations on the inspection, construction and equipment of passenger ships in domestic service" as well as in the European passenger regulations for air, rail, waterborne, and road transport (documents 1–4).

The Norwegian Directorate for Children, Youth and Family Affairs (BUFDIR) (2016), on the other hand, defines mobility impairment as a separate subgroup of disabilities alongside impaired vision, impaired hearing etc., in the sense that impaired movement is linked to reduced movement of the body. This is also the definition used in most academic work on the topic in Norway (Nielsen et al., 2022). Other transport agencies, such as Avinor, which is responsible for running the Norwegian airports, also use this definition.

If we look at the definitions in the Store Norske Leksikon (Great Norwegian Encyclopedia), one can perhaps explain why this difference in the use of terms exists. Under both explanations for disability ('nedsatt funksjonsevne' and 'funksjonshemming') we find a similar way of applying the concept of mobility impairment as done by BUFDIR (BUFDIR, 2016), where mobility impairment or reduced mobility is one of several types of disabilities (Lid, 2020).

"Disability can be experienced as cognitive, mental, social, sensory and physical impairment, more clearly specified in subcategories such as blind, visually impaired, deaf, hearing impaired, **mobility impaired** and environmentally impaired. Such categories are linked to and spring from the bodily functions".

On the other hand, if you look at the definition used for mobility impairment (Nylenna, 2022):

"Mobility impairment or movement impairment (*forflytningshemmet*) is a reduced ability for movement and mobility. Mobility impairment is most often due to physical causes (for example illness or injury) but can also have mental causes (for example anxiety)."

The term is used here in a similar way to what we see in parts of the legislation, where mobility impairment is used synonymously with reduced ability to move from A to B and can, therefore, refer to all groups.

Also, in the English language there are different ways of using mobility impairments or reduced mobility. As shown in the results section, European laws also used the term reduced mobility as a general term for people having difficulties moving from A to B. However, mobility impairment is also used as a subgroup of disabilities (Healthcare PRO, 2016; Washington Edu 2022, Disabled World, 2022; University of Illinois, 2022; Accessibility, 2022).

The lack of a common understanding of the use of terms can be highly problematic, particularly as rights are linked to who is considered to have a disability and who does not. This finding also has significant practical implications. An example of where this is a problem is that the government has set a requirement that new buses with capacity for more than 23 passengers that are to run on routes in Norway must be accessible to people with reduced mobility, or be universally designed. In this case, it is not specified which definition of reduced mobility is used. However, reference is made to various regulations.

- Regulation on the universal design of motor vehicles in licensed transport (applies to class II and III buses)
- Regulation on the technical requirements and approval of vehicles, parts and equipment § 8-1 (applies to buses class I)
- ECE-107 annex VIII – Accommodation and accessibility for passengers with reduced mobility

The first regulation uses the term reduced ability, but only mentions measures related to wheelchairs, a real-time system with visual and auditory information, and an external sound beacon announcing which bus is arriving. The Vehicle Regulations use several different terms: wheelchair users, mobility impaired, and handicap. Children and prams are also mentioned in the document. This document covers the design of seating, as well as requirements for visual contrast on, among other things, steps. ECE-107 uses the terms disabled, mobility impaired and wheelchair users. This is mainly about technical requirements for seating and step-free access, but it is also mentioned that there must be room for a guide dog.

None of the documents define which user groups are included when they use the various terms, but it is largely measures aimed at people with reduced mobility and the visually impaired that are mentioned. In other words, it can easily be interpreted that the government requirements for the buses only need to take account of people with physically reduced mobility or impaired vision, which are the groups that have been historically associated with universal design.

4.2. Definitions of universal design

The main legislation on universal design and disabilities in Norway mentions these terms at a very general level – individual groups are not specifically highlighted in the legislation, apart from children being mentioned in the Planning and Building Act.

In the Norwegian Act on Equality and the Prohibition of Discrimination, the definition is to a greater extent, directly linked to disabilities, while the UN emphasizes everyone. This could potentially affect how people think about universal design in Norway, and contribute to a continued focus on disabilities only. This can be problematic as other user needs are not included, e.g., gender-related needs, children's needs, people who do not speak the local language.

Another major problem with the definition in the Act on Equality and the Prohibition of Discrimination is how it only talks about physical environment. The UN's definition also refers to programs and services, which is more than just physical design. This is a key point, as many groups with disabilities need facilitation which to a greater extent is aimed at services in the public transport system rather than technical solutions. To some extent this could also explain the continued focus on groups where physical design solutions are more important, e.g., people with walking aids or visually impaired people in need of tactile paving. However, toilets are also a part of physical design, but still not a focus in the regulation documents.

Another problematic finding from the regulation documents is the use of the term 'mobility impairment' or 'reduced mobility' instead of the more general word 'disability'. This could also be one of the reasons why there is a bias towards including physical disabilities and not including mental disabilities in the legislation.

4.3. Prestige versus visibility

When looking at the ranking of disabilities in terms of times mentioned in the legal documents and in terms of the number of documents they are mentioned, we can see that there are major differences between the different types of disabilities, even though the differences are most pronounced in number of times mentioned. Mobility impairments are mentioned more frequently than all other types of disabilities. Visual impairments, which are also mentioned frequently, come in second.

As mentioned, this could be influenced by differences in disease status linked between the different types of disabilities (hypothesis 2). However, when we look at the results from the disease ranking in relation to disabilities, the findings are almost opposite for some of the groups. There may be several and different reasons that can explain this. First of all, a lot of the diseases used as examples in some of these groups are cancers or other diagnoses with a possible deadly outcome. These types of diseases often have a higher prestige (Grue et al., 2015; Alburn and Westin, 2008). Therefore, it would be possible that other types of diseases in the disability groups would have had a different ranking. In the last group – bowel and urinary tract impairments – two different types of cancers that are related to these types of impairments are rated highly in terms of prestige, even though this is a group that is not at all mentioned in the laws and regulations. It would be possible that diagnoses like IBS and overactive bladder might have been rated lower. The way these types of disabilities are treated generally in society is also not linked to prestige. There has recently been a legal case between a bus company and the national NGO for people with bowel disease after the bus company decided to close the toilets as there was no obligations in the law to have them open. Although the bus company lost in court, a similar incident has recently emerged where another company states that there is no reason to buy buses with toilets as it is not required by law. These examples demonstrate a completely different attitude towards these types of disabilities. In Norway you will also get a fine for urinating or defecating in a public space (pursuant to criminal law paragraph 181), making this the only disability where you would be committing a criminal act if you don't have available toilet facilities.

For seizure related disabilities, myocardial infarction is ranked very high and epilepsy is ranked in the middle. These types of diagnoses demand help from other people, and as the social environment has not been conceived as part of universal design in the Norwegian law, this could also explain why these types of diagnoses are not mentioned in any of the documents.

For mobility impairments there is a huge spread in diseases where we find that the higher prestige diseases that are often visible in terms of the person having to use wheelchair or other walking aids. In the analysis of the laws, the word "wheelchair" was used frequently. The more hidden disabilities in this group are however rated in the bottom 25 %. This is in line with the explanation that sympathy is easier for visible disabilities.

We would expect disabilities with high visibility and high prestige to be mentioned most in the legal documents. The opposite would be expected for disabilities with low visibility and low prestige. If prestige is more important than visibility, we would expect that the second most mentioned groups are high prestige, low visibility – and low prestige, high visibility being the third most mentioned category. If visibility is more important, we would expect the opposite.

As we see in the table, visual disabilities are the only group that is in the high visibility – high prestige category. This is the second most mentioned group in the regulation documents. The most mentioned group in the legal documents is mobility disabilities – even though it is in the lower prestige group, it still has a high visibility, which might suggest that visibility is more important than prestige.

For the low visibility groups, they are all mentioned less frequently than the mobility and visual disabilities, and prestige does not seem to be as important in terms of how often they are mentioned in the regulation documents. As mentioned earlier the prestige of disabilities related to digestion and urinary tract could very well be on the lower rank of prestige if diagnoses other than cancer had been chosen.

The results show that both prestige and visibility seem to be plausible explanations for some of the discrimination between groups in legal and regulation documents. However, visibility seems to be more important. The results might be better explained by prestige, if having other diagnoses to represent the different disability groups, and to have a clearer division between the visible and non-visible diagnosis within each group. More research is needed, and it would be interesting to also look at this in relation to NGOs' use of resources in lobbying activities. There could also be other possible explanations for why people with mobility and visual impairments are mentioned more often than others.

As mentioned in the introduction, gender related issues could be relevant, if more men are in the groups of “classical disabilities”. Less knowledge on the travel experience for groups with other types of disabilities than “classical” could also possibly explain the biases in the legal documents. However, the question of why these biases exist would still be equally relevant.

Final remarks

Whether or not disabilities should be mentioned specifically in regulation documents' definitions is a highly relevant discussion. As people with disabilities often experience discrimination, having specified this in the definitions could potentially increase focus on their needs and give people with disabilities stronger legal rights. On the other hand, universal design is about everyone, not just people with disabilities. This is important in terms of making the general public interested in having a universally designed transport system. A broader focus on everyone's needs could potentially improve the system for people with disabilities to a greater extent. The UN definition does not focus on disabilities in the same way as the Norwegian law, as UN only states that it should “not exclude aids for certain groups of people with reduced functional abilities when there is a need for it”.

It is highly problematic that there are fines for using the public space as toilet facilities, while there are no legal obligations for society to ensure actual indoor facilities when there is a large group of people having disabilities related to increased need of toilet facilities. Another major problematic finding is that legal rights and regulations are only established for certain types of disabilities, thereby discriminating other disabilities. Especially visual disabilities seem to be prioritized in the regulation documents. However, we have not examined the quality of the legal rights for any of the groups, hence even the groups most frequently mentioned in documents might not have sufficient rights.

As a way forward we suggest implementing the following.

- Basing *all* legal documents on the same definition of universal design. Preferably the UN definition of universal design as the focus is much broader than just built environment and therefore encompasses other types of needs than technical solutions
- Using the term “disabilities” rather than “mobility impairment” or “reduced mobility” as the second terms are associated with people having physical problems only
- Collaborating with NGOs and user representatives for the groups that are underrepresented in the legal documents in order to reduce the current bias towards visible disabilities

Financial disclosure

The empirical data collection is funded by Samferdselsdepartementet.

Writing of the paper is funded by Institute of Transport Economic.

CRedit authorship contribution statement

Anja Fleten Nielsen: Writing – review & editing, Writing – original draft, Resources, Project administration, Methodology, Investigation, Funding acquisition, Formal analysis, Data curation, Conceptualization.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

[Recommended articles](#)

References

[Accessibility, 2022](#) Accessibility

Mobility and Physical Disabilities. Downloaded at: [Mobility and Physical Disabilities | Disabilities | Accessibility com](#) (2022)

[Google Scholar](#) ↗

[Album, 1991](#) D. Album

Sykdommers og medisinske spesialisters prestisje (The prestige of disease and medical specialties) *Nord. Med.*, 106 (8–9) (1991), pp. 232-236

[View in Scopus](#) ↗ [Google Scholar](#) ↗

[Album and Westin, 2008](#) D. Album, S. Westin

Do diseases have a prestige hierarchy? A survey among physicians and medical students

Soc. Sci. Med., 66 (1) (2008), pp. 182-188, [10.1016/j.socscimed.2007.07.003](https://doi.org/10.1016/j.socscimed.2007.07.003) ↗

 [View PDF](#) [View article](#) [View in Scopus](#) ↗ [Google Scholar](#) ↗

[BUFDIR, 2016](#) BUFDIR

Hva er nedsatt funksjonsevne?

Downloaded 06 (2016)

jan 2022 at:

https://www.bufdir.no/Nedsatt_funksjonsevne/Hva_er_nedsatt_funksjonsevne/Hva_er_nedsatt_funksjonsevne/ ↗

[Google Scholar](#) ↗

[Disabled World, 2022](#) Disabled World

Physical and mobility impairment information

Downloaded at: Physical and Mobility Impairment Information: Disabled World (disabled-world.com) (2022)

[Google Scholar](#) ↗

[European Commission, 2014](#) European Commission

COMMISSION REGULATION (EU) No 1300/2014 on the Technical Specifications for Interoperability Relating to Accessibility of the Union's Rail System for Persons with Disabilities and Persons with Reduced Mobility

(2014)

[Google Scholar](#) ↗

[European Parliament and Council, 2001](#) European Parliament and Council

DIRECTIVE 2001/85/EC Relating to Special Provisions for Vehicles Used for the Carriage of Passengers Comprising More than Eight Seats in Addition to the Driver's Seat, and Amending Directives 70/156/EEC and 97/27/EC

(2001)

[Google Scholar](#) ↗

[European Parliament and Council, 2006](#) European Parliament and Council

Regulation (EC) No 1107/2006 Concerning the Rights of Disabled Persons and Persons with Reduced Mobility when Travelling by Air

(2006)

[Google Scholar](#) ↗

[European Parliament and Council, 2007](#) European Parliament and Council

Regulation (EC) No 1371/2007 on Rail Passengers' Rights and Obligations

(2007)

[Google Scholar](#) ↗

[European Parliament and Council, 2009](#) European Parliament and Council

Regulation (EC) No 392/2009 on the Liability of Carriers of Passengers by Sea in the Event of Accidents

(2009)

[Google Scholar](#) ↗

[European Parliament and Council, 2010](#) European Parliament and Council

Regulation (EU) No 1177/2010 Concerning the Rights of Passengers when Travelling by Sea and Inland Waterway and Amending Regulation (EC) No 2006/2004 Text with EEA Relevance

(2010)

[Google Scholar](#) ↗

[European Parliament and Council, 2011](#) European Parliament and Council

Regulation (EU) No 181/2011 Concerning the Rights of Passengers in Bus and Coach Transport and Amending Regulation (EC) No 2006/2004 Text with EEA Relevance

(2011)

[Google Scholar](#) ↗

[Grue et al., 2015](#) J. Grue, L.E.F. Johannessen, E.F. Rasmussen

Prestige ranking of chronic diseases and disabilities. A survey among professionals in the disability field

Soc. Sci. Med., 124 (2015), pp. 180-186

 [View PDF](#) [View article](#) [View in Scopus](#) [Google Scholar](#)

[Healthcare PRO, 2016](#) Healthcare PRO

Living with reduced mobility

(2016)

Downloaded at:

<https://www.healthcarepro.co.uk/articles/living-with-reduced-mobility>

[Google Scholar](#)

[Horne and Ricciardo, 1988](#) M.D. Horne, J.L. Ricciardo

Hierarchy of response to handicaps

Psychol. Rep., 62 (1) (1988)

[Google Scholar](#)

[Ingstad, 2007](#) B. Ingstad

Medisinsk antropologi

En Innføring, Bergen: Fagbokforlaget (2007)

[Google Scholar](#)

[International Maritime Organization, 1996](#) International Maritime Organization

MSC/Circ. 735 Recommendation on the Design and Operation of Passenger Ships to Respond to Elderly and Disabled Persons' Needs

(1996)

[Google Scholar](#)

[Kleinman, 1988](#) A. Kleinman

The illness Narratives

Suffering, Healing and the Human Condition, Basic Books Inc, New York (1988)

[Google Scholar](#)

[Lid, 2013](#) I.M. Lid

Universell Utforming. Verdigrunnlag, Kunnskap Og Praksis

Cappelen Damm Akademisk (2013)

[Google Scholar](#)

[Lid, 2020](#) I.M. Lid

Nedsatt funksjonsevne i Store norske leksikon på snl

no. Hentet 4. oktober 2023 fra

https://snl.no/nedsatt_funksjonsevne (2020)

[Google Scholar](#)

[Nielsen and Skollerud, 2018](#) A.F. Nielsen, K.H. Skollerud

Universell Utforming Av Transportsystemer for Grupper Med Nedsatt Psykisk Funksjonsevne

(2018)

TØI-rapport 1615/2018

[Google Scholar](#)

[Nielsen et al., 2022](#) A.F. Nielsen, R. Phillips, J.V. Haukeland, I. Landa-Mata

Universell Utforming Av Transportsystemet I Norge

(2022)

TØI-rapport 1896/2022

[Google Scholar](#)

[Norwegian Building Authority, 2017](#) Norwegian Building Authority

Regulations on Technical Requirements for Construction Works (Byggteknisk Forskrift)

(2017)

[Google Scholar](#) ↗

[Norwegian Civil Aviation Authority, 2011](#) Norwegian Civil Aviation Authority

Regulations on the Universal Design of Airports, and on the Rights of Disabled People and People with Reduced Mobility in Air Transport

(2011)

[Google Scholar](#) ↗

[Norwegian Maritime Authority, 1998](#) Norwegian Maritime Authority

Regulations on the Construction, Equipment and Operation of High-Speed Craft Used as Passenger Craft or Cargo Craft

(1998)

[Google Scholar](#) ↗

[Norwegian Maritime Authority, 2000](#) Norwegian Maritime Authority

Regulation on Inspection, Construction, and Equipment of Passenger Ships in Domestic Service

(2000)

FOR-2000-03-28-305)

[Google Scholar](#) ↗

[Norwegian Maritime Authority, 2014](#) Norwegian Maritime Authority

Regulation on Construction of Ships

(2014)

[Google Scholar](#) ↗

[Norwegian Ministry of Culture and Equality, 2017](#) Norwegian Ministry of Culture and Equality

The Act on Prohibition of Discrimination Based on Ethnicity, Religion, Etc. (Anti-discrimination Act)

(2017)

[Google Scholar](#) ↗

[Norwegian Ministry of Justice and Public Security, 1994](#) Norwegian Ministry of Justice and Public Security

The Norwegian Maritime Code (Sjøloven)

(1994)

[Google Scholar](#) ↗

[Norwegian Ministry of Local Government and Regional Development, 2008](#) Norwegian Ministry of Local Government and Regional Development

The Norwegian Planning and Building Act (Plan- Og Bygningsloven)

(2008)

[Google Scholar](#) ↗

[Norwegian Ministry of Local Government and Regional Development, 2013](#) Norwegian Ministry of Local Government and Regional Development

Regulation for Universal Design of Information and Communication Technology (ICT) Solutions

(2013)

[Google Scholar](#) ↗

[Norwegian Ministry of Trade Industry and Fisheries, 2007](#) Norwegian Ministry of Trade, Industry and Fisheries

The Norwegian Ship Safety and Security Act (Skipssikkerhetsloven)

(2007)

[Google Scholar](#) ↗

[Norwegian Ministry of Trade Industry and Fisheries, 2016a](#) Norwegian Ministry of Trade, Industry and Fisheries

The Public Procurement Act

(2016)

[Google Scholar](#) ↗

[Norwegian Ministry of Trade Industry and Fisheries, 2016b](#) Norwegian Ministry of Trade, Industry and Fisheries

The Regulation on Public Procurement

(2016)

[Google Scholar ↗](#)

[Norwegian Ministry of Trade Industry and Fisheries, 2018](#) Norwegian Ministry of Trade, Industry and Fisheries

Guide to the Rules on Public Procurement

(2018)

[Google Scholar ↗](#)

[Norwegian Ministry of Transport, 1963/2021](#) Norwegian Ministry of Transport

The Norwegian Road Act (Vegloven)

(1963/2021)

[Google Scholar ↗](#)

[Norwegian Ministry of Transport, 1993](#) Norwegian Ministry of Transport

The Norwegian Railways Act (Jernbaneloven)

(1993)

[Google Scholar ↗](#)

[Norwegian Ministry of Transport, 1994a](#) Norwegian Ministry of Transport

Regulation on the Technical Requirements and Approval of Vehicles, Parts and Equipment (Kjøretøyforskriften)

(1994)

[Google Scholar ↗](#)

[Norwegian Ministry of Transport, 1994b](#) Norwegian Ministry of Transport

Regulations on Vehicles on the Railway Network (Kjøretøyforskriften)

(1994)

[Google Scholar ↗](#)

[Norwegian Ministry of Transport, 1994c](#) Norwegian Ministry of Transport

The Norwegian Aviation Act (Luftfartsloven)

(1994)

[Google Scholar ↗](#)

[Norwegian Ministry of Transport, 2002](#) Norwegian Ministry of Transport

The Norwegian Professional Transport Act (Yrkestransportloven)

(2002)

[Google Scholar ↗](#)

[Norwegian Ministry of Transport, 2009](#) Norwegian Ministry of Transport

Regulation on Universal Design of Motor Vehicles in Licensed Transport

(2009)

[Google Scholar ↗](#)

[Norwegian Ministry of Transport, 2011](#) Norwegian Ministry of Transport

Regulation on National Technical Requirements, etc., for Railway Infrastructure on the National Railway Network (Jernbaneinfrastrukturforskriften)

(2011)

[Google Scholar ↗](#)

[Norwegian Ministry of Transport, 2012](#) Norwegian Ministry of Transport

Regulation on the Appeals Board for Passenger Transport (Transportklagenemndforskriften)

(2012)

[Google Scholar ↗](#)

[Norwegian Ministry of Transport, 2014](#) Norwegian Ministry of Transport

Regulation for Tramways, Underground Railways, Suburban Railways (Kravforskriften)

(2014)

[Google Scholar ↗](#)

[Norwegian Ministry of Transport, 2016a](#) Norwegian Ministry of Transport

Regulation on Bus Passenger Rights

(2016)

[Google Scholar](#) ↗

[Norwegian Ministry of Transport, 2016b](#) Norwegian Ministry of Transport

Regulation on Conditional Parking for the Public and Enforcement of Private Parking Regulations

(2016)

(parkeringsforskriften)

[Google Scholar](#) ↗

[Nylenna, 2022](#) M. Nylenna

Bevegelseshemning i Store norske leksikon på snl

no. Hentet 4. oktober 2023 fra

<https://snl.no/bevegelseshemning> ↗ (2022)

[Google Scholar](#) ↗

[Tringo, 1970](#) J.L. Tringo

The hierarchy of preference toward disability groups

J. Spec. Educ., 4 (3) (1970), pp. 295-306

[View at publisher](#) ↗ [CrossRef](#) ↗ [View in Scopus](#) ↗ [Google Scholar](#) ↗

[University of Illinois, 2022](#) University of Illinois

Mobility impairments

Downloaded at: Mobility Impairments | Disability Resources & Educational Services, University of Illinois (2022)

[Google Scholar](#) ↗

[Washington Edu, 2022](#) Washington Edu

What is a mobility impairment? Downloaded at: what is a mobility impairment?

AccessComputing (washington.edu) (2022)

[Google Scholar](#) ↗

[World Wide Web Consortium, nd](#) World Wide Web Consortium (W3C). (n.d.). Web Content Accessibility Guidelines (WCAG) 2.0.

[Google Scholar](#) ↗

Cited by (0)

[View Abstract](#)

© 2024 Published by Elsevier Ltd.



All content on this site: Copyright © 2024 Elsevier B.V., its licensors, and contributors. All rights are reserved, including those for text and data mining, AI training, and similar technologies. For all open access content, the Creative Commons licensing terms apply.

