



Institute of Transport Economics
Norwegian Centre for Transport Research



Universal design in transport

Editors: Nils Fearnley and Kjersti Visnes Øksenholt

Preface

The current literature on universal design has so far failed to fully address the challenges faced by transport agencies, and when the planners lack holistic knowledge, the solutions that are developed will not meet the required standard.

The aim of this collection of articles is to contribute to increased overall knowledge about what universal design and accessibility for all entails, and also the principles of how accessibility for all can be achieved in a transport context in terms of the planning process and physical solutions. In this way, the articles will contribute to the realisation of universal design, and thus promote a better quality of life and equality for people with disabilities.

The collection of articles is a topical reference work on universal design for various study programmes, fields of study and postgraduate courses in the higher education sector, and for transport agencies and planning authorities.

We would like to extend a big thank you to Liv Øvstedal and Stein Brembu at the Norwegian Public Roads Administration, who initiated and partly funded the articles, and to the Norwegian Directorate for Children, Youth and Family Affairs (Bufdir) who partly funded the collection through their grant scheme 'Universal design – knowledge development, skills development and information'. A big thank you also to Tanu Priya Uteng from the Institute of Transport Economics (TØI) who took on the role of substitute editor for the first article in the collection, which was written by the editors. And thank you very much to Hanne Sparre-Enger from the TØI's Department of Communication, who edited the texts and led the work on layout and design.

Finally, we would like to thank the anonymous reviewers who have peer reviewed all the contributions. The authors and editors agree that their close reading and thorough feedback have greatly improved the articles.

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A collection of articles: Universal design in the transport sector

The aim of this collection of articles is to contribute to increased knowledge about what universal design and accessibility for all entails, as well as principles of how accessibility for all can be achieved in a transport context in terms of both the planning process and physical solutions. We want the collection to strengthen universal design, and in turn contribute to a better quality of life and equality for people with disabilities.

The collection is comprised of seven articles, where this introductory article is Article 1. All shed light on various aspects of universal design in the transport sector.

Article 2, '**Functional requirements for inclusive transport**', discusses the functional requirements that transport solutions must satisfy in order to facilitate social inclusion of people with disabilities (Bjerkan, 2022).

Article 3, '**Universal design and barriers to using public transport**, aims to deepen the understanding of how the transport system is perceived by different groups of people, and to understand and foresee challenges, weigh up the various issues, and facilitate good solutions that benefit as many people as possible (Nielsen and Øksenholt, 2022).

Article 4, '**Universal design and public participation in planning processes**', discusses how universal design can be better safeguarded in the planning process. The article aims to deepen the understanding of the complexity of the planning system, and how this can act as a hindrance for good and holistic solutions (Sjøstrøm et al., 2022).

Article 5, '**How can we ensure universal design of trip chains in a system with complex laws, regulations and responsibilities?**', gives the reader an introduction to the statutory and organisational framework for universal design in the transport sector, with a particular focus on trip chains. The article discusses how to safeguard universal design of the transport system in a context where legislation and accountability are complex, and reforms alter the distribution of responsibility (Øksenholt and Krogstad, 2022).

Article 6, '**Effects of universal design: quality of life, demand and socioeconomic benefit**', shows how the utility of universal design for passengers can be measured, and thus also used in cost-benefit analysis, which surprisingly often show that universal design measures in public transport are highly efficient, i.e. they improve social welfare because benefits exceed costs (Fearnley, Veisten and Nielsen, 2022).

Article 7, '**Transport solutions of the future: technology, design and innovation**, describes a selection of new and future transport solutions that are of particular relevance in Norway, and discusses these in the context of what we know about the needs of various user groups. The article demonstrates how new transport solutions are multifaceted and affect the various user groups in different ways (Aarhaug, 2022).

How can we ensure universal design of trip chains in a system with complex laws, regulations and responsibilities?

KJERSTI VISNES ØKSENHOLT AND JULIE RUNDE KROGSTAD

This article aims to provide the reader with an introduction to the legal and organisational framework for universal design in the Norwegian transport sector, with a particular focus on trip chains. The goal is to illustrate how the framework is structured and functions, as well as to enhance understanding of the laws, regulations and responsibilities that underlie universal design in trip chains. Finally, it discusses how to ensure universal design of the transport system in the face of complex legislation and responsibilities and shifting accountabilities as a result of reforms within the transport sector.

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1. Introduction

Stringent statutory requirements are in place for universal design in the transport sector. This includes requirements for the design of footways, safe road crossings, winter maintenance, and proper lighting and colour contrasts. Public transport is subject to requirements for the design of stops (bus stops, stations/platforms, ferry quays, etc.) and the access to these, the design of vehicles and user interfaces on ticketing systems (which can vary across the different modes of transport in a journey). A multitude of stakeholders are responsible for the different elements of the trip chain, and they need to work together to ensure universal design in transport.

If a journey involves public transport, the complexity of responsibility increases. There have been several changes in legislation, regulations and the distribution of responsibilities in recent years that affect the overall perspective on the universal design of the trip chain.



Public transport involves trip chains that consist of multiple segments, where each individual segment impacts on the passenger's ability to complete the journey successfully. If a single segment of the trip chain is not universally designed or does not meet the individual's accessibility requirements, it can disrupt the entire trip chain and make the journey impossible or difficult to complete. A universally designed transport system is particularly crucial for people with disabilities, but it also benefits other travellers.

'If a single segment of the trip chain is not universally designed or does not meet the individual's accessibility requirements, it can disrupt the entire chain and make the trip impossible or difficult to complete.'

A trip chain consists of elements such as footways to and from public transport stops, the stops themselves, information, ticketing and vehicles. In each of these elements, there can be multiple responsible parties depending on the mode of transport (bus, tram, train, boat, etc.) and the type of road (privately owned, or owned by the local or county authority or the government).

Figure 1 illustrates who is responsible for the various elements in a trip chain, with examples from public transport by road and rail. Stakeholders can also be divided into different agencies and departments, further complicating the picture.

Equality and Anti-Discrimination Act: 'All groups in the population shall have equal opportunities and rights to participate in all aspect of society, regardless of their abilities'.

Roads to and from stops/stations/transport hubs

- County authority
- Local authority
- Government
- Private



Photo: Ruter As/Redink/Hampus Lundgren

Information and travel planning

- Administration company/county authority
- Operating company
- EnTur AS
- Dane NOR SF



Photo: Ruter As/Nucleus AS/Daniel Jacobsen

Stops/stations/transport hubs

- County authority
- Local authority
- Norwegian Public Roads Administration
- Bane NOR SF



Photo: Ruter As/Nucleus AS/Daniel Jacobsen

Ticketing

- Administration company / County authority
- Operating company
- EnTur AS

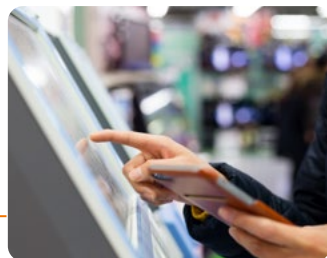


Photo: Shutterstock

Modes of transport

- Operating company
- Administration company / County authority
- Norske Tog AS



Photo: Ruter As/Nucleus AS/Daniel Jacobsen

2. Laws, regulations and standards

All segments of the population must have equal opportunities and rights to participate in all aspects of society, regardless of their functional ability. This sums up the overarching goal of the Equality and Anti-Discrimination Act, which sets requirements for universal design.



Photo: Peter Mydske/Stortinget

Numerous laws and regulations govern and impact on various aspects of universal design in the transport sector. Laws are general legal rules that have been enacted by Norwegian Parliament (the Storting), while regulations are legally binding provisions that are established by public authorities based on the applicable legislation.

Laws are general legal rules that have been enacted by Norwegian Parliament (the Storting), while regulations are legally binding provisions that are established by public authorities based on the applicable legislation.

Over the past decade, requirements in Norwegian legislation have been tightened, as the EU has adopted a series of regulations and directives that strengthen the rights of people with disabilities. Norwegian legislation is influenced by EU regulations via the EEA Agreement, which is the cornerstone of Norway's cooperation with the EU. A regulation adopted in the EU becomes legally binding in its entirety in the member states without the need for it to be approved in the individual country. Directives set out goals and conditions within a specific area of activity, and member states must incorporate these into their national statutory framework within a set deadline.



Norwegian legislation is influenced by EU regulations

EU regulations can be incorporated into Norwegian legislation in one of two ways:

- The relevant legislation is directly incorporated into Norwegian law through a regulation stating that the EU regulation shall be implemented (incorporation)
- The provisions are rewritten into Norwegian law or adapted for existing legislation (transformation)

An example of a regulation that has been incorporated into Norwegian law is the TSI PRM (Technical specifications for interoperability relating to accessibility of the Union's rail system for persons with disabilities and persons with reduced mobility), which has been included as a separate regulation (FOR-2015-09-28-1131). TSI PRM imposes requirements for railway buildings and vehicles, but it also states that if stricter requirements are set in national regulations, these take precedence.

The current regulatory framework is fragmented and, in some cases, lacks specificity. This is partly due to the gradual tightening of Norwegian law alongside the implementation of EU legislation, as well as the complexity of the transport system, which inherently necessitates compliance with various laws, regulations and recommendations.

The current regulatory framework is fragmented and, in some cases, lacks specificity.

Keeping track of what is legally mandated and what is recommended can be a challenge for authorities. Requirements and recommendations have also evolved gradually over many years as new knowledge has emerged. Several voluntary standards have been established, but these often provide more detailed descriptions than laws and regulations.



Figure 2 shows a selection of laws, regulations and standards that are central to each of the different elements in a trip chain.

Photo: Ruter As/Redink/Hampus Lundgren



Roads to and from stops/stations/transport hubs

- The Roads Act
- Manual N100: Road and street design
- Manual V129: Universal design of roads and streets
- NS 11033: Universal design – Passenger transport – Transport services

Photo: Ruter As/Nucleus AS/ Daniel Jacobsen



Information and travel planning

- Regulation for universal design of ICT solutions
- EU Regulation concerning the rights of passengers in bus and coach transport/the Professional Transport Act
- NS 11032: Universal design – Passenger transport – Requirements for transport providers on passenger rights

Photo: Ruter As/Nucleus AS/Daniel Jacobsen



Stops/stations/transport hubs

- The Planning and Building Act
- Regulations on technical requirements for construction works
- Manual N100: Road and street design
- TSI PRM
- Bane NOR's Manual for railway stations

Photo: Shutterstock



Ticketing

- Regulation for universal design of ICT solutions
- EU Regulation concerning the rights of passengers in bus and coach transport/the Professional Transport Act
- NS 11032: Universal design – Passenger transport – Requirements for transport providers on passenger rights
- NS 11033: Universal design – Passenger transport – Transport services

Photo: Ruter As/Nucleus AS/ Daniel Jacobsen



Modes of transport

- Regulation on the universal design of licensed motor vehicles
- The Public Procurement Act
- NS 11031: Universal design – Requirements for the design of buses
- TSI PRM
- Guide to universal design in maritime passenger transport

2.1 Laws

Equality and Anti-Discrimination Act

The Act relating to equality and a prohibition against discrimination ([Equality and Anti-Discrimination Act](#)) is the central overarching legislation that imposes requirements for universal design in all areas of society. The act provides for the inclusion of all population groups in society and safeguards against discrimination. The purpose of the act is (Section 1):

'To promote equality and prevent discrimination on the basis of [...] disability, [...]. "Equality" means equal status, equal opportunities and equal rights. Equality presupposes accessibility and accommodation. [...] This Act shall help to dismantle disabling barriers created by society and prevent new ones from being created.'

The Equality and Anti-Discrimination Act is, therefore, a framework that imposes requirements for universal design in all areas of society. The act explicitly prohibits discrimination, which is understood as direct or indirect differential treatment. The act also includes a chapter dedicated to universal design and individual accommodation (Chapter 3), where both individual rights and the obligations of public and private entities are detailed. It also establishes requirements for the universal design of the transport system, based on Section 17, which states that:

'Public and private entities that cater to the general public have a responsibility to ensure that their core functions incorporate universal design principles. "Universal design" refers to the process of designing or adapting the primary solutions, considering physical conditions, including information and communication technology (ICT), to ensure that the essential functions of the undertaking can be used by as many people as possible, irrespective of disability.'

While the act is intended to promote equality and prevent discrimination, there is nevertheless a risk that interpretations may vary, and some people may continue to feel discriminated against. In such cases, the Anti-Discrimination Tribunal – a neutral administrative body – will adjudicate appeals.



Planning and Building Act

The Act relating to planning and the processing of building applications ([Planning and Building Act](#)) aims to **'promote sustainable development in the best interests of individuals, society and future generations'**. It is central to land use planning and the processing of building applications. The act aims to facilitate the coordination of the work of central, regional and local authorities, while also ensuring that building works comply with laws, regulations and planning decisions, and that each measure is implemented responsibly.



When considering universal design in the transportation system, the Planning and Building Act is pertinent to ensuring accessibility to public transport stops, as well as the design of these stops, platforms, terminal buildings and transfer hubs. Even if land intended for transportation purposes is planned in accordance with the Roads Act, the regulations mandating that planning processes must adhere to the Planning and Building Act still remain in effect.

Section 1-1 'Purpose of the Act' states that both universal design and participation shall be safeguarded and ensured:

'Planning and administrative decisions shall ensure transparency, predictability and public participation for all affected interests and authorities. There shall be emphasis on long-term solutions, and environmental and social impacts shall be described. The principle of universal design shall be taken into account in planning and in requirements relating to individual building projects.'

A distinction is drawn between general participation (public disclosure) and active involvement by groups requiring special facilitation (Section 5.1), for which the local authority holds a specific responsibility. Works that are subject to application under the Planning and Building Act, they shall:

'Within their designated functions, they must be universally designed in accordance with the regulations issued by the Ministry. These works should not pose any danger and should meet the necessary safety, evacuation, health and environmental requirements, as stipulated by the law or in accordance with the law (Section 29-3).'

Under the law, orders for improving universal design in existing buildings and installations can be issued if there are compelling reasons for doing so.

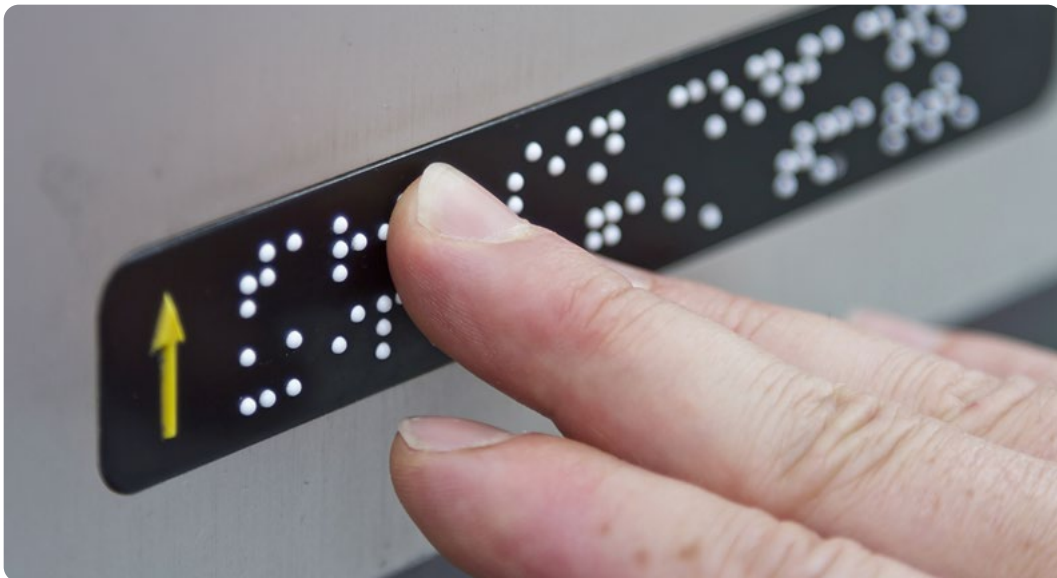
The Roads Act

The Act relating to Roads ([Roads Act](#)) aims to **'ensure the planning, construction, maintenance and operation of public and private roads in a manner that can benefit road users and society at any given time'**. Section 13 of the Roads Act requires the construction of public roads to adhere to road standards. The Norwegian Public Roads Administration is responsible for developing these road standards.

The Public Procurement Act

The Act relating to Public Procurements (Public Procurement Act) regulates public procurement in Norway. Section 5 describes how governmental, regional and local entities, as well as public law bodies should structure their procurement practices, and that

'The contracting authority shall impose requirements for universal design in public contracts in accordance with the rules set out in regulations'.



Other laws

There are also several important laws that impose requirements on transportation by various modes of transport. The purpose of these laws includes regulating transport operations and ensuring quality. The following laws provide legal authority for several important Norwegian and EU regulations related to the design of vehicles and passenger rights:

- **The Professional Transport Act**
- **The Aviation Act**
- **The Railways Act**
- **The Norwegian Maritime Code**
- **The Ship Safety and Security Act**



2.2 Norwegian regulations



Regulations on technical requirements for construction works

The Regulations on technical requirements for construction works (*Forskrift om tekniske krav til byggverk (TEK)*) are founded on the Planning and Building Act. The purpose (Section 1-1) is to:

‘ensure that works are planned, designed and carried out with regard to good visual quality, universal design, and so that they meet technical requirements for safety, environment, health and energy’.

In relation to universal design in the transport system, these regulations are particularly relevant for the design of terminal buildings, transfer hubs, roadside picnic areas/toilets and developed outdoor spaces.

The most recent version of the regulations imposes requirements for universal design in:

- **Developed outdoor spaces:** for the general public; for residential buildings that require a lift; for construction works for the general public and work buildings (Section 8-2).
- **Construction works for the general public and work buildings,** unless the construction work or parts of the construction work is, given its function, unsuitable for people with disabilities (Section 12-1).

Specific requirements are also set for floor plans and building components in construction works: Entrances (Section 12-4); Communication routes (Section 12-6); Rooms and other areas for people (Section 12-7); Entrance halls and cloakrooms (Section 12-8); Bathrooms and toilets (Section 12-9); Balconies, terraces and similar (Section 12-11); Waste system and separation of waste (Section 12-12); Doors, gates and similar (Section 12-13); Stairs (Section 12-14); Ramps (Section 12-16); Windows and other glazed areas (Section 12-17); Signage, control and operating panels, handles, fittings and similar (Section 12-18). These requirements concern, for example, physical design, width, height and placement of control panels, etc., tactile and visual marking of warning areas and awareness areas, luminance contrast and safeguards.



Regulations on the construction of public roads

The Regulations on the construction of public roads are founded on the Roads Act and are intended to regulate the design and standards for the planning and construction of public roads and streets. The regulations address road standards (Section 3), which are intended to ensure

'Efficient and safe carriage of people and goods, and the best possible adaptation to buildings, living environments, urban environments, landscapes, biodiversity, cultural heritage, vegetation and agricultural areas.'

In terms of the design of roads and streets, the current road standard in Norway is N100 Road and street design. This standard primarily applies when a new road is to be built or when an existing road is subject to major improvement works. There is no defined standard for minor improvements works or spot improvements.

Universal design of public transport vehicles

Universal design of public transport vehicles is provided for in regulations founded on the Professional Transport Act, the Railways Act and the Norwegian Maritime Code.

- **The Regulation on the universal design of licensed motor vehicles** is founded on the Professional Transport Act.
- **The Regulation relating to requirements for tramways, metros, suburban railways etc. (Requirements Regulation)** is founded on the Railways Act.
- **The Regulation relating to the implementation of Commission Regulation (EU) No 1300/2014 [TSI PRM]** is founded on the Railways Act.
- **The Regulation on the construction of ships is founded on** the Ship Safety and Security Act.

Passenger rights

Passenger rights for users of the various modes of transport have been secured through a series of EU regulations. These regulations aim to ensure, for example, requirements for and high quality in the assistance offered to people with disabilities, non-discriminatory access to transport and the training of personnel. In general, the rights of people with reduced function and mobility have been strengthened as a result of several changes. The regulations that have been adopted are as follows:

- **The EU Regulation concerning the rights of passengers in bus and coach transport** was adopted in 2011 and is founded on the Professional Transport Act and the Regulation on the Transport Complaints Board for passenger transport.
- **The EU Regulation concerning the rights of passengers when travelling by sea and inland waterway** was adopted in 2016 and is founded on the Norwegian Maritime Code.
- **The EU Regulation concerning the rights of disabled persons and persons with reduced mobility when travelling by air** was adopted in 2006. This regulation has been adopted in the form of the Regulation on the universal design of airports, and on the rights of disabled people and people with reduced mobility in air transport, and is founded on the Aviation Act.
- **The EU Regulation on rail passengers' rights and obligations** was adopted in 2007 and amended in 2018, and is founded on the Railways Act.



Regulation on the Passenger Complaint Handling Bodies for passenger transport

The Regulation on the Passenger Complaints Handling Body for passenger transport is founded on the Professional Transport Act, the Railways Act and the Aviation Act. The regulation sets out the mandate of the Passenger Complaints Handling Body, which 'shall ensure reasonable, fair and expeditious resolution of disputes between passengers and service providers that fall within the Board's remit. The Passenger Complaints Body shall contribute to the dissemination of general knowledge about passenger rights.'



Regulation for universal design of ICT solutions

The Regulation for universal design of ICT solutions is founded on the Equality and Anti-Discrimination Act and sets requirements for the design of online solutions and self-service machines to ensure universal accessibility without causing a disproportionate burden to businesses. The regulation states that

'Enterprises in the training and education sector are obligated to implement universal design in new ICT solutions no later than 12 months after January 1, 2018. Existing ICT solutions must also comply with universal design standards by January 1, 2021.'

Furthermore, there is a likelihood that the EU's Web Accessibility Directive (WAD) will be adopted¹, but the method of adoption, whether through incorporation or adaptation (transformation) of existing regulations, has not been determined.

2.3 Standards and guidelines

This section gives an overview of standards and guidelines that provide technical specifications for universal design in the transport sector.

Norway's statutory framework is complex, and establishing an overview of all applicable requirements can be challenging. Therefore, guidelines and standards that provide more detailed technical specifications can be helpful. [Standards Norway](#) develops and manages standards in Norway and holds exclusive rights to the product name '*Norsk Standard*' (Norwegian Standards). These standards can be appended to

¹ WAD largely imposes the same requirements as those already established by Norwegian law but also introduces several new requirements. National implementation has not yet been approved. More details are available here: <https://uu.difi.no/krav-og-regelverk/eus-webdirektiv-wad>

contracts or used when contracting parties and operators enter into agreements or in tender documents.



Standards

When it comes to universal design, the European Committee for Standardization (CEN) has appointed a strategic advisory group to work on the inclusion of universal design in all relevant standardisation efforts. Because standards are flexible instruments that are regularly created, amended and updated, it is not possible to provide a complete overview of them. However, Standards Norway has standards within the following areas that can be particularly useful in the transport sector:

- **Universal design of construction works** - for the general public and work buildings, which specify requirements for public buildings and adjacent parking and access.
- **Universal design of outdoor spaces**, which covers developed areas in connection with buildings, green infrastructure and transport facilities.
- **Requirements for bus design**, which specify and expand on statutory requirements for the universal design of buses.
- **Passenger rights**, which set requirements for contracting parties and transport operators that protect user rights in passenger transport.
- **Self-service machines for use by the public** - Requirements for physical design and user interaction, which address the requirements for universal design of self-service machines.

Guidelines

There are also numerous guidelines aimed at assisting in the work with universal design in the transport sector.

'Manual 129 - Universal design of roads and streets describes the main principles for achieving universal design in planning, construction, operation and maintenance, and provides guidance on the design of roads and streets, equipment and roadside facilities.'

Drawn up by the [Norwegian Public Roads Administration](#), this guide describes in more detail how the requirements in the road standard can be met. [Bane NOR](#) has a [manual for railway stations](#), which presents requirements, recommendations and guidelines related to standards for public areas at railway stations. Universell Utforming AS has drawn up the [Guide to universal design in maritime passenger transport](#) as well as a checklist based on statutory requirements. The Norwegian Asthma and Allergy Association has drawn up the guide [Universal design of buildings – for people with asthma, allergies and other sensitivities](#), which will be relevant for transport hubs and stations.





3. Stakeholders, roles and responsibilities

The responsibility for universal design in the various parts of the transport system is distributed between various tiers of government and stakeholders. The authorities in the various levels of government have the discretion to choose how they want to organise this work, whether they want to handle it internally or outsource it by establishing wholly-owned enterprises or limited companies.

'Achieving universal design requires interdisciplinary collaboration across governmental, regional and local entities. Each entity must have independent responsibility for internal coordination and ensure implementation, competence enhancement and awareness-raising (Ministry of the Environment, 2009).'

3.1 Government authorities

At the government level, ministries and directorates influence the universal design efforts in the transport sector by establishing framework conditions through laws, regulations, guides and guidelines that lower levels of government and other stakeholders must adhere to. Additionally, the government is responsible for overseeing various aspects of the transport system, such as mapping, planning, development, administration, operation and maintenance.

- [The Ministry of Culture](#) has overall responsibility for equality and non-discrimination. The work on universal design in the Norwegian Directorate for Children, Youth and Family Affairs² (Bufdir) falls under the Ministry of Culture. Bufdir is responsible for implementing government policy in this area, disbursing grants for universal design projects, and working on competence enhancement, while also managing various networks for universal design (including areas such as construction, ICT and public transport).
- [The Ministry of Local Government and Regional Development](#) is responsible for planning and impact assessments under the Planning and Building Act, housing and building policies, as well as ICT policies and the digitalisation of the public sector. The following directorates and agencies are subordinate to the Ministry of Local Government and Regional Development.
- [The Norwegian Building Authority](#) is responsible for ensuring environmentally friendly and accessible housing and buildings, as well as improving knowledge about building regulations and the building application process. It has, for instance, drawn up a guide for the most recent version of the Regulations on technical requirements for construction works. **The Norwegian Digitalisation Agency** (Digdir) aims to contribute to rapid and coordinated digitalisation of the public sector and the expedient digitalisation of society.
- [The Authority for Universal Design of ICT](#) falls under Digdir and is responsible for ensuring that online solutions and self-service machines can be used by everyone.
- [The Norwegian Mapping Authority](#) helps to map accessibility and universal design in cities, towns, urban areas and recreational areas.
- [The county governors](#) are the government's representatives in the county authorities, and they are responsible for following up administrative decisions, goals and guidelines issued by the Storting and the government. The county governors follow up on governmental initiatives by

² As a directorate, Bufdir is subordinate to the Ministry of Children and Families.

contributing to the incorporation of universal design into regional and municipal plans. The county governors also give advice and guidance on universal design to regional and municipal partners, as well as voluntary groups, organisations and service user groups.

- [The Ministry of Transport](#) has overall responsibility for national transport policy. It is also responsible for policy development and administration related to aviation, national roads, national road ferries and railways. The core tasks of the Ministry of Transport include long-term planning, investigation, analysis, legislation, regulations, licences and budgeting in these areas. Several directorates fall under the Ministry of Transport, with responsibilities for managing national roads, national road ferries, railways and aviation. Some tasks have been assigned to state-owned enterprises and limited companies. The key stakeholders are described in more detail below, and all of these are subordinate to or wholly owned by the Ministry of Transport. In addition to these, there are also various supervisory authorities (such as the Civil Aviation Authority of Norway, the Norwegian Railway Authority, etc.), which are responsible for ensuring various entities' regulatory compliance.
- [The Norwegian Public Roads Administration](#) is responsible for the national road network and the associated infrastructure, national road ferries, operation and maintenance. Its mission is to develop and facilitate an efficient, environmentally friendly, forward-looking and safe transport system. In addition, the Norwegian Public Roads Administration has sectoral responsibility for traffic safety, climate and environmental matters, and overarching urban policies, as well as national responsibility for coordination and oversight in public transport (Ministry of Transport, 2019). The Norwegian Public Roads Administration consists of the Directorate of Public Roads (authoritative body) and six divisions. In the letter of award for 2020,³ universally designed trip chains are an interim target under the overarching goal of accessibility. The indicators for this work are the number of bus/tram stops on the national road network and the number of universally design public transport hubs.
- [Nye Veier AS](#) is a limited company with responsibility for developing the national road network. The company plans, constructs, operates and maintains safe national roads. Nye Veier was founded in 2016 with the goal of creating a 'lean, efficient and specialised construction and project management organisation', and took over four development projects from the Norwegian Public Roads Administration. Since then, the company has been awarded several other projects.
- [The Norwegian Railway Directorate](#) is responsible for managing and coordinating the railway sector, developing the railway system, and defining and procuring services related to infrastructure, passenger traffic and rolling stock. It is also responsible for coordinating the cooperation between the different stakeholders in the railway sector. The aim is for the railway sector to be operated as effectively, safely and environmentally friendly as possible for the benefit of passengers, freight transport and society.
- [Bane NOR SF](#) is a state-owned enterprise with responsibility for railway infrastructure. It is also responsible for the planning, development, management, operation and maintenance of the rail network, traffic control and the management and development of railway properties.
- Several state-owned limited companies were established when the railway sector was restructured in 2017. The companies relevant to universal design are [EnTur AS](#) and [Norske Tog AS](#). EnTur owns and manages the ticket sales system for trains and collects information about public transport in Norway to make it easier to choose sustainable travel options. Norske Tog procures and owns rolling stock and leases it to companies operating passenger transport on the Norwegian railway.
- [Avinor AS](#) is a limited company with responsibility for airports in Norway. Avinor aims to have all of its airports universally designed by 2025. Seventy to eighty per cent of universal design requirements are met by the major airports, but some of the older airports still work to older regulations that do not adequately address universal design.

3 <https://www.regjeringen.no/contentassets/087954c97c8e47b7b2a733e350a25b4a/tildelingsbrev-statens-vegvesen-2020.pdf>



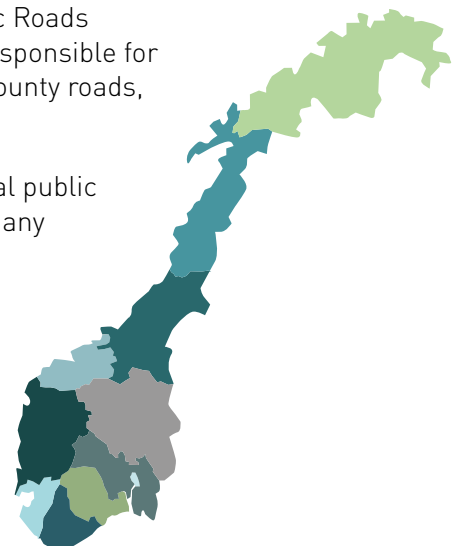
3.2 Regional level

The regional governments are Norway's largest road owners and are responsible for the county road network and for providing and facilitating public transport services. They are also tasked with regional planning, which is a key tool for setting goals and providing strategic direction for their activities and influencing local authorities' land use and community planning. This makes the regional government an important stakeholder in the field of universal design in the transport sector.

'Regional governments are responsible for the construction, upgrading, operation and maintenance of roads, bus stops and public transport terminals along county roads.'

Regional governments own and manage the county road networks and associated infrastructure. They took over responsibility for the majority of the current county road network in 2010. Additionally, as part of the regional reform in 2020, they assumed responsibility for managing, planning, constructing, operating and maintaining the roads, which was previously held by the Norwegian Public Roads Administration. As a result, regional governments are now responsible for the construction, upgrading, operation and maintenance of county roads, bus stops and public transport terminals.

Regional governments provide and facilitate local and regional public transport services (except trains and national road ferries). Many authorities have chosen to establish limited companies or enterprises to manage public transport, such as [Ruter](#), [Kolumbus](#) and [AtB](#).





Some regional governments have established public transport departments within their government administration. Nowadays, all or most public transport services are subject to competitive tendering, which has led to a shift from *net contracts*⁴ to *gross contracts*. In this transition, most regional governments have opted for gross contracts, thereby taking over the planning and marketing of public transport services. These authorities now possess considerable expertise in public transport planning and have overall responsibility for universal design, including specifying vehicle requirements in contracts, overseeing ticketing, and providing information.

'Regional authorities now possess considerable expertise in public transport planning and have overall responsibility for universal design, including specifying vehicle requirements in contracts, overseeing ticketing, and providing information.'

The operating companies are solely responsible for training drivers in providing good passenger care. However, unlike trains and trams, buses rely heavily on the drivers for ensuring accessibility, making it crucial for operating companies to closely monitor and support their drivers in achieving universal design in bus services.

A survey on universal design in regional public transport revealed that regional authorities prioritise vehicles, bus stops, ticketing and information systems in their work on universal design. However, there was less emphasis on evaluating implemented measures, competence development, winter maintenance and pedestrian access to bus stops.

⁴ In net contracts, the operator receives the ticket revenue and therefore gives a bid for the net cost (after deducting revenues) when responding to tenders. In gross contracts, the ticket revenue goes to the contracting authority (the county authority), so service providers only give a bid for the (gross) operating cost.



Photo: Hampus Lundgren/Redink

3.3 Local level

While the regional authorities own and manage the county road network and associated infrastructure, it is the responsibility of local authorities to manage the municipal road network and associated infrastructure. Along municipal roads, local authorities are thus responsible for ensuring universal design in the construction and upgrading of access roads to bus and tram stops, as well as at the stops themselves, and for their operation and maintenance.

Local authorities are responsible for land use planning and ensuring that, within their own municipality, it is in line with the principles of universal design. In addition, the local authority can adopt requirements for universal design in both the land use element of the municipal master plan and in zoning plans.

'The municipality may, independently of land-use objectives, adopt provisions for the land-use element of the municipal master plan regarding [...] functional requirements, including provisions for design for universal access [...].'

Planning and Building Act (Section 11-9)

'Provisions can be included concerning land use and zones requiring special consideration in regard to functional and quality requirements, relating to buildings, installations and outdoor areas, including requirements for the protection of health, the environment, safety, design for universal access and children's particular need for play and public outdoor areas.'

Planning and Building Act (Section 12-7)

In addition, the local authority processes building applications and is responsible for assessing whether construction, extensions, upgrades, substructures and the siting of buildings, structures and facilities comply with administrative decisions, regulations and the Planning and Building Act. As the planning authority and developer, employees across all of the local authority's service areas (planning, building applications, technical departments, etc.) must have sufficient expertise in universal design.

3.4 Private entities

In addition to the responsibilities of various tiers of government, several private entities also need to have a good understanding of universal design in the transport system.

The operating companies run the public transport service on behalf of the contracting authority. The Norwegian Railway Directorate has divided the rail network into various traffic packages, where the services are run by different train operators. The contracts stipulate that the operating companies, in collaboration with relevant parties, shall seek suitable solutions for universal design in the railway sector (e.g. services, rolling stock).

'A regional authority often divides its jurisdiction into several tender areas and may, therefore, have contracts with different operators – even in the same urban area.'

Because the regional authority or its public transport company plans the routes and markets the services, customers may not necessarily understand that different operating companies are running the services in the various tender areas. It is bus drivers and personnel employed by the different operating companies who interact with passengers on a daily basis and play a crucial role in providing service and creating a pleasant public transport experience for their passengers.



Consultants, architects and construction companies who assist the authorities in the planning, design and construction phases as well as during operation and maintenance, also play a vital role in ensuring compliance with requirements and guidelines. Such parties can be involved in various projects that consist of each individual element in a universally designed trip chain, from the consultant who assisted with information and ticketing to the construction company that built the public transport terminal, the bus stop or the access road to and from it. Systematic cooperation across the trip chain can be challenging due to the involvement of numerous stakeholders and the fact that works often entail the upgrading of a single link in the trip chain. It is therefore particularly important to give special consideration to passenger transfers from one link to another in such projects.

4. How can reforms impact on universal design work?

A complex regulatory framework and a multitude of stakeholders with various roles and responsibilities form the basis for the continuous development of a universally designed transport system.

The framework is constantly evolving in line with political objectives and societal change. Since the 1980s, the public sector in Norway has seen an increase in the involvement of independent entities.

'Public agencies have been reorganised into more autonomous entities that are not subject to direct political control, such as enterprises or limited companies.'

Public agencies have undergone a reorganisation process, resulting in the formation of more autonomous entities that are not directly influenced by political control. These entities, which include enterprises and limited companies remain fully owned by public authorities. However, their organisational structure provides them with increased flexibility and opportunities to realize overarching political goals. Such an arrangement necessitates less direct governance and collaboration among stakeholders.



4.1 Changes in the road sector

Two major reforms, namely [the Road Reform](#) (Ministry of Transport, 2015a) and [the Regional Reform](#), were implemented during the tenure of the previous Prime Minister of Norway, Erna Solberg (2013–2021), which significantly impacted the road sector. The Regional Reform saw the transfer of the old state road administration (*Sams vegadministrasjon*) to the new county authorities in 2020 (The Ministry of Local Government and Modernisation, 2016). As a result, the distribution of responsibilities within the road sector has undergone significant changes.

‘Due to the reforms implemented in the road sector in Norway, the Norwegian Public Roads Administration’s overarching responsibility has been significantly reduced. The responsibility for universal design in the sector has been distributed among multiple stakeholders as a result of this change.’

The Road Reform established Nye Veier as a limited company with responsibility for planning, building, operating and maintaining safe national roads. Nye Veier is thus also responsible for infrastructure connected to national roads, such as bus stops. The company’s primary mission is to achieve comprehensive development and greater cost-effectiveness (Ministry of Transport, 2015a). This may result in solutions and standards being challenged more than before.

The regional authorities are the largest road owners in Norway since the transfer of 44,000 km of road in 2010 from the government to the regional level, as part of the [Administrative Reform](#).⁵ However, the Norwegian Public Roads Administration was responsible for the administration of county roads until 2020, when administrative responsibility for county roads was transferred to the new regional authorities.

Since the Norwegian Public Roads Administration had a broader responsibility and specialized expertise in designing solutions for the road network in the past, the administrative responsibilities have now been divided between the government and the regional authorities. As a consequence of the administrative division, there is no longer a single entity, such as the Norwegian Public Roads Administration, with overall responsibility for the national and county road network. However, this change also means that the regional authorities are now more responsible for the regional road network, and can therefore have a more overarching responsibility for the overall roads and public transportation systems, including universal design.

Despite the administrative division, the Norwegian Public Roads Administration still holds the social responsibility and regulatory authority for the road sector, and manages regulations and road standards. While it is still unclear how strict the national guidelines for the county road network will be, the regional authorities, through their own road administration, can better adapt road policies and standards to local conditions and political objectives. Moreover, Nye Veier can challenge existing practices for planning and developing national roads. Nonetheless, the Norwegian Public Roads Administration still retains responsibility for national coordination and for expertise in public transport that uses the road system.

⁵ In the Administrative Reform, responsibility was transferred from government level to the county authorities in several areas, but particularly roads. However, road administration for national and county roads remained with the Norwegian Public Roads Administration through the joint road administration (*Sams vegadministrasjon*).

There is some concern about whether the new distribution of responsibilities will result in a less uniform service for road users, also in relation to road design, traffic safety, accessibility, and the environment (Directorate of Public Roads, 2020).

The regional authorities have the authority to deviate from road standards and establish their own practices for road management, which could lead to greater regional differences in the county road network than previously. However, it could be argued that differences would exist regardless, because county authorities, as road owners, have different priorities when it comes to investment in the road network, and the topography varies. Nevertheless, providing greater opportunities for local adaptation is one of the reform goals. Regional authorities are the most knowledgeable about local conditions and can thus better assess which solutions are suitable for their region.



The transfer of responsibilities and services to lower tiers of government is often viewed from a democratic perspective. When regional authorities are responsible for the administration of county roads, county committees and councils, such as the Council for the Elderly (*Eldrerådet*) and the Council for Persons with Disabilities (*Rådet for personer med funksjonsnedsettelser*), can have a greater direct influence on strategies, plans and standards than before. The county authority also holds the responsibility for regional development and can more effectively connect roads to other policy areas within its organisation. However, it is likely that the overall coordination between national and county roads will be reduced under the new system, and that future practices will be more differentiated across the road systems.

One aspect of the new system concerns the standards for road and street design. A debate has arisen around what can be considered an 'adequate' standard, particularly in light of regional authorities' previous efforts to find more cost-effective alternatives to the high standards set by the Norwegian Public Roads Administration. Road planners now face greater challenges in developing alternatives and deciding which aspects can be deprioritised in order to achieve solutions that are 'adequate' and enable more roads to be built for the money. Cost considerations have always been a challenge, even when the government was responsible for the county road network, and budget constraints continue to pose a challenge. However, according to data from Statistics Norway, county authorities have increased their county road network budgets since 2010. Upgrading existing infrastructure and facilities to ensure universal accessibility is a costly process and if budgets are tightened, it could lead to deprioritization of universal design upgrades for facilities such as bus stops.

4.2 Changes in the railway sector

The most significant change in the railway sector during Erna Solberg's time as Prime Minister of Norway was the [Railway Reform](#) (Ministry of Transport, 2015b), which in 2017 altered the responsibilities in the sector. The aim of the reform was to clarify the distribution of responsibilities and facilitate a more competitive railway system.

The Railway Reform

The reform led to a reorganisation of the former Norwegian National Rail Administration (*Jernbaneverket*) and the national railway company NSB, establishing several new stakeholders and companies.

The Norwegian Railway Directorate was established to assume overarching control of the sector, including strategic planning, infrastructure development, overall coordination of the sector and competitive tendering.

The state-owned enterprise Bane NOR was established to assume responsibility for the national railway infrastructure, including traffic control, operation, maintenance and development of the rail network and train stations.

NSB was transformed into an operating company that no longer owned trains or station properties. The name of the company was changed to Vy.

Norske Tog AS is now responsible for leasing state-owned rolling stock to operating companies that run trains on behalf of central government.

State-owned EnTur AS owns and manages the ticket sales system for trains and is responsible for providing travel planning and basic digital services for public transport throughout Norway (across operating companies).



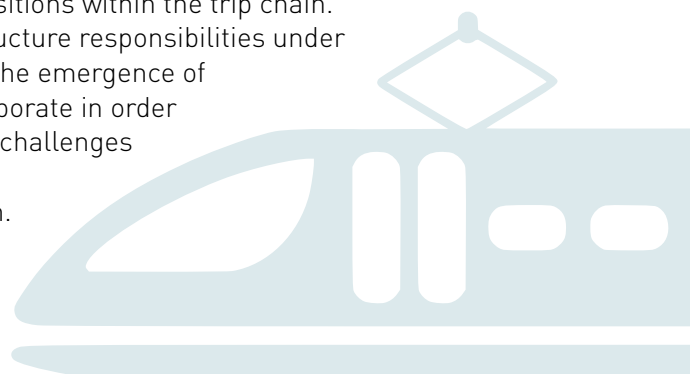
The development of station areas is a domain where the reform has helped clarify the distribution of responsibilities. Previously, both the Norwegian National Rail Administration (Jernbaneverket) and NSB's subsidiary Rom Eiendom AS had shared responsibility, leading to unclear accountability for developing transport hubs. Now all railway properties are managed by Bane NOR, enabling a more comprehensive development of transport hubs and surrounding properties. This presents an opportunity for a more overarching focus on universal design in and around transport hubs and railway stations. The Norwegian Railway Directorate is responsible for the future development of the railway and procures infrastructure services through agreements with Bane NOR. Government grants are distributed through an agreement for operation and maintenance and an agreement for planning, design and expansion. The establishment of an enterprise reduces central government's ability to directly instruct the management of infrastructure. This can pose a challenge for coordinated planning and requires clear procurement procedures and agreements.



Improved coordination between local train services and other public transport services (bus, boat, ferry, etc.) is another challenge that the reform aimed to resolve and which has implications for universal design. It has previously been challenging for regional authorities to influence changes in train services and to collaborate with NSB on seamless ticketing in regions where local trains are part of the regional public transport system (Krogstad and Aarhaug, 2015). The Oslo region has been an exception when it comes to the coordination of ticket products, but it has been emphasized that the cooperation should be with the contracting authority rather than the operator. As the competitive tendering of railway traffic packages is rolled out, the Norwegian Railway Directorate enters into cooperation agreements with regional authorities on routes, fares and ticketing. The new train operators are obliged to adhere to the agreement and work together to ensure seamless journeys within urban areas. This benefits people with disabilities as well as other passengers. In addition, the establishment of EnTur AS provides a one-stop shop where customers can access route information and buy tickets for trains and other public transport services managed by the county.

'The goal of the Railway Reform was to clarify the distribution of responsibilities related to station areas, route planning, ticketing and information, which are key elements of a trip chain.'

The increased involvement of local and regional authorities in this work was considered crucial to ensuring more seamless transitions within the trip chain. However, it is also important to consolidate infrastructure responsibilities under a single entity. Nevertheless, the reform has led to the emergence of multiple independent stakeholders, who must collaborate in order to optimize the trip chain as a whole. This can pose challenges regarding the comprehensiveness of the transport system, particularly with respect to universal design.





5. How can we ensure universal design of trip chains?



The [National Transport Plan 2022–2033 \(Ministry of Transport 2021\)](#) underscores universal design as a critical principle for achieving the fifth overarching objective, which is to facilitate travel and bolster the competitiveness of business and industry. This necessitates close collaboration among multiple stakeholders to establish efficient, seamless travel experiences and chains over time. Reforms in the transportation sector have modified the allocation of responsibilities and brought about the involvement of new, more autonomous stakeholders. As such, collaboration is vital to realizing universal design across the entire trip chain.



Photo: Ruter As / Redink, Thomas Haugersveen

5.1 Budget constraints

In recent years, significant efforts have been made towards realizing a transport system that is universally designed. Presently, low-floor buses, real-time information, and automated announcements of upcoming stops have become the standard throughout most of Norway. Nonetheless, upgrading infrastructure can be a time-consuming and costly endeavour. Budgetary limitations may pose the most significant obstacle to advancing universal design. This may cause the upgrading of existing infrastructure to become a balancing item – a consideration that is relinquished in budgetary talks in favour of other measures or projects deemed more pressing.

The government has previously introduced various financial support schemes, such as the BRA support scheme for better infrastructure, rolling stock, active logistics improvements (*BRA-ordningen*) (2006-2015), the grant for public transport in rural areas (*KID-ordningen*) (2007-2015) and financial incentives for giving regional authorities access to funds to upgrade public transport infrastructure. If the government wishes to expedite the work on universal design, similar support schemes can once again be established. An evaluation of the BRA support scheme showed that the implemented measures were well-received and made it easier for people with

disabilities to use public transport. An alternative solution is to employ national road funding to upgrade to universal design in areas where it is deemed critical. Such an approach is currently being implemented in cities through urban growth agreements⁶, although not yet in the towns. In this regard, the Norwegian Public Roads Administration, which is responsible for overseeing public transportation, can assume an important role in administering any forthcoming financial support schemes.

In light of recent reforms, regional authorities now possess their own road administration departments and can therefore contest expert assessments of what may be deprioritised in order to attain satisfactory solutions whilst making the funds go further.

In the future, there may arise a question concerning the acceptability of alternative solutions that render the trip chain accessible but not necessarily universally designed. Frequently, the challenge lies in the uncertainty of whether an individual can access a mode of transport – as opposed to their capacity to embark it independently or with the help of adapted solutions. The emphasis on solutions that offer accessibility, albeit not necessarily universal design, can spark discussions about the value of such solutions. It is therefore important to stress that a focus on ensuring accessibility should not be employed to bypass universal design solutions where such solutions can be achieved.

5.2 Specialist guides and development



Current legislation includes stringent requirements to ensure that people with disabilities are not discriminated against, either directly or indirectly. This means that the requirement for universal design is statutory in all parts of the trip chain: footways to and from public transport stops as well as the stops themselves, information, ticketing and the design of vehicles. However, legislation on universal design in the transport sector is fragmented and, in some areas, unclear. Laws and regulations are intended to be general and not to stipulate specific solutions. This can lead to various stakeholders adopting disparate practices with regards to designing solutions.

The recent organisational changes in the transport sector have resulted in a rise in the number of stakeholders, including more autonomous stakeholders over which the government does not have the authority to directly instruct. As such, it is important to keep an eye on the development and practices of universal design of trip chains via reporting procedures and guidance. Ultimately, the government has the

⁶ Urban growth agreements are policy packages where the main objective is to reduce car traffic and increase use of walking, bicycling and public transport, adopted by regional and local entities in the 9 largest urban areas in Norway.

option to tighten legislation if the development is not in line with national objectives. However, specialist guides and national guidelines are more flexible tools for updating knowledge when practices do not align with the objectives.

The Directorate of Public Roads (a branch of the Norwegian Public Roads Administration) bears the responsibility of setting criteria for the design of roads and streets. Regional public transport departments have established a collaboration, and standards have been devised to streamline the procurement of vehicles and fulfil legal requirements concerning passenger rights.

'Guidelines and standards can be effective tools for establishing uniform solutions that meet legal requirements. However, their tendency to focus on specific disabilities (such as reduced mobility or vision impairment) while overlooking others (such as hearing impairment, cognitive impairment, mental health problems, etc.) is a challenge.'

If a wide range of challenges and needs is not taken into account, it can be difficult to achieve universal design for entire trip chains. To establish effective knowledge sharing and uniform guidelines, collaborative platforms must be established where the various stakeholders can contribute to the development of specialist guides for different modes of transport and functionality requirements. This will also benefit passengers as they will no longer have to deal with different systems throughout the country.



All planning requires discretionary assessments. Planners can interpret and assess considerations in different ways, and knowledge of universal design can vary according to their experience and education. Existing topography, such as natural inclines, may also limit the possibility of creating solutions that adhere to universal design standards. Nevertheless, it is important for planners to see the overall picture of the system and how different solutions are interconnected. Road standards apply to the design of new roads, but most upgrades are isolated improvements to existing roads. This sets a high bar for planners' competence and professional judgement.



To ensure effective knowledge sharing, it can be crucial to establish specialised arenas and arrange themed meetings across tiers of government and modes of transport. National competence-building arenas can be useful for discussing existing laws and regulations and solutions. An example of this is the Norwegian Directorate for Children, Youth and Family Affairs' national network – [Universal design in regional and local public transport](#) – which aims to enhance the competence of stakeholders in public transport and development as well as contracting authorities, operators and other stakeholders within the trip chain at national, regional and local level. Another useful tool could be a professional competence programme aimed at learning, competence development and competence enhancement. It is also important that a single stakeholder has primary responsibility for gathering positive experiences from various places throughout the country and conducting research and development to generate new knowledge.

5.3 Cooperation

The weakest link in a trip chain determines its overall strength. Because the transport system is complex, responsibility for its various components is shared among different stakeholders. Cooperation is therefore essential for establishing seamless trip chains.



To minimize the likelihood of disruptions in the trip chain, it is essential to discuss this matter during the planning, design and construction stages of a project. The project manager is responsible for establishing cooperation with relevant stakeholders in order to ensure universal design in the relevant and adjacent links in the trip chain. The larger and more complex the project is, the more stakeholders and tiers of government are typically involved. Therefore, effective and robust cooperation among the different stakeholders is key to ensure that universal design is maintained during this phase.

'The weakest link in a trip chain determines its overall strength.'

Research indicates that people with disabilities often encounter obstacles when using public transport when transferring from one stage of their journey to another or from one operator to another. This can result in passengers being unable to complete their journey. If transfers between operators in pre-existing infrastructure are not universally designed to be seamless, it is not always evident how this issue can be addressed or who is accountable.



It is equally important to highlight issues and challenges that arise during the transfer between links in the trip chain and to discuss potential solutions among the relevant stakeholders. This will facilitate the identification of whether this is a recurring issue at multiple sites and may reveal a necessity for uniform solutions.

The work on universal design is broad and spans various sectors. In the transport sector, it can therefore be important to have a national action plan for universal design that is overseen by the transport sector authority.

'The national road safety action plan serves as an example of a plan that has been collaboratively developed by numerous stakeholders and delineates measures and responsibilities. Perhaps this model can be employed for universal design?'

When establishing this type of action plan, it is also necessary to establish a national network that oversees this work and cooperates to generate more knowledge on, and propose solutions for, how to ensure universal design across the entire trip chains. Such a network should strive to produce recommendations on how different forms of collaboration can and should occur to ensure the effective implementation of universal design across stakeholders' areas of responsibility throughout the trip chain.

Regional authorities assume a crucial role in upholding regional coordination concerning universal design work. It is imperative for local and regional stakeholders to coordinate and collaborate at a comprehensive level that enables them to determine which transport hubs and routes should be prioritised and in what sequence, and to ensure implementation. Collaboration networks at the local level can provide stakeholders with a broader and more comprehensive overview of local challenges and of how to contribute to solutions. They can also offer more specific insights and knowledge for particular projects. The networks should also focus on how the different stakeholders can work together to achieve a coherent development of entire trip chains and ensure a comprehensive approach to universal design in the transport sector. Cities often possess pre-existing local networks in the form of urban development and transport partnerships (known as *bypakke*), but there may also be collaboration networks focusing specifically on universal design.



6. Summary



Restructuring and reforms can destabilize inter-organizational relationships, both formal and informal, as they may require re-establishment. Moreover, stakeholders who have undergone a restructuring process may experience uncertainty regarding their areas of responsibility for a period if this has not been explicitly communicated throughout the entire process. This can render it more challenging to uphold progress and continuity, both for the stakeholders involved in the reforms and for external actors who need to maintain the cooperation with affected individuals and agencies. The result may be a diminished attention on universal design and more problematic follow-up during brief periods.



Nevertheless, the requirements for universal design in areas such as the planning and construction of infrastructure and the procurement of vehicles are clearly stipulated in existing legislation. The current legislation (and the associated regulations) imposes stringent requirements on how society should make the necessary adaptations for people with disabilities. To date, the changes in organisation and areas of responsibility that have been implemented in Norway are unlikely to have any significant adverse impact on the universal design of the transportation system in a long-term perspective. The challenge is due to the fact that the regulatory framework for universal design is dispersed across a series of laws and regulations under different ministries, and this fragmentation sometimes leads to confusion regarding who is accountable for the overall picture (Ministry of Transport, 2020).

Below, we summarise some of our recommendations on how to ensure universal design in the transportation sector within a system of complex laws, rules and responsibilities. Our suggestions are organized into three main categories: Budget constraints, specialist guides and development, and collaboration.

Budget constraints

- To ensure that the upgrading of existing infrastructure is not sidelined in favour of other measures, the establishment of financial support schemes can sustain a continued focus on universal design.
- National road funding can be used to upgrade infrastructure to universal design standards where this is critical.
- Several influential stakeholders in the road sector (county authorities and Nye Veier AS) can contest standards regarding what constitute 'satisfactory' solutions moving forward.



Specialist guides and development

- The growing number of stakeholders, including independent stakeholders, in the transport sector means that it will be important to oversee development and practices within universal design in trip chains.
- Guidelines and standards can be effective tools for establishing uniform solutions that meet statutory requirements, and these should be developed and updated on an ongoing basis.
- Collaborative platforms ought to be established where diverse stakeholders can contribute to the development of, for instance, specialist guides for different modes of transportation and functionality requirements.
- To ensure effective knowledge sharing, specialized arenas can be established to host themed meetings that encompass the tiers of government and modes of transport. Examples of such arenas include national competence-building arenas and a professional competence programme.
- A single stakeholder should assume overall responsibility for gathering positive experiences from different regions and initiate research and development to generate new knowledge.

Collaboration

- The project manager must assume responsibility for establishing cooperation with relevant stakeholders to ensure universal design in the relevant and adjacent links in the trip chain. Typically, large and complex projects involve multiple stakeholders and tiers of government.
- If transfers from one operator to another in already established infrastructure are not seamless in terms of universal design, it is not always clear how such a problem can be resolved or who is actually responsible. A single stakeholder should be responsible for dealing with such problems.
- *A national action plan for universal design in the transport sector can serve as an effective approach for overseeing the various stakeholders' responsibilities and can function as a tool for generating more knowledge on universal design throughout the trip chain.*
- *County authorities can assume responsibility for the regional coordination of universal design work, and/or it can be incorporated into existing local networks that exist through urban development and transport partnerships.*
- A trip chain is only as strong as its weakest link and cooperation is therefore essential for establishing seamless trip chains. *Regardless of the recommendations above, universal design should be well-supported by all stakeholders working on the different components of trip chains.* Universal design has become an increasingly integrated and natural part of the transport sector. However, it is important that competence is enhanced on an ongoing basis and that resources are allocated to following up on objectives, strategies, measures and goal achievement.



7. Further reading

Directorate for Children, Youth and Family Affairs (Bufdir). 2020. *Universell utforming. Tilstandsanalyse og kunnskapsstatus.*

https://bufdir.no/globalassets/global/nbbf/universell_utforming/universell-utforming---tilstandsanalyse-og-kunnskapsstatus_uu.pdf

This is a review of the status of universal design in Norway as of 2020. The purpose is to describe the status of universal design in Norway and provide a basis for developing policy and measures in this area. Providing a complete overview of the extent of universal design in Norway is challenging due to the lack of systematic measurements of accessibility and universal design. It is also partly due to the wide-ranging scope of universal design and the multitude of domains it encompasses, such as ICT, transport, planning, construction, outdoor spaces, products and services.

Krogstad, J.R., Phillips, R.O., Berge, S.H. 2019. *Kollektivtransport for alle: Bussjåførenes rolle. TØI rapport 1683/2019.*

<https://www.toi.no/getfile.php?mmfileid=50230>

The report uses document reviews, interviews and a survey to gain insight into the factors that impact on how bus drivers deliver service to passengers with different needs.

Krogstad, J.R. 2015. *Fylkeskommunenes arbeid med universell utforming i kollektivtransporten. TØI rapport 1456/2015.*

<https://www.toi.no/getfile.php?mmfileid=41624>

The report summarises the county authorities' work on universal design in public transport and assesses the greatest challenges for the work going forward. The report provides an introduction to the county authorities' responsibilities in 2015, which are still largely applicable.

Lerdahl, E. 2015. *Slagkraftige møter - større engasjement og bedre resultater. Fagbokforlaget*

This is the book for anyone who wants to create engaging and productive meetings in which participants are actively involved and visible results are achieved. The book describes simple methods that you can use to create dynamics, focus and direction in meetings. The book covers everything from daily update meetings to large all-day meetings. You are introduced to numerous methods and tips for planning, chairing and conducting meetings. These can be easily incorporated into your working day.

Lerdahl, E. 2007. *Slagkraft - Håndbok i ideutvikling. Gyldendal akademisk*

This book presents various methods for how individuals or groups can work as efficiently and targeted as possible with idea development. Here you will find methods for every stage of the idea development process – from identifying needs, exploring and developing new ideas, refining and evaluating ideas, to realising and implementing them. The idea development methods are presented as practical examples, using a variety of sketches and images.

Farner, A. 2008. *Verksted som verktøy - å planlegge og lede workshops. Kommuneforlaget.*

The book explains how workshops can be used as a working method in planning and development work. It describes how workshops can be a process-oriented working method that fosters interaction, participation and innovation. The book links workshops as a working method to planning theory and principles of communication and collaboration. It also addresses the design of workshops for various purposes and specific techniques for implementation, and provides examples from previous workshops.

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