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Realising Human Diversity in the Built Environment through Universal Design

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Realising Human Diversity in the Built Environment through Universal Design

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"Maybe we should remove a piece?"

Bridging the Gaps

Bridging the Gaps:

Realising Human Diversity in the Built Environment Through Universal Design

Lilian Müller

DOCTORAL DISSERTATION

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Title and subtitle: Bridging the Gaps: Realising Human Diversity in the Built Environment Through Universal Design

Abstract: This thesis explores how more equal and inclusive living environments can be achieved by using Universal Design (UD) to incorporate human diversity in all stages of planning and construction. The ongoing exclusion of persons with disabilities from the built environment does not result from a lack of knowledge on how to remedy existing obstacles nor of how to avoid creating new ones. Other reasons must be found.

The aim of the thesis is to provide new knowledge and solutions regarding how UD can be implemented in urban development and the built environment, including the whole process from vision to outcome. The thesis is based on three studies, which resulted in five papers.

The theoretical framework involves conditions that affect the planning and construction processes of today: forms of governance, the view of the users of the built environment and how they are categorised, choices and priorities in the planning process, and theories of UD.

Triangulation was used in the studies as a research strategy, to test the validity and increase the reliability of the findings. The studies included a document study, a multiple case study, semi-structured interviews, workshops and go-along interviews in three cities.

The findings show numerous factors that influence the conditions for how human diversity is included or not in urban development processes. These factors include the norms and categorisations of the users, current urban building trends and planning practices. Examples show how Universal Design can be implemented in the entire process – from idea to finished construction. The findings show the need for several changes. All studies demonstrate the importance of protecting significant societal goals throughout planning and construction processes. This indicates that public actors must take greater responsibility to lead planning processes and follow up on the results.

The municipalities are at the forefront of defending social goals and operationalising conventions that Sweden as a nation has undertaken to follow, an example being the UN Convention on the Rights of Persons with Disabilities. Being able to access and use the built environment is a fundamental human right.

Key words: Built environment, Universal Design, Accessibility, Urban Planning, Disability, Human Rights

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Table of Contents

Abstract

To be able to access and use the built environment is a fundamental part of human rights.

All people are affected by the design of the built environment in diverse ways. It concerns health and well-being, and our opportunities to participate in society.

This doctoral thesis explores how one can achieve more equal and inclusive living environments by using Universal Design (UD) to consider human diversity in all stages of planning and construction. This thesis examines the relationship between the built environment and the users' abilities, where there is often a gap, one that we frequently talk about in terms of inaccessibility. This gap is a common reason why people are excluded from the built environment and participation in society.

People are excluded from the built environment despite the laws, regulations, and conventions stating that what is built must also be accessible and usable for people with reduced mobility or orientation. This ongoing exclusion of persons with disabilities does not result from a lack of knowledge on how to remedy existing obstacles and how to avoid creating new ones. Other reasons must be found.

There is a need to increase knowledge on how to implement UD and accessibility. This should be done not only on the detailed level, but along the entire process from vision to outcome, including the connections between different scales: the building or place, the city level, and the societal level.

The aim of the thesis is to provide new knowledge and solutions on how UD can be implemented in urban development and in the built environment. The findings increase knowledge on how practices can be changed through UD by taking human diversity more into account when buildings and places are planned and constructed.

The theoretical framework involves different phenomena related to the external conditions that affect the planning and construction processes of today: forms of governance, the view of the users of the built environment and how they are categorised, choices and priorities in the planning process, and theories of UD.

Triangulation was used in the studies as a research strategy, to test the validity and increase the reliability of the findings, The consistency of the findings was cross-checked using different methods and data sources: document study (Study 1); multiple case study, interviews, and workshops (Study 2); and go-along interviews in three different cities (Study 3). The participants in Studies 2 and 3 included officials in the cities involved, professional groups linked to the construction industry, and citizens.

The thesis is based on research conducted in three studies, which resulted in in five papers. The findings show a picture of numerous factors that influence the conditions for how human diversity is included or not in urban development processes. The reasons why inaccessibility and exclusion of people with disabilities occur in the built environment can be searched for in the norms and categorisations of the users, and in current urban building trends and planning practices. Thought patterns in the image of the users, which are visible early in the process, are drivers behind exclusion and separate solutions for some user groups, such as persons with disabilities and older persons. Urban planning trends, such as densification, are phenomena that can have negative effects on the implementation of UD in both the processes and the built environment. This involves the reduction of open spaces and green areas, increased noise, lack of daylight, restrictions on modes of transports and more. Complex environments, from a human diversity point of view, are found in mixed-use ideals like 'shared space'. Furthermore, examples came to the fore of how the imbalance between sustainability dimensions resulted in unrealistically high demands on users' abilities.

Another picture emerges from examples of how and under what circumstances Universal Design can be supported and implemented through the process and the outcome. It became clear in Study 2 that the presence of UD was more evident in the reconstruction of older buildings than in newly constructed ones. The successes of the remodelling projects can be sought in the focus of the projects (updating a building to today's values, increasing the number of users, removing barriers, etc.) and the role of the developer. In contrast to the new building projects, the city was the owner and project manager, with completely different values on which the projects were based, and the ability not to limit its motives for the sake of financial profit.

Some clear patterns emerged when examining the details in the built environment. Two very successful strategies that supported UD and equal use were 1) to place low demands on users' abilities, to avoid special solutions and the separation of users, and 2) to shift the focus from person to function. As an outcome of the findings, ten qualities and features are presented as critical factors to handle in the built environment on a city level.

The findings show the need for several changes. This applies, for example, to the view of the user of the built environment. What drives inequality is an unrealistic and normative image of the users' abilities, and a lack of understanding of disability as a part of the human condition. All studies demonstrate the importance of protecting significant societal goals throughout the planning and construction

processes. This indicates that the public actors must take greater responsibility to lead planning processes and follow up on the results.

The municipalities are at the forefront of defending social goals and operationalising conventions that Sweden as a nation has undertaken to follow, an example being the UN Convention on the Rights of Persons with Disabilities. The capacity among professionals to shape a built environment on equal conditions can and should be strengthened. Awareness of the consequences for different users, and the long-term costs of planning paradigms such as densification and concepts such as shared space, must increase.

The findings also show how UD needs to be implemented in the entire process – from idea to finished construction – and on a coherent scale, from overarching goals to detailed design, in harmony with the surrounding environment and the overall societal goals.

Keywords: Built environment, Universal Design, Accessibility, Urban Planning, Disability, Human Rights

Populärvetenskaplig sammanfattning

Att kunna förstå, ha tillträde till och att kunna använda den byggda miljön, oberoende av funktionsförmågor, handlar i grunden om mänskliga rättigheter och jämlikhet. Denna doktorsavhandling handlar om att väga in mänsklig mångfald i alla skeden av planering och byggande, för att på så sätt åstadkomma mer jämlika och inkluderande livsmiljöer.

Alla människor påverkas av den byggda miljöns utformning på olika sätt. Det berör hälsa och välbefinnande, och våra möjligheter att vara en del av samhället på olika sätt. Bristande tillgänglighet är en vanlig orsak till att människor utestängs från byggnader, platser, aktiviteter, arbete, utbildning, transporter med mera. Därför finns det lagar och föreskrifter som säger att det som planeras skall främja en god livsmiljö som är tillgänglig och användbar för alla samhällsgrupper; och att det som byggs och anläggs också skall vara tillgängligt och användbart för personer med nedsatt rörelse- eller orienteringsförmåga.

I min yrkesroll som tillgänglighetsrådgivare och konsult har jag under åren ofta funderat hur det kommer sig att man fortfarande utestänger människor från byggnader och allmänna platser, genom olika hinder för tillgänglighet och användbarhet. Detta trots att det finns gott om kunskap om hur man kan åtgärda de hinder som finns och hur man undviker att skapa nya. Ett sätt att tänka in människors alla olika förutsättningar och förmågor när man planerar och bygger är att använda sig av konceptet Universell Utformning (UU). I svensk funktionshinderspolitik och arkitekturpolicy lyfts UU fram som en viktig pusselbit för att lyckas. Sverige har också genom anslutningen till internationella konventioner och överenskommelser bland annat förbundit sig att ta bort diskriminering på grund av otillgänglighet, att sätta slutdatum för borttagandet av befintliga hinder, och att ha ett fungerande regelverk som säkerställer att det som byggs är tillgängligt och användbart.

Syftet med denna avhandling är att få en djupare förståelse för vilka mekanismer det är som skapar jämlikhet och ojämlikhet i den byggda miljön, och hur man genom UU skulle kunna förändra praktiken till att ta mer hänsyn till mänsklig mångfald när byggnader och platser planeras och anläggs. Det är ett försök att öka kunskapen om hur UU kan användas i hela plan- och byggprocessen och i stadsutveckling.

Det teoretiska ramverket jag använder berör de yttre förutsättningarna som styrformer, synen på människor och hur de kategoriseras, och val och prioriteringar i planeringsprocessen.

Som grund för avhandlingen har jag genomfört tre olika studier, som har resulterat i fem artiklar. I resultatet från de olika studierna framträder olika mönster som påverkar: mönster i tanke, planeringspraktik, stadsutveckling, och i medborgarnas upplevelser av platser och byggnader. Här framträder också mönster som stödjer jämlikhet och inkludering i den byggda miljön och vad som kännetecknar förekomsten av UU.

Den första studien handlade om hur människor som skall använda den byggda miljön beskrivs i tidiga planer och program. Vem man tänker på när man planerar har betydelse för hur man sedan bygger. I studien framkom att de som oftast förekommer i texter, bilder och på illustrationer är företrädesvis unga människor, ofta cyklister som är friska, rörliga och högutbildade. Äldre personer förekom sällan, och personer med funktionsnedsättning inte alls.

I nästa studie undersökte jag genom fältbesök vilka mönster jag kunde hitta av UU i nybyggda projekt och i ombyggnad av äldre kulturskyddade byggnader. Mönster som framträdde här var hur ojämlikhet skapas i många nybyggda miljöer, genom att användare kategoriseras, särskiljs och att höga krav ställs på användarens funktionsförmågor. Samtidigt fanns många exempel på hur UU kan användas för att göra äldre, tidigare otillgängliga byggnader, mer öppna och användbara för fler användare. Efter denna del av studien, hölls workshoppar och intervjuer, där jag kunde undersöka närmare vilka faktorer i processen som kunde leda fram till inkluderande eller exkluderande miljöer. I en avslutande studie genomförde jag fyra samtalspromenader i tre städer, och intervjuade medborgare om hur de upplevde sin stad, vad upplevdes som välkomnande och inkluderande miljöer, och var man upplevde hinder.

Resultaten visar på behov av flera förändringar. Det gäller exempelvis synen på användaren av den byggda miljön, och vikten av att värna viktiga samhällsmål under hela plan och byggprocessen. Resultaten visar också på hur UU behöver implementeras i hela processen – från idé till färdigbyggt – och på flera nivåer – i samklang med den omgivande miljön och de övergripande samhällsmålen.

På lättare svenska

Bakgrund till forskningen

Den här boken handlar om att platser och byggnader ska vara användbara för alla människor.

Boken är en avhandling som tar upp forskning om att platser och hus ska bli mer tillgängliga.

Den är skriven av doktoranden Lilian Müller från Certec vid Lunds universitet.

Hon är expert på tillgänglighet i hus och på platser. Det är resultaten från hennes forskning som

presenteras i boken.

Varför ska hus och platser kunna användas av alla?

Alla människor är olika.

Det måste vi tänka på när vi planerar platser och bygger hus.

Det finns regler och lagar som säger att det vi bygger ska kunna användas av alla människor.

Ändå passar inte alla platser och hus för alla människor.

Vad kan vara otillgängligt i ett hus eller på en plats?

Vissa platser eller hus kan vara svåra att använda för en del människor.

Det kan handla om trappor som är svåra för en del att gå i.

Ibland saknas det hiss i huset.

Vissa dörröppningar kan vara för smala.

Skyltar kan vara svåra att förstå.

Ibland kan det vara svårt att hitta dit man ska.

Vad är universell utformning?

I avhandlingen funderar Lilian Müller på varför människor fortfarande stängs ute från platser och byggnader.

Det finns ju mycket kunskap om hur husen ska byggas för att bli användbara för fler.

Begreppet universell utformning förklarar hur en plats eller ett hus ska kunna användas av alla.

I boken förklarar Lilian Müller hur våra tankar och beslut påverkar hur platser och byggnader blir.

Universell utformning behöver användas av myndigheter och företag.

Då blir våra platser och byggnader mer rättvisa och inkluderar fler människor.

Tre studier i avhandlingen

I avhandlingen presenteras tre studier som handlar om hur vi planerar och bygger.

Den första studien visar att vi oftast tänker på unga och friska människor när vi planerar.

Äldre människor och personer med funktionsnedsättningar glöms ofta bort.

Den andra studien visar hur vissa äldre platser och byggnader inte är användbara för alla, men att universell utformning kan göra de gamla byggnaderna bättre för fler.

I den tredje studien gick Lilian Müller runt och pratade med människor i tre olika städer.

Hon frågade dem vad de tyckte om sina städer.

Hon frågade också om de kände sig välkomna och om de upplevde några problem.

Svaren visade vad som gör platser välkomnande och inkluderande.

Slutsatser

Alla tre studier visar att det är viktigt att använda universell utformning i hela byggprocessen.

Man måste också tänka hur det som byggs hänger ihop med andra hus och platser som redan finns.

En annan sak som är viktig är att prata med människorna som ska använda husen och platserna.

Detta behöver man göra innan man börjar planera, och ända tills allt står klart att användas.

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First of all, I would like to thank my supervisors: Per-Olof Hedvall, Stina Ericsson, Gunnar Sandin and Malin Sjögren, all of whom contributed their knowledge, experiences, and thoughts to this work.

Thank you, Per-Olof Hedvall, my main supervisor, for believing in me, and making it possible for me to become a PhD student at Certec. From the very start, through the many difficult moments throughout the process, you convinced me that I would complete this. Your ability to make complicated questions and contexts clear and understandable, along with your always positive attitude, have been of great value and inspiration to me in carrying out this research.

Thank you, Stina Ericsson, for all your efforts to help me sort through thoughts, ideas, and words.

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Thank you, Emil Erdtman, also for inspiring conversations and collaboration between doctoral students, in courses and project assignments. A special thanks for your contribution and participation in the four go-alongs that I carried out in my third study.

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Thanks to everyone who participated in the studies: employees at Gothenburg's city administrations, developers and private players in the construction industry who participated in the interviews and workshops (Study 2); and everyone who participated in the go-along interviews in Lund, Kalmar, and Gothenburg (Study 3).

Thanks to all other employees and doctoral colleagues at Certec. It was a privilege to meet and work with this incredible team at a wonderfully inspiring workplace.

My studies took place in the framework of four research projects. In these projects, I was able to collaborate with a wide range of people who contributed to the thesis in various ways. I want to thank all of you, foremost I would like to thank the staff at the former Real Estate Department in Gothenburg, and employees in the municipalities of Kalmar and Östersund.

Finally, a big thanks to my dear family. Thank you for all the encouragement, great patience and understanding. Your support has been invaluable. Thanks to my husband Dieter, children, and grandchildren for all the love and joy you have spread, which has been so important to me all the way in the process of completing this research.

List of Papers

This thesis is based on the following five papers, published, or submitted for publication in international scientific journals:

Paper I

Müller, L.; Ericsson, S.; Wojahn, D.; and Hedvall, P-O. (2021). Young, Mobile, and Highly Educated Cyclists: How Urban Planning and Policy Dis/able Users. *Scandinavian Journal of Disability Research* 23(1), pp. 124–135. DOI: https://doi.org/10.16993/sjdr.731.

I designed the study and collected data. All authors took part in the analysis and writing of the paper. Status: Published.

Paper II

Müller, L.; Wojahn, D; Sandström, I.; and Hedvall, P-O. (2022). Planning for Human Diversity: Design Patterns of Universal Design. *Nordic Journal of Architectural Researc*h, vol 34, no 2, pp. 75-104. ISSN 1102-5824.

I designed the study and performed the multiple case study independently.

All authors took part in the analysis and writing of the paper. Status: Published.

Paper III

Müller, L.; Ericsson, S.; and Hedvall, P-O. (2022). Visions of a City for All. Resources, Choices and Factors Supporting and Impeding Universal Design in the Urban Development Process. *The Journal of Public Space*, 7(2), 63-78.

DOI: https://doi.org/10.32891/jps.v7i2.1486

I participated in the planning and design of the workshops, together with members of the Real Estate Department in Gothenburg. I selected participants, collected data and performed interviews.

All authors took part in the analysis and writing of the paper. Status: Published.

Paper IV

Is the City Planned and Built for Me? Citizens' experiences on Inclusion, Exclusion and (Un)equal Living Conditions in the Built Environment (submitted).

I designed the study and performed the go along interviews together with the second author. All authors took part in the analysis and writing of the paper. Status: Submitted.

Paper V

Müller, L. (2023). Who Are We Building for? Tracing Universal Design in Urban Development. In: Ilaria Garofolo, Giulia Bencini (Eds.) *'Design for Inclusion. Dialogues on Universal Design. Theory, Ethics and Practice'.* Ebook Series*:* Studies in Health Technologies and Informatics, vol. 303. IOS Press, Amsterdam.

The content of the Paper V is based on studies 1-2 and was written by me independently. Status: Published.

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Summaries of the articles can be found in Chapter 5.

The five papers can be found at the end of the thesis under the heading Scientific Publications.

Definitions and Abbreviations

Accessibility

The Article 9 of the UN Convention on the Rights of Persons with Disabilities (CRPD) refers to *accessibility* as a means to enable persons with disabilities to live independently and participate fully in all aspects of life. Thus, accessibility refers to physical accessibility as well as cognitive and social aspects.

In Swedish building regulations accessibility (tillgänglighet) is always used in connection to *usability* (användbarhet*)*, targeted at persons with limited mobility or orientation capacity.

Accessibility can also be perceived as situated, in the lived experience of people in relation to their environment and activity.

In this thesis, *accessibility* mainly refers to the requirements in building regulations, and as something measurable and evaluable.

Disability

Disability in this thesis is referred to as an expression of the gap that can occur between a person's functional ability and the demands in the physical and social environment.

All work for a more equal and inclusive built environment should include efforts to equalise this gap by preventing and removing obstacles, lowering the environment's demands on people's functional abilities, and strengthening the individual's opportunities.

Equity and Equality

Equity and *equality* are both important parts of Universal Design. Among the seven principles formulated in 1997, equitable use is the first principle. It assumes a just design that does not disadvantage or stigmatise any group of users (Connell et al., 1997). Equitable solutions allow all users to be treated equivalent, with equality as a result.

Human Diversity

Human diversity addresses the variety of personal characteristics that make every person unique and different from others.

Impairment

Impairment in this thesis is understood as functional limitations, as a natural part of human diversity.

Persons with disabilities

The term *persons with disabilities* are used accordingly to the United Nations' Convention on the Rights of Persons with Disabilities:

> Persons with disabilities include those who have long-term physical, mental, intellectual, or sensory impairments which in interaction with various barriers may hinder their full and effective participation in society on an equal basis with others.
>
> (UN, 2006, art. 1).

Sustainable development

Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs.

In the UN report (UN, 1987), the requirements of sustainable development were described in three different dimensions: ecological, economic, and social. There are different interpretations of the relations between the dimensions (Hedenus et al., 2018). Equality among the three dimensions is a starting point in this thesis.

Universal Design

A definition of *Universal Design* is formulated as the **"**design of products and environments to be usable by all people, to the greatest extent possible, without the need for adaptation or specialised design" (Connell et al., 1997).

In the UN Convention on the Rights of Persons with Disabilities, the definition is further developed, which is the way Universal Design (UD) is interpreted in this thesis:

“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 specialised design. “Universal design” shall not exclude assistive devices for particular groups of persons with disabilities where this is needed. (UN, 2006).

Usability

According to the International Organisation for Standardisation (ISO) and European Standards, the term *usability* refers in this context to the extent to which a product, service, and the built environment can be used by specified users to achieve specified goals with effectiveness, efficiency, and satisfaction in a specified context of use. (ISO 9241-11:2018; EN 17161:2019, 3.11).

In Swedish building regulations *usability* is always used in connection to *accessibility*, targeted at persons with limited mobility or orientation capacity**.**

User

A person who interacts with a system, product or service (ISO 27500:2016; 2.12). In this thesis, the user of the built environment is referred to as *user*.

Abbreviations

CRPD	United Nations Convention on Rights for Persons with Disabilities
NPM	New Public Management
UD	Universal Design

1 Introduction

For almost three decades, my professional life has revolved around issues of accessibility, usability, disability, and Universal Design. The built environment has been the focus in my roles as a municipal accessibility advisor and as a certified expert in accessibility for inspections of construction projects. I also bring with me experience from work as an accessibility consultant in the private sector, mainly focused on the hospitality industry. In transnational cooperation I contributed to increased knowledge and the development of accessible tourism. Earlier in life, I also worked in politics as an elected official at the local level in Swedish municipalities. Like many of us, disability issues have been present in private life, in close relationships and during parts of life. My aggregated experiences touch many of the fields and actors that I address in this thesis: politics, public administration, the influence of the market, and the user perspective. From various starting points during this period, I have often asked myself why the development in terms of accessibility for all users is so slow and, in some cases, goes backwards. There are repeated reminders that due to disabilities, people are often treated as being special or are excluded from the built environment. Habits of exclusion and discrimination go on daily and seem to continue regardless of visions, laws, or financial means. It has therefore been important for me to gain more insight into the underlying causes and driving forces behind inclusion and exclusion through the in-depth studies presented in this thesis. It is also important for me to point at alternative courses of action that may better correspond to common overarching goals such as democracy, the equal value of people, and equality. Now in my role as researcher, this is an attempt to contribute to this development.

The multidisciplinary work that is presented touches upon several disciplines and research fields, such as planning, architecture, design, humanities, sociology, political science, and culture. The common thread is the relationship between the human being and the built environment. It includes the consequences that follow if human diversity is considered or not in planning processes, and what opportunities there are to bridge shortcomings with a Universal Design -approach.

Specifically, this research is about patterns that emerge in thought, process, and action in the planning and construction processes. This concerns the outcomes in

the built environment that results from different norms, values, and views on human beings; and how the power to form our built environment is creating equalities and inequalities in our society.

My focus is on the entire process from the early stages of urban development, planning and building phases to the users' perspectives on the completed environments.

This chapter introduces of the focus of the thesis – planning and creating a built environment in such a way that it does not exclude, discriminate, or disable its citizens.

Section 1.1 puts the issue of human diversity and the built environment into its context, followed by a short introduction of Universal Design (UD) in Section 1.2. Section 1.3 is about the projects that have made my studies possible. Section 1.4 presents the overall aims and research questions. Finally, an overview of the seven chapters of the thesis can be found in Section 1.5.

1.1 Human diversity and the built environment

Being able to understand, access, and use the built environment, regardless of functional abilities or other individual conditions, is ultimately a matter of human rights (UN, 2006; 2014). The design of our built environment has significance for the individual in all areas of life. To participate independently in work, social life, and activities is, among other things, dependent on each person's ability to use the built environment. The design of the environment also affects our health in positive or negative directions (Steinfeld & Maisel, 2012; Perdue et al., 2003; Gehl, I, 1971; Vicens et al., 2020). This requires a democratic, equality-based approach to community planning and construction. And such an approach presupposes that human diversity is considered throughout the entire process – from ideas to outcome.

At the global as well as the national level in Sweden there are policies, laws and regulations to ensure everyone's access to the built environment, regardless of functional abilities. Sweden has joined the UN Declaration on Human Rights (United Nations, 1948), the UN Convention on the Rights of Persons with Disabilities (United Nations, 2006), and is also tied to the EU's Charter of Fundamental Rights (European Union, 2009). Universal Design in Sweden has been highlighted as one of the cornerstones of the National Disability Policy (Swedish Government, 2017) and in the Policy for Designed Living Environments (Swedish

Government, 2018). The Swedish Planning and Building Act (Swedish Parliament, 2010) establishes that whatever is to be built or constructed must also be accessible and usable for people with limited mobility or orientation capacity. There is thus a stable political basis for ensuring everyone's rights and opportunities to use the built environment in an equal way. In addition, there are several standards on the national, European and global levels, that should ensure the knowledge of how to build in an accessible and usable manner that addresses the diversity of users (ISO, 2021; Svensk Standard, 2021).

Lack of accessibility daily excludes and discriminates persons with disabilities of all ages from the built environment and activities in daily life (Imrie & Hall, 2001). This exclusion may last for certain periods of life or continuously throughout life. This is a consequence, among other things, of the planning and construction that was created without regard to human diversity. A built environment that is properly designed to be able to meet human diversity is central for achieving goals such as inclusion, equality, and participation.

Participation is a fundamental prerequisite for people's opportunities to be part of society, to be able to make their own decisions and to influence their own lives. Achieving equitable living conditions and full participation for people with disabilities in a diverse society is central in the Swedish disability policy (Swedish Government, 2017), and in the commitments at the international level (United Nations, 2006).

A society that excludes cannot be regarded as a sustainable society (United Nations, 2015). Other thoughts and tools are needed to 'build away' exclusion and discrimination. Universal Design can be one way to meet this challenge.

1.2 Universal Design – policy and practice

Universal design (UD) is a concept addressing how human diversity can be considered in the production of products, services, or environments. UD is now a guiding principle in both important global agreements (United Nations, 2006) and in Swedish politics (Swedish Government, 2017, Swedish Government, 2018; SOU, 2019a). But we are still at an early stage when it comes to putting this into practical action in planning and construction processes from idea to finished result.

> "Universal Design is simply a way of designing a building or facility at little or no extra cost, so it is both attractive and functional for all people, disabled or not".
>
> (Mace, 1985)

UD emerged from the Disability Rights Movement in late 1960s and was introduced in the 1980s. UD was presented as a concept whose time had arrived (Mace, 1985). It was later described as a reaction against barrier-free design, seeking not only to remove barriers but to eliminate discrimination by design and to support full participation:

> "Universal Design, however, is concerned with more than just removal of barriers. It seeks to eliminate discrimination by design and support full social participation for all members of society".
>
> (Steinfeld & Tauke, 2002).

There are multiple definitions of UD. When introducing the seven principles of UD in 1997, the North Carolina State University defined UD as *"the design of products and environments to be usable by people of all ages and abilities, all people, to the greatest extent possible"* (Story, in Preiser/Ostroff, 2001). A commonly used definition today is the one declared in the UN Convention on Rights for People with Disabilities *"…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 specialised design. "Universal design" shall not exclude assistive devices for particular groups of persons with disabilities where this is needed" (UN, 2006).*

In addition to the original concept in the development of UD, eight design goals were introduced to support the overall purpose of UD in order to improve human performance, health and social participation: body fit, comfort, awareness, understanding, wellness, social integration, personalisation and cultural appropriateness (Steinfeld & Maisel, 2012, p. 90). UD was brought to the fore by Lid as a value-based concept of human rights regarding people's opportunities to live as equal citizens in a democratic society (Lid, 2020).

UD is a concept in change that should be understood against the background of contemporary events and social development. The term is sometimes mistakenly associated with an effort to find one solution for all users, whereas the aims are rather to find solutions that respond in different ways to meet the conditions of human diversity, through flexibility and a diversity of solutions. *Inclusive design*,

Design for all or *Barrier-free design,* are adjacent concepts, aiming at design that takes the largest possible range of users into consideration. These terms are often used interchangeably with the same meaning, as is stated in the European Standard *Design for All-Accessibility following a Design for All approach in products, goods and services- Extending the range of users* (EN 17161:2019).

UD has been described both as a guiding principle for the design process and as the qualities and features of the outcome. It has previously been shown how to make use of UD principles, methods, and strategies in practice, in planning and architecture (Preiser & Ostroff, 2001; Steinfeld & White, 2010; Maisel et al., 2017; Dion, 2006). Previous research has also dealt with the understanding of UD among designers and methods to inspire architects and how to transfer the needed knowledge about the user (Mosca et al., 2019).

However, the practice of UD in urban development processes are still limited (Erdtman et al., 2021). The need to implement UD strategies when shaping the built environment is highly relevant against the backdrop of rapid urbanisation, the inequalities that emerge from today's urban development trends, and in strategies for urban sustainability.

The built environment is multifaceted and complex. Contemporary Swedish planning tends to become increasingly fragmented, as the power over social planning has been transferred to a greater extent to the private market (Allmendinger, 2017; Franzén et al., 2016). At the same time, the complexity of contemporary social planning calls for a more holistic view in social planning, and that local public actors are strong enough to effectively guard societal and long-term interests (Cars & Hedström in Blücher, 2006, pp. 161-175). For people who encounter barriers in the built environment, it is particularly crucial and decisive to make full participation possible.

UD applied on the built environment refers to more than the design of a single building or place; its values concern all stages from visions to outcomes. From the users' perspectives it also touches, in addition to the outcome, the wholeness of the lived experience in the built environment. This includes the surrounding environment, services, activities, and attitudes, that support or impede UD, equity and inclusion.

There is a need to develop UD further to capture how it can be applied on the societal level as well as in single construction projects and the processes in between. More knowledge is needed about what supports or hinders UD in such a development to strengthen UD's function in order to also frame human diversity as a guiding principle in the process of shaping a more equal and inclusive society also on an

overall level. One has to consider that the built environment is in constant change, where each individual construction project often has many actors involved and is long drawn out in time. Such studies need to have a diversity of approaches and perspectives, and to explore not only intentions and outcomes, but all the different stages.

1.3 The research projects

The thesis is based on research carried out in the framework of three projects:

- KatUU (Categorisation Supporting the Implementation of Universal Design in Sweden).

  The research in the project was focused on categorisations in written documents and in physical space. The project was a collaboration between the Universities of Lund and Gothenburg, Sweden. In one part of the project, research was carried out on how accessibility and UD are described and applied within the municipal the planning process. This was the base for Study 1 and Paper I, *Young, Mobile, and Highly Educated Cyclists: How Urban Planning and Policy Dis/able Users.*

- Staden ska funka för alla (The City is for Everyone).

  This project was a collaboration between Certec (Rehabilitation Technology and Design, Lunds University) and the City of Gothenburg, Sweden. In the framework of this project, Study 2 took place (multiple case study, workshops, interviews) resulting in the Paper II, *Planning for Human Diversity: Design Patterns of Universal Design;* Paper III, *Visions of a City for All. Resources, Choices and Factors Supporting and Impeding Universal Design in the Urban Development Process;* and Paper V, *Who are we building for? Tracing Universal Design in Urban Development*.

- Jämlikhetens Syntax (The Syntax of Equality).

  One of the aims of this project was to identify patterns in the physical environment that support equality and inclusion. The project was a collaboration between the Universities of Lund and Gothenburg, and the municipalities Kalmar, Lund, Östersund and Gothenburg, Sweden. Study 3 was partly carried out in the framework of this project, resulting in Paper IV (submitted), *Is the City Planned and Built for Me? Citizens' experiences*

on Inclusion, Exclusion and (Un)equal Living Conditions in the Built Environment.

- Visualisering för universell utformning i plan- och byggprocesser (Visualisation for Universal Design in Planning and Construction Processes).

  The project was a collaboration between Certec at Lunds University, and the cities Lund and Gothenburg, Sweden. The main goals of the project were to create tools to make visible how planned environments work for different persons and abilities, and to highlight social consequences of different design solutions in the built environment. Study 3 was partly carried out in the framework of this project, resulting in Paper IV (submitted), *Is the City Planned and Built for Me? Citizens' Voices on Inclusion, Exclusion and (Un)equal Living Conditions in the Built Environment.*

1.4 Aims and research questions

The overall aim of this thesis is to provide new knowledge and solutions regarding how UD can be implemented in urban development and the built environment. This includes how UD can be applied in the whole process from vision to outcome. It also includes how UD can be applied on different scales: in the single project, the urban development and at the societal level.

The research is an effort to contribute to a changed practice that takes into account human diversity in the planning and design of the built environment.

My research questions on the thesis level are:

- RQ1- What factors in urban development processes affect the built environment in relation to UD?
- RQ2- What are the consequences of this impact for the user and for society?
- RQ3- How can UD support the implementation of human diversity aspects through the entire process from early visions to detailed planning, building permits and construction, to the users' experiences of the built environment?

1.5 Overview of the thesis

This is a compilation thesis and consists of seven chapters, a list of references and five appended papers.

- Chapter 1 introduces the research area and specifies the research aim and questions.
- Chapter 2 provides the background and research context.
- Chapter 3 provides relevant theoretical perspectives linked to the research fields.
- Chapter 4 describes the research process, methods, and ethical considerations.
- Chapter 5 summarises the appended papers and the overall findings.
- Chapter 6 discusses the findings by returning to the research questions in the introduction.
- Chapter 7 presents a summary of the main conclusions and suggestions for future research.

2 Background and Research Context

The relationships between humans and the environment have been an area of research and discussion from far back in history. However, the view on the conditions and prerequisites for the participation of *all* people in the built environment has been limited in the past and still is in contemporary thoughts and practices.

This chapter presents a brief introduction and overview of key areas in the thesis and related previous research. Section 2.1 looks back in retrospect on human approaches in planning, architecture, and the built environment. Section 2.2 reports on the challenging trends in contemporary planning practice and urban development. Section 2.3 is on disabling environments and UD.

2.1 Thoughts and trends on human-environment related perspectives in architecture and planning

This section touches on the human-environment relationship and looks back at how architecture and planning in different periods have considered the user of the built environment, and the relationship between human conditions and what the environment has to offer.

Despite shifting ideals through history, a common thread is the *reductive and normative view of the user of the built environment.* According to Hamraie, a mythic average norm, a 'normate template' has served as a pattern language in architectural design since antiquity (Hamraie, 2017, p. 20). From the Vitruvian man to Le Corbusiers' Le Modulor and forward, the conception of a 'universal body' has taken its place in architecture Added to this limited understanding of human diversity, inequalities also appear on a group level. The focus on who to build for has shifted over the years: from former days focus on society's elite, via an emerging class perspective in the 20th century, to socio-political urban ideals such as mixed neighbourhood typologies (Sarkissian, 1976) or the creative class (Florida, 2006).

Despite a contemporary practice that has moved towards human and social aspects, certain people are still excluded, or have limited access to the built environment.

Throughout history, different approaches to the human-environment relationship have been expressed, often without consideration of human diversity. How spatial relations reinforce injustice have been discussed since the late 1960's. The topic has been raised as the right to the city (Lefebvre, 1968; 1970/2003); as relationships between social justice and space and the power of urbanisation (Harvey, 1972/1988, 2006), as the democratic deficits of neoliberal planning (Purcell, 2009) and as cities for people, not for profit (Marcuse, 2009).To further the just city, Susan Fainstein has argued for a definition of justice based on the criteria of equity, diversity and democracy (Fainstein, 2013).

The view of the user who will use what is produced - in this case the built environment- also affects design choices. If the image of the user is narrowed down to include only certain parts of the population, there is a great risk that the needs and conditions that are important for groups outside this framework will not be met. How the group of users can be expanded and how human diversity can be integrated into the entire plan and construction process is a core issue to discuss and find solutions for.

2.1.1 Design qualities and planning principles

Strength, beauty and functionality have been interpreted as fundamental laws of architecture since the days of Vitruvius' *Ten Books of Architecture'* in 25 BC. The cornerstones in Vitruvius' triad – Firmatis, Venustas, Utilitas - had a great influence on housing design for centuries to come, and were expressed in Leon Battista Alberti's theory on architecture, *De Re Aedificatoria* from 1452 as *aesthetics, functionality, and durability* (Rowland & Howe, 1999). In later translations Vitruvius' triad is expressed as firmness, commodity, and delight.

Architecture based on *human measurements* is another thread through history. Measured units and proportions run as a common thread from Vitruvius harmony principles up to functionalism and Le Corbusier's human body-based measurement framework, *Le Modulor* (Le Corbusier, 1948). The measurable became increasingly important over other values such as beauty. New dimensions were added to the architectural discourse with modernism and functionalism, where a social commitment came to the fore. Architecture's influence on human well-being became important and the focus during the era of modernism was to remedy overcrowding and the low housing standard to which the working class was

relegated. Access to light, air and sun were central values when placing rooms in relation to each other, and wind directions were some of the important factors when placing and designing buildings.

Architecture theory was influenced in part by urban conditions of the 19th century, when living environments in cities were characterised by overcrowding, disease, and social misery. With functionalism, the idea of separating zones for living, recreation, work, and transportation became a main concept in urban development during a vast part of the 20th century (Johansson & Khakee, 2008, 88f).

In contemporary urban development trends, densification has been brought to the fore as a reaction against urban sprawl in the previous period (Carmona, 2021). The dense city is put forward as an argument both for a more humane city (Gehl, J, 1971; Sim, D., 2020) and for sustainable urban development (Berghauser Pont et al., 2021; Boverket, 2016).

2.1.2 A human-centred approach

During the latter half of the 20th century, new ideals gradually emerged with more focus on social values, a more *human oriented approach* and planning for a 'human scale'. Thoughts from the 1960s and 70s still have a great influence in architecture and planning theory. A turning point from functionalism to today's planning ideals can be traced to the early 1960s. Jane Jacobs is still often cited as a reference point for the human scale and a vibrant urban life. Jacobs' criticism against urban renewal at that time has largely influenced the urban development trends we see today. The conditions she sets out as necessary for social and cultural diversity in the city are based on four conditions: a mix of functions, for example housing and workplaces; a block city with short blocks; mixed ages of the buildings within the same block; and density (Jacobs, 1961).

The urban theorist, Kevin Lynch, contributed with theories on *imageability* with criteria for peoples' experiences and orientation in the city. Lynch drew conclusions about how people took in information about the city and created mental maps. Those images were created from five qualities in the built environment: paths, edges, districts, nodes, and landmarks (Lynch, 1960).

The influence of architecture on people was described by the Danish environmental psychologist Ingrid Gehl. She described social needs and values for living environments divided into contact, privacy, experiences, purposefulness, play, orientation, identification, and aesthetics (Gehl, I. 1971). These eight psychological needs that Gehl identified, conceptualise a human-friendly design that can also be

applied in today's discussion on social sustainability, and are discussed by Peters (Peters, 2016).

A significant influence on today's planning context had the ideas from the same time, launched in the book *Livet mellem husene* (Life Between Buildings), (Gehl, J. 1971). Jan Gehl emphasised the human dimension at a time that marked a turning point in urban planning towards a more explicit prioritisation of the human scale. According to J. Gehl, the principles of the human dimension are about collecting and mixing functions, short distances, density, making it attractive to walk and cycle, making environments inviting by having open meeting places between the buildings (Gehl, J. 2010).

The brief description of thoughts from this period still have significance for today's urban development and the context of this thesis.

2.1.2 The ideal city

Several attempts have been made to describe the ideal city.

A pattern language as an approach to architecture, building and planning was developed by Christopher Alexander et. al. The idea was to describe building patterns and how every detail was linked together as a wholeness. No pattern is an own entity but is linked to patterns above and below it on different levels. The 'language' contains several patterns that are thoroughly explained, such as why buildings should not exceed the limit of four floors (pattern 21) why the full cycle of life should be represented and balanced in each community (pattern 26) or why the depth of a balcony should be at least 1,8 m (pattern 167) (Alexander et al., 1977).

In the spirit of Jan Gehl, the Scottish architect David Sim reasons about nine criteria for a pleasant dense city: mixed building forms, different kinds of outdoor environments, flexibility, human scale, walkability, place identity, a pleasant microclimate, smaller carbon footprint and greater biological diversity (Sim, 2020).

The key components today circle around notions of densification, mixed-use, proximity, and walkability. In its extreme, a '15-minutes city' was proposed, where all activities such as work, education, services, entertainment, health care etc., should be able to reach within a 15-minute walk from home (Moreno et al., 2021). Already in 2009, the 20-minute city was set as a goal in the Portland Climate Action Plan, with the objective that 90% of the residents should walk or bicycle to meet all basic daily, non-work needs by 2030 (City of Portland, 2009).

From a UD point of view, several of the ideals do not correspond to human diversity. In terms of accessibility, usability, or universal design, qualities need to be added.

2.1.3 Social perspectives in contemporary policies

The social perspectives of urban planning and development are becoming increasingly relevant, not least of all as a dimension in recent frameworks of sustainability development. As this thesis is being written, policies on the Swedish national level as well as the European level are concerned with the issues of social sustainability and equality measures to be included in the planning and formation of built environments. In the Swedish National *Policy for Designed Living Environment*, one of the goals to create a fully inclusive community is stated as the systematic use of the principles of Universal Design to ensure that environments, products, and services function for people of all ages and abilities (Swedish Government, 2018). In the concept of *New European Bauhaus*, one of three inseparable values is inclusion, from valuing diversity to secure accessibility and affordability (European Union, 2023).

2.2 Challenging trends in contemporary planning practice and urban development

Two clearly different directions, that are assumed to be contradictory, can be distinguished in contemporary planning: a neoliberal market-oriented planning direction (Allmendinger, 2017; Purcell, 2009; Franzén, 2016) and the sustainable urban development agenda direction (Carmona, 2021). They set the conditions for planning and urban development. Both directions have implications for planning and building with regard to human diversity, since both paradigms are intertwined in the discussion of densification (Saiu, 2017; Berghauser Pont et al., 2021).

This section deals with two dominating trends: 1) urban development and planning focused on benefits for economic growth and place marketing, and 2) a sustainability approach mainly focused on environmental and climate aspects, with an elusive and sprawling understanding of the social dimensions and consequences.

In the wake of modernism, criticism grew against top-down social planning. The concept of the ‘communicative turn’ symbolised the turn towards a more dialogue-driven social planning (Healey 1997/2006). Parallel to this development, neoliberalism and its influence on social planning grew, in the social climate that

demanded more market solutions. Neoliberal planning should not only be understood as a way to push back the state's influence for the benefit of companies. However, because neoliberalism also includes attitudes and values, such as in the area of urban development, where the city is seen primarily as a place that competes for investments and must be sold on these terms (Baeten, 2012).

One of the descriptions of this condition, called 'entrepreneurial urbanism', which is characterised, among other things, by how public and private actors collaborate to sell the city in an imagined global competition for investments and visitors (Franzén et al., 2016). One of the effects of this phenomenon is the change in planning practice, which is also characterised by concepts such as NPM (New Public Management). Boundaries between public and private are blurred in the notion that market rationality works equally well in the public sphere as in the private (Sager, 2009). The phenomena of NPM and neoliberalism feed each other in several ways. The NPM reform was driven by ideas rooted in public choice theory and the neoliberal theory of the state. It reduced the public sector's capacity to govern, brought market-oriented practices into the administration, and decoupled policy and administration (Peters & Pierre, 2016, p. 142).

Previous research has addressed the paradox that planners are increasingly focused on the process instead of the content of what is to be planned (Campbell & Marshall, 1999). The focus on measurements and results, that was brought into administrations with NPM, has resulted in planners being more responsible for 'good ranking' rather than 'good planning'. It also makes planners provide the frameworks for production rather than planning for an overall goal (Baeten, 2012).

Global urbanisation is a megatrend that has a direct impact on how and where new exploitation and constructions will be located. In Sweden, there is also a strong increase in urbanisation that has taken place over the past 20 years, where population growth has been increasingly concentrated in the larger cities (SCB, 2023). In parallel, ideals such as densification have become a norm in urban development Johansson & Khakee, 2008). Densification is highlighted as the opposite of urban sprawl, which is described as negative from a sustainability point of view. Densification is thus justified because of its limited expansion of land use, and its usage of existing infrastructure (Berghauser Pont et al., 2021; Ståhle, 2008). Originally as a reaction against urban development during modernism, the argument to combat urban sprawl has become one of the most salient arguments for a sustainable urban development. A number of opposites have become part of this argumentation: while densification should represent low CO2 emissions, minimise the need for transport, and support a human scale development, urban sprawl is

considered to mean car dependency, high energy consumption and high CO2 emissions (Dennis & Urry, 2009 in Carmona, 2021).

However, densification as a solution for a sustainable society is increasingly being questioned. Reduced green spaces, higher land prices, and social inequality are some of the conflicts between densification and sustainability that have been highlighted in previous research. Densification applies more vertical movement at the cost of horizontal movement possibilities in cities. The loss of open spaces can result in shaping new inequalities in the built environment, not least seen from a human diversity perspective. The presence of a disability perspective is low in academic social sustainability literature and in the larger academic area of urban studies literature (Wolbring & Rybchinski, 2013). The tension between environmental sustainability and human diversity has been regarded as 'eco-ableism' – a form of discrimination towards persons with disabilities through an environmental lens (Wolbring & Lisitza, 2017).

According to Berghauser Pont et al., (2021) there are considerable negative environmental, social, and health impacts of densification, while the positive effects are mainly linked to public infrastructure, transport, and economics. A growing awareness of the reduction of green urban spaces as a result of densification is getting more attention. Evidence-based guidelines for the greening of cities, the 3-30-300 model, was launched by Konijnendijk, stating that each person should be able to see at least 3 trees from the apartment window, each part of the town should have at least 30% coverage of tree crowns, and everyone should be able to reach a green area within 300 metres (Konijnendijk, 2022). As access to green space is particularly important for people's health and well-being, this factor is important in planning, along with considering the risks for increased inequalities with increased densification. Here it can be noted that even a 300 m walk to a green area can be a challenging distance for some people.

The Swedish planning monopoly gives the municipalities a unique opportunity to lead and make decisions about where to build and what to build. In practise, however, the power that drives urban development lies in many other hands than elected politicians in public organisations. The politically appointed building committees have allowed for a far-reaching delegation to employed officials, who today act as intermediaries and enablers for developers and builders. They do this rather than as leaders in a community driven planning. From the neoliberal horizon the role of the planners' role is to support the market (Allmendinger, 2017; pp. 105-)

Moreover, it is a long way from visions to practice. The theory of the complexity of long implementation chains highlights the obvious challenges: The longer the chain, the greater the risk of deviations. The number of links between intention and result affects how likely it is that political decisions are implemented successfully. Even under ideal conditions, implementation is likely to fail (Pressman & Wildavsky, 1973; Hertting, 2018). Long processes in terms of time, shifting goals and a multitude of actors are additional aspects that increases the risk of failed implementation (Hertting, 2018).

Another challenge of relevance is the weak public control in Sweden. In a comparison between five countries' public building control systems, Sweden was singled out as having a very liberal market practice. The responsibility rests with the developers, regardless of their competence (Thelandersson & Wikström, 2020). A lack of competence and resources among the market players was singled out as one of the dominant reasons for the extent of general errors, defects, and damage in the construction sector, where the direct costs of measures were calculated to be at least SEK 24-38 billion per year. This was calculated on the investment volume in 2016 (Boverket, 2018).

2.3 Disabling environments

From an historical perspective, the ambition to take human diversity into consideration and to shape a built environment accessible for all, is still to be considered to be a 'new topic' in architectural and planning theory. Several concepts of accessibility, such as inclusive design, design for all and universal design all emerged in the latter half of the 20th century. Through history, different models of defining disability have existed and still co-exists. The gap model, or relational model, defines disability as a relation between individual capabilities and surrounding demands such as environmental demands. One may have impairments, but the disability appears in the gap between a persons' abilities and the expectations from environments or interactions (Lid, 2013; Begnum, 2020).

Striving at goals, such as equity, social sustainability, participation, and equal rights, assumes that the city is planned according to a wide range of needs, abilities and conditions in a diverse population. The designs of street network, buildings and public places are decisive for how individuals or groups of people can use the built environment and participate in society.

Hence, the built environment determines partly what persons with disabilities can or cannot do. The built environment can facilitate or hinder and disable by design (Imrie, 2012b; Hall & Imrie, 1999). It can be made an enabler or a disabler in a broad sense. In the understanding of how disability emerges in the interaction between person and environment, one should take into consideration how these interactions take place on a physical level, but also on social and psychological levels (Lid & Solvang, 2016). Hedvall developed a model that describe accessibility as being lived and experienced in the moment of action. This provides a wider a wider picture of the aspects involved (Hedvall, 2009).

Issues related to disabilities, human diversity, and accessibility are still to a large extent absent in planning and building practices. The lack of knowledge and awareness of disability causes architects to apply only the accessibility rules required by the building code, as an extra add-on that becomes more expensive in the project (Imrie & Hall, 2001). Apart from the added costs it also creates special solutions, dividing people into groups: abled or disabled. The understanding of what disabilities are varies among architects, and accessibility is often planned primarily based on mobility impairment, more specifically wheelchair users (Hall & Imrie, 1999; Carmona, 2021, pp. 367).

Embedded norms and references to ideal inhabitants have a prescriptive function in architecture, leading to design based on a normate template (Hamraie, 2017). The treatment of persons with disabilities as being a defined part of the population has been criticised not at least against the background of how such attitudes are built into the language (Boys, 2014; Ericsson et al., 2020).

In *Five Faces of Oppression*, Young proposes a set of categories covering ways by which different groups are oppressed, among them marginalisation and powerlessness (Young, 1990). An approach to social justice assessing what each person is able to do, or to be, is found in the *Capability Approach*, further developed by Nussbaum. Control over one's environment belongs to the core capabilities that should be supported by all democracies (Nussbaum, 2000).

Persons with impairments are not the only ones that are made disabled by the built environment and are excluded from it. An increasingly common approach is *Design for Exclusion*, also called 'hostile architecture' or 'defensive architecture' (de Fine Licht, 2017). People who are considered as not belonging in ideal images of the attractive city are, in this approach, deliberately 'built away' by design that excludes or deletes qualities in the urban landscape, such as benches and public toilets.

As a concept that embraces the human diversity -perspective, UD can be the '*game changer'*. A UD approach stirs away from the separating *we-them* or *norm-deviation*

ways of thinking and opens up a view of disability as a natural human variation (Hedvall et al., 2022).

Thus, there is also a need to further develop UD as a concept not only in the design of the planned object, but also how its values and goals can be applied in all phases of the planning process, and on different scales. In all its complexity, UD and accessibility should also be considered from a spatial system perspective (Koch, 2022; Legeby, 2022). A checklist is not enough to establish a Universal Design approach. UD concerns the way we see and think about human variety and diversity (Maisel et al., 2017). UD requires knowledge of what it is that disables people in the environment, in the gap between the individual's conditions and what the environment can offer (Lid & Solvang, 2016). It requires an inherent desire to contribute to an equal society where all people have the same rights and values, and to understand the consequences on the individual level of different action options. In all its complexity, there is a general risk of mistakes. This becomes particularly noticeable in urban development, considering the number of actors, possible areas of conflict, and the time span of the processes.

One area this thesis contributes to, where previous research is still limited, is the application of a holistic view of UD in the field of the built environment. It is an approach that links together the urban development process and the built environment, where UD is applied in different scales and phases. It is both about finding ways to implement Universal Design on a time scale and on a spatial scale.

3 Theory

The theoretical framework of the thesis is built upon theories and concepts that elucidate the research findings from four different perspectives: governance of community planning (3.1); categorisation of users (3.2); planning dilemmas (3.3); and Universal Design theory (3.4). Each perspective represents theoretical tools used in the analysis and discussion of the findings.

3.1 Governance in community planning

There are many different theories on governance, with different purposes. The governance concept, which has been widespread since the 1990s, is still understood and used with different orientations. Some orientations focus on network interactions, while others, for example, are about how different kinds of governance contributes to innovative ways of solving societal problems (Ansell & Torfing, 2016). Governance can also be about changes in decision making, involving public and private actors, and the civil society. The traditional understanding of *governance* was that it was more or less synonymous with *government.* However, this has changed, to a use of governance that signifies changed ways to govern the society. Rhodes (1996) defines governance as:

> ‘a change in the meaning of government, referring to a *new* process of governing; or a *changed* condition of ordered rule; or the *new* method by which society is governed’.
>
> (Rhodes 1996, pp. 652–3).

In this thesis governance is used in the latter sense, that is, as new ways and processes of governing society, such as in public-private partnership. Theories of governance will be used as a lens to analyse the shift of power from formal, democratically elected forums to external actors and informal networks, specifically in the field of community planning and urban development. According to this definition, theories of governance reflect the stepping back from, or an alternative

to the state and institutional forms of government. The focus is on the role of government in governance. How are the formal, democratic governing principles and ideals are affected by the informal networks in planning and construction? How does the impact of interdependency and power relations between public and private actors have an impact on the urban development processes and the built environment?

In an ideal model of governance, the concept is described as decentralised decision-making based on negotiation and cooperation. In a governmental inquiry on management of disability policy, governance is highlighted as a preferable management model, based on all actor's commitment, responsibility and resources (SOU: 2019a: 23, pp 108-116). In the research focus in the field of governance, there are processes where common goals are defined and implemented (Peters & Pierre, 2016). Governance is still a young field of research, with a diversity of overlapping theoretical discussions (Ansell & Torfing, 2016).

Governance, in the sense of informal organisation of power, has grown strongly in importance in temporal parallel with neoliberalism and NPM, and has a clear connection to these ideas (Peters & Pierre, 2016). The NPM reforms limit the power of elected bodies in favour of strategic goal management. A basis for this development has been the transfer of responsibility and production of public services to private actors and to public buy-and-sell systems. The challenges produced by NPM have resulted in a fragmentised public sector, which has caused an increasing need for interaction between public and private actors (Ansell & Torfing, 2016, p. 7). These changes in the administrative policy model are clearly connected to the changes in planning conditions described in Section 2.2 and are in line with the ideas of pushing back of the state, of blurring boundaries between the public and private sectors, and of transferring responsibilities to the private and civil sectors, and to individuals (Stoker, 1998/2019). The importance of governance grows both because of society's increased complexity as a result of globalisation, and because of the state's reduced capacity to govern (Peters & Pierre, 2016).

As governance in this sense is about self-governing networks of actors, the dilemmas that arise are linked to democracy and the difficulties of accountability. In research, it is well known that governance also can cause problems. When, applied to my research, some special terms become highly relevant, namely the problems of responsivity, responsibility, and integrity (Pierre, 2018).

Responsivity, when applied to urban development processes and the context of this thesis, raises questions about the ways in which the urban development actors are responsive to citizens' need for an accessible, usable, and inclusive built

environment, for example? Responsivity touches the limitations of the formal citizens' dialogue (Allmendinger, 2017, pp. 264-; Tunström, 2009) and whose voices are being heard. Social responsivity presupposes interactions that lead to communication arising in the interaction (Asplund, 2004). But such interactions will only take place among involved partners. This exposes the fact that citizens and the civil society are not regarded as equal members of the network or governance in planning. In a network, the interests of the network members are considered first. The ability and willingness to look beyond one's own interests may be limited. Applied to urban development, complications arise if the network takes over responsibility on behalf of public institutions, without ensuring the interests that exist outside the network.

Responsibility in this context relates to citizens' possibilities to demand democratic accountability, and how people can claim their rights from actors outside the public sector, for instance, when being excluded from housing or public buildings and places. When decisions affecting the individual are made by elected representatives or their delegates, there are formal democratic ways to claim ones' rights. Values of a just society, such as equity, diversity and democracy (Fainstein, 2013) are included in public policy, but are rarely included as requirements in contracts and agreements with private actors.

Integrity – How do we know that the decision-making in networks is made with respect to law and equality? Our trust in public institutions rests on the existence of rules for transparency, responsibility, equal treatment, and that applicable laws are followed. This can be disturbed by the reduced openness that follows by governance.

Urban development and the planning and construction processes constitute a clear example of a field where governance is practised. However, it is performed with a limited or low level of interaction with those who are affected by decisions and the outcome. This highlights the democratic dilemma from yet another point of view. Young (1990) claims that the normative legitimacy of a democratic decision depends on the degree to which those affected have been involved in the decision-making process or been able to influence the outcome.

3.2 Categorisation of users

Every planning process includes the considerations of users. In some such processes, the image of the user is stronger than in others. An example of this is when the planning of buildings or places is related to certain ages or activities. But ideas about the user are also clearly present in the planning of the built environment in general. In this context it becomes highly relevant to go deeper into theories on categorisation.

By categorisation we distribute items into classes or categories, understood to be of the same type. As such, it is an active action, done by someone directed at someone (Ericsson et al., 2020). Social categorisations are made on basis of social information about the individuals, such as gender, age, race, or disability. It is closely linked to classification and standardisation, where each standard and category values certain perspectives as being higher while silencing others (Bowker and Star, 1999; Ericsson et al., 2020). The categorisations of user and user groups are often made in policies and community planning, however often with the motive of supporting groups that otherwise are disadvantaged for various reasons. Problems that arise concern, among other things, how categories are mutually exclusive and excludes the possibility that an individual belongs to different categories, simultaneously or in different contexts. Categorisation of bodies, people and roles reinforce a norm-deviation thinking (Hedvall et al., 2022) which in turn contrasts sharply with concepts such as human diversity.

Theories on categorisation were used in this thesis to specifically analyse and discuss *persons with limited mobility or orientation capacity* and similar classifications and standards that are directed at people with disabilities; and the effects this has in the form of special solutions and exclusion, in the built environment.

3.3 Planning dilemmas

Contemporary planning is dominated by the sustainability-paradigm, but the three dimensions (environmental, social, and economic sustainability) are not equally prominent in the planning practice (Peters, 2016; Wolbring & Lisitza, 2017). Urban development has a clear economic driving force, in today's planning paradigm that is influenced by neoliberal currents of ideas. However, there are reasons to take a deeper look into the arguments and driving forces in urban planning that are

connected in various ways with sustainability arguments. Environmental and social sustainability have common values and motives in many respects, not least of all in opposition to economic driving forces. On the other hand, environmental sustainability is used as an argument, for example, for denser cities, a phenomenon that is said to benefit both ecology and the economy (Kotkin, 2016, p. 9; Berghauser Pont et al., 2021).

All three sustainability dimensions should be considered when discussing a built environment with human diversity and UD as guiding principles. With focus on the human-environmental relation, an analytic lens to cover conflicts, similarities and differences and a balance of sustainability dimensions in urban development is needed.

In the *'Planner's triangle'* Campbell illustrated the planning priorities and core conflicts between the three sustainability dimensions (Campbell, 1996). The hypothesis is that sustainability cannot be reached without confronting and solving the triangles' conflicts. The tensions between the economic development, environmental protection and equity/social justice of the planning goals were identified by Campbell as 'the resource conflict' (between economic goals and environmental protection); 'the property conflict' (between economic development and equity/ social justice); and 'the development conflict' (between environmental protection and equity/social justice) (Campbell, 1996). The model illustrates the gap between the ideal - sustainable planning - and the fragmentation of the practice. According to Campbell, the planners define themselves by where they stand in the triangle, and the ideal picture of sustainable development leads to the centre of the triangle, in an ongoing process of solving conflicts (see figure in Campbell, 1996). The triangle also shows a hierarchy between the dimensions: *'Economic interests usually displace environmental concerns, which in turn repeatedly trump social justice goals'* (Campbell, 2016, p. 391-392). An example that Campbell raises is how the environmental interests of the middle class always come before the interests of marginalised residents (Campbell, 2013).

The *Planners triangle* was used in the analyse of aspects in urban development processes that were affecting the built environment in relation to UD, and in the discussion on the disabling gap between human conditions and what the environment will afford.

3.4 Universal Design – theory

The theoretical content of the concept of Universal Design has been criticised for being poorly developed (Imrie, 2012a; Lid, 2013). For a long time, the seven principles elaborated at the end of the 1990s (Connell et al., 1997) were at the forefront of the understanding of UD. The discussion of UD as theory has been ongoing almost as long. Viewing UD as a 'melting point between cross paradigms', D'souza discussed that UD perhaps could operate as a universal pragmatic system since it could, as well, come under the functionalist paradigm as the pragmatic, positivistic, normative and critical theorist paradigms (D'souza, 2004).

An ongoing discussion and elaboration of UD's content and conceptualisation has taken place during the decades that have passed since the introduction. With the development of eight goals of UD the authors moved further and explained UD as a

> "..,process that enables and empowers a diverse population by improving human performance, health and wellness and social participation"
>
> (Steinfeld & Maisel, 2012).

Lid proposed the need to develop UD with a stronger focus on dimensions related to the concept of human and the understanding of disability as a dimension of human diversity (Lid, 2013; 2020). Lid also suggested an analytical approach to Universal Design, accessibility, and usability by differentiating between macro, meso, and micro levels. At the macro level, Lid places UD as a principle, value base, and strategy. The meso level is the institutional level with laws, regulations, prescriptions, standards and guidelines. The micro level is about experiences and usability on an individual basis. Lid argues that UD is relevant to use as a political and legal concept on the macro and meso levels, while accessibility and usability are more relevant to use on the micro level, since UD is not directly possible to experience by the individual (Lid, 2013).

The understanding of relationships between UD, accessibility and usability are still a key aspect of UD content and approaches. One interpretation suggests that the base for analysing accessibility has both an individual and an environmental component. With the addition of an activity component, the more complex term *usability* is used, while UD is primarily seen as being more process oriented. The three components complement each other, but there are also signs that a harmonisation between the concepts is on the way (Hedvall, Ståhl & Ivarsson,

2022). As UD now has a clearer impact on Swedish policy, questions are raised about implementation and application. UD goes beyond the minimum requirements for accessibility, while legislation and regulations risk going in the opposite direction, by lowering existing minimum requirements for accessibility (Hedvall, Iwarsson & Ståhl, 2022; SOU 2019b).

UD has a radical potential to bring about change, and to raise attention to spatial practices that produce or reproduce exclusion and inequalities (Steinfeld, 2023). Challenges for UD were brought to the fore in an analysis of the conceptualisation of UD in Swedish policies. One challenge was how to convey that UD is design for everyone and how to move away from a thought pattern of norm and deviation. Ericsson et al., argue that there is a contradiction between Universal Design described as being for everyone, while it is addressed in policies as being for a specific group, namely persons with disabilities. This means that existing inequalities and lack of sustainability remain. Furthermore, Ericsson et al., argue that another challenge is that the existence of an average body is continuously presumed, where norm-deviation thinking is maintained which hides that diversity exists in any population (Ericson et al., 2020).

Lid also argues that it is necessary to involve people's experiences of disability and accessibility to develop the theoretical content in UD. Lid used phenomenology and hermeneutics as theoretical perspectives, along with critical realism, to highlight the individual and the interaction perspectives that need to be connected to UD and contribute to new knowledge about how individuals experience disabling barriers (Lid, 2013). Such knowledge of what is in the gap between a persons' abilities and what the environment can offer is central when it comes to a deeper epistemological grounding of UD. Both individual and environmental factors need to be involved to understand disabling and enabling mechanisms and structures in the person-environment interaction (Lid, 2013; Lid & Solvang, 2016; Hedvall, 2009). From a human right -perspective, UD could be a strategy actualising the full citizenship for all (Lid, 2023).

Applied to urban development and planning and construction processes, UD has not been recognised to any satisfactory degree as a tool to meet complexity in planning for human diversity. On the contrary, UD is often presented as something very easy to do (Mace, 1985), just good design and good business for everyone. This was criticised by Hamrie who pointed out the necessity to orient UD towards disability justice (Hamraie, 2017).

There is a gap in UD research when it comes to see how UD can be applied both within the process and the outcome in the built environment, especially when it is

not about a single building project, but when it comes to the overall picture. Knowledge about how UD can be used for a more inclusive design at the city level is described by various researchers (Steinfeld & White, 2010; Steinfeld & Maisel, 2012; Maisel et al., 2017; Burton & Mitchell, (2006), but more research is needed on how individual projects are successively linked together in a UD approach on an overall level and feed into traffic policies, sustainability work, existing built environment etc. The need for such an approach becomes particularly striking in relation to the administration's functioning in NPM and governance. This leads in the opposite direction to fragmentation in planning.

The built environment is not one single product, but an entirety with details in constant change. Every new single project process includes large time spans and many actors and is often planned with limited regard to the surrounding environment. I use theories on UD as points of departure and references in Chapter 6. There I elaborate on UD's potential and implementation in urban development processes, and where I regard UD both as a process (in a time and planning chain) and as an outcome in the built environment on all levels of urban form (the spatial chain).

4 Methods

This chapter describes and discusses my choices of methods in terms of the research approach (4.1); the studies, materials, and analyses linked to data collection (4.2); reflexivity and transferability (4.3); selection of participants (4.4); ethical considerations (4.5); and methodological limitations (4.6).

4.1 Research approach

The research presented in this thesis is located in the intersection of multidisciplinary research fields. This has had an impact on the choice of methods.

In the different studies I tried to capture the thoughts, actions, and outcomes of the urban development processes and in the planning and construction processes, and their impacts on the individual user. I also analysed the presence, absence, and conditions for using UD along these processes. This involved different perspectives and paradigms that led me to use mixed methods, and the use of inductive and deductive approaches in my exploratory qualitative research.

Triangulation was used in the research strategy, on the overall level but also in the studies. Triangulation is often used to doublecheck findings both in qualitative and quantitative research and can be used as a research strategy in qualitative research (Bryman, 2016). In addition to the traditional qualitative methods such as interviews and observations, workshops, documents studies and go-along interviews were also used.

4.2 Methods, materials, analyses

The studies were carried out with a mix of design and methods. On the overall level, triangulation and pattern matching were used.

The methods used included documentary studies, a multiple case study with field observations of construction projects, interviews with professionals, photo elicitation and process mapping in workshops, and go-along interviews, see Table 1.

Table 1. Overview of methods, studies and papers.

Methods	Study	Papers
Document studies Qualitative content analysis of texts, photos and illustrations in 15 policy- and planning documents. Analysis of categorisation of users.	*1*	*Paper I:* Young, Mobile, and Highly Educated Cyclists: How Urban Planning and Policy Dis/able Users. Paper V: Who Are We Building for? Tracing Universal Design in Urban Development.
Field observations Analysis of photos, go-along interviews, planning documents and physical artefacts in a multiple case study of new constructions and remodelling projects.	*2*	Paper II: Planning for Human Diversity: Design Patterns of Universal Design. Paper V: Who Are We building for? Tracing Universal Design in Urban Development.
Workshops with involved professionals. Photo elicitation of collected photos from the different cases in the multiple case study. Process mapping of cases.	2b	Paper III: Visions of a City for All. Resources, Choices, and Factors Supporting and Impeding Universal Design in the Urban Development Process Paper V: Who Are We Building for? Tracing Universal Design in Urban Development.
Semi-structured interviews Interviews based on the outcome of workshops, with professionals from the public and private sphere, involved in urban development.	*2b*	Paper III: Visions of a City for All. Resources, Choices, and Factors Supporting and Impeding Universal Design in the Urban Development Process Paper V: Who Are We Building for? Tracing Universal Design in Urban Development.
Go-along interviews with involved professionals. Qualitative content analysis, with elements of critical discourse analysis of underlying documentation. Go-along interviews with citizens in three cities. Pattern coding of collected data.	2a 3	Paper II: Planning for Human Diversity: Design Patterns of Universal Design. Paper IV: Is the City Planned and Built for Me? Citizens' experiences on Inclusion, Exclusion and (Un)equal Living Conditions in the Built Environment (submitted).

The methods of the research strategy were selected to ensure that the research questions could be elucidated in several different ways and from different perspectives to strengthen the validity of the findings.

Depending on the complexity of the research area, it was justified to prioritise that many different voices could be heard in the material, both involved actors and users of the built environment. The analysis of planning and policy documents and the number of photos from field studies were a valuable complement to the data from interviews with actors and users.

4.2.1 Document study

A document study was carried out in Study 1. Fifteen 1 planning and policy documents were selected from a medium-sized Swedish city and were analysed using a content analysis of texts and images/illustrations (Bergström & Boréus, 2005; Hellspong & Ledin, 1997; Ledin & Machin, 2018). The strategic selection of documents covered large parts of the process, including documents such as a comprehensive plan, detailed development plans, design programmes, entries in architectural competitions, and local policies on mobility planning.

The aim was to identify how users of the physical environment are presented and categorised at an early stage of the planning process, in policies and guidelines for the built environment. A text analysis was performed on the written material and a visual analysis on photos and illustrations. Direct and indirect categorisations of users were identified in the materials and grouped into thematic categories. The findings were discussed in relation to possible consequences for the user, with a particular focus on people with disabilities (Paper I).

4.2.2 Field observations

Study 2 involved field observations (Yin, 2011), go-along talks (Kusenbach, 2003) with staff from the city administration, workshops and interviews with public and private actors. A qualitative multiple case study (Yin, 2018) was carried out on a selection of new construction projects and reconstructions of older culturally protected properties and urban environments. They were studied against the background of principles, values and goals of Universal Design. By searching for UD in the completed projects, this part of Study 2 aimed to find patterns of what supports or opposes the implementation of UD in the built environment (Yin, 2018). As a complement to the field observation, underlying documents for the selected projects were collected and analysed (Schreier, 2014; Boréus & Kohl, 2018).

4.2.3 Workshops

After the multiple case study, four workshops were held with involved professionals from all phases of the urban development process, such as the city's administration staff, planners, builders, developers, and architects. The purpose of the workshops was threefold:

- to find critical factors and phases in the process where UD risks being lost (Paper II)

- to identify choices and decisions that were made during the process and that contributed to inclusive or exclusive environments in the finished outcome.
- to determine what support was needed to better include UD from an early stage in the process.

A sequential research design (Creswell, 2003); in the form of Bryman's explanatory-sequential research design (Bryman, 2016) was used for the qualitative analysis of collected data (Paper III).

4.2.4 Semi-structured interviews

The workshops were followed by six semi-structured interviews, conducted with a selection of participants from the workshops. Among the interviewees were involved staff employed at different departments of the city, and private actors as representatives of building companies. Photos were used for their reflections on the cases discussed (Harper, 2002).

4.2.5 Go-along interviews

In the final study, Study 3, I conducted four go-along interviews (Kusenbach, 2003) with 16 participants in three cities in Sweden. The method was chosen to get a holistic, in-depth understanding of how people relate, or do not relate, to the spaces in their cities and what their day-to-day experiences of inhabiting this place are like. The purpose of this study was to find out which factors in the built environment affected people with different conditions to be included and participate in the built environment, their experiences of belonging in the city, and which strategies they used to deal with obstacles in the environment. The interviews were analysed thematically, aimed at finding patterns in the participants' answers on their experiences of the environment that they visited (Yin, 2011, 2018; Bryman, 2016; Kvale & Brinkmann, 2014). (Paper IV).

4.3 Reflexivity and transferability

My own background and position as accessibility expert with a long working experience in the field, both as an employee in the public sector and as an entrepreneur in the private sector, have had an impact on my methodological

choices and considerations, mainly through the knowledge of the complexity of the processes and the number of actors involved, which among other things, led to the design of studies concentrated on different phases in the process.

My professional knowledge also had an influence on my understanding of the findings and my conclusions. This is something I have tried to consider all through the process. Possible preconceptions and the habit to discover deficiencies in the built environment might have made an impact on the research, without distorting the results for that reason. The reliability and validity of the findings were strengthened through the different methods chosen for data collection and analysis. The use of different methods for data collection, such as triangulation and observations in-situ, has reduced the risk for pre-assumptions that could influence the results (Bryman 2016; Yin, 2018).

Considering the transferability of the findings, my research is placed in a Swedish context. However, despite a common national framework for building regulations and disability policies in Sweden, there is a plan monopoly on the local municipal level. That means, theoretically, that exploring visions, thoughts and actions on the local level can vary in 290 different ways in the country. The selection of cities in this research was among those that were participating in the research project in which my research took place and where I had access to underlying documents. But when taking global urban development trends and global conventions into account, the transferability of findings could reach far beyond national borders.

4.4 Participants

Participants in the studies has been both professionals and citizens.

In Study 2, professionals from the city of Gothenburg took part in the field observations. The staff were involved in the project, and others invited by them to contribute with information during the process.

In workshops and interviews in the second part of the study, the participants were professionals from the city and private actors, such as developers and staff from architect firms. These were invited through the City's Real Estate Department, and represented different departments and companies involved in urban development processes.

The six interviews were held with strategically selected public and private actors representing different roles and responsibilities in the urban development processes.

The aim was to get as broad a selection as possible, when it came to roles, responsibilities and knowledge of the processes discussed.

In Study 3, 16 participants from three cities participated. Invitations were sent through the cities (with regard to General Data Protection Regulation [GDPR]) to persons involved in municipal dialogue councils, such as the accessibility/disability council, youth council, older persons council, and integration councils, see Table 2

Table 2. Overview of studies and participants

Study	Participants
2	Professionals from public and private sector in urban development, planning and construction: Employed by the city (representatives from five departments) Developers Architects Consultants
3	Citizens involved in Municipal advisory councils such as those related to accessibility and ageing The municipal initiative “Developers of the future” Civil society organisations (disability, ageing)

4.5 Ethical considerations

The ethical principles for social sciences from the Swedish Research Council (Swedish Research Council, 2017) have been considered. None of the studies touched on personally sensitive information and did not require ethical approval from the Swedish Ethical Review Authority.

However, ethical considerations still had to be made, for example when formulating questions for interviews in Studies 2 and 3. In Study 2, the questions could get too personal if they touched areas where the interviewee was responsible for obvious mistakes found during the field observations. In Study 3, considerations had to be made not to ask questions that were too personal in relation to the persons abilities or disabilities. All participants in interviews (Papers II, IV) received and were asked to sign a consent form including their conditions and rights related to participation. Recordings from interviews are securely stored in line with Lund University’s regulations.

4.6 Methodological limitations

One of the limitations in Study 2 (first part), and Study 3 concerns the choice of participants. In both cases, I could not freely choose the participants. In the first part of Study 2, the participants were invited to the workshops by the city, as this was part of a project run by the city's Real Estate Department. For the interviews carried out in the second part of Study 2, I was able to make a strategic selection of the participants based on the outcome and findings from the first part.

My research questions are focused on matters linked to accessibility and Universal Design in the built environment. The concept of Universal Design addresses 'all users' but has its roots in the field of accessibility for people with disabilities. A limitation in this sense is that my focus on accessibility and disability may have resulted in me not observing features and factors that exclude people from the built environment for other reasons, but where Universal Design still might be a valuable approach.

The issue of disability is related to context and situations, and the urban development processes are highly complex. The possibility to generalise based on the findings is therefore limited. In this context, my own role and background can be both an asset and a limitation. My research can contribute to strategies and methods to implement a UD- approach through the entire process, in that it shows patterns that contribute to or counteract UD. Important path choices are identified, but opportunities for successful strategies are also dependent on local conditions, the context and the people involved in each process.

5 Findings

This section presents summaries of the most important findings reported in each of the five papers (5.1). This is followed by a thematic presentation of the overall findings from the completed studies with examples taken from collected empirical evidence (5.2). The third section presents a description of the specific challenges in implementing UD in the planning and design of the built environment observed in the studies (5.3). An overview is included of the factors impeding UD in its implementation in the various phases of the urban development.

5.1 Summary of Papers

The thesis consists of three studies, that is the basis of the five articles included.

5.1.1 Paper I: Young, Mobile and Highly Educated Cyclists: How Urban Planning and Policy Dis/able Users

This paper reports on the analysis of policy documents, programmes, and development plans in a medium-sized Swedish town.

In total, 15 documents from different stages of the planning process were selected. The aim was to identify the categorisation of users that were carried out in the strategies, policies, and guidelines for the built environment. The findings were discussed in relation to possible consequences for users, with a particular focus on persons with disabilities.

Patterns of inequalities were found throughout the materials, within and across groups of users. The findings reflected a clear picture of a disabling society, in conflict with established policies on a society for all. Certain groups, such as older persons, and persons with disabilities, were made invisible, while youth, health and mobility were put in the foreground as the prevailing norm.

5.1.2 Paper II: Planning for Human Diversity – Patterns of Universal Design

Paper II reports on a multiple -case study of eight completed construction projects in a Swedish city. The study included both new constructions and remodelling projects.

The aim was to identify patterns that supported the implementation of UD in the built environment, and to identify critical phases and events in the planning and building process when UD was at risk of getting lost. Among the patterns found in support of UD, were design solutions that did not separate people, and where low demands were placed on the users' abilities. Other UD supportive factors were the flexible solutions and a conscious shift of focus from person to function.

The unequal environments found in projects were characterised by the categorisation of users, and where high demands were put on users' abilities. Urban trends, such as densification and mixed-use areas, and an unbalance between the environmental and social sustainability dimensions seemed to work against UD values and goals and raise the demands on users' abilities.

Moreover, UD seemed easier to implement in existing buildings than in new constructions, despite the significantly more challenging conditions, involving technology and the protection specified in cultural protection laws.

5.1.3 Paper III: Visions of a City for All. Resources, Choices and Factors Supporting and Impeding Universal Design in the Urban Development Process

Paper III reports on findings from the second part of Study 2. Findings from the first part of the Study were used as a base for workshops and interviews in the second part of the study. Public and private actors in the process were involved in the workshops, and some of the participants in workshops were selected for interviews.

In four workshops with 28 participants, the planning and building process was discussed, from the end (late stages) back to the start (early stages). The aim was to find choices and factors during the process that caused the exclusion of users in final constructions. Another aim was to determine what tools and support were useful for the actors in implementing UD in the different phases of the projects. The workshops were followed by interviews with six selected participants of the workshops.

Critical aspects in the process were identified, along with conflicting visions and goals, and resources, support, and tools needed for the implementation of UD. Paper III concludes by addressing seven recommendations for the city, to meet the challenge of maintaining an early vision and the goals throughout the processes.

5.1.4 Paper IV: Is the City Planned and Built for me? Citizens' Experiences on Inclusion, Exclusion and (Un)equal Living Conditions in the Built Environment

Paper IV reports on Study 3, go-along interviews performed with citizens in three Swedish towns and cities of various sizes (a small, a medium, and a big city).

The aim of the interviews was to gather the users' views on the conditions that were necessary for them to visit the city centre, what barriers they might experience that either made them change routes or avoid the area, and what kind of environments they experienced as welcoming and inclusive.

5.1.5 Paper V: Who Are We Building for? Tracing Universal Design in Urban Development

Based on the findings of Studies 1 and 2, some particularly critical areas were highlighted for further discussion in Paper V. These included:

- the competing and conflicting interests in the urban development processes, inside the city's organisation and between societal interests and economic profit interests;
- positive and negative forces in the implementation of UD; and
- how the absence of a human-diversity perspective distorts the conception of the user's conditions and abilities. (Paper V).

5.1.6 Summary

The findings from the studies, presented in the five papers, provide a clear picture of how citizens are excluded from city life, neighbourhoods, and from many of the activities a city can offer due to barriers of different kinds.

The cities' attempts at improving accessibility and usability are fragmentised, and sometimes even counteractive to UD values and goals. Measures in the existing environment to improve accessibility often end up with special solutions that

become stigmatising. When it comes to opportunities to influence city planning, most participants viewed that it was difficult or impossible, although some were active in citizen dialogues. Four aspects especially related to barriers according to the participants were issues concerning 1) ground cover material/deficiencies in the street space, 2) mobility, 3) car parking, and 4) signage/wayfinding.

5.2 UD and the built environment: from early visions to users' experiences of the built environment.

In this section, the findings are presented, divided into factors from the phases of the process that influence the conditions for implementing UD in the built environment:

- Norms and categorisations of the user.
- Trends in urban development and planning practice.
- The user perspectives.
- Strategies and examples supporting UD.

The three studies together make visible how decisions and choices during the various phases of the planning and construction process contribute to a built environment that largely assumes that the intended user belongs to a relatively limited proportion of the population. Guiding ideals in contemporary community planning place demands on the user's abilities, which are not consistent with overall visions and goals of building a society for all. There is a clear gap between global sustainability goals, conventions, and national policies on the one hand, and the outcome of completed construction projects on the other.

5.2.1 Norms and categorisations of the user

Early in the process, thought patterns can be found that in different ways affect the extent to which the finished environment will function regarding human diversity. The imprints of these thought patterns appear in different ways and in several cases run like threads throughout the course of the planning and construction processes. Thought patterns, in the view of users, drive the norms, values and categorisations of users, and are common already during the early planning stage (Paper I). They are driven by urban planning trends and conflicts of interest, among other things (Paper III), and they are clearly found in selected design solutions (Paper II). The

thought pattern also affects the user's experience of the built environment (Paper IV).

The exclusion of persons with disabilities and elderly people that is brought to the fore in this thesis, starts in their invisibility in policies and planning documents, and continues in the actors' priorities and management during the planning process, on to the creation of inaccessibility and special solutions in the completed project. This is what was found in the users' experiences of the built environment. Examples of this can be found in the planning documents where:

- mainly young people and cyclists appear in the illustrations (Paper I, p. 132).
- all 'non-stair walkers' in the Viva Housing estate were excluded (Paper II, p. 90).
- the administrations' opposed outdoor elevators (Paper III, p. 74)
- there were many public spaces with inclined, cobbled walkways (Paper IV).

In many of the environments that were included in the study, and which created unequal conditions or the exclusion of certain users, one can find ideas, images and expectations about humans that do not correspond to human diversity. Examples are the thought patterns of what people should be able to do, such as walking, cycling, having quick reaction skills, and more. Such thought patterns can be found among expressions about citizens' 'right' and 'wrong' behaviour in the planning documents (Paper I). They can also be found in the unspoken requirements to be able to use stairs and to cycle and manage complex environments, such as *shared space* and *open working landscapes* in a school (Paper II), or to move about over large areas with uneven ground cover (Paper IV).

Recurringly, it is also about a distinction between people within and outside the current norm (Papers I, II, III, IV). Human diversity, including functional impairments, are often overlooked in planning, and persons with disabilities are regarded as a particular kind of person that cannot use mainstream solutions. This leads to the shaping of special solutions that create inequalities in the built environment, for example, through signage that points out certain types of users instead of the function the room or the place has (Figure 1). Other examples are separate entrances for those who need a wider passage; or special entrances for those who cannot climb stairs (Figure 2), (Paper II, p. 89-90).

Figure 1: The sign shows two types of users for this changing room: wheelchair users and people of all gender/or no gender. Instead it should show the function of the room – an individual changing room.

Figure 2: An entrance to a bakery in a newly built building where the level to the entrance is not even with the level of the pavement. According to regulations this difference should not be there. It could have been smoothed out by ground planning. Instead, a ramp has been built for those who cannot use the stairs.

5.2.2 Trends in planning practice and urban development

The thought patterns that appear in the studies have different foundations and origins. In the papers, I have shown links to contemporary urban planning trends and ideals, which cause problems and challenges to create a built environment that is characterised by UD values and goals. Such factors can be traced in several different areas, from vision and planning to finished construction.

Some of these are about how densification and high exploitation leads to a reduction of open and green areas. This does not only affect the possibility of creating flexible solutions for increased accessibility, but also reduces areas for movement and play (Figure 3), provides limited light penetration in homes (Figure 4), fewer green areas, longer walking distances, car-free streets, increased noise and more. Plots that were previously rated as unbuildable for reasons such as difficult topography or to protect green areas are being built on at a high pace without considering perspectives such as human diversity (Paper III).

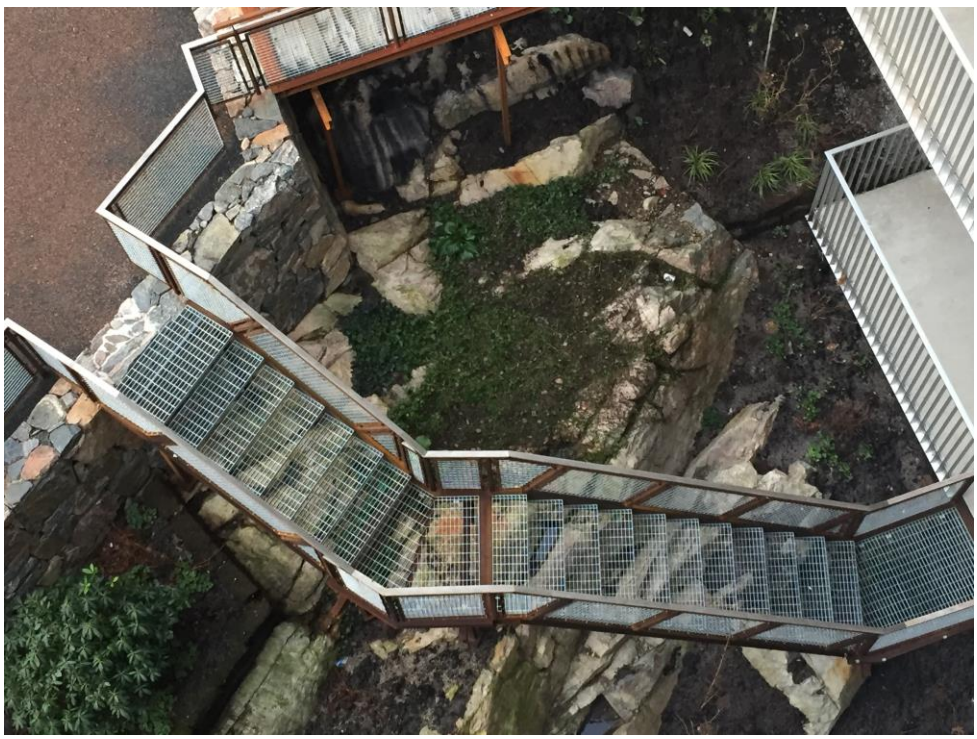

Figure 3: In addition to the lack of accessibility to the outdoor environment, there is a lack of space for living and playing in this highly exploited densification project.

Figure 4: The goal of squeezing as many apartments as possible into this densification project has also led to a lack of daylight in apartments.

Densification and high exploitation are further reinforced by the gap that emerges between policy and practice (Papers II, III, IV). In the early visions, there are thoughts about how to plan and build for all users, while the detailed questions about accessibility and usability for people with disabilities will be dealt with late in the process. During the planning and projecting phases there is a void where UD values and goals risk being lost. The lack of preliminary studies that also address a human diversity perspective contributes to unclear orders and requirements, and the lack of clarity around social sustainability perspectives in relation to environmental aspects can further weaken the UD approach (Paper III). Solutions in late stages can instead turn out to be special solutions for some users, or that people with a need for good accessibility will be completely excluded from the finished environments (Papers I, II, III).

Complex environments as an outcome of mixed-use ideals can be found in Paper II and IV. The concept of shared space for mixing traffic types was perceived by the participants as very challenging for people with impaired vision, hearing, or orientation (Paper IV). Practical problems that arise when mixed use is applied in an existing environment, are found in Paper IV. A cultural investment in the form of a fixed summer theatre, also with planned accessibility adaptations in the street environment as a measure included in the project, was cancelled due to appeals from residents in the area. The mix of housing and outdoor events, attracting many visitors, was not accepted by the tenants due to the expected increased noise level (Paper IV).

Other examples can be linked to positions and ideas that have emerged in the discussion about what a sustainable lifestyle is like. Strong norms still characterise this discourse (Papers I, III), and an unbalance can be noticed between the three sustainability dimensions (UN, 1987; Hedenus et al., 2018), (Papers I, II, III, IV) where measures that are considered to benefit the environment and climate create demands on citizens that are unrealistic from the perspective of human diversity.

The influence of ingrained norms in planning practice can already be found in planning documents (Paper I) and in several examples in the case study (Paper II). Norms and categorisations are mechanisms behind observed special solutions and excluding environments. Inflexible design that places high demands on the user's abilities, divides and separates users, contributes to the exclusion of those who, for various reasons, cannot use the solutions offered. The observed patterns have been shown to lead to increased demands on users' functional abilities, which contributes to increased inequality and exclusion in the built environment (Paper II, p. 90-95; Paper III, p. 69-71, Paper IV). The effects are reinforced by urban planning ideals such as densification, high exploitation and mixed use, fragmented planning, and the use of standard solutions for many users and special solutions for others.

In all studies, various forms of gaps emerge such as the lack of agreement between vision and practice, between municipal administrations, and between the users who are included in the planning standard and those who are excluded. The gap between actual laws and building regulations and the deviant application and effects of this is most conspicuous in Papers II and IV. The consequences of planning practice such as densification and high development are further reinforced by the gap that emerges between policy and practice (Papers II, III, IV). In the early visions and comprehensive plans, a build-for-all-vision is present, while the detailed issues of accessibility and usability for people with disabilities are addressed late in the process. During the planning and projecting phases there is a vacuum where UD

values and goals are at risk of being lost. The lack of pre studies that also address a human diversity perspective, contributes to unclear orders and requirements. The ambiguity of social sustainability perspectives compared to environmental aspects can further weaken the UD approach (Paper III). Solutions in late stages risk becoming special solutions for some, or that people with a need for good accessibility are excluded from the finished environments (Papers I, II, III). The later in the planning and construction process, the more difficult it is to change incorrect solutions (Paper III).

In the research findings there is a clear pattern showing how the level of engagement of the public actors in the projects had an impact on the outcomes (Papers II, III). In the comparison between studied cases where UD values and goals have had an impact or not, there are common denominators. Certain elements in the process appear to strengthen the UD approach. Table 3 presents examples of which common factors were found in the processes where UD was more prominent, along with respective factors in the processes where UD was less prominent.

One of the conclusions in Study 2 was how UD values and goals were more prominent in the rebuilding of older, culturally protected buildings and places in comparison to the newly built projects. Table 3 reports some of the common factors that can be read from the basic prerequisites and processes in the remodelling projects, and where there is a clear difference in comparison with the newly built projects.

The most obvious differences between the projects and its processes are the differences related to ownership and management of the project, the overall purpose, budget, and focus of innovation.

Table 3: Differences of conditions in remodelling projects and new construction projects

	A Remodelling project	**B New construction project**
Developer	The City	Private companies
City's role	Owner and manager	Enabler Network actor
Aims	Update for future use Increase accessiblity and usability Extend the range of users Non-profit	Urban development /urban image Profit
Budget allocation	What was needed to obtain settled goals	Reduction of spaces and costs
Focus of innovation	Achieve the aims with kept cultural values Accessibility solutions in an old building	Minimise environmental footprint Mobility management Densification

A remodelling project (A in Table 3) was owned and managed by a municipal corporation. The basic purposes of the project consisted of the well needed maintenance, and the updating of the building (which was protected as cultural heritage), to todays' needs. These needs were expressed in three aims:

- to achieve a relevant standard for the planned city management office,
- to make it accessible for all, and
- to support increased public life at the square in front of the buildings.

The challenge was to achieve these aims and at the same time keep cultural values and contribute to more visitors. A detailed preliminary study on accessibility and usability was carried out. It resulted in several possible choices in terms of the degree of accessibility and the budget required. The city's council decided to choose the highest level of accessibility (the most expensive option presented in the prestudy).

The newly constructed housing area project (B in Table 3) was initiated when the city gave a developer access to a piece of land, previously rated as buildable depending on the hilly terrain and the need to save land as green areas. With reference to densification, this piece of land was pointed out for possible exploitation, containing around 60 apartments (Göteborgs stad, 2005). The developer was given free access to the land, initially for two years, later prolonged with two more years, depending on the time needed to set the detailed development plan (Göteborgs stad, 2011). Professionals employed by the city worked closely with the developer during the process. The contract between the city and the developer enabled 50-100 apartments and housing without carparking. A high environmental profile was set in the project, in collaboration with research. Social sustainability was discussed in the prestudies, but with a weak attention given for accessibility and usability. During the process a certified accessibility expert repeatedly noticed deviations from the Planning and Building Act and building regulations (Göteborgs stad, 2015).

The following findings from the studies can be linked to power perspectives:

- the absence of older people and people with disabilities in the planning documents (Paper I)
- the gap between policy and practice (Papers II, III, IV)
- the shortcomings in the internal collaboration within the municipality
- unclear demands on the private actors (Paper III)

These all shine a light on the power structures in the urban development process that become obstacles to a UD approach in planning and construction. Governance at the administrative and actor level leaves aside both active influence from citizens and the possibility of a democratic accountability. In urban development processes, dialogue with citizens can take place in various forms on the voluntary initiative of the municipality or the private actor. The building law only requires that interested parties must be able to provide comments on a proposal for a detailed plan that is already prepared. Governance in this form paves the way for an ever greater market influence where the citizen is left out (Papers III, IV).

The studies also reinforce the picture of how the number of actors involved and the long-time ongoing, shift from community power to market dominance impact issues of inclusion or exclusion in the built environment. The design of the city is planned for privileged groups (Paper I) and excludes users in the built environment (Papers II, III, IV). If the municipalities do not stand up for and protect the public interest and qualities such as accessibility and usability, there is a risk of losing the disability perspective in the planning process and becoming 'disability-blind' (Paper III).

The need for increased knowledge and collaboration throughout municipal organisations and between public and private actors and civil society is addressed in Papers III and IV.

5.2.3 The user experiences

In Paper IV, users describe their experience of their city. Many of the places and buildings visited in the studies were built environments owned or managed by the city, but also privately owned properties containing public premises.

Among the findings, many of the participants felt alienated in their own city. For people with reduced mobility, it was largely about inaccessibility that had not been remedied. Excluding barriers were open, visible and thus possible for governing municipalities to influence and change, with the help of current laws and regulations and with available technical solutions. Among other participants, an economic and digital exclusion also appeared. Paper IV reports that the most frequent excluding factors found during all go-along interviews were:

- large public areas covered with uneven cobble stones,
- stairs with no ramps or lifts as alternative,

- inaccessible entries or special designated wheelchair -entries located at the backside of buildings, sometimes connected to staff or kitchen entrances,
- lifts that were too small, or were missing,
- lack of understanding/bad attitudes

The lack of an overall holistic perspective in the municipality's accessibility work was recurring in the three cities where the studies were carried out. On the planning stage, it often stopped with discussions on parking spaces for people with reduced mobility (Paper III). Improvements that were made were only on a detailed level and were not connected to the environment in general. An overall and coherent strategy was missing (Papers III, IV).

Several examples also emerged of how the municipality's supervisory work to force private actors to remove barriers in the environment was de-prioritised, and how the municipality itself had initiated designs that made the use difficult or excluded users. Examples of this can be found:

- in design solutions in newly built municipal facilities (Paper II);
- in the construction of housing in a hilly, inaccessible terrain (Paper III);
- in the resistance to installing lifts in outdoor environments with large level differences (Papers III, IV);
- or in the consistent use of cobblestones as paving on walking surfaces (Paper IV).

Another form of unbalance between environmental and social sustainability forced users into unsustainable behaviour and solutions. Excluding barriers in the city centre forced users to alternatives that were considered not very good from a sustainability point of view, such as visiting external shopping centres because of their higher level of accessibility or taking the car instead of the bicycle to reach public facilities that the municipality had moved out from the city centre. Another example is how some users were referred to take the car to the city centre because bus stops for public transport were placed too far away from home. In practice this leads to exclusion as a result of the cities' active work against private cars, based on climate arguments (Paper IV).

Some important conditions, that made it possible for the participants to visit and stay in the city, were:

- short distances between destination points,
- the possibility of finding benches to rest on, a

- access to public toilets,
- lighting that reduces insecurity
- a coherent functioning level of accessibility in street spaces and buildings,
- possibilities for movement between destination points.

Attractive places worth visiting in the city were according to several of the participants, places with beautiful views, historically interesting buildings, and squares as meeting places. Places they would prefer to avoid for various reasons were streets with cobblestones as paving (Figure 5), places with signage that was difficult to understand, lanes without benches, and services located at a long walking distance from available parking lots (Paper IV).

Figure 5: A square paved with cobblestones, a typical environment that several of the participants in Paper 4 prefer to avoid visiting due to the lack of accessibility.

5.2.4 Strategies and examples supporting UD

Various examples in the studies show where UD values were perceived as integrated.

In the remodelled older culturally protected properties, there was a clear direction from the start to increase the number of possible users through increased accessibility and usability. The intention to reconstruct the buildings with the aim to open it up to all users in environments with strong building protection, also entailed higher demands for innovative thinking beyond the standard solutions (Paper II, pp. 84-87). The visions were followed up with prestudies, budget, and follow-up activities along the entire process. Dialogue with civil society was particularly significant in the redevelopment of a public place (Paper II, p. 86). In cases where UD-related values and goals took place in all parts of the process, it was also clearly visible in the finished result (Papers II, III).

Examples in the studies show how design that *places low demands on the user's abilities* supports UD and contributes to more realistic expectations of people's abilities (Figure 6). In examples from case studies and go-along interviews, it also appeared that these were mainly integrated solutions and not special solutions for certain users (Papers II, IV).

Figure 6: In this reconstructed park there are several benches with different design to fit different users. The paving is made even and smooth to encourage all users to use the park.

Several examples also show how equal use can be facilitated by *not separating users,* (Papers II, IV). The rebuilding of the entrances to Börshuset (Figure 7) and Röhsska Museum, and integrated stairs/lifting plates in both buildings are such examples (Paper II, pp 84-85). The "flex-step" solution is also an example of how more equal conditions can be shaped with the help of new technical solutions, and on how to built-in flexibility supports and facilitates equal use.

Figure 7: Users are no longer separated when entering this old public building. A new entrance, on the same level as the square, is located to the left of the steps.

Examples of how the *shift of focus from categorisations of individuals to the function of the building or space* can avoid singling out certain users (Figure 8) were found in signage and visualisations, and in features of the built environment. The designation of individuals instead of the function of the environment occurs both in the graphic and spatial design (Papers II, IV).

Figure 8: Many door openers are marked with a wheelchair symbol, but here it has been preferred to show what happens if you press the button: the door opens.

Examples and strategies in the findings, show a shift in the focus from how people fit or do not fit into the norm, to creating the greatest possible flexibility in order to meet human diversity. These are patterns that support UD, equality, and inclusion.

Measures to facilitate the conditions for implementing UD in the municipalities' urban development processes can be found in the seven recommendations in Paper III on page 76.

5.3 Implementing UD in the built environment – qualities, factors and features in planning and design.

Based on the findings from the three studies, certain factors and features emerge as being particularly important to integrate a UD approach and achieve environments that are feasible from a human diversity perspective. The factors and features described in the rest of this chapter constitutes the challenges and options that need to be met with well-thought-out strategies and solutions in the process and final outcomes. Examples from the studies show how these otherwise can create barriers and exclusion, but also how a UD approach can be supported by a conscious stance in these areas (Papers II, IV).

5.3.1 Holistic versus fragmentised planning

Several examples in the studies showed how the fragmentation in planning becomes an obstacle. A UD-approach needs to be present both throughout the process and in the final design of the built environment. As such, an overall picture on planning is presupposed.

The streetscape, a public building, a housing block, or park, are also like the single ramp, benches to rest on, or good lighting, single details in the built environment that need to be treated from a UD perspective all the way from planning to use and maintenance. But everything must also fit together in its entirety. Measures for improved accessibility in one building are of limited use if there are barriers in the surrounding environment preventing people from reaching the building.

Examples in the studies show how barriers evolved, not only from bad design of a single object, but also by factors in the surrounding areas. Accessibility as such is dependent on every link in the chain. The workshops with public and private professionals also revealed that there is a lack of such an overall strategy in the urban development. This can ensure the transfer of a UD -perspective from the vision stage to the detailed planning phase (Paper III).

5.3.2 Topography

How the topography can be a big challenge, especially in connection to urban development based on densification, became obvious in the studies (Papers II, III).

To build housing in hilly terrain requires lifts, ramps and parking spaces, among other things, to make it accessible and usable for persons with disabilities and older persons, or for anyone walking from the bus station with heavy luggage or grocery bags. Other influencing factors are how the buildings are designed and how they are placed in the area.

Several examples showed how the combination of high exploitation, densification, and policies to build closed blocks and avoid outdoor lifts, reduced the possibilities to make hilly areas accessible and usable for all (Papers II, III).

5.3.3 Space & dimensions

In the wave of densification, space is a quality at risk to be built away. Lack of space diminishes the use of the various solutions required to make accessibility and usability for all possible.

Shrinking spaces in houses make small apartments inflexible and increase the demand for housing changes, which is negative from an environmental point of view. With reduced space follows higher demands on users, a stricter mobility management, and considerable risks from health and environmental aspects. Two examples are the effects of effects of poorer daylight inflows in housing, and increased noise.

Among the examples from Study 2 was newbuilt housing with no stair-free access to the common facilities, and a lack of space to solve accessibility issues or to put in a playground for the children. Another example is public areas with a lack of space for safe pedestrian walkways because it was not separated from bicycle express paths (Paper II).

5.3.4 Distances

The distance between destination points is one of the critical factors that affects if and how a person can participate in city life and get between home, work, and activities. How far one can move is influenced by the individual's ability to move, state of health, fitness, access to various aids for movement, and more.

In the go-along interviews, the problems of using measurements in planning that do not correspond to human diversity came to the fore. For some people, 500 m can be a ‘walking distance’, for others 10 m can be a challenge. And sometimes the day's form and the temporary state of one’s health can determine how far it is possible to move. Paper IV describes how three people with different types of mobility impairment and the use of different aids (wheelchair, walker, cane) all depended on strategically placed parking spaces to be able to carry out their errands in the city. The parking lot's location was decisive for which activities, places, shops they were able to visit. Public transport was not an option for any of the three, because of inaccessibility of vehicles, stations or stops. Distance also matters. Stops in peripheral residential areas are often located at longer distances, and here the very challenge of getting to a bus stop or tram station can be decisive for using public transport, which may cause exclusion (Paper IV).

5.3.5 Modes of mobility

Each study showed how the cities’ mobility planning did not consider human diversity. The planning documents pointed out that the mobility management concept solely took walking, cycling, and public transport into account, as a strategy (Papers I, II). In the study of policies in the early phase, young persons and bicyclists

were the most frequently described citizens (Paper I). In the new constructed housing block, the only accepted transport mode to park in the garage were bicycles. Due to building regulations, a few parking lots for persons with reduced mobility and special parking permits were built outdoor. This is also an example of how raised demands on users' abilities create inequalities (Paper II), and how users are being categorised (Paper I).

5.3.6 Level differences

According to Swedish Building Regulations, entrances to all new buildings shall be accessible for persons with limited mobility or orientation capacities. In existing public buildings and places, level differences shall be removed when noticed (Boverket, 2013).

Nevertheless, examples of the opposite were found. In a newly constructed building, there was a level difference of 17 cm at the entrance to a public premises. Clashing strategies were considered as the reason for this. Level differences at entrances was considered by one of the cities' departments to be a good protection against flooding, and a new local policy was created (Paper III).

The presence of stairs, with no alternatives such as ramps or lifts, also appeared in new housing constructions, public spaces, and environments that originally were not hilly; and existing level differences in public spaces were never fixed. Stairs that also functioned as meeting places appeared in a school, a library, and in outdoor public places (Papers II, IV).

5.3.7 Ground surface

In all cities where the go-along interviews were arranged, uneven ground surface was observed as one main problem for different users, when moving around in the city centre.

One of the cities had settled on a strategy of how to improve the ground surface in the city centre with origins from the Middle Ages. Cobble stones of various dimensions and design are still used on pavements. The strategy is to integrate a walkable surface with even-levelled stones among the cobble stones. This measure should be done continuously over time in connection with water and sewage pipes replacement. As the timeframe is not set, it might take a long time to get a complete grid of streets that can be used to connect to each building and facility in the city. For the citizen in need of accessible walkways, the waiting might be long.

Another issue highlighted during the go-along interviews was the side sloping walkways. In some cases, these were a result of time (with deficient maintenance); in other cases, a result of a conscious choice to lead away water from facades. The difficulties that occur for persons using wheelchairs, walkers, prams e t c are considerable and constitute a risk for accidents (Paper IV).

5.3.8 Views and visibility

Participants in the go-along interviews expressed how views were an important factor for a pleasant and attractive environment, but also a point of reference in orientation.

In dense areas the open field of view is reduced. Thus, the possibilities of perceiving and orienting oneself in an environment can decrease. Single landmarks, on the other hand, were pointed out as facilitators for orientation (Paper IV).

5.3.9 Signage and information

Categorisation by signage came to the fore in several examples.

In one example the wheelchair symbol, was used on a dressing room in a newbuilt sports arena. It had an all gender-no gender symbol instead of indicating that the dressing room was a room for individual use. The wheelchair- symbol was also found on doors for the delivery of goods, resulting in backside entrances (Paper IV).

Important digital travel information for users of public transport and contrast markings for safety were placed on glass walls, making the readability completely dependent on weather and the amount of daylight (Paper II).

5.3.10 Health and safety aspects

Contrast markings, colours and tactile cues are details that were well taken care of in the remodelling projects in the case study, but often absent or poorly designed in new constructions (Paper II).

Participants expressed the lack of lighting in outdoor areas as being of decisive importance for their choice to visit an area or not (Paper IV). In one new housing area, the limited area between buildings resulted in low daylight flow into the apartments (Paper II).

The risks of noise were discussed in the Study 3, both as health and safety aspects The risk of increased noise, and thus increased health risks, was linked, for example, to new residential environments near railways. The decreased noise from car traffic in connection with more and more electric cars, made it more difficult to detect them, resulting in a safety risk in the traffic environment. (Paper IV).

5.3.11 Enablers for a day in town

Among important prerequisites for the opportunity to spend a day in the city or to participate in activities, the participants mainly mentioned three factors, reported in Paper IV:

- access to benches
- access to public toilets
- access to parking space

6 Discussion

The studies identified factors that affect the urban development process and the built environment in relation to UD. On the overall level, the thesis contributes new knowledge on the conditions for implementing UD from the perspectives of time, scale, and form, in the process and in the outcome.

The studies have indicated that there are several factors that can contribute to some parts of the explanations behind new, routinely created barriers; but the findings also show choices of paths that can lead in a different and more positive direction.

The findings are discussed in this chapter, based on different starting points:

a) *Changing the mindset towards a new planning paradigm*. Current habituated thought patterns and categorisations of users need to change, in order to put human diversity in focus for urban development, planning and building. The community's capacity to shape a built environment with more equal conditions for all users can be strengthened.

b) *Implementing UD on the time- and planning scale -from vision to practice*. Without having a UD approach all the way from vision to outcome, important factors and qualities risk getting lost, especially during the planning and projecting phases.

c) *Implementing UD on the spatial scale – from society goals to the single project*. This touches a holistic way to link the chains in urban development. To reach goals as full participation for all and an equal opportunity to use the built environment, is about linking the smallest components into a functioning whole on all levels of the urban form.

6.1 Changing mindset towards a new planning paradigm

An unrealistic and strongly normative image of the planned user leads to the arise of inequalities, where those who deviate from the norm are instead offered special solutions. These 'solutions' can often be exclusionary and stigmatising and entail additional costs in the projects. Categorisations of users based on these norms can, in turn, lead to a fixed view of 'us and them' (Bowker and Star, 1999; Hamraie, 2017; Ericsson et al., 2020; Hedvall et al., 2022).

The normalised use of special solutions such as separate toilets, parking lots and special entrances dedicated only to wheelchair users, etc. have contributed to a situation where policy and practice are no longer connected. The issue of accessibility is still to a large degree seen as added-on qualities for some users (Imrie & Hall, 2001), and focused on physical accessibility for persons with reduced mobility (Hall & Imrie, 1999; Carmona, 2021). Disability as deviations from the norm, categorisations and a narrowed image of the user are factors that stand in the way of building a society that includes human diversity (Hamraie, 2017; Ericsson et al., 2020; Hedvall et al., 2022; Boys,2014). The findings show possible ways to change old thought patterns.

In the thesis studies, there are several examples of how equitable and accessible design solutions came about: for example, it has been about strategies to increase the number of potential users, to open the cultural heritage to all citizens and because of the work to combine preservation and modernisation of cultural buildings. There are examples of how equal use was included in strategies and analysis, such as analyses of social consequences; but that these issues were also fragmented and divided into age, ethnicity, and more on an overall level.

In the examples from the remodelling of older culturally protected buildings (Paper II), the project owners have had, in several cases, the complicated task of updating older buildings and environments for future use. At the same time, budget funds were allocated to ensure that previous accessibility deficiencies, etc. have been removed. This placed high demands on knowledge and awareness in the process of identifying existing barriers and remedying them with the help of new solutions.

Such kind of 'awareness raiser' is missing in new construction projects. When creating new buildings and places, there is no point where a comparison takes place in terms of *Who was the user before?* or *How can we expand the range of users?* The actors in the process are completely dependent on that someone, preferably at a very early stage, involves human diversity- perspectives in the planning strategy.

Otherwise, the design will be based only on the limited frames of reference of the involved actors involved (Campbell & Marshall, 1999), with the risk of disabling the future users of the environment (Hall & Imrie, 1999, Lid & Solvang, 2016; Mosca et al., 2019, Wolbring & Rybchinski, 2013).

The UN: s Declaration of Human Rights was proclaimed in 1948 (UN, 1948). The EU: s Charter of Fundamental Rights of 2000 came into force in 2009 (EU, 2009). This was the same year as the UN Convention on Rights for Persons with Disabilities (CRPD) (UN, 2006; 2014), came into force in Sweden. As this is written, another 14 years have passed since 2009. It is time to consider all users and human diversity in planning theory and practice and urban development.

The studies show how ingrained thought patterns led to categorisation, special solutions, and the exclusion of persons with disabilities by not considering disability as a part of human diversity.

To access the underlying reasons why people are excluded in the built environment, a critical discussion is needed around issues of power and influence over the planning process Young, 1990; Nussbaum, 2000; De Fine Licht, 2017). Who governs who, and why don't the laws that have been passed and the policies that have been decided, reach the expected outcome? Current urban development trends and planning practices have a clear influence on the patterns that emerge in the new construction projects (Paper II). These patterns can be seen in the light of planning management and an urban planning discourse with roots in neoliberal planning and new public management.

The reasons for the gaps between vision and practice are many. The overview is weak in the temporally long-drawn-out processes with many actors involved Hertting, 2018; Pressman & Wildavsky, 1973). Knowledge of overall goals, policies, and regulations (United Nations, 1948, 1987, 2006, 2014, 2015; European Union, 2009, 2023; Swedish Government, 2017, 2018; Swedish Parliament, 2010; SOU, 2019a) varies in the municipalities, where the same responsibility rests on a municipality with 3,000 inhabitants as it does for municipalities with close to a million inhabitants. The conditions for maintaining knowledge and competence and for putting it into practical action in Sweden's municipalities vary greatly. Although the larger cities may have the advantage of being closer to highly educated staff, the smaller municipalities may be closer to citizens and to dialogues between administrations.

The studies show that it is often that the visions of a city for all disappear in the planning and project stages. It is also in this phase where the market's influence over the process grows in strength and where it is most urgent that important social goals

are protected. In this critical phase (see Figure 9), the extent to which the planned building or location will function for different people based on different conditions is essentially decided. This is where the public actors need to be knowledgeable, well-read, and pushy in order to achieve the results that reflect the visions. Governance (Rhodes, 1996, Pierre, 2018) places extra high demands on the public actors to defend important societal goals, especially in planning processes where the market influence is strong.

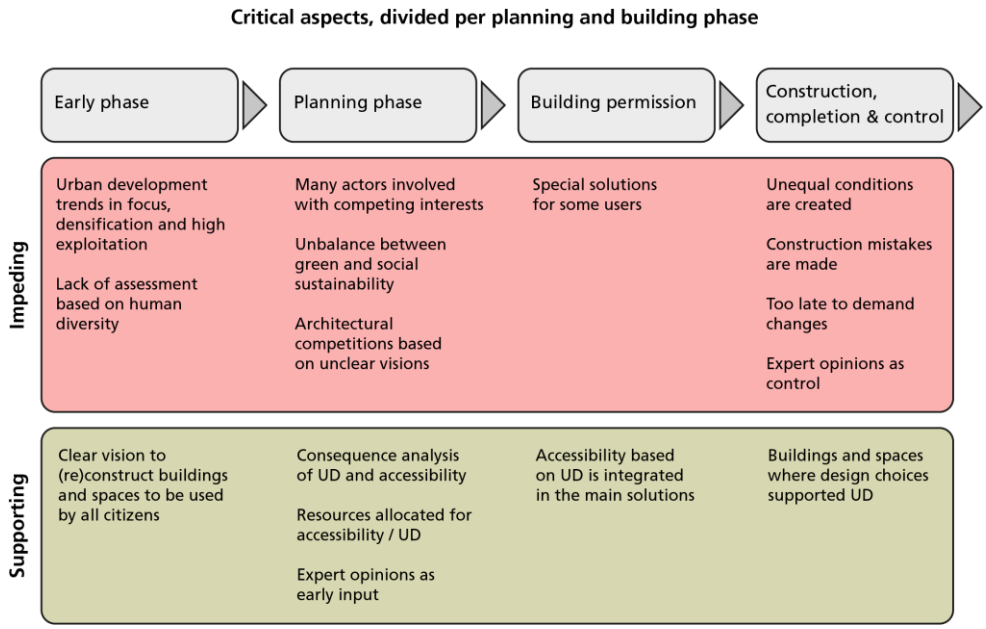

Figure 9: Critical aspects, supporting and impeding the implementation of a UD approach in the different phases of urban development.

The blurred boundaries between public and private sectors reduce transparency and control (Stoker, 1998/2019; Pierre, 2018; Peters & Pierre, 2016; Sager, 2009) and thus also the possibility to fully follow a process afterwards and to return knowledge back to the organisations.

The democratic system assumes that the chain from vision and decided policy to implementation of management and execution works (Pierre, 2018). In governance applied to community planning and urban development, mainly two groups of actors are involved in the 'networking': the market actors who drive the projects with the municipality's planners who are mainly enablers. Market players have a responsibility for their product, but no overall responsibility towards the citizen, who cannot demand any responsibility either (Peters & Pierre, 2016; Pierre, 2018;

Allmendinger, 2017; Fainstein, 2013). Society's influence and control functions are not sufficient. Society's responsibility and possibility to guard important societal values is limited when the social perspectives disappear or do not become dominant in this form of governance (Stoker, 1998/2019).

Neoliberal planning is often raised as an explanation behind the strong densification paradigm, partly because partly because of how it has contributed to ever higher land prices as well as being behind increasing inequality (Purcell, 2009; Kotkin, 2016; Fainstein, 2013). The issue of densification (Johansson & Khakee, 2008) has been discussed too one-sidedly, primarily as a necessary part of climate -adapted sustainability (Ståhle, 2008; Boverket, 2016), or as a 'counterpoint to urban sprawl' (Carmona, 2021; Dennis & Urry, 2009). The negative effects from a social or environmental perspective have not been perceived among planners, and Swedish planning strategies are not aligned with scientific evidence. (Berghauser Pont et al., 2021, p. 378)

Several negative effects of densification, seen from the perspective of UD, are obvious, such as the consequences of the increased demands on the user's abilities linked to mobility and mixed functions (Papers II, IV); negative health impact from increased noise, reduction of open space and green areas, stress related health problems etc. (Steinfeld & Maisel, 2012; Konijnendijk, 2022; Vicens et al., 2020; Berghauser Pont et al., 2021; Perdue et al.; 2023).

In this way, the condensing paradigm cements past inaccessibility rather than changing it. Other consequences of neoliberal planning such as rising land prices and a focus on the city's attractiveness and location competition (Baeten, 2012; Florida, 2006) induce densification, and the costs for accessibility, green spaces, playgrounds, etc. are prioritised away (Paper II). During the last decades a significant reduction of green spaces has taken place in Swedish cities (SCB, 2010, 2023).

With the increasingly strong market influence (Harvey, 2006; Franzén et al., 2016; Allmendinger, 2017; Kotkin, 2016) and the weak public control (Thelandersson & Wikström, 2020; SOU 2019b), the conflicting interests in planning work against the conditions for UD in the built environment. This causes an ongoing and continuing exclusion of people with disabilities, because of the increasing inaccessibility and unequal environments (Imrie & Hall, 2001).

The sustainability perspective contains other planning dilemmas (Campbell, 1996, 2013, 2016; Hedenus et al., 2018). A society that excludes people cannot be regarded as a sustainable society (UN, 2015). The social dimension of sustainability today is generally seen as in need of being strengthened (Saiu, 2017; Swedish

Government, 2018). Here a UD approach can be an effective strategy to ensure that equality and human diversity are not lost. The areas of conflict in the sustainability concept (where social sustainability is the weakest link), result in maintaining and reinforcing the unequal conditions in the built environment. Planning ideals such as the 15-minutes city or that citizens should walk or bicycle to meet all basic daily needs (Moreno et al., 2021; City of Portland, 2009) are not thought through with regard to human diversity (Wolbring & Lisitza, 2017). The conflicts of the planners' triangle are more important than ever to address, specifically the one between social justice and environmental protection (Campbell, 2016; Peters, 2016). This needs to be done both to reach sustainability and to adjust the gap between persons' abilities and the environmental affordances (Lid, 2013; Begnum, 2020). The studies showed several examples of the unbalance between the environmental and social perspectives of sustainable development in planning (Papers II, IV, V).

A human-centred approach and many of the architectural qualities that we today associate with UD have been present in architecture and planning since the days of Vitruvius (in Section 2.1.2 exemplified in modernity based on Rowland & Howe, Lynch, Jacobs, Alexander, Gehl J., Gehl, I., Sim, and others). What separates history from where we stand today is the view of the human being, who we really regard as the user of the built environment. Depending on one's preferred theory, those who were the previously the imagined target groups (society's elite, working class, etc.) (Sarkissian, 1976; Florida, 2006), would today be 'all people', against the background of modern human rights policies, etc. (UN, 1948, 2006, 2014; EU, 2009). And if the starting point is all people, new strategies are required that were not previously in the planning toolbox.

Today, we face a long series of challenges in urban development that have not been answered. It is unclear how to achieve the overall societal goals with contemporary planning conditions and new power structures in public-private networks. However, this raises the question of who protects society's interests and how it should be done (Lid, 2023; SOU 2019a).

As a conclusion of this reasoning on sustainability, urban development and the planning and construction processes needs to be more imprinted by the task and responsibility of putting human rights into practice. The public actors' roles and responsibilities to protect societal goals and to lead the way to closing the gaps between vision and practice cannot be underestimated. In the findings presented in Paper II, there are examples of a better correspondence between policy and practice in the projects where the municipality has been a strong actor in construction projects.

The challenge of protecting important social goals in urban development processes requires that public actors have the capacity to play an active and, when necessary, a governing role in the interaction with market actors (Ansell & Torfing, 2016). It requires both knowledge and courage, and to use the tools that are nevertheless available within the formal part of the planning process, such as in strategic and detailed planning (Cars & Hedström, 2006). The power relations between public and private are variable along the process, with a stronger market influence in phases when issues that have major consequences from the user's perspective are decided (Papers II, V).

In an international comparison, Sweden's weak control over the construction sector needs to be changed, in order to reduce construction errors and deficiencies, and thus construction costs (Thelandersson & Wikström, 2020; Boverket, 2018), but also to ensure that laws, rules and policies that have been decided in a democratic manner are followed. The right and ability for citizens to claim responsibility and accountability is a central question in this context (Pierre, 2018). The findings show how laws and regulations on accessibility are overruled or misinterpreted (Papers II, III, IV, V), while dis/abled and excluded citizens' voices and experiences are not taken into consideration (Paper IV).

6.2 Implementing UD on the time and planning scales - from vision to practice

The findings all contribute with knowledge of how UD can be applied in urban development and the various phases of the planning and construction processes. Considering human variations in every step of the process leads onto a path towards a built environment that is more equal and just (Mace, 1985; Steinfeld & Maisel, 2012; Marcuse, 2009; Fainstein, 2013; Lefebvre, 1968, 1970/2003; Harvey, 1972/1988, 2006).

The challenges of implementing UD along the entire process are many. UD's goals and values (Steinfeld & Maisel, 2012; Connell et al., 1997; Story 2001) have currently no place in a planning practice that puts higher demands on users (Imrie, 2012b) and that excludes and separates people. UD perspectives need to take more place in planning theory and practice (Erdtman et al., 2021; D'souza, 2004). To be established in today's planning practice, the UD approach needs to be put in practice all the way from policies, laws, visions, planning practice to construction (Imrie, 2012a). Only to 'do-right-from-the start' is not enough. (Figure 10).

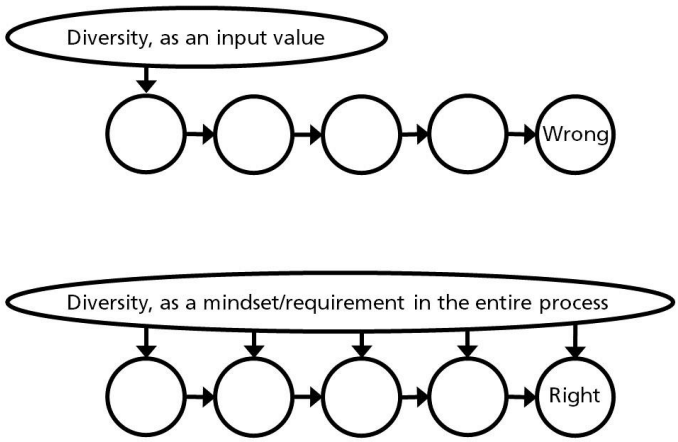

Figure 10: Human diversity needs to be a part of the mindset in all single phases of the project, not only in the visions, but all along the way to finished construction.*(Illustration by Håkan Eftring).*

The 'human-centred approach' to planning is still missing human diversity as a basic prerequisite, despite the clear links to UD (Mace, 1985; Steinfeld & Tauke, 2002; Preiser & Ostroff, 2001; Steinfeld & Maisel, 2012; Lid, 2020). Too often UD is considered as something to be applied only to the object (Hedvall, Iwarsson & Ståhl, 2022), in this case a building or place. But it needs to be closely linked to the full context – the surrounding environment and the overall societal goals (Figure 11), and to a broad understanding of accessibility as situated and as a lived experience (Hedvall, 2009; Lid, 2013; Lid & Solvang, 2016).

The analyses of material from the studies highlighted some important patterns to consider in the implementation of UD in design, planning and construction:

- Focus on function rather than person (Hedvall et al., 2022). Any attempt to decide *who needs what?* risks leading in the wrong direction. A better starting point is to ask: *what will this be used for?* and then apply UD and human diversity in all its aspects.
- Put low demands on users' abilities. By having realistic expectations and setting low demands on users' abilities, more people will be included.
- Have human diversity in mind, not the 'normate template' (Hamraie, 2017) when planning.
- Avoid special solutions for some users as far as possible. What were intended as supportive solutions can instead turn into stigmatisation and

exclusion. Equal use is facilitated, and costs are often saved by not separating people unnecessarily,

- Provide flexible solutions. Universal Design does not mean 'one-size-fits-all' but a wide range of possibilities to meet all the variety in human diversity.
- Ensure the conditions for the public actors to collaborate across administrative boundaries and to acquire the knowledge, competence, and resources required in collaboration with market actors.
- Unleash the voices of users. A close dialogue and the involvement of a broad variety of users along the entire process are necessary to create the necessary and required knowledge base (Young, 1990; Healey, 1997/2006; Allmendinger, 2017; Tunström, 2009; Asplund, 2004).

Implementing UD on a large scale into planning practice and urban development has never been done before. As part of a possible new planning paradigm, UD can act as a driver of innovative ideas and solutions. All actors in planning, construction, and urban development processes constantly come to different crossroads in the process, when the choice of solutions that support UD can change community planning. The studies have pointed out several such crossroads where the decision leads towards, or away from, a UD-approach in the process and UD in the built environment. A UD based planning practice needs to be included in all phases - from visions and goals to the design of buildings and places. To cater to the whole process, the application of laws and regulations should be seen from a holistic and inclusive perspective and considered in early phases.

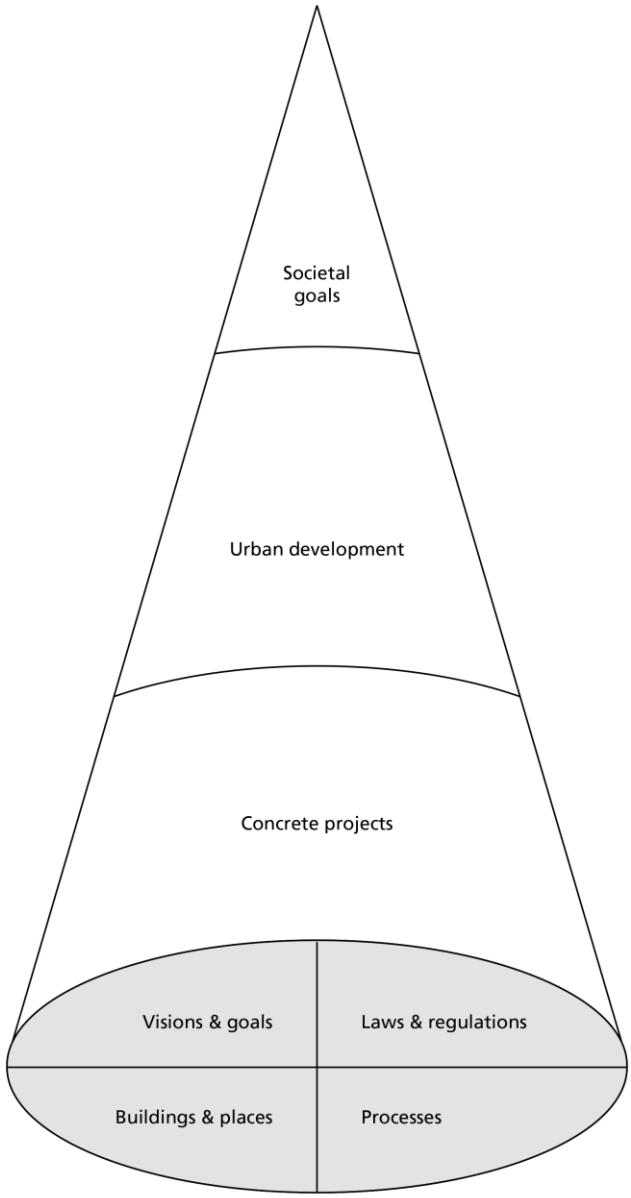

Figure 11: Implementation of UD in planning requires that the UD approach is included in the entire process and supported by current regulations. But UD must also be applied at different levels: in concrete projects and at the urban development level to achieve the overall societal goals. *(Illustration by Anna-Sara Fagerholm).*

6.3 Implementation of UD on the spatial scale – linking the levels of urban form

Implementing UD in built environment is not only a matter of design approach in a single project. The implementation of UD in planning and construction also requires that the concept is used in parallel at different levels and scales (Lid, 2013). For the individual user, it is the entirety that counts, to be able to achieve full participation in social life (Steinfeld & Tauke, 2002; Hedvall, Ståhl & Iwarsson, 2022). The detailed solutions at the micro level are important, but also that all the details can work as a whole (Koch, 2002).

On a micro level, it is about having a UD approach in every single project to ensure that what is built can meet human diversity (Mace, 1985; Connell et al.; 1997; Burton & Mitchell, 2006; Steinfeld & White, 2010; Steinfeld & Maisel, 2012; Maisel et al., 2017). Accessibility and usability should be possible to reach in each project, by following the requirements of the law. But the building regulations (Swedish Parliament, 2010) do not particularly express the goals and values of UD: not every accessible solution is equal or inclusive. Patterns and techniques for inclusive housing buildings and places, and how to put UD in practice in the single project is well known (Preiser & Ostroff, 2001; Steinfeld & White, 2010; Maisel et al., 2017, Dion, 2006). However, to get all actors involved in UD solutions at this level, a clear commitment is also required earlier in the process, and to make it useful for the user, that the UD approach is connected to the meso and macro levels.

On a meso level, it is about the individual construction project also being linked with a UD -approach in the surrounding environment, in traffic solutions, in proximity to community services, green spaces etc. (Lid & Solvang, 2016; Koch, 2022; Legeby, 2022). On the macro level, it concerns the society, overarching societal goals. Hence, a strategy is needed to connect a broad network of actors who are also in the city administrations. This needs to be done to raise the awareness across departments and areas of responsibilities.

An accessible home solves the needs in parts of life, but one must be able also to get to and from the home and the workplace to education and to leisure activities. Such an overall approach is possible to integrate on the overall strategic level, in comprehensive plans, detailed development plans, local area regulations, in policies and more. A major challenge here is the increasingly fragmented community planning. One way to tackle this challenge is to work strategically at the neighbourhood and district levels, and at the overall city and regional levels.

Lid suggested an analytic approach to UD, accessibility, and usability, that differentiate between macro, meso and micro levels (Lid, 2013, 2020). This framework can well be used when discussing the UD on the spatial scale. Lid suggested the use of accessibility and usability on the micro level, and UD at the meso and macro levels, arguing that UD is not possible to experience by the individual. I have drawn the conclusion that the values and goals of UD is possible to identify also on the micro level. The accessibility regulations could be met on a detailed level but, without supporting inclusion and participation, qualities that might be realised with a UD approach from start to finish (Steinfeld, 2023).

7 Conclusions and suggestions for future research

The overall aim of this thesis was to provide new knowledge and solutions on how UD can be implemented in urban development and the built environment. The findings show several different factors that either support or counteract the implementation of UD in urban development processes. Critical aspects, which either support or impede UD, are identified in relation to different phases of the planning and building process (Figure 9). Areas to pay particular attention to are how and by whom the processes are managed, what are the competing and contradictory interests among actors, and which preconceived ideas about the user are conveyed early in the process. Another area to observe when implementing UD in the urban development processes is how contemporary urban development trends affect different users in the built environment. Ten measures for the implementation of UD in all phases of the urban development processes are highlighted in Paper III.

The findings also show three principled strategies that are supported by UD in the built environment:

- Put low demands on users' functional abilities.
- Do not separate users.
- Focus on function instead of person.

By being aware of these patterns, there are opportunities to make choices and priorities that lead the development in a different, more equal, and just direction.

Whether UD can be traced or not in terms of qualities in the outcome of the built environment, it affects many citizens' possibilities to participate in society at all. The presence of UD affects how equal or unequal the built environment will be. The findings show that society continues to routinely create new inequality by generating environments characterised by experiences of 'us and them' and manifestations of a poor image of who lives in the city. The state has withdrawn its role in monitoring the rights of persons with disabilities in relation to the built environment. This withdrawal stands in clear contrast to the laws and conventions

society's actors have committed themselves to follow. It is not acceptable from society's point of view to allow market actors to continue to exclude and discriminate against people based on disability. Fundamentally, it is about the equal rights and value of all people.

Some main conclusions from the research presented in this thesis:

- UD needs to be managed throughout the process, from early visions to the finished built environment. You cannot think of UD only at the beginning or end of the process. It must be there throughout all phases, which requires new methods and working methods among the actors involved.
- UD is also relevant on a spatial scale, where accessibility and usability are integrated both in single projects and in an entire city perspective and are related to overall societal goals.
- Innovative solutions that support UD were mainly found in the remodelling of older culturally protected buildings. Critical aspects for success were related to the management, aims, resources, and the selected focus of innovation. This shows how knowledge of Universal Design can contribute to innovative solutions, even in complicated construction projects. It also shows how much difference the municipality's involvement in construction processes can make.

There is a need for more research on the socioeconomic consequences of the exclusion of persons from the built environment, and on society's costs for inaccessibility. The reluctance to plan and build with human diversity in mind needs to be put in relation to the price tag for correcting deficiencies afterwards and with various forms of compensation.

More research is also needed on how to implement a UD approach on an overall level and along the whole process, and to reach a consensus between different professions, different municipal administrations and between different areas of society.

UD has the potential to bridge competing interests by being a common thread throughout the process. It also has the potential to inform and propel efforts beyond minimum requirements. Exemplary patterns, some of which are identified and described in this thesis, provide knowledge on how to reach further for a more equally built environment. It is also evident that it is possible to reach further when the public actors follow their mission to lead by example.

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Bridging the Gaps

This thesis explores how more equal and inclusive living environments can be achieved by using Universal Design (UD) to incorporate human diversity in all stages of planning and construction. The ongoing exclusion of persons with disabilities from the built environment does not result from a lack of knowledge on how to remedy existing obstacles nor of how to avoid creating new ones. Other reasons must be found.

The aim of the thesis is to provide new knowledge and solutions regarding how UD can be implemented in urban development and the built environment, including the whole process from vision to outcome.

The municipalities are at the forefront of defending social goals and operationalising conventions that Sweden as a nation has undertaken to follow, an example being the UN Convention on the Rights of Persons with Disabilities. Being able to access and use the built environment is a fundamental human right.

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