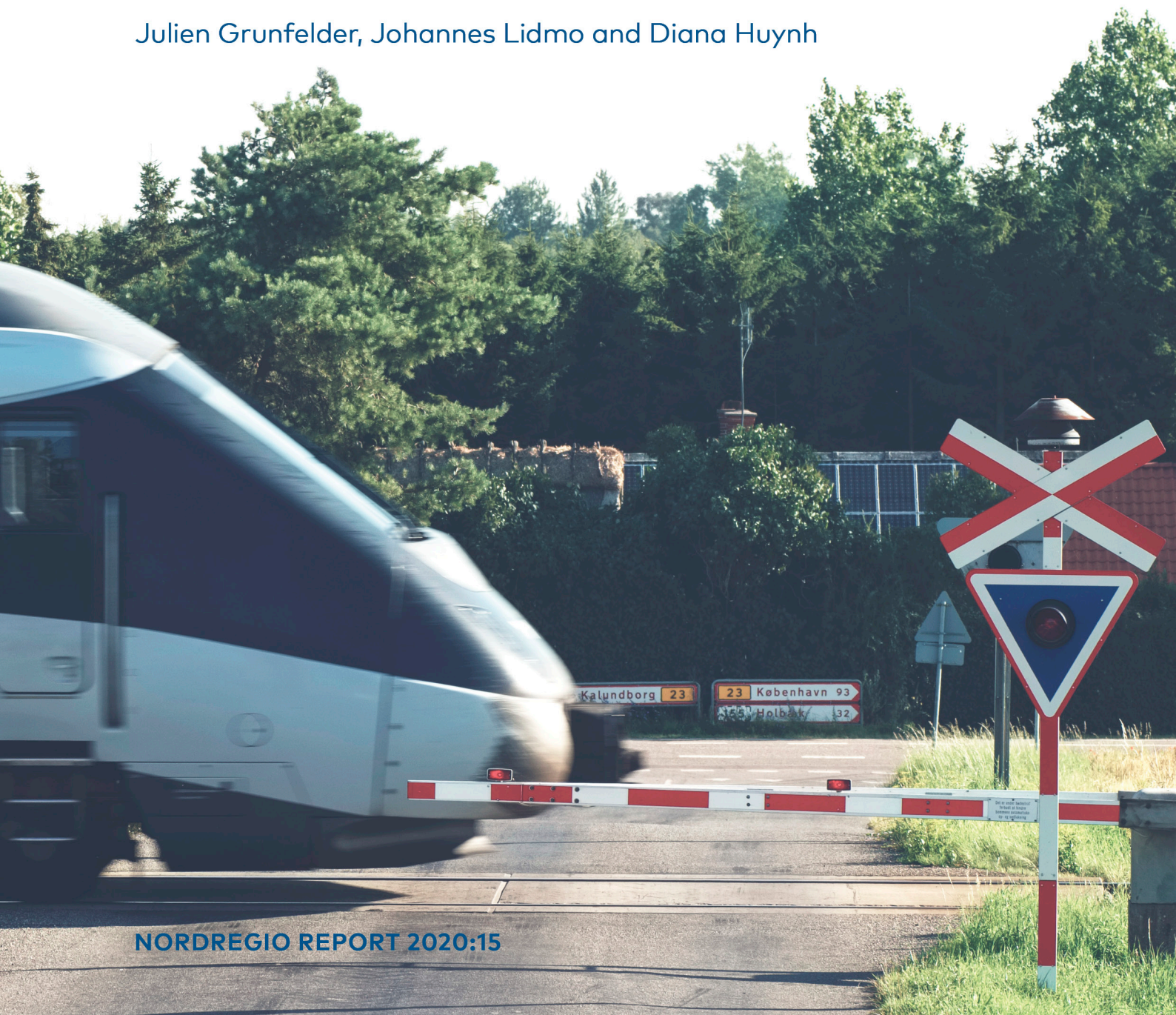


Transit-oriented development in the Greater Copenhagen Region

Insights from small- and medium-sized cities

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Preface

As part of the Nordic Co-operation Programme for Regional Development and Planning 2017–2020, three thematic groups have been established, in the following areas:

1. Sustainable rural development.
2. Innovative and resilient regions.
3. Sustainable cities and urban development.

The groups have been set up by the Nordic Committee of Senior Officials for Regional Policy (EK-R), under the Nordic Council of Ministers for Sustainable Growth. Members are representatives of the relevant ministries, national authorities, regional authorities and cross-border co-operation committees.

This report is part of the Transport for Regional Integration in Border Regions (TRIBORDER) project. TRIBORDER consists of three elements which all fall under the theme of Sustainable Cities and Urban Development. The purpose of TRIBORDER is to analyse the potential challenges of planning and developing transport connections in three cross-border areas of the Nordic Region. Part One focuses on how small- and medium-sized cities in Värmland and Østfold can benefit from the introduction of a high-speed train connection between Oslo and Stockholm. Part Two focuses on the Kvarken Region and the effects of the Umeå-Vaasa ferry connection on their surrounding regions. And Part Three, which this report is an outcome from, focuses on accessibility to and from small- and medium-sized cities in the cross-border context of the Greater Copenhagen Region.

The topic of the report is an important part of a Nordic agenda concerned with strengthening cohesive border regions that promote development, innovation, and growth (Nordic Council of Ministers, 2017). The border committees in these three areas are active partners in these projects, along with Nordregio and members of the thematic group on Sustainable Cities and Urban Development. The issues of integrated transportation were re-emphasised in Spring 2020, when the Nordic Council announced that it wanted to strengthen the Nordic countries' cooperation around transport. (Nordic Council of Ministers, 2020).



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Summary

How can an enhanced understanding of transit-oriented development (TOD) characteristics and mobility planning in small- and medium-sized (SMS) cities contribute to a more integrated Greater Copenhagen Region? Also, what are the multi-functional roles and potentials for the development of areas surrounding railway stations in small- and medium-sized cities from a planning and design perspective?

Answering these questions is the main purpose of this study that has been conducted by Nordregio on behalf of the Nordic thematic group for sustainable cities and urban development 2017– 2020 and its cross-border member Greater Copenhagen Region (GCR). It explores the concept of TOD, accessibility by train, as well as TOD-characteristics and mobility planning in the context of the GCR. This cross-border region is composed by four administrative regions: the Capital Region of Denmark (Hovedstaden) and Region Zealand on the Danish side, and Region Skåne and Region Halland on the Swedish side of the Öresund strait.

This study is based on desk research, accessibility mapping, and semi-structured interviews in four selected municipalities (Lejre and Ringsted in Denmark and Höör and Landskrona in Sweden). Our research describes how accessible these four cases are within a local, regional and cross-border context. A particular focus is on the past, present and future plans in the station vicinity areas in order to highlight planning and design specificities of transit-oriented developments.

The accessibility mapping highlights that the GCR benefits from well-developed rail infrastructure overall. At the same time, due to its geography and the distribution of people and jobs across the region around a third of the population cannot feasible access the main urban areas by train on a daily basis (e.g. commuters). The findings also indicate that each of the four case SMS-cities are rather well-integrated within their sub-regional context, whereas their cross-border integration was more limited. The case study analysis reveals that rail transport is a feasible option for commuting in all four selected areas. Additionally, the study identifies a variety of transport-oriented developments around the selected train stations, reflecting differences in spatial strategies and priorities. For instance, housing and parking spaces are characteristics of the two small cities (Höör and Lejre) aiming at attracting new residents, whereas mixed-use space and integration of the station with the existing city center are characteristics of the two medium-sized cities (Landskrona and Ringsted).

We conclude that showing that planning and design principles of TOD-development of SMS-cities are important insights to take into consideration when trying to achieve the goal of the Traffic Charter of the Greater Copenhagen ("It should take a maximum of one hour to get to either Copenhagen or Malmö by train from all parts of Greater Copenhagen"). Station vicinity planning has an important role to play in SMS-cities to better connect the existing rail infrastructure with their surrounding hinterland. Such improvements would contribute to work towards an integrated and sustainable growth region, which is one of the main aims of the Greater Copenhagen Committee.

Sammanfattning

Hur kan en ökad förståelse för så kallad transit-oriented development (TOD) (stationsnära/kollektivtrafiknära utveckling) och transportplanering i små och medelstora städer bidra till att en gränsregion som Greater Copenhagen blir mer integrerad? Vilka multifunktionella roller och möjligheter finns i stationsnära lägen i små och medelstora städer och hur kan dessa utvecklas ur planerings- och designhänsyn?

Studiens huvudsyfte har varit att besvara ovannämnda frågor vilket Nordregio gjort på uppdrag av den nordiska temagruppen för hållbara städer och stadsutveckling 2017-2020 och gruppens medlem i gränskommittén, Greater Copenhagen Region (GCR). Projektet utforskar begreppet TOD i relation till järnvägsnoder, men även olika former av stationsnära utveckling och mobilitetsplanering i GCR. Gränsregionen består av fyra administrativa regioner: huvudstadsområdet i Danmark (Hovedstaden) och Region Själland på den danska sidan samt Region Skåne och Region Halland på den svenska sidan av Öresund.

Metodiken har bestått av dokumentstudier, en tillgänglighetsanalys och semi-strukturerade intervjuer med representanter från fyra utvalda kommuner (Lejre och Ringsted i Danmark och Höör och Landskrona i Sverige). Studien beskriver tillgängligheten i de fyra utvalda kommunerna från ett lokalt, regionalt och gränsöverskridande perspektiv. Särskilt fokus har lagts på att studera genomförda och framtida utvecklingsplaner inom stationsnära områden för att lyfta fram olika planerings- och designaspekter i dessa områden.

Tillgänglighetsanalysen visar att GCR överlag har en välutvecklad järnvägsinfrastruktur men att en tredjedel av befolkningen i regionen inte kan erbjudas tågförbindelser till de större urbana områdena på daglig basis (t.ex. pendlare), på grund av regionens bosättningsmönster och lokalisering av arbetsplatser. Resultaten tyder också på att var och en av de fyra studerade städerna är relativt välintegrerade i sitt subregionala sammanhang medan sammankopplingen över nationsgränsen är mer begränsad. Fallstudieanalysen visar även att spårtrafik är ett bra pendlingsalternativ i alla fyra utvalda områden. Dessutom identifierar studien en mängd olika TOD-lösningar runt de utvalda tågstationerna vilket visar på skillnader i rumsliga strategier och prioriteringar. Till exempel är bostäder och parkeringsplatser kännetecknande drag bland de två mindre städerna, Höör och Lejre, medan de två medelstora städerna, Landskrona och Ringsted, arbetat mer med funktionsblandning och integrering av stationerna med befintliga stadskärnor.

Hur man fysiskt utformar miljön kring spårstationer i små och medelstora städer har betydelse för hur dessa kan användas som transportnoder för boende i den omgivande landsbygden och kopplingen till ett större ruralt omland. Om man vill uppnå det uppsatta tillgänglighetsmålet i gränsregionen ("Det bör högst ta en timme att nå antingen Köpenhamn eller Malmö med tåg från alla delar av Greater Copenhagen") menar vi att det är viktigt att ha insikt i olika principer för fysisk planering och design kring stationer i små och medelstora städer och hur principerna påverkar resmönster och tillgänglighet. Dessa är aspekter som vi tror kan bidra till arbetet för en mer integrerad och hållbar tillväxtregion vilket är ett av huvudmålen för Greater Copenhagen gränskommitté.

1. Introduction

Cross-border cooperation has long been a strong element of the Nordic Region's efforts to become better integrated, while simultaneously working towards shared ambitions in the areas of economic, environmental and social sustainability. As set out in the Nordic Co-operation Programme for Regional Development and Planning 2017–2020, successful collaboration can help create integrated and cohesive border regions which promote development, innovation, and growth. Common to all cross-border cooperation is the need to facilitate freedom of movement in order to meet these development objectives. This includes a strong, politically-shared vision in terms of sustainable public transportation. During the Covid-19 pandemic, for instance, challenges inevitably emerged as countries shut down borders. This effectively put cross-border cooperation into gridlock. Prior to the Covid-19 crisis, however, the Greater Copenhagen Region (GCR) had been chosen to illustrate the potential challenges of planning and development in a Nordic cross-border context. This is the scope that this working paper is operating within.

The aim of this report is to provide a backdrop for future discussions about ways in which spatial and transportation planning, particularly in small- and medium-sized (SMS) cities, can ensure sustainable mobility solutions and enhance local and regional integration, supporting regional development in Greater Copenhagen, and Nordic collaboration more broadly.

The research questions that have been explored are:

- How can an enhanced understanding of transit-oriented development (TOD) characteristics and mobility planning in small- and medium-sized (SMS) cities contribute to a more integrated Greater Copenhagen Region?
- What are the multi-functional roles and potentials for the development of areas surrounding railway stations in small- and medium-sized cities from a planning and design perspective?

Our report is based on desk research (a literature review, including policy reports, media articles and statistics), accessibility mapping, and semi-structured interviews. The literature review covers existing research on transit-oriented development (TOD) and focusses on the specificities of SMS cities. The mapping provides an overview of accessibility by train within the GCR. It does this by highlighting which parts of the cross-border region are able to access the two main urban centres within an hour. Semi-structured interviews were conducted in order to gather information from regional and municipal stakeholders – including municipal planners in four selected municipalities of the GCR which are used as case studies to gain further insight concerning TOD in SMS cities.

Our case study findings do not aim to be an exhaustive representation of all the region's municipalities. But they do, nonetheless, suggest that SMS cities in the GCR:

- Have limited cross-border integration, as seen by the limited inflow and outflow of cross-border commuters (except for Helsingør-Helsingborg). However, there are more cross-border flows for leisure purposes (e.g. second homes, nature experience activities, and shopping).
- Are well integrated within the regional or sub-regional labour market to which they belong, thanks to the accessibility of larger urban areas.
- Have different transport-oriented developments (TODs) around their train stations, reflecting differences in spatial strategies and priorities.

2. Transit-oriented development in small- and medium-sized Nordic cities

This literature review provides a synthesis of the general concept of TOD, and its development over time, with attempts to highlight the specifically-identified TOD-characteristics of SMS cities in a Nordic context.

According to Fertner *et al.* (2015), research from around Europe demonstrates a great diversity of small-town development, despite the general perception that small towns are considered to be 'losing out' to the rapid forces of urban development. In a study of development patterns across small towns in Denmark, the concept of 'residential urbanism' was introduced. Employing this concept, the authors suggest that residentially-driven urban development can compensate for a 'generally unfavourable regional development context' (*Ibid*, 2015). Seen in parallel with the understanding of TOD in Nordic SMS cities, there are reasons to believe that the role SMS-cities have in strengthening cross-border integration has indeed been underestimated.

2.1 Small- and medium-sized cities in a Nordic context

In the light of urbanisation processes throughout the Nordic Region, it can be observed that there are parallel, ongoing population dynamics within municipalities – where, for instance, municipalities experience population decline at the municipal level and population growth in certain other areas, such as the city core, within the municipality (Stjernberg & Penje, 2019). These cities observe diverse population trends which also reflect the diversity of small- and medium-sized cities. In addition, these population dynamics put pressure on planning and urban development, not least in smaller cities.

The development taking place in small- and medium-sized cities varies, and can be seen to be different to that of larger city-regions (see e.g. Tunström *et al.*, 2018), not least in scale, but also in relation to the 'urban' qualities available to residents. In addition, these cities are situated within a range of territorial settings which have various effects on the different localities. For example, some are located in regions with shorter travelling distances to larger cities. This could lead to mobility out from the small towns – both for leisure and for work. By contrast, other small towns may have the role of being the 'big city' in their particular territorial context. This could potentially influence mobility flows to rather than from small towns. In other words, as evidenced by Fertner *et al.* (2015), small towns can be situated in 'enlarging, functional regions' but can also be characterised as small towns with 'hinterlands'. The diversity of territorial settings puts pressure on local public/commercial services, as well as travel patterns, but also effects the potential for development taking place there.

With that background, it is not surprising that Bell & Jayne (2009) are suggesting a new agenda within urban research:

"Small cities are typical in a quantitative sense, and theorists have been too dazzled by the spectacular urbanism of big cities to notice them. They are unique in that the way they 'do' 'cityness' is distinctive, while still recognisably urban".

Bell & Jayne, 2009: 695

There are a number of reasons for this approach. Most of the urban research conducted during the 2000s was embedded in the context of globalising forces and international comparisons. As such it focussed on metropolitan areas, city regions and other 'big' and 'global' places (Bell & Jayne, 2009; Servillo *et al.*, 2017). Bell & Jayne (2009) point out that empirical research has been conducted in relation to small cities, but has failed to focus primarily on understanding and conceptualising the *smallness* of cities as its own topic of research. In other words, considering matters such as how 'smallness' effects the urban qualities, urban planning, planning challenges and strategies taking place there.

Over the past decade, there have been attempts to conceptualise and better understand small- and medium-sized cities (Servillo *et al.*, 2014; Servillo *et al.*, 2017; Smas 2018). In addition, the ESPON programme has funded a few projects on small- and medium-sized towns and/or cities which have led to various definitions of those areas. For example, a 'small- and medium-sized' town might, according to the ESPON TOWN project, have a population of between 5,000 and 50,000. In the Nordic Region that would mean Bodø would be considered a small city, but Norrköping would be considered a large city (Servillo *et al.*, 2017). However, even if a population threshold similar to the one above is set, different cities will be included or excluded from the definition as small- and medium-sized cities, depending on whether one defines a city from a functional, morphological or administrative approach viewpoint. In our project, we have selected cities which may be considered small- and medium-sized based on: 1) the joint Nordic definition of urban settlement, 2) the parameters of the Smas (2018) analysis, which means having at least a population of 2,000 inhabitants, and 3) the prescription that the urban settlement should not have more than 50,000 inhabitants – in other words, an urban settlement with a population of between 2,000 and 50,000.



Morgondis - Svedala

Photo: John Wessman (News Öresund)

Three possible approaches to cities:

- The morphological approach relates to coherent built-up areas with concentrations of buildings and a minimum population threshold. In a Nordic context, there is already a joint morphological definition of urban settlements (in Swedish *tätort*; in Danish *byområde*) in which “the population threshold is 200 individuals living within 200 metres (in Norway 50 metres) of each other. The delimitation of the urban settlement is regularly updated to account for settlements growing together and/or growing apart” (Smas 2018, p. 39).
- The administrative approach refers to the administrative delimitation of cities (in the Nordic Region, municipalities), which in the Nordics often cover large areas – ones which could be the size of a region elsewhere in Europe.
- The functional approach refers to the functional role(s) of the city, for example the role of the urban core in a functional region (Servillo *et al.*, 2017).

In planning and policy, a strong urban norm dominates both planning discourse and practice. That is also the case in smaller cities. Core planning ideas and practices often spring from larger urban areas, not least those including planning concepts such as densification and housing development in city centres or around train stations (Qviström, 2015; Tunström *et al.*, 2018). Tunström *et al.* (2018) who have studied compact city development in the city cores in smaller cities, observe that other development trends, such as single-family homes and car spaces in the city centre, came high on a planning agenda “[which] ... makes densification and enlargement of the central city more of a planning ideal, an expression of the urban norm, rather than a response to existing demand” (Tunström *et al.*, 2018: 38).

As a result, there is evidently a need to add the dimensions of smaller cities into urban research, which then also has further policy relevance for small- and medium-sized cities. This becomes particularly important in a Nordic context, where most of the population live in settlements which can be considered small- and medium-sized (c.f. Smas, 2018). For example, in 2016, 77% of the Swedish population lived in urban settlements of at least 2000 inhabitants, but only 28% lived in the six largest urban settlements (author’s own calculation, based on Statistics Sweden).

2.2 An introduction to transport-oriented development (TOD)

As noted above, urban planning in the Nordic Region is, to a relatively large extent, influenced by planning principles originating from larger urban areas. There is now the need to understand these planning principles, and their effects, in the context of smaller cities. One current planning principle is transit-oriented development (TOD), which can be translated in a Nordic context to densification in areas near stations – often meaning train stations (see Qviström, 2015). TOD is sometimes understood as a relatively new planning principle, since the language concept (i.e. TOD itself) originates from America, particularly as a response to urban sprawl in the 1990s (see Pojani & Stead 2014; 2018). However, as argued by Pojani & Stead (2018; see also Pojani & Stead 2014), the principles behind TOD had already existed in Europe (and also elsewhere in the world, to some extent) throughout the 1800s and 1900s, focussing of various types of rail-based urban development.

TOD planning has therefore evolved throughout history. The first phase of TOD can be referred to as the historical TOD which took place in the 1800s and at beginning of the 1900s, often in relation to suburbanisation processes. Some land-use characteristics of this included clustered housing, and sometimes high-density housing, jobs and activity sites (Knowles et al., 2020). These early TODs were located alongside heavy rail infrastructure. Compared to tram stops, stations were spaced more widely and had less frequent – but faster – connection to the city centre's concentration of employment opportunities, retail outlets and leisure activities.



Öresundståg

Photo: [visitskane.com](https://www.visitskane.com) © Studio e

The second phase of TOD (mid-twentieth century) took place at a time when car ownership was still relatively low (but growing). Here, "TOD had become less influential in urban development as privately-owned transit companies were becoming unprofitable" (Knowles et al., 2020:3). This occurred mainly in countries such as the USA and the UK, where city councils started taking over this responsibility. At that time, TOD also took place in countries other than the USA and the UK, such as in some of the Nordic countries' capital regions (e.g. Oslo, Copenhagen and Stockholm), and later in Paris, France. These are referred to as Planned TODs (Knowles et al., 2020). Planned

TODs comprised principles for the development of large-scale suburban areas, alongside upgraded rail-based transit routes, which led to a fast-growing urban population. The main land use characteristics of planned TODs consisted of high-density housing and attractive locations for both business and housings development, but also large-scale urban development leading to new neighbourhoods or towns. Transit hubs were to be accessed mainly by bicycle and by foot, but also to some extent by bus. One example from this time is Copenhagen, with its 1947 Finger Plan, which implemented the principles of urban development along the five 'fingers' supported by public transport – notably, trains running at least four-times-an-hour. Similar planned TODs took place in Stockholm, with the development of the underground, and in Oslo, with a new electrified suburban railway to neighbouring satellite towns (Knowles et al., 2020). The towns that were established in this way may or may not be considered as small- and medium-sized cities, depending on how they are approached in terms of the above discussion about defining cities.

In contemporary TOD, the development is not only linked to heavy-rail transit (HRT) systems but also includes light-rail transit (LRT), cycling and bike-sharing, as well as bus rapid transit (BRT) (see Knowles et al., 2020). In the Nordics, for instance, a recent example of a TOD like this is the light rail system in Bergen, Norway (Engebretsen et al., 2017). Knowles et al. (2020) identify several different trajectories in the contemporary TOD. One example is Active Transport and TOD. Here, TOD includes components such as bike-sharing schemes and development around these hubs, but also elements of design for the routes from homes to transit hubs which make them attractive and safe. This is highlighted as crucial in promoting active (and attractive) access to transit hubs, or to the TOD site.

TOD today focuses more on urban aesthetics. This was a less prominent concern back in the traditional TOD era, but some of the traditional ideas have nonetheless remained in modern TOD – such as accessibility, density and mixed-use facilities (Pojani & Stead 2018). Knowles et al. (2020) have reviewed the historical, contemporary and future role of urban development elements in TODs. In so doing, they have identified seven key characteristics and planning components of successful TODs (Table 1). However, since most research on TOD is conducted on the basis of larger cities or city-regions, the applicability of the key characteristics identified as success criteria by Knowles et al. (2020) should be understood cautiously in relation to small- and medium-sized cities – particularly in the Nordic Region, where the territorial context for SMS cities varies considerably. Some characteristics, such as diversity, may function as general principles in contemporary planning practices, but more knowledge is required concerning their implementation as TOD in SMS cities.

1. Density: high density of dwelling units, population, jobs and activity sites.
2. Diversity: multiple forms of land use.
3. Design: dense urban grids which are pedestrian-friendly.
4. Distance to transit stations and stops: thresholds for walking.
5. Destination accessibility: thresholds for walking.
6. Demand management of road transport.

Table 1. Key characteristics and planning elements of successful TODs.

Source: Knowles et al. (2020: 2).

In summary, TOD consists of planning principles such as mixed-use development taking place in a station area or in proximity to mass transit facilities. It includes elements such as urban compactness, pedestrian- and cycle-friendly environments, as well as community and service centres (Pojani & Stead 2018; Qviström *et al.*, 2019; Knowles *et al.*, 2020). However, ideas about how to access these transit hubs has shifted over time, and has turned more towards active modes such as walking and cycling. These ideas already started to emerge in the mid-twentieth century's planned TODs. Now they have become the most common characteristics of access to transit hubs in contemporary TOD thinking. In addition, one underlying assumption within transport geography is that locating near improved public transit hubs will increase the accessibility profile of a site, which in turn makes the land more attractive, especially for dense and intense urban development (Qviström *et al.*, 2019). This will be explored further in relation to smaller cities in the following section.

2.3 Characteristics of TOD in small- and medium-sized Nordic cities

The international research literature on TOD has primarily looked at metropolitan areas, and has a strong urban focus – which perhaps makes sense, because the potential to develop those areas has received most scholarly and policy attention so far. However, in the Nordic Region there is a large peri-urban countryside, as well as many smaller and medium-sized cities. In that territorial context, more knowledge is required. In other words, there also is a need to shift focus in TOD research to those geographies.

As outlined above, according to Fertner et al. (2015), small towns may be located with a large rural hinterland or within an enlarging, functional region, often close to a sizeable town which forms the main centre of a large labour market (e.g. Copenhagen and Malmö in the GCR). This creates different preconditions for TOD in smaller towns. In Sweden and Denmark, these small towns (or even smaller settlements in peri-urban areas) are termed as *stations samhäll* and *stations byer* (see Slätmo, 2015): namely, small communities which have evolved and developed around the railway network. These are settlements which can be translated into communities with a train station in English. They have historically played an important function as territorial and social nodes (Slätmo, 2015). That is, a relatively significant number of smaller settlements have historically emerged with good access to rail-based transit in Sweden and Denmark¹.

The planning ideas and concepts surrounding these communities with a train station might, in planning practice, be applied to any station in either a large or small urban area, and to some extent in rural settings, too. This, in line with Qviström (2015), is part of contemporary planning practice. An overview of the development of *stations samhäll*en (Dahlstrand et al., 2013) highlights the fact that the current planning aims of densifying station areas and providing climate-friendly transport are two predominant values associated with TOD in cities. Several of those communities were also established back when the railway network was built, and it is worth noting that there is further potential to develop those socialities. This report also outlines some of the rationales as to why some municipalities in Sweden have particularly chosen to focus on TOD. It identified the following reasons:

- To increase or generate economic growth.
- To satisfy the need to increase capacity.
- To solve local housing challenges.
- To densify, as an alternative to urban sprawl.
- To develop the city by increasing its attractiveness – particularly focusing on current inhabitants.
- To improve labour market possibilities through proximity to public transport.
- To connect different areas within the city.
- To improve connections to other settlements/towns/cities.
- To achieve current (national) objectives for spatial and transportation planning.

In addition, Slätmo (2015) reviews planning and policy ideas and research in relation to communities with a train station, and analyses them from a rural perspective, with a particular focus on smaller settlements. Slätmo (2015) also concludes that TOD literature, and the focus on *stations samhäll*en in the Nordic Region, mainly takes us away from an urban perspective. Questions that arise are related to whether TOD is an appropriate investment in smaller cities or towns, or whether these communities are better supported by other potential measures? There is, therefore, a need to put more emphasis on TOD in smaller cities and rural areas – adding further critical dimensions to dominant planning frameworks such as TOD (Slätmo, 2015).

As outlined above, there are further elements to be considered in TOD planning, especially in smaller cities. This is particularly the case when a major concept in TOD planning is to reduce car dependency. In a Swedish study (Qviström et al., 2016), it was reported that the landscape amenities of a TOD site and its surrounding area will impact the residents' mobility. For example, if landscape amenities are not considered, TOD may actually increase car dependency. This is

1. It should be noted that these geographies vary, and that a comprehensive overview of those communities is lacking in a Nordic context.

because residents want to access the kind of 'qualities of place' more commonly found in rural areas, including suitability for second home development (Ibid.).

Qviström (2015) argues for the relevance of reading regional planning documents from a relational geography perspective. This is based on the dominant model of measuring in a radius distance from a transportation node within TOD, which often starts with accessing transit hubs via a ten-minute walk (about 800 metres). These 'attractive areas' within TOD are therefore located near transit hubs, by drawing a circle of approximately 800 metres around the transit hub. Such planning principles risk overlooking other qualities of place further away (Qviström et al., 2019). This is what has been referred to as the notion of 'circular thinking' within TOD, and it has been highly influential in spatial planning and in the development around transit hubs (i.e. within TOD implementation). Moving beyond such an approach is particularly important in peri-urban locations and in smaller towns, according to Qviström et al. (2019). This is because it is not uncommon for these locations to offer other types of rural-urban configuration and characteristics (compared to larger cities), based on their territorial setting.

In other words, in smaller cities and peri-urban areas, there are other aspects and 'place qualities' which are also viewed as important for the kind of development that needs to take place there. These geographies are interlinked, and as such it is important to consider them by adding a relational understanding of space in TOD development, in order to capture these perspectives adequately. This will also shift the settings of TOD, taking it into a wider framework (Qviström et al., 2019). Such perspectives will have policy relevance for the development of TOD areas, both from a functional and regional perspective, and also in terms of the specific rural-urban configurations within a municipality.



Customers on the platform.

Photo: Holsting Klaus (The Danish railway)

Examples of TOD within the Greater Copenhagen Region

The importance of densifying the station vicinity is not a new concept in Skåne, where transit-oriented development is often translated as 'densification in the vicinity of station areas' (stationsnära förtätning). For instance, regional and national actors engaged in spatial development in Skåne have stressed precisely this point in a publication from 2010 (Länsstyrelsen i Skåne et al., 2010). That document emphasises the importance and opportunity to develop and densify around station areas. 'Station vicinity areas' are defined as those areas located between 600 and 1,000 metres beyond the train station. The report makes an inventory of available land close to train stations in Region Skåne. A remarkably large amount (80% of land within 1,000 metres of train stations in Skåne) was undeveloped when the report was published in 2010 (Länsstyrelsen i Skåne et al., 2010). However, about 30 of the 55 train stations in Skåne have different protected characteristics and nationally assigned interests within 1,000 metres of the train station, which may make the principles of concentrating urban development in the station vicinity more complicated to implement.

In addition, a position paper entitled Stationsnära läge 2.0 (station-near areas 2.0) was produced and approved in 2018 (Region Skåne et al., 2018). This strategic document put emphasis on joint planning principles and aims, in order to support the work of municipal, regional and national actors in implementing these ideas. The document also aims to strengthen development around stations with or without rails, which means that bus stations and similar transit hubs also are considered in the position paper. Briefly, the document enumerates five principles: efficient land use, the whole journey, keeping the station in focus, cooperation and dialogue, and common objectives and targets (Region Skåne et al., 2018).

On the Danish side of the GCR, the Fingerplan guides urban development for the Capital Region of Denmark and for parts of Region Zealand. Published for the first time in 1947, the Fingerplan stresses, among other things, the principle of having workplaces located near stations as a way to promote the use of public transport. The planning directives of the Fingerplan vary in terms of accommodating different settings within its area – for instance, different distances from the station (Figure 1). Urban developments of a regional nature are in the core area, and urban developments of a local nature are in the most peripheral areas (Ministry of the Environment, 2015).

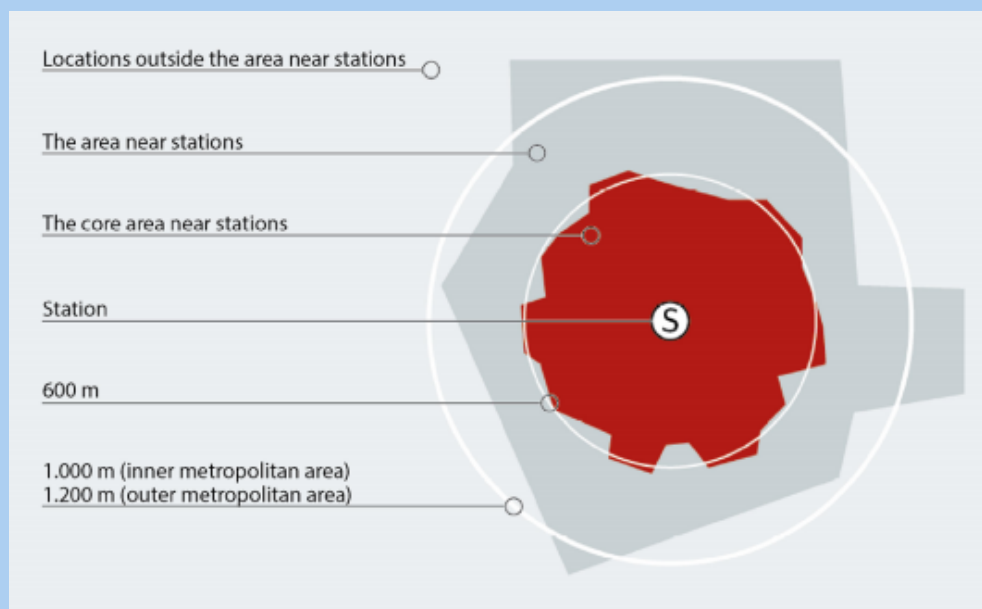


Figure 1. Station vicinity typology in the Fingerplan.

Source: Ministry of the Environment, 2015.

3. Rail accessibility in the Greater Copenhagen Region

This section of the report provides the contextual elements of rail accessibility and commuting within the Greater Copenhagen Region. It starts by providing an overview of the cross-border region and its Traffic Charter, a vision document prepared by the Greater Copenhagen Committee². It then proceeds with a short description of rail traffic, as well as a mapping analysis of accessibility by train within the Greater Copenhagen Region.

3.1 Cooperation across the Öresund

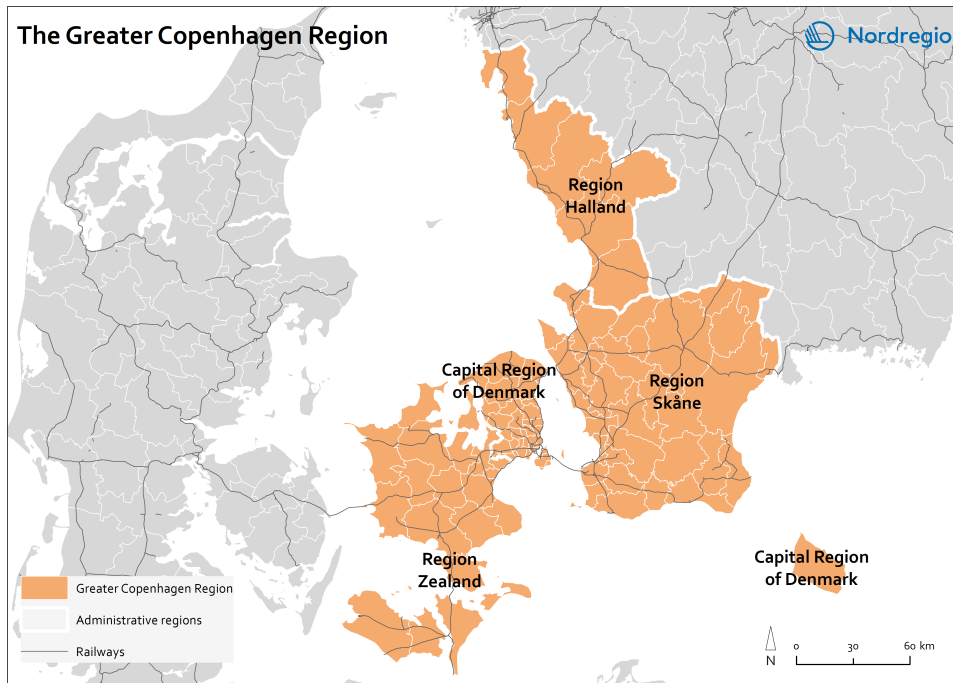
The Greater Copenhagen Region, a territory with areas located on both sides of the Öresund strait, is the largest metropolitan area in the Nordic Region. It is home to 4.3 million inhabitants, and it is Scandinavia's largest recruitment base for highly skilled employees (Greater Copenhagen Committee, 2020). Cooperation within this region has a long history. In the recent past, a common vision promoting cooperation and integration in the Greater Copenhagen Region was developed concurrently with the opening of the Öresund bridge, i.e. in early 2000.

Another step was taken in 2016, with the establishment of the Greater Copenhagen and Skåne Committee, commonly referred as the Greater Copenhagen Committee. This is a political organisation aiming to remove those cross-border obstacles which prevent economic growth in the region. In 2019, the Swedish region of Halland joined this cross-border cooperation, resulting in it expanding to embrace 85 municipalities and four regional authorities: the Capital Region of Denmark and Region Zealand on the Danish side, and the regions of Skåne and Halland on the Swedish side (Map 1).

The Greater Copenhagen Committee aims for its area to be the leading metropolis in Northern Europe, in terms of attracting and retaining international investments, companies, tourists and talents (Greater Copenhagen Committee, 2020). Its main purposes are:

- Supporting the joint marketing of the Greater Copenhagen Region.
- Supporting cooperation between investors, tourists, businesses and talents.
- Work to create a strong international infrastructure.
- Work towards an integrated and sustainable growth region.
- Influencing legislation effecting border barriers, which are estimated to be barriers to growth.
- Establishing joint strategic business initiatives.

2. Including elements collected in interviews and discussions with senior advisors in regional development in the Greater Copenhagen, Skåne and Zealand regions.



Map 1: The Greater Copenhagen Region.

Source: Nordregio

> See the original map in [Nordregio's map gallery](#)

3.2 A cross-border Traffic Charter

The Greater Copenhagen Committee, an organisation composed of politicians at municipal and regional levels, dedicates special effort to improving accessibility between cities and regions – both within the two domestic contexts, and across the national border, among others. The Committee has elaborated a so-called Traffic Charter, a shared vision document presenting “how a well-functioning, robust and sustainable infrastructure will help to strengthen mobility and boost economic growth and welfare” (Greater Copenhagen Committee, 2016). This six-page document, published in October 2016³, was prepared by the steering committee of the Greater Copenhagen Region. The document is the fruit of a long negotiation process, which in itself has strengthened the collaboration among key stakeholders within the region. The Charter aims at strengthening the cross-border perspective on mobility and transport by bringing regional and national politicians around the table to discuss the common desire for a better and more integrated transport system within the Greater Copenhagen Region. Such collaboration on a common transport vision has become even more important now that the cross-border perspective is weak at national level, both in Denmark and Sweden (Ibid.). Hence, the Charter can be used as a basis for dialogue with national governments as well as with other national level actors, such as the train operators in Denmark and in Sweden.

One section in the Traffic Charter relates to the cross-border objective of “a coherent public transport system” (Greater Copenhagen Committee, page 6, 2016). This can be understood as the ambition to achieve a more attractive, cross-border public transport offer (e.g. a unified tariff system). This section has a clear emphasis on the need for better commuting conditions in the cross-border region, in order both to provide a strong alternative to the use of private cars, and to create a single commuting area. Two specific goals are set out. These state that:

- A coherent public transport system should be promoted in the Greater Copenhagen Region.
- It should take a maximum of one hour to get either to Copenhagen or Malmö from all parts of the Greater Copenhagen Region by train, as the primary means of transportation.

The former goal is the main focus of an Interreg project in the Öresund-Kattegat-Skagerrak region. It aims at promoting mobility and accessibility in the Greater Copenhagen Region through forms of sustainable transport, and also strengthening the region as a node for the Trans-European Transport Network (Interreg Öresund-Kattegat-Skagerrak, 2018). The latter is the point of departure for the analysis presented in the next section of this report, which maps those parts of the Greater Copenhagen Region which can be reached by train within an hour when departing from either Copenhagen or Malmö main train stations. This analysis contributes to an up-to-date overview of train accessibility which aims to be comparable between the two sides of the Öresund, and therefore provides a valuable contribution to this specific goal within the Traffic Charter.

While the Traffic Charter puts forward a shared vision and accompanying ambitions for an integrated cross-border region, it also recognises that development on each side of the border is still subject to different legislative contexts and spatial planning developments. This may help to focus priorities concerning how these features can be further aligned in Denmark and Sweden, in terms of the needs of small- and medium-sized cities.

3. This document applies to the delineation of the Greater Copenhagen Region as of 2016. At that time, the Swedish region of Halland was not part of the Greater Copenhagen Region.

3.3 Cross-border commuting in the Greater Copenhagen Region

Cross-border commuting flows contribute to the integration of the Nordic Region. There are several areas across the Region where a relatively significant number of commuters cross national borders on a daily basis. The Greater Copenhagen Region is where the highest number of daily cross-border commuters are to be found in a Nordic setting, with a peak in 2008 of almost 20,000 people commuting over the Öresund strait (Örestat, 2020). Cross-border commuters either use the fixed link between Copenhagen and Malmö, or else the ferry connection between Helsingør and Helsingborg. Two-thirds of them commute by rail (Öresundsbro Konsortiet, 2018).

The vast majority of commuters, around 90% in total, reside in the Swedish part of the cross-border region, and work in the Danish part. It is interesting to note that about 75% of cross-border commuters live in five municipalities of the Greater Copenhagen Region. Malmö is the municipality with by far the largest number of cross-border commuters (ca. 8,400), followed by Helsingborg (1,220), Lund (790), Vellinge (620), and Copenhagen (520). These figures can be explained by the good conditions provided by Danish labour markets for commuters from Skåne. Consequently, the remaining municipalities, which mainly correspond to small- and medium-sized cities, bring together just 25% of the residents of the Greater Copenhagen Region who engage in cross-border commuting.



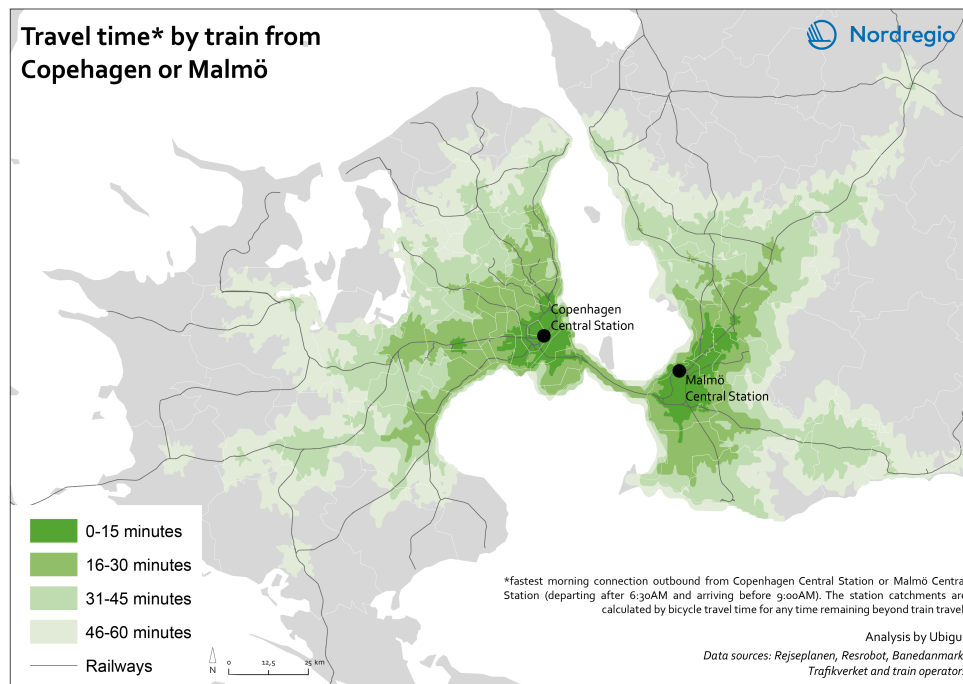
Öresundståg - Pågatåg

Photo: Skane.com @ Studio e

3.4 Rail accessibility in the Greater Copenhagen Region

The Traffic Charter of the Greater Copenhagen Committee includes the following goal: "It should take a maximum of one hour to get from all parts of Greater Copenhagen to either Copenhagen or Malmö by train". It is therefore interesting to visualise which areas of the GCR are actually within a one-hour travel time by train from one of these two main urban areas.

Map 2 shows the fastest travel times in 2020, by commuter train, departing from Copenhagen and Malmö main train stations. The travel times indicate the fastest morning connection outbound from Copenhagen Central Station or Malmö Central Station, departing after 6:30AM and arriving before 9:00AM. The station catchments are calculated by bicycle travel time for any time remaining beyond train travel. For instance, a 35-minute train ride and a 10-minute cycle ride results in a 45-minute total travel time. The shades of green indicate the travel time to other train stations and their surrounding areas in four main classes: up to 15 minutes, 16 to 30 minutes, 31 to 45 minutes and 46 to 60 minutes. The areas not highlighted in green on the map are further than one hour by train from either Copenhagen or Malmö main train stations. The map clearly shows that the vast majority of areas within the Capital Region of Denmark, a number of stations and areas which are part of the region of Zealand, for instance Slagelse and Næstved, as well as areas located along four main train corridors in Skåne (Malmö-Helsingborg, Malmö-Hässleholm, Malmö-Trelleborg and Malmö-Ystad) are within the one-hour travel time by train from/to Copenhagen and/or Malmö, thanks to the different train types (Öresund trains, regional trains and intercity trains). Areas of the GCR which are beyond the one-hour travel condition are the most northern part of the Capital Region of Denmark, the southern and western parts of Zealand (e.g. Kalundborg and Vordingborg) as well as most of the eastern half part of Skåne. In terms of population, the current situation provides this possibility to almost 3 million out of 4.3 million inhabitants, corresponding to 69% of the total population living in the Greater Copenhagen Region in 2020. The proportion of the total population increases to 75% when the region of Halland is excluded (as this was not initially part of the GCR when the Traffic Charter was released).



Map 2. Travel time by train from Copenhagen or Malmö.

Source: Nordregio (adapted from Ubigu)

> See the original map in [Nordregio's map gallery](#)

The effect of COVID-19 on mobilities

This analysis has been completed during the Spring and Summer of 2020, the peak period of the COVID-19 pandemic in Europe so far. It was therefore interesting to ask local planners of the four selected municipalities about their views concerning the possible impacts of the pandemic on local, regional and cross-border mobilities

The main impact on mobilities is linked to decisions from the Danish authorities about which Swedish residents are able to enter Denmark. It mostly effects cross-border travel, especially commuters. Working from home was a solution for some, but not for employees in the hospitality industries (e.g. hotel and aviation sectors, among others). There was also an impact on less regular trips, such as leisure visits involving Danes enjoying the experience of nature in Skåne and Halland, and Swedes appreciating the culture available in the Copenhagen area.

The limited number of cross-border commuters in SMS cities has not had any significant effect in these cities. However, SMS cities were also hit by bankruptcies in the hospitality sector, due to the cancellation of conferences and other large events. Intra-regional mobilities have also contracted in comparison to pre-Covid-19 periods (Table 2). There is a similar and clear reduction in mobility to workplaces across the four case studies, around -20% between the baseline and the end of August 2020. It is less straightforward to identify a pattern in differences over time in mobility to transit stations, with variation between -32% in Höör to +6% in Lejre. That might be explained by the rather small sample size. The variation for the two medium cities is closer, with -14% in Landskrona and -24% in Ringsted.

It is not yet clear how these changes in mobility will impact the development of SMS cities, in the context of the GCR, including TOD and rail transport, in the medium and long term. Also some uncertainties remain, such as how long limitations on mobility are going to remain, and how long the current pandemic is going to last.

	Höör	Lejre	Landskrona	Ringsted	Zealand	Skåne
Transit stations	-32%	+6%	-14%	-24%	-4%	-23%
Workplaces	-21%	-19%	-24%	-19%	-19%	-28%

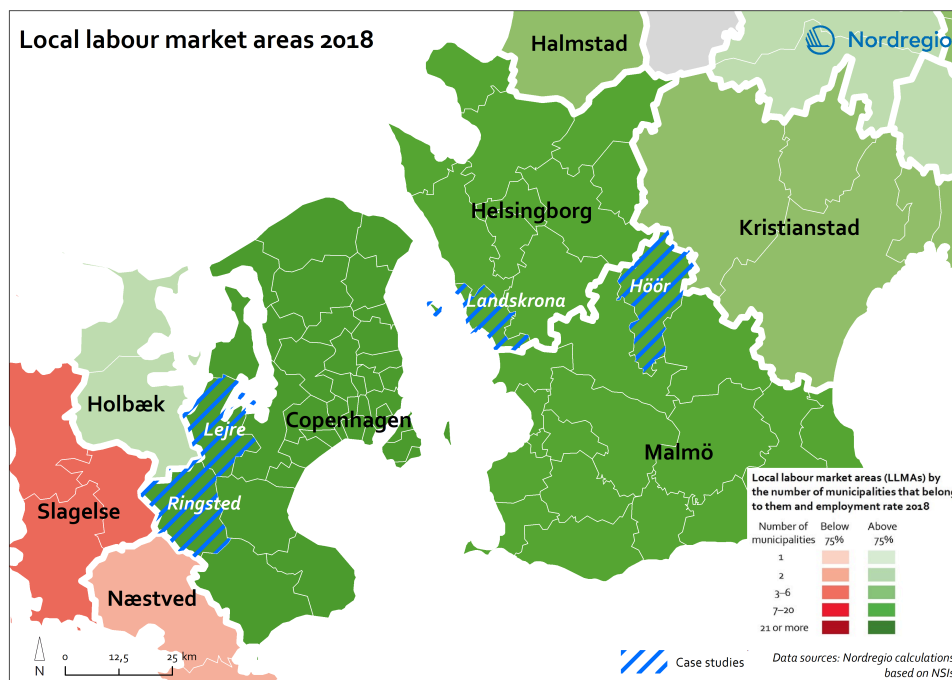
Table 2. Difference in mobility to transit stations and workplaces between a baseline and 28th August 2020.

Data source: Google COVID-19 Community Mobility Reports.

4. Regional mobility patterns and TOD characteristics in the four SMS cities

The inputs in this case study analysis rely mostly on qualitative interviews and discussions with municipal and city planners in four municipalities within the Greater Copenhagen Region. Two cases, representing one small and one medium-sized city, were selected on each side of the Öresund strait: Höör and Landskrona in Sweden, and Lejre and Ringsted in Denmark. They are in different labour market areas located within one hour of either Copenhagen or Malmö, all having at least 75% of their workforce employed (Map 3).

The case study analysis does not aim to provide inputs which are representative of the context for all SMS cities within the GCR. This is because the SMS cities are diverse by nature (e.g. having a different population size, different locations, different functions, and different national and regional contexts). Rather, the study aims at gathering qualitative inputs capable of illustrating examples of TOD in SMS cities within the GCR. By adding depth to the way in which we understand these four case studies, there is potential to adapt its findings to decision-making in the near future, e.g. around the Traffic Charter as a more broadly implementable strategic tool, at both local and regional levels.



Map 3: Local labour market areas 2018.

Source: Nordregio

> See the original map in [Nordregio's map gallery](#)

4.1 Höör, a small city in Skåne

Höör Municipality is located in Skåne, 55km north-east of Malmö along the southern main line railway that goes between Malmö and Stockholm. In 2019, the municipality had 16,713 inhabitants, of whom 12,608 lived in the main urban settlement (Statistics Sweden, 2019). It is also part of the Malmö local labour market. Höör has one train station in the main urban settlement which is located with good accessibility to both Malmö-Lund in south-west and Hässleholm and Kristianstad in north-east. Both regional trains (Öresundståg) and commuter trains (Pågatåg) pass through and stop in Höör. By train, the fastest train connection to Malmö takes about 34 minutes, and 76 minutes all the way to Copenhagen.

4.1.1 Cross-border and regional considerations

The municipal plan describes the connections by different modes of transportation to the Danish side of the Greater Copenhagen Region as good, with opportunities to travel to the rest of world via Copenhagen Airport (Höör's kommun, 2018). The connection in the opposite direction (for those who travel from the Danish side to Höör) is described in a similarly positive manner, because visitors can easily get to Höör to access the untouched landscape of Skåne, with its various hiking routes. The natural environment is something the planners we interviewed emphasised as an important asset of the municipality, one appreciated by visitors and inhabitants alike. The municipal plan goes on to describe Höör as a small town within a large metropolitan area, including growth centres such as Lund, Malmö and Copenhagen. Copenhagen and its proximity is described as an asset in this context – one in which it is easy to visit the opera in the evening and then return back to Höör after the show, for example. The planners who were interviewed confirmed this perspective, describing Copenhagen as an asset which most of Höör's inhabitants can travel to for leisure, particularly in terms of accessing various cultural activities or shopping.



Öresundståg

Photo: Nikolai Perjesi (The Danish railway)

From Höör's perspective, being a small town in the large cross-border metropolitan area leads to fresh possibilities from a labour market perspective, though enhancing daily commuting to Copenhagen is not a priority. This is further strengthened by the travel statistics, which show only 214 daily trips between Höör and Denmark (Region Skåne 2018). Even so, the proximity to Copenhagen and Denmark is also perceived as an asset, regardless of sub-regional cooperation.

In Höör, most of the municipal planning related to cross-border transportation occurs within the sub-regional cooperation in the Malmö-Lund region. The fact that Höör is a small city in a cross-border region with two large cities, Malmö and Copenhagen, but also with proximity to other relatively large cities in Skåne, such as Lund, places it in a highly distinctive context from a mobility perspective. The labour market is multi-directional – i.e. most people residing in Höör commute to Malmö-Lund, but there are also commuters to Hässleholm and Kristianstad. The same applies for pupils in upper-secondary school (Gymnasium in Swedish). There is no upper-secondary school in Höör, which means that the train station also plays an important role in enabling pupils to commute, so that they can get to school.

The location and smallness of the city means that it possesses several significant qualities – including access to nature, cheaper house prices and good public transit connections. Many people move to Höör at that time in life when it is appropriate to establish a family. One planner also stressed another positive feature as being that those who settle in Höör will automatically find themselves living close to the train station, regardless of where they settle in the city. This means, according to this planner, that you get all the qualities mentioned above and at the same time a station near to home. In other words, it is easy just to go by bike, directly from your home, either to the countryside or to the train station.

Even though there are these significant assets and qualities which can be ascribed to its limited size, Höör faces challenges in keeping such a small city as a living and viable environment. Höör has so far been seen as 'too far away' from Malmö and Lund to be a so-called 'dead' or 'dormitory town', which means that many activities in people's everyday lives are still located in town. However, the planners we interviewed perceive 'dead city centres', or the risk of becoming a 'dormitory town', as a potential challenge in the future – one which they would like to avoid in the development of the city. Potentially that is in line with the regional strategies aiming to strengthen the polycentric development of Skåne as a whole, but it is already possible to observe intra-regional competition between towns in Skåne. The city centre is therefore facing major challenges with many unlet premises, and the municipality is now seeking the right strategy to address this. What should Höör's role in the region be in order to avoid becoming a 'dormitory town'? This seems to be the major problem and concern which the municipality is seeking to overcome as it seeks the right path for itself. This is challenging, when the relationship between particular places and the location of different activities is connected, especially in a region like Skåne.

4.1.2 Station area and its vicinity

Figure 2 illustrates the location of Höör train station in its direct surroundings (Figure 2). The train station is located north-west of the city centre, while most of the built environment is concentrated south-east of the train station. The majority of urban settlement is also south of the train station, with the city centre within walking distance – although visually disconnected from the station. North and north-west of the train station, there are a number of single-family homes, but also relatively large portions of undeveloped land, which are also in direct proximity to the north-western parts of the train station. That specific area north-west of the train station has in fact been undergoing planning over the past decade; and even more intensively in recent years, when the planning process for a detailed development plan was taking shape.

The first phase of the new area consists of a detailed plan, which will give building rights for land under planning consent. This was approved by the municipal council in September 2019. An expected second phase is currently at a standstill, awaiting political guidance in terms of clearer guidelines, objectives, and a vision for the next phase of development. The construction of

apartment buildings and new public spaces are part of the first phase of a fresh urban area being created around the train station. The design of the apartment buildings should, according to the description in the plan, relate to the contemporary building tradition in Höör. The public spaces aim to be used as obvious meeting points for the local population – with a centrally located square and close connections to both the bus station and the train station, for all linking public transit options.

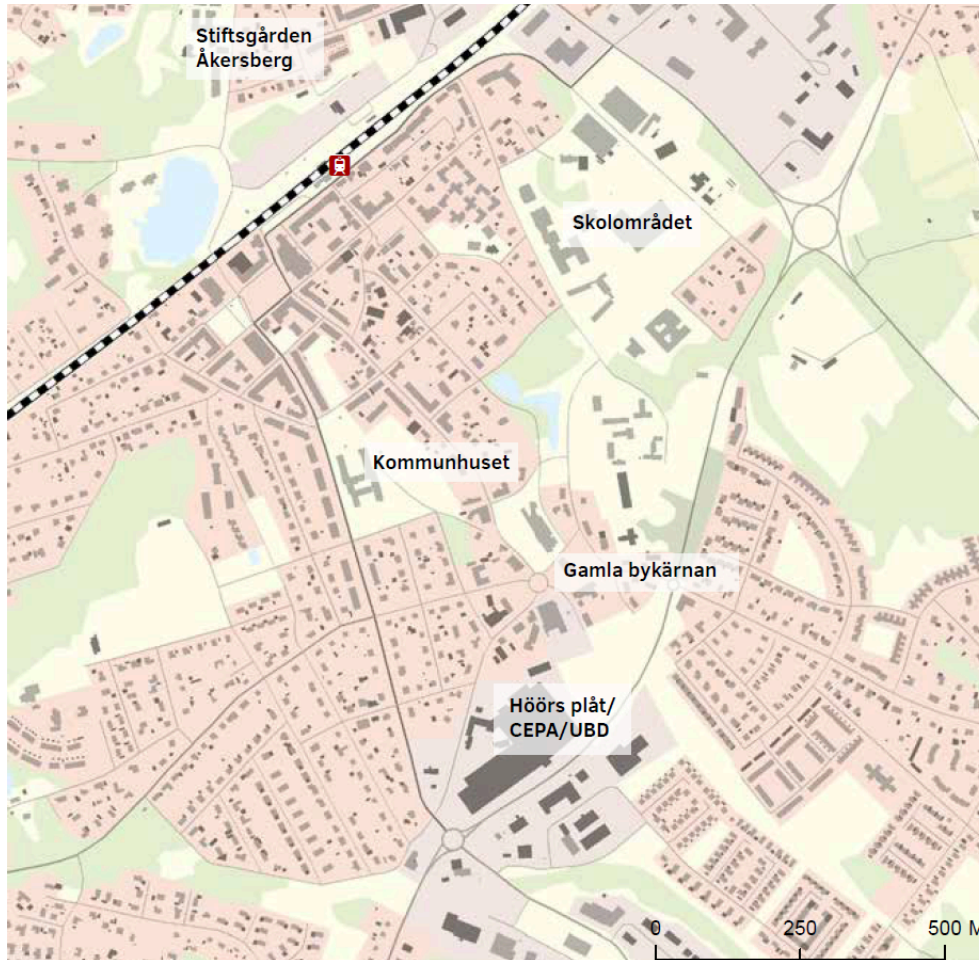


Figure 2. Höör city centre
Source: Höörs kommun (2018)

As can be seen in the two figures above (Figure 3 and Figure 4), phase one consists of three blocks of building (the yellow sections on the map), with one apartment building suggested in each. The detailed development plan allows for both housing and services – such as restaurants or coffee shops – to be established in the new quarters. However, the main objective and concept is to develop housing in these new buildings, because the city centre lies just a few hundred metres on the other side of the railway track. The planners we spoke to emphasise the importance of not moving or developing a new city centre around the train station, because this would compete with the current city centre. That is the main reason why housing development is the primary objective in the new area for phase one.



Figure 3. An illustration of the new station area (this is for illustrative purposes only and not the final outcome).

Source: Höörs kommun (2019: 5), credit to Fojab arkitekter.

When the planners were asked about specific functions for the new area, one of the first things mentioned was hiking paths and starting points for hiking routes, i.e. to create clearer signage towards hiking routes in the municipalities, which are used by visitors and tourists from both sides of the Greater Copenhagen Region and beyond. These are among the qualities that Höör is renowned for and a reason why people visit. That is why it is important to signpost this clearly at the train station. These areas are located north and north-west of the station, which means that hikers will need to cross the new station area. The station area will be kept in its present character, which contains a small hill with uncultivated nature. The area will be maintained in its natural state, rather than as a city park or similar. The apartment buildings will be situated between the nature area and the train station, and the different blocks of buildings therefore will be under different regulations in terms of their height. Even though the location by the station is, in principle, favourable for office development, no offices are planned in this new area, due to a lack of demand.

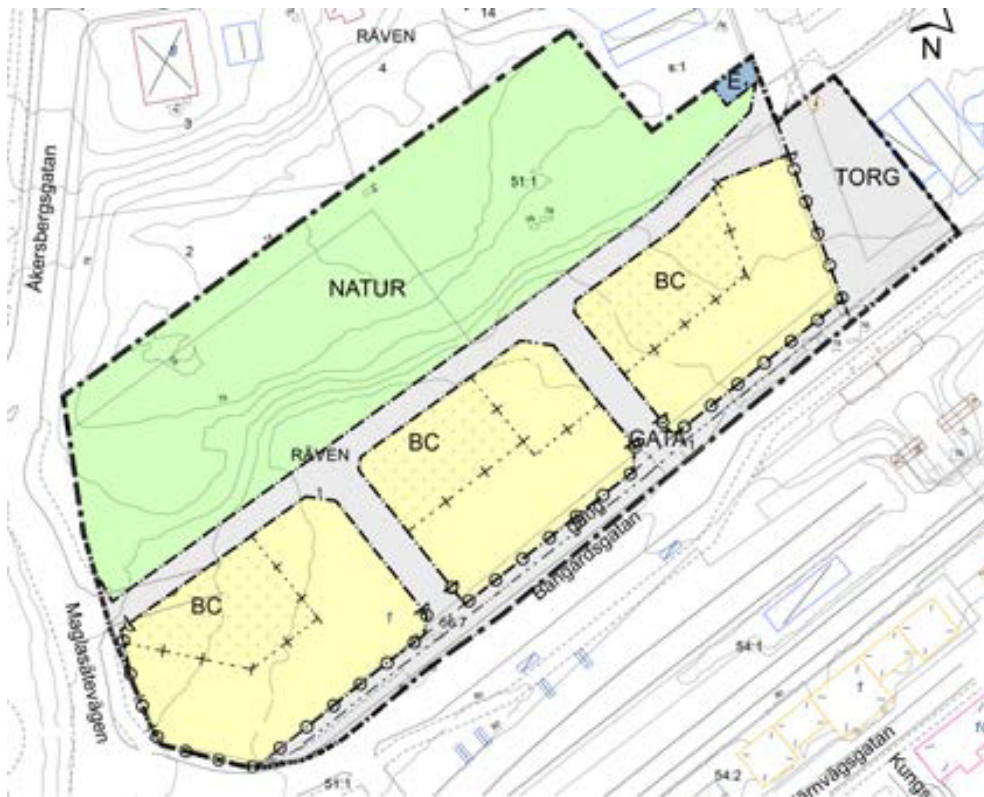


Figure 4. Planning map within the detailed plan (phase one). (Yellow sections: the new districts with housing and some services; green area: nature).

Source: Höörs kommun (2019: 5)

One specific feature of the vicinity around the station in Höör is the role and importance of parking. Indeed, the train station has one of the largest car parks in whole of Skåne, with around 400 spaces. These are available without a parking fee being charged, which is also a factor that contributes to the attractiveness of the train station today. It is used by, among others, people from the rural parts of Höör Municipality who can easily drive to the station within 15-20 minutes. The parking facilities are also used by inhabitants of neighbouring municipalities who do not have a train station, such as people in Hörby. That makes the train station an important node from an inter-municipal and sub-regional perspective too. The issue of parking spaces for cars is one example of a planning challenge faced by small cities which contradicts some of those concepts which are supportive of policies designed specifically to reduce land used to accommodate cars, according to current TOD ideals (c.f. Knowles et al., 2020). Small cities like Höör offers car spaces and easy access to the train station for its residents, which might make the train station (and perhaps even the small city) more attractive for some. Another recent change in the vicinity of the rail station, is the bus station, where bus services are deliberately scheduled to link with train departures and arrivals. The area by the train station has recently been re-designed in order to make space for more buses. This development contributes towards more sustainable commuting from the rural hinterland and neighbouring municipalities in the nearby region, by making public transport more attractive.

Phase two for the station area is now at standstill, due to further discussions about car parks. There are also negotiations about developing public service functions such as a library, municipal offices and a kindergarten. Those discussions and planning proposals have not yet been elaborated in any detail because the parking issue has ground the planning to a halt.

4.2 Landskrona, a medium-sized city in Skåne

Landskrona Municipality is located in Skåne, 43km north from Malmö along the West Coast Line railway, which runs all the way from Copenhagen to Gothenburg. Even though the West Coast Line has existed for quite a long time, the route via Landskrona is relatively new. It opened in 2001. Before then, the train connection to Landskrona went south-east to Kävlinge. The main urban settlement of Landskrona had 33,308 inhabitants in 2019, while the entire municipality had 46,090 inhabitants (Statistics Sweden, 2019). It is located within the local labour market area of Helsingborg, at the border for the local labour market area of Malmö. There are two more train stations in the municipality, situated in two smaller settlements. Our study, however, only focuses on the train station located east of the main urban settlement in the municipality of Landskrona. By train, the fastest connection to Malmö takes about 29 minutes, and 71 minutes all the way to Copenhagen. On a daily basis, around 439 trips go to Denmark, including all modes of transportation (Region Skåne, 2018).



Landskrona Municipality

Photo: Drahomir Postebý (Unsplash.com)

4.2.1 Cross-border and regional considerations

Landskrona's location within the cross-border region is described in the municipal plan (Landskrona stad, 2016) as having great potential, situated as it is between two regional centres, Malmö/Copenhagen and Helsingborg. However, the plan claims that Landskrona has traditionally failed to utilise its proximity to Copenhagen and Denmark. Hence, there is an opportunity to increase accessibility, both regionally and across the border, which is considered just as important for urban and regional development. A direct connection from north-western Skåne towards Denmark is felt to be necessary in strengthening links with Denmark (Landskrona stad, 2016). Landskrona has its own proposal for a connection from north-western Skåne to Denmark – a tunnel called Europaspåret, which is different from the HH-connection between Helsingborg-Helsingør⁴.

4. Included in the municipal plan of Landskrona but not in the Traffic Charter of the Greater Copenhagen.

The new station area (see following section) is based on the creation of a new connection, but the planners we interviewed stressed the need to be somewhat flexible in planning, in order to avoid dependence on a proposal that is not as anchored within the municipality itself as it could be. Landskrona has otherwise developed some of the cross-border planning work through the Familjen Helsingborg sub-regional cooperation. This is a collaboration which has worked quite intensively with its own structural plan, an informal planning instrument to enhance planning cooperation in this part of Skåne. The collaboration has focussed in particular on coordinating planning areas such as green structure and infrastructure, including elements of cross-border accessibility. All this can be seen in the municipal plan, where a connection in north-western Skåne to Denmark is recognised as one way of strengthening links to the Danish side of the Greater Copenhagen Region, regardless of which options are likely to be implemented in the future.

Even if Landskrona's main urban settlement is about three times bigger than Höör, the town itself can be perceived as rather small and compact, with short distances to most key points and activities within the municipality – including good access to the peripheral train station. Landskrona has been (and still is) an out-commuting town, where most people commute out to other parts of the region (mainly within Skåne) for work and studies. Despite its favourable location and improvements in rail access during the last two decades, the city still suffers from a lack of overall attractiveness, as well as extensive challenges regarding segregation and criminality. This means that Landskrona has often been perceived as a town that people move away from, rather than to. Rebranding the town to attract new residents has proved difficult, though the location remains promising because of its good transit connections. That meant that the municipality needed a holistic planning approach, just at the time when the idea to develop the train station area and areas around it had to be postponed. Instead, local developments occurred in other parts of the municipalities, such as along the shoreline in north-western Landskrona (Norra Borstahusen) and through improvements to the Million Programme⁵ area (Karlslund) – which consists of improved facilities such as public transportation connections and enhancing the qualities of the outdoor environment.

In the near future, plans to further develop the municipality will focus on improving the attractiveness of its settlements by concentrating on housing quality and the living environment. Those developments are mostly located in the existing core of Landskrona's main urban area. This case illustrates a strategic and long-range approach when it comes to developing a station area. Rather than developing the station directly in line with regional planning strategies, the municipality decided on a more cautious, long-term perspective, tackling its other more prevalent challenges and instilling energy into the city as a whole – before starting the more detailed and technical planning work involved in the new station town.

4.2.2 Station area and its vicinity

Even if Landskrona's crossroads meant prioritising development and resources within the existing body of the city, ideas for developing the station area in the future have always been part of the underlying strategy and planning concept for the city's long-term prospects, according to planners we interviewed. When the new route on the West Coast Line was built, the new train station was located east of the urban settlement, about 2.5 kilometres from the city centre. This resulted in large areas of undeveloped land just east of the new train station (Figure 5). The undeveloped area consists of agricultural land, which has the highest classified value and is therefore considered a national asset. The new train station itself, and its surrounding location, is also considered a national asset from a transport point of view.

5. The Million Programme is the common name for a Swedish national public housing programme that was implemented between 1965 and 1974. During that period, one million dwellings were built in Sweden, of which one third was apartment buildings in modernistic architecture like the area in Karlslund.

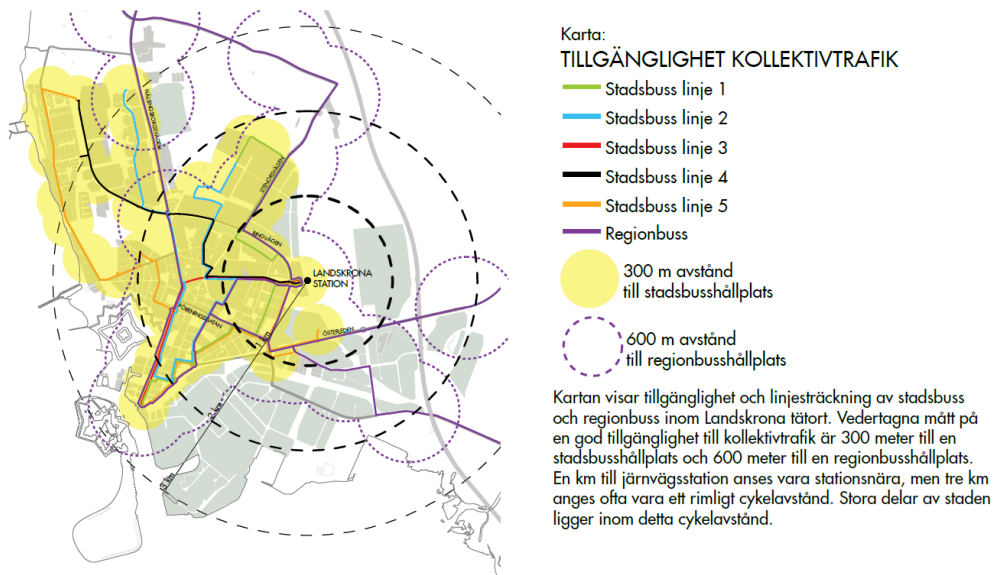


Figure 5. Location of Landskrona station and its surroundings.

Source: Landskrona Stad (2014:30)

Due to the location of the train station, redesigning and strengthening links within the city – and to some extent out to the countryside, too – is another of those recent strategies endorsed by the city. Planners referred to this as improving urban connectivity, and the links that make this possible have mainly been directed from the train station to the city centre and towards the north-west to the new shoreline project via the deprived Million Programme area. The aim is to further connect those parts with the rest of the city. For instance, the detailed municipal plan (Fördjupad översiktsplan) which is limited to Landskrona’s main urban area, was approved in 2014 (Landskrona stad 2014). In that planning document, the eastern and undeveloped parts of the station area were identified as a single urban development project in the long term. The municipal plan from 2016 (Landskrona stad, 2016) makes a further suggestion to investigate the preconditions for developing Landskrona station and its surrounding area. That planning has just begun, and when conducting interviews with our planners in April 2020, they had just received the first architectural illustrations envisioning the new station area. So, the planning work for the new station area has been initiated only recently, and more thoughts on these initial ideas will be outlined in the following section.

Even if connectivity to the train station has improved, most of the recent improvements have been within the urban settlement. The connections east, to the surrounding rural areas, are poorer – even though the planners mentioned that bus connectivity to the countryside is relatively good in general. The connection to the train station from the eastern part of the city is not so good, however, and there is no way to cross under the tracks from the eastern part. This means that accessing the train station from the countryside to the east requires a short detour. That is something which could potentially be improved sooner rather than later, when the Swedish Traffic Administration constructs a new tunnel under the tracks – and in the long run, when proposed urban development around the train stations enters its implementation phase.

To conclude, regional strategies and planning ideas have been in line with the municipal ones – namely, to develop the train station area. However, in the past decade, Landskrona has prioritised overcoming its own challenges rather than developing an isolated ‘island’ – which, in practice, would have been disconnected from the rest of the city, and therefore considered a remote area. There is clearly further potential to strengthen links to the surrounding rural area, and to develop sustainable transport solutions from a municipal and regional perspective, based on development around the station

As outlined above, the more detailed planning ideas for the new station area are in their initial stages. The coming years will define how the new development unfolds. Concepts and new functions for the new station area have already been produced. Some areas in the eastern parts of the station vicinity will likely consist of productive activities such as industry, while the new station area itself will primarily consist of housing and office development, with potential for additional small services such as cafés and perhaps supermarkets. Some planning processes have already begun. One along the motorway, north-east from the train station, will soon enter a new detailed planning development process (at the time of writing, Spring 2020). Another, along the motorway south-east from the station, had a detailed development plan approved way back in 2009, which led to the establishment of the DSV Road Property. That industry has been an important cornerstone of local business development, according to our planners. The other development will take place just next to the train station and along the tracks up north (Figure 6).

The new district will consist mainly of housing and office buildings next to the train station, probably with a public square. The new area will eventually and smoothly segue into a forest, which according to current planning concept is referred to as 'the station forest'. As the vision stage of planning process has just begun, the issue of attracting office buildings to the area has not been investigated thoroughly, but those ideas exist in early form. The functions for the most proximate areas in the new district will also consist of city centre activities – like commercial services such as cafés and supermarkets. However, planners have emphasised that functions such as retail will not be allowed in the new station area, so as not to compete with the existing city centre of Landskrona, located 2.5km away.

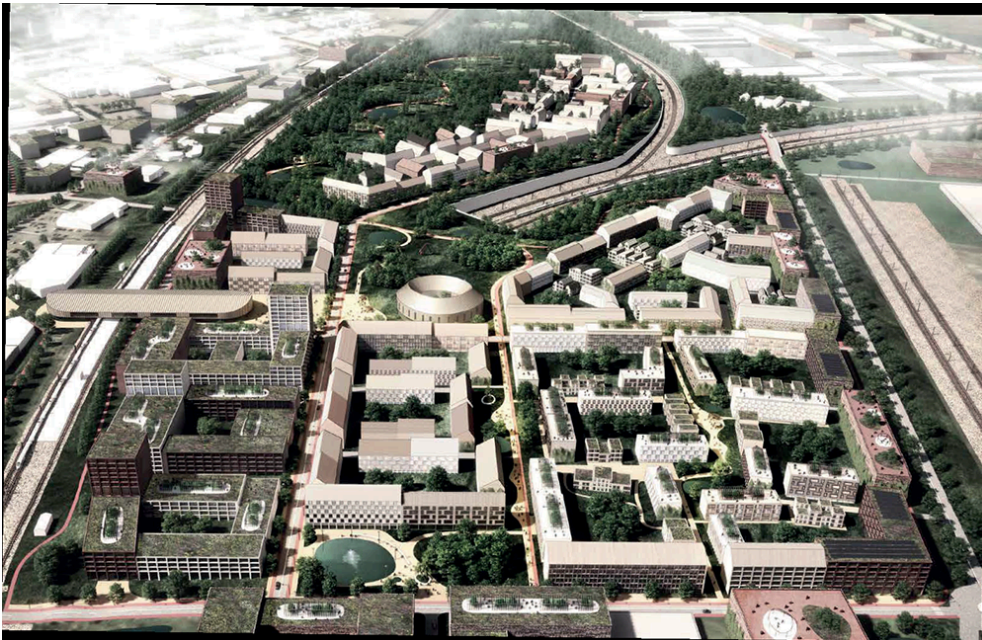


Figure 6. The vision for the new station area from the south. (An illustration from an early stage of the planning process, so the outcome for the future may be different.)

Source/Credit: Landskrona stad/Schauman Nordgreen Architechts.

In addition, the municipality needs to strengthen links from the train station to the rest of Landskrona, work that has already begun. Since most cultural and commercial activities will remain (and be developed) within the city centre, links and paths from the station to that centre need to be attractive, safe and easily accessible, e.g. eight minutes by high frequency electric trolley bus (Skånetrafiken, 2020). The reason for the choice of a trolleybus was to make the connection to the city centre more resilient – a sign that the connection is here to stay, and that it is an extension of the railway. On top of that, new bicycle lanes and pedestrian paths have been developed recently. These contribute towards the creation of intra-urban linkages in Landskrona, using an environmentally friendly means of transportation. Finally, improvements to existing bus connections out to rural areas, as well as parking spots for rural dwellers by the station, would increase accessibility from and to the station to other parts of the municipality.

4.3 Lejre, a small city in Zealand

Lejre is a municipality in Region Zealand, located along the Roskilde-Holbæk-Kalundborg train line, about 45km west of Copenhagen. It is located at the periphery of the local labour market in Copenhagen. Lejre offers an interesting context – a case study enabling understanding of small town and regional cross-border dynamics, especially as they relate to mobility needs and station developments. Lejre consists of approximately 27,000 inhabitants living in the 17 so-called parishes, while other smaller places within the municipality are considered rural areas. As set out in the municipality's vision – Lejre is 49 hamlets, villages, and localities (Lejre Kommune, 2016)⁶. It is recognised as the most decentralised municipality in the country, because of the spread of population and residential areas. This suggests that mobility options for people living in Lejre rely either on cars or on local public transport.

The current municipality is the result of an administrative reform in 2007, which merged the former Lejre Municipality with Bramsnæs and Hvalsø municipalities. The municipality today therefore administers two train stations: one in Hvalsø and one in Lejre. Hvalsø is, according to national designation, considered an urbanised area, whereas the size and setting of Lejre is rural. In the regional cross-border context, accessibility to Hvalsø is more relevant, because it services more people in the Greater Copenhagen region overall. However, the case study also considers some aspects of the smaller station in Lejre, to provide a more comprehensive understanding of transit-oriented characteristics within the municipality.

4.3.1. Cross-border and regional considerations

Given Lejre's location, it is close to the capital and well-integrated within the Greater Copenhagen Region. It enjoys short travel times by train (34 mins to Copenhagen main station, 54 mins to Kastrup Airport, and 1hr 26 mins to Malmö main station). It is also accessible by car. There are, however, few, if any, regular cross-border commuters from Lejre to Skåne and vice versa (See e.g. 2018 figures on cross-border commuting from Öresundsinsitttet). That being said, the municipality actively participates in, and is connected to, Greater Copenhagen – working for growth and development in eastern Denmark and Southern Sweden. According to its plan and sustainability strategy from 2016, Lejre is also part of 'Madfællesskabet', a partnership with the City of Copenhagen and Bornholm Regional Municipality. This aims to demonstrate how, in practice, improved conditions for local food producers and cooperation between the country and the city can benefit the whole region, as well as bind country and city more strongly together (Region Zealand, 2016).

Interestingly, while the municipality is driven by a vision to develop, there is a strong wish to remain rural. This is reflected in its municipal 'story', which was created with the involvement of its residents. There it says that "We choose to be a rural district as a matter of preference. We embrace our villages, the natural world and the local community" (Lejre Kommune, 2016). Correspondingly, while it is important for the municipality to maintain its rural residential identity, Lejre is an outward-commuting municipality with employment spread out across the region. Its population is on the move every day, therefore.

Around 70% of the workforce commutes to jobs outside Lejre, and young people travel to the nearby major cities to access the educational opportunities they offer. It is atypical for a small municipality in Region Zealand to have such a large proportion of out- and in commuters (10,000 out of the 13,000 people in the workforce). But this is, among other things, a result of its proximity and good accessibility to Roskilde and Copenhagen. In 2016, Lejre Municipality had more citizens working in Roskilde and Copenhagen municipalities together than all the citizens working within the municipality's borders. As a result, people in Lejre face, on average, some of the longest commuting distances in the country. The average commuting distance for those with residence in the municipality with employment is 29.6 km (Statistikbanken Danmark, 2019). By

6. Definition of parish according to Lejre Kommune in a 2016 study entitled På forkant (Ahead). The parish is used as a delimitation in the analysis to uncover the various typologies, including differences between towns and rural areas.

comparison, the usual commuting distance for all employed people in Denmark, based on figures from a 2016 report, is 20.1 km (Lejre Kommune, 2016).

Therefore, most residents of Lejre, whether they live in Hvalsø, Lejre town or in other parishes or villages, are dependent on commuting for work. Half of commuters drive cars every day. Because of the rural nature of Lejre, public transport cannot service all demographic groups across the municipality. However, efforts are being made to mitigate the climate impact of car usage, in line with the municipality's development strategies and vision. Among those commuting in to Lejre, many of whom work in the public sector or for the municipality, are those who depend upon an efficient transport service. This is something which the municipality needs to plan for, since these are people who bring in essential skills and competencies for local development and growth. In recent years, the municipality has made commuting by train more attractive to car commuters by providing access to parking at the train stations in Hvalsø and Lejre. It is also relevant to mention the existence of a bottom-up process in vesting in the welfare of local commuters. This corresponds to an active, online community, whose agenda includes ensuring that the 30-minute travelling time is consistent, that night trains are available, that there is seating for all commuters, and that adequate station facilities are available for all for commuters.

Lejre is a residentially-oriented municipality with broad ambitions to remain attractive and competitive, so it follows that an important factor in settling there is the opportunity for employment within a reasonable distance from home, as well as affordable housing prices. To this end, as has been observed in a study on small towns in Denmark, "People can seem forced to commute, but commuting is also attractive as a means of widening the scope of people's choice of residence, moving away from urban development driven by residential amenities" (Fertner, C. et al., 2015, 120).

Having found its role as a rural, residential setting, Lejre is focused on strengthening transportation and mobility processes, and making the '49 villages' an attractive place to live – regardless of where people may work. As such, it will require the municipality to consider its role as a small-sized city in a regional and cross-border context, if the local strategy is to accomplish national and international sustainable objectives. For now, Lejre is committed to becoming a location that has "an ongoing response to major social issues concerning urbanisation, centralisation, indifference and stress. We love the big city, where many of us work, but we have our homes and lives in Lejre Municipality." (Våres Sted (Our place), 2016, 8).

4.3.2 Station area and its vicinity

While there is an increase in economic activity and local 'value creation', Lejre will not become 'a hub' of the sort that seeks to attract a lot of new workplaces. Rather, it will offer (domestic) regional mobility and access, in particular for residents who are employed and therefore have to commute. Lejre's development is guided by a holistic outlook, recognising that the quality of life and wellbeing among its residents is vital. This is politically-driven, but also conditioned by both the physical and social geography of Lejre. A strength that the municipality draws upon is its prominent rural landscape. This is an asset which it plans to continue to build on locally, while striving to maintain its integrated and sustainable role in a regional (but also international) context. Lejre's transit-oriented and station area development therefore relates largely to the local context and community. The focus is on the station's multi-functional roles, serving diverse groups within the local community, and improving the spatial quality of the immediate surroundings.

The stations of Hvalsø and Lejre are similar in their typology and setting within the centres of each of their towns, respectively (Figure 7). The priority for both stations in Lejre Municipality as a whole is to develop functional areas for people to commute and to convene in, with particular emphasis on outcomes which are environmentally sustainable and that contribute to the overall wellbeing of the stations' daily users and its local communities. In short, improving access to both stations (Hvalsø and Lejre), especially for already-settled and new outward-commuters living in high-quality rural areas, remains a priority.

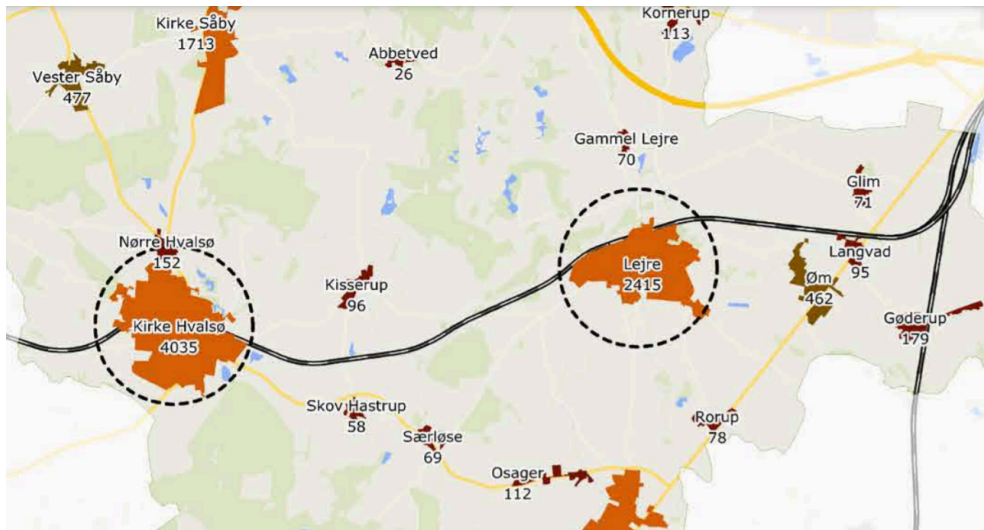


Figure 7. Hvalso and Lejre

Source: Lejre Kommune, kommuneplan

Hvalso station has historically been developed as a 'station town' and can be said to have experienced the kind of transit-oriented development (TDO) which characterised small Danish cities for much of the mid-twentieth century. The station in Hvalso is integrated within the town centre, with cultural and commercial amenities surrounding it, and provides a vibrant community life for the immediate area. Hvalso town hall is located about 500 metres from the station. The municipality is administered from Hvalso, so most commuters who work for the municipal administration travel to Hvalso, for instance, to work. In recent years, there have been upgrades to the station area, with expanded parking for bicycles in the northern part of the station, as well as more car parking spaces for commuters (Figure 8).

The station's location provides good opportunities for combined travel between different transport options for the residents of Hvalso. There are forthcoming plans for the station which will prioritise access and ensure more climate-friendly commuting options to and from the train station. Previously, the station was only accessible from the north side of the track. The new tunnel and the temporary parking area south of the track have now provided a different traffic pattern. The challenge is to improve direct and safe routes for cyclists in Hvalso, and also to improve parking close to the platforms – including improved access conditions for motorists and cyclists on both sides of the track to the south side. For bus traffic, the challenge is also to ensure more direct routes with shorter travel times to the station, perhaps by creating access from the south side of the station area as well (Lejre Kommune, 2016).



Figure 8. Hvalsø station

Source: Lejre lokalplan

By comparison, the station in Lejre village is a much smaller station. That said, it also accommodates bicycle parking and bus areas for its users. Unlike the surroundings of Hvalsø station, the centre of Lejre town is much smaller. There are no plans to expand the station area significantly at present, with a recent development which sees the car parking expansion for commuters included in local development plans having been approved in late 2019 (Figure 9). For the small station, this is part of an integrated municipal approach to develop the surrounding area overall, alongside public services. A good example of this is the local library, which moved into the former station building a few years ago, serving its daily commuters and the local community well.

It should be added that the stations of Hvalsø and Lejre are not within walking distance for most people, because private homes are spread out across the villages within the municipality. This adds to commuting times for those who depend on the train, and results in an extensive use of cars instead. However, locally, public transport services in Lejre include trains, buses, and school buses (Lejre Kommune, 2016).



Figure 9. Local plan for commuter parking by Lejre train station.
 Source: Lejre Municipality

4.4 Ringsted, a medium-sized city in Zealand

Ringsted is located in the middle of Region Zealand, 65km south-west of Copenhagen, and is a hub for traffic flows within Denmark. The municipality has approximately 35,000 inhabitants and is experiencing the largest population growth rate in the region (ca. 10% in the last 10 years). It is located at the periphery of Copenhagen's local labour market. Population forecasts predict that Ringsted will have grown by an additional 5,000 residents by 2030 (Statistikbanken, 2020). It is the combination of an attractive location in proximity to the capital city and moderate house prices that forms the basis for this anticipated population growth.

The medium-sized city has historically been an important 'connecting' town since medieval times, but it also experienced periods of growth and decline for centuries before its position and regional significance was manifested in 1856, when the railway link to Copenhagen was established. With the inauguration of the Copenhagen-Ringsted line in 2019 (one of the largest rail infrastructure upgrades in Denmark in recent times), it seems that Ringsted has once again become an important centre of development for the country.

4.4.1 Cross-border and regional considerations

The location of Ringsted in the municipal plan has been given consideration in terms of both local and international perspectives. As a regional transportation node, Ringsted connects Zealand with the border region to Germany and the Baltics in the south, to Fyn and Jutland to the west, and naturally, to the Greater Copenhagen Region to the north-east. By train, one can reach Ringsted in 36 minutes from Copenhagen and vice versa. By car, it takes between 45 and 70 minutes via E20, depending on traffic. To Malmö/Skåne, it takes between 65 and 100 minutes.

This connection, coupled with its location near the national highway, has presented opportunities for Ringsted's growth, many of which are characteristic of transit-oriented development. These include the establishing of new companies, an influx of knowledge and service professions, and educational institutions, to name a few recent trends experienced in Ringsted. Today, around 8,500 people commute to Ringsted to work – most coming from Western and South Zealand. About 9,500 people commute out of Ringsted Municipality – most over to East Zealand and Copenhagen. The railway access and in- and out-flows for Ringsted are a driver for development in themselves. They show that the municipality has focused on identifying and working to harness opportunities for growth, and that this has been reflected in its spatial planning.

As a growing, medium-sized city, Ringsted nevertheless considers its key role in the Greater Copenhagen Region (GCR) as one which will increasingly serve local residents in terms of housing development. Throughout Zealand, but also in Ringsted, there is a strong focus on creating commercial growth and attracting new residents. This is reflected in the municipality's strategy plan and vision, 'Ringsted – at the centre of opportunities', which concentrates on sustainable housing development, education and business – as well as emphasising broad socio-cultural engagement from all stakeholders in the city's development.

As a city determined by transit-oriented development (TDO) in a variety of ways, Ringsted is also conditioned by demographic trends and spatial density when it comes to the physical planning of the municipality. The strengths of Ringsted's history as a connecting hub also present some limitations, because car and railway traffic activities have increased over the years. An immediate challenge for Ringsted therefore seems to be balancing its regional and international role with 'local' potential, given the fact that the motorway and railroad cuts right across the city. As such, Ringsted might in some ways be more directly 'accessible' externally in the Zealand region than within the municipality.

It is expected that Ringsted will see an increase in the out- and in-flows of commuters over the next decade. The central location has, however, a price – given that the motorway and road connection is just as, if not more, important to the mobility of people in the area. In addition, the average commuting distance for people in Ringsted is almost 30 km, and according to national figures this distance has increased over the years, suggesting that there is unevenness between

residents, the labour market and employment opportunities within and beyond the municipality (Statistikbanken Denmark, 2020). The motorway, local bypasses and the railway create greater distances and barriers in the municipality – not least in Ringsted town centre.

Addressing these challenges is something that needs to happen alongside other considerations central to the municipality's development, which includes climate and infrastructure sustainability. In short, both technical and social development is needed for an integrated Ringsted at the local (and increasingly regional) level. Despite this, the municipality has generally established high intentions towards ensuring sustainable urban development (Ringsted Kommune, 2019). The goal is to provide current and future citizens with access to nature and recreational opportunities, coherent infrastructure, and a strong community in which climate adaptation and reducing the impact of greenhouse gas emissions is an integrated part of the municipality's work.

As far as the Swedish part is concerned, the connection with the Greater Copenhagen Region (GCR) is less evident in ongoing development work. While there are a small number of people who travel to Skåne, these trips are predominantly for leisure activities, especially pertaining to second-home owners. The occasional work trip also occurs, although this is likely to be Ringsted residents travelling from the Copenhagen area. To this end, the vision for Greater Copenhagen's development (as far as the Traffic Charter is concerned) plays a small, if any active role, in current and future plans for infrastructure and mobility development.

However, it is likely that, given the good train connections, longer commuting trips – e.g. to Copenhagen and Roskilde – will be done by train, while more local commuting trips are made by car, which in this context could include cross-border travel to Sweden. For now, there is no obvious integrated connection between Ringsted and the Swedish side of the GCR reflected in regional commuter patterns, however. Nevertheless, this does not mean that Ringsted's outlook is inconsistent with the overall ambitions of an integrated region. The dynamics of its transit-oriented development need to be understood more closely at different levels of governance, but that falls outside the scope of this study.

4.4.2 Station area and its vicinity

Ringsted has a significant role as a rail hub in Denmark, with a connectivity that continues to 'push and pull' the development of Ringsted overall. The city has both to serve its external regions and offer a local development pattern that remains attractive and sustainable for its growing number of residents. The city's spatial development is centred around a future including an increasing number of train commuters, plus expansion of mixed-use amenities for businesses and institutions.

In the municipal plan, the objective is to ensure that national and regional traffic is aligned with the planning of municipal bus operations and the strengthening of opportunities for commuting to the capital area and the rest of Zealand (Ringsted Kommune, 2017). In terms of the general surrounding area of the station today, there are some existing residences, in addition to car parking both north and south of the station, and areas for bikes close to the station buildings, too (Figure 10). Bus stop areas and some commercial amenities are also located right beside the station, and these aspects are what characterises the station's immediate vicinity for its daily users.



Figure 10. Ringsted station area and railway tracks, seen from above.

Source: Banedanmark

With the Copenhagen-Ringsted line in full operation, the station area has consequently been, and continues to be, an important part of the municipality as it is planned – and onto which transit-oriented development trends are being projected and realised. In a 2013 report surveying the development potential of the station area, it was observed that, "One of the most lucrative areas for the construction of larger office space is the area around Ringsted Station." (Ringsted Kommune, 2013). This development follows the upgrade of the railway track area, which started in December 2016. In total, 75% of the station's tracks, switches and platforms will be rebuilt. It is therefore the largest station rebuild in Denmark, according to Banedanmark. One concrete example of development within the station area vicinity has been the newly built offices for Banedanmark, the state-owned railway network company (Figure 11). The building, which is 8,200 m², will accommodate about 360 employees and is located within walking distance of the station.



Figure 11. Banedanmark's new offices in Ringsted.

Source: KPC København

With so many commuting between Ringsted and Copenhagen on a weekly basis, and the limitations for physical development because of the railway tracks, it makes sense that commercial buildings stay near the station area. Another reason for this development might be that a lot of the land surrounding the station is privately-owned. The question that then emerges is how to ensure access not just from the station to nearby workplaces, but also access to the station for all those headed to other parts of the Greater Copenhagen Region. Given that the station is not as physically integrated within the core of the city centre, Ringsted needs to consider how to serve local commuters better – considering its increased service, traffic, and surrounding development. The station is 1 km away from Ringsted 'square' and town hall, a central area where there also are plans for development. In addition, Ringsted Municipality is currently preparing a comprehensive plan for a new, mixed-use commercial district which is only 800 metres from the station, and 1.5 km to the city centre. The vision is to transform the area into housing, educational institutions, and businesses – all with planned easy access to the train station.

Ringsted is of enormous importance for the settlement of traffic, and it is a national focal point. Yet, a prerequisite for people wanting to take the train is that they live relatively close by, or have easy access to a station. This is in the interest of shortening commuting times and distances. By incorporating modern technology to mitigate the noise and rupture caused by the railroad, there are good reasons to investigate whether areas closer to the station, apart from the plans that have already been mentioned for them, can also be developed for residential purposes in the future. Today, the motorway near the railway, in particular, is burdening nearby residential areas with noise. These challenges must continue to be addressed, in part by providing pedestrians and cyclists a viable infrastructure, but also by establishing foreclosure measures – such as ground systems shaped to be natural, recreational areas. At the local level, administration and political priorities might benefit from being more closely aligned with cross-border regional strategies, too.

5. Main conclusions

The aim of this report is to provide a backdrop for future discussions about ways in which spatial and transportation planning, particularly in small- and medium-sized (SMS) cities, can ensure sustainable mobility solutions and enhance local and regional integration, supporting regional development in Greater Copenhagen, and Nordic collaboration more broadly. Based on desk research, accessibility mapping and semi-structured interviews in four SMS-cities located on both sides of the Öresund strait, two research questions have contributed at framing this study:

- How can an enhanced understanding of transit-oriented development (TOD) characteristics and mobility planning in small- and medium-sized (SMS) cities contribute to a more integrated Greater Copenhagen Region?
- What are the multi-functional roles and potentials for the development of areas surrounding railway stations in small- and medium-sized cities from a planning and design perspective?

The literature review covers existing research on transit-oriented development (TOD) and focusses on the specificities of SMS cities. The mapping provides an overview of accessibility by train within the GCR. It does this by highlighting which parts of the cross-border region are able to access the two main urban centres within an hour. Semi-structured interviews were conducted in order to gather information from regional and municipal stakeholders – including municipal planners in four selected municipalities of the GCR which are used as case studies to gain further insight concerning TOD in SMS cities.

"It should take a maximum of one hour to get to either Copenhagen or Malmö by train from all parts of Greater Copenhagen".

That goal was included in the Traffic Charter of the Greater Copenhagen Committee, and is fulfilled in most of the territory of the GCR. Indeed, the vast majority of areas within the Capital Region of Denmark, parts of Zealand, as well as areas located along the four main train corridors in Skåne are within one-hour travel time, by train, from Copenhagen or Malmö main train station. Areas of the GCR which are beyond that one-hour condition are those in the most northern part of the Capital Region of Denmark, and the southern and western parts of Region Zealand, as well as most of the eastern half of Skåne. The territory covered by the goal of a one-hour train travel time comprises almost 3 million of the 4.3 million inhabitants living in the GCR in 2020, or 69% of the total population. The proportion increases to 75% when the region of Halland is excluded⁷.

This situation highlights the fact that the GCR benefits from strong rail infrastructure overall, but due the distribution of people and jobs across the region, approximately a third of the population cannot realistically access the main urban areas on a daily basis. Geography is also one of the reasons why the vast majority of cross-border commuters live and work within the urban areas of Copenhagen, Malmö, Helsingborg and Helsingør. This is possible given their proximity to cross-border transport infrastructure (i.e. fixed linked between Copenhagen and Malmö, and the ferry connection between Helsingborg and Helsingør).

Investment in rail infrastructure, the optimisation of train schedules, and connections with other public transport modes would greatly contribute to the ability of more people to reach more places within the GCR inside the one-hour travel goal. That would require decisions to be taken at national, regional and local levels on both sides of the Öresund strait. Such improvements would help contribute to work towards an integrated and sustainable growth region, which is one of the main aims of the Greater Copenhagen Committee. It would also contribute at

7. Halland was not initially part of the GCR when the Traffic Charter was released

fulfilling the Nordic Council of Ministers' vision of having the Nordic Region as the most sustainable and integrated Region in the world in 2030.

At the municipal level, public and private stakeholders as well as local community organisations also have a role to play in improving accessibility by train, and in making train travel a more attractive mode of transport. Transit-oriented development has been a central feature of the case studies given that most of the places strive for a type of urban development that mixes residential, business and leisure spaces with the ambition of improving access to public transport nodes (e.g. train stations). Our study has focused on TOD in four case-studies, with the aim of highlighting characteristics for SMS cities within the GCR. While the findings do not intend to provide an exhaustive list of TOD characteristics SMS cities, they offer insight into four unique cases located in different regional contexts on both sides of the Öresund strait.

The analysis has highlighted the multi-functional roles and potentials for the development of areas surrounding railway stations in small- and medium-sized cities from a planning and design perspective (Table 3). The development of housing and public facilities (e.g. library) as well as the promotion of green mobility option characterise TOD in the two small cities. Access to the train station by car is also important in these two cities in making rail traffic more attractive to local residents. Mixed-use developments that include offices and commercial facilities and connection to local public transports are TOD characteristics in the two medium-sized cities.

These differences reflect the different function of these cities in their regional context. Small cities are mostly places of residence, focussing on providing a high quality of life in an attractive environment. They are characterised by outward commuter flows to regional centres and the dominant use of cars for travel. Medium cities are local centres for the surrounding areas, characterised by incoming commuter flows from both smaller and larger cities.

The selected four SMS-cities of the GCR highlights a rather weak cross-border dimension. It is expressed by few commuters, if any, or by leisure trips for experiencing nature or urban qualities found within the cross-border region. The analysis also reveals that the Traffic Charter of the GCR was not thoroughly understood among the planners we interviewed. If the Traffic charter constitutes a common vision for the whole Greater Copenhagen Region, then that vision needs to be more firmly anchored within small- and medium-sized cities. One might therefore consider the possibility of evaluating the impact of Traffic Charters in SMS cities, in a similar way as has been done for land use and transport in Denmark (Center for Public Impact, 2019).

City, size	Time to Copenhagen/Malmö by train	Cross-border flows	Regional function	Municipal strategy	Station area and TOD characteristics	Future developments
Höör, small	Less than one hour to Malmö main train station (34 minutes) but more than one hour to Copenhagen main train station (76 minutes).	The Danish side of the GCR are recognized as an attractive place for leisure trips, whereas Danes travel to Höör for its nature.	Small towns with a range of commercial and public services. Good accessibility for labour, both in Kristianstad and Malmö-Lund.	Attract new residents seeking access to nature, cheaper house prices and good public transit connections.	North of the city center with a large parking area, where many rural and nearby town dwellers park and commute from Höör.	Housing development, a new square, improved signs to nearby hiking routes, and preservation of the nearby nature (phase 1). Possibility also for a library, housing development and a new town hall (phase 2).
Lejre, small	Less than one hour to Copenhagen main train station (34 minutes) but more than one hour to Malmö main train station (86 minutes).	No significant flows to the Swedish side of the GCR	Characterised by a large share of out-commuters, a result of its proximity and good accessibility to Roskilde and Copenhagen	Attractive place to live with good accessibility to the large labour market of Copenhagen.	Integrated within the town centre and good access and parking for bikes. Cultural and commercial amenities are found at Hvalsø station.	The priority is to improve the access to both stations. Future development should serve the local community.
Landskrona, medium	Less than one hour to Malmö main train station (29 minutes) but more than one hour to Copenhagen main train station (71 minutes).	Around 439 daily trips to Denmark. The proximity to Denmark is perceived as an underused potential which the municipality is now aiming to utilise and improve.	Out-commuting town, mostly to Helsingborg and Malmö.	Seeking its new identity as a town where people want to settle.	Peripheral location but well-connected by public transport to the core city centre.	Mixed-use development (office and commercial services) and safeguard of an undeveloped area.
Ringsted, medium	Less than one hour to Copenhagen main train station (36 minutes) but more than one hour to Malmö main train station (88 minutes).	Very limited, predominantly for leisure trips.	Train hub with both in- and out-commuters.	Creating commercial growth and attracting new residents.	1km south of the town centre, with housing, business and commercial amenities, public transport facilities and a car park.	Pending.

Table 3. Overview of case study findings.

More generally, the findings of the case study analysis provide insights about TOD-characteristics and the functioning of SMS cities in the context of the GCR:

- They have limited cross-border integration, seen in the limited inflow and outflow of cross-border commuters (except for Helsingør-Helsingborg). But there are more cross-border flows for leisure purposes (e.g. second homes, nature experiences, shopping).
- They are well integrated within the regional or sub-regional labour market, to which they belong to thanks to good accessibility to larger urban areas. They correspond to SMS cities integrated in 'enlarging, functional regions' as defined by Fertner et al (2015).
- They feature different transport-oriented developments around their train station, reflecting differences in spatial strategies and priorities (e.g. to accommodate the combination of car use and rail transit, and to focus on residential development in small cities; to increase the number of functions for, and integration of, the station with existing city centres in medium cities).

The planning and design principles of TOD-development of SMS-cities are important insights to take into consideration when trying to achieve the goal of the Traffic Charter of the Greater Copenhagen ("It should take a maximum of one hour to get to either Copenhagen or Malmö by train from all parts of Greater Copenhagen"). TOD has an important role to play in SMS-cities to better connect the existing rail infrastructure with their surrounding hinterland, contributing at improving their regional and cross-border accessibility, whilst maintaining the local quality of life and wellbeing that SMS-cities offer. Such improvements would contribute the work towards an integrated and sustainable growth region, which is one of the main aims of the Greater Copenhagen Committee.

In contrast to the findings on TOD in large urban areas, this case study analysis highlights two main differences in comparing SMS cities. The first one corresponds to the importance of the use of cars, either to commute or to reach the train station, both due to the low density of the area and the lack of realistic public transport solutions for commuters. The second is the focus on attracting new residents, rather than other urban functions, seeking to settle in a SMS-city and commute towards a larger labour market. These two characteristics are closely related to the quality of life and well-being which can be found in SMS cities.

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Municipal and city planner(s) at:

- Höör Municipality
- Landskrona Municipality
- Lejre Municipality
- Ringsted Municipality

Senior advisors in regional development at:

- Region Skåne
- Region Zealand

Senior advisor at the Greater Copenhagen Region.

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