

# Transport and Sustainable Urban Development

A comparative project in collaboration between Cape Town,  
Kisumu and Gothenburg



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## A comparative project in collaboration between Cape Town, Kisumu and Gothenburg

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Mistra Urban Futures was an international research programme and a Centre for sustainable urban development, active 2010-2019. We believe that the coproduction of knowledge is a winning concept for achieving sustainable urban futures and creating accessible, green and fair cities. The Centre is hosted by Chalmers University of Technology and has five platforms in Cape Town, Kisumu, Gothenburg, Skåne and Sheffield-Manchester as well as a node in Stockholm. The research agenda 2016-2019 was called Realising Just Cities - Accessible, Green and Fair. This was achieved through transdisciplinary co-production and comparative urban research at Local Interaction Platforms in Cape Town, Gothenburg, Kisumu, Sheffield-Manchester and Skåne.

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# Contents

<b>Abstract</b> .....	<b>4</b>
<b>Introduction</b> .....	<b>5</b>
Background to the project.....	5
Aim of the project and research questions.....	5
Knowledge co-production and co-creation.....	5
A co-creative R&D process.....	6
Organisation of the project.....	8
<b>Urban Challenges</b> .....	<b>8</b>
<b>Case Studies</b> .....	<b>11</b>
Cape Town: Blue Downs Rail Link .....	11
Kisumu: Standard Gauge Railway.....	13
Gothenburg: Landvetter Södra.....	14
<b>Expanding the Urban Station Community project: Co-Creation Activities</b> .....	<b>15</b>
Introduction to the urban station communities knowledge process.....	15
Overview of co-creative methods and tools.....	16
Practical Tools needed.....	17
Backcasting and scenario methodology.....	19
Practical Tools needed.....	19
<b>Analysing the transition to transport justice</b> .....	<b>28</b>
Transport planning transition to accessibility.....	28
Accessibility and transport justice.....	29
Transition theory and the Multi-Level Perspective.....	30
Multi-level perspective as a trans-disciplinary approach .....	30
Cape Town, South Africa.....	32
<b>A multi-level perspective of each city's accessibility regime</b> .....	<b>32</b>
Gothenburg, Sweden.....	34
<b>Comparative analysis of Transport Justice</b> .....	<b>38</b>
<b>Combined conclusions and lessons learned from the Transport Justice and Urban Station Communities comparative research activities</b> .....	<b>40</b>
<b>References</b> .....	<b>42</b>

# Abstract

The Transport and Sustainable Urban Development project represents one of eleven similar projects conducted under the Mistra Urban Futures research strategy: Realising Just Cities. The aim of this project was to develop the collaboration between three of the platforms: GOLIP, KLIP and CTLIP. The three cities involved in the project, Gothenburg, Cape Town, and Kisumu, are all subject to rapid urbanisation and face similar local challenges, such as growing inequalities, degrading infrastructure, insufficient housing, among others, while trying to cope with global challenges such as climate change. The project explored the role that transport plays in creating inequity and injustice, in three very different urban contexts, and the value in taking a ‘transport justice’ approach to analysing transport systems.

A collaborative, co-creative R&D process was developed continuously from the first discussion of the project ideas at the Realising Just Cities (RJC) conference in Gothenburg, in 2016. Important milestones in the implementation of the project were the RJC conferences in Kenya, in 2017, in Cape Town, in 2018, and in Sheffield, in 2019. The methods and tools for co-creation that have been introduced and tested by the representatives from the three platforms—and also by wider groups in their respective cities—have proven themselves valuable in grappling with an exceptionally daunting challenge that permeates across extremely different contexts. Transdisciplinary co-creation and co-production methods have a bright future as the boundaries between disciplines blur and the complexity of the challenges continues to grow.

These tools and approaches are particularly relevant to the transport planning discipline, where there is a growing acknowledgement among scholars that the traditional, mobility-focused approach has created futures with undesired, unintended characteristics. A paradigm shift regarding the fundamental premise of transport planning is being proposed. Accessibility-based planning involves shifting the focus from speed to access, from the system to the user, and from efficiency to equity. In order to examine the potential transition to a transport justice, or accessibility-based, approach to transport planning, this project applies the Multi-Level Perspective—a method from the sustainability transitions field—to the accessibility systems of the three cities. Furthermore, to provide insight into the functioning of these accessibility systems, initiative-based learning was conducted through an examination of planned rail projects in each city in collaboration with practitioners, decision-makers, and stakeholders. In Gothenburg, the policymakers have an advanced understanding of transport justice and access equity, but the consumers continue to demand suburban housing and car-based mobility opportunities. In Kisumu,

the paratransit (informal public transport) system is well-attuned to the differential accessibility needs of the communities that it serves, but it still relies on the infrastructure provided by government entities with very narrow perspectives on mobility. In Cape Town, the disparity in the transition seems to be between policy and implementation. Many of the actors within the transport system are calling for a more equitable distribution of access in the city. However, the budget allocation still favours road infrastructure and BRT (Bus Rapid Transit Systems) expansion over salvaging the rapidly deteriorating rail system and supporting the burgeoning paratransit industry. The differential pace of change by different actors within the accessibility system of each city could create as much disruption as the landscape challenges like climate change. This study has shown some of the value of bringing together the fields of urban planning, engineering, and socio-technical transitions to better understand complex urban systems and their related governance challenges.

Some of the key takeaways for using transport to contribute to realizing just cities are:

- A ‘transport justice’ approach starts with accessibility as the primary premise for transport planning and infrastructure investment. A central tenet of this perspective is that there is a minimum level of accessibility that a transport system should provide every user, irrespective of their income, gender, age, spatial location, or any other characteristic. Through this approach, accessibility acts as a proxy for poverty and other forms of injustice.
- Transport interventions that serve those with the lowest access should be prioritised and subsidised in order to raise their accessibility to the minimum level. Similarly, improvements to the transport system that largely benefit people with high levels of accessibility—usually wealthy car owners—should be optional and self-financing.
- The upgrading of the existing and new transportation systems should be planned and implemented in parallel with mixed-use and accessible urban developments, close to transportation nodes, including a multitude of commercial, social, and cultural services.
- The real estate markets should be sufficiently incentivised and regulated to facilitate more equitable access provision, through the facilitation of affordable housing and entrepreneurship around new or existing public transport stations.
- A rail system, with its important capacity to restructure cities, is a key tool in counteracting inequality and access inequity in the long term.

# Introduction

## Background to the project

There is a need for more knowledge exchange between cities, and around issues of how we are planning for future transportation, that is sustainable, green, and accessible. The three cities involved in this project, Kisumu, Cape Town, and H arryda (Gothenburg region), differ in many aspects. Cape town lives with the legacy of apartheid, which still has a significant effect on the current planning processes. Kisumu has grappled with its history of colonisation, which has also had a huge effect on the nature and decision-making of investment in infrastructure. While the Gothenburg region, and the H arryda Municipality, may appear very different, with an advanced transportation system, but it suffers from its own historic challenges, such as a lack of sufficient flexibility.

## Aim of the project and research questions

The transport and sustainable urban development project represents one of eleven similar projects within other fields relevant to sustainable development. Comparative projects within Mistra Urban Futures including this project are generally aiming at:

- Identification of common challenges across very different contexts
- The exchange of knowledge between the different platforms/projects
- Transdisciplinary co-production and co-creation between academics and public officials
- Learning by doing and self-reflective learning processes

Developing guidelines of good practice (not blueprints) within the global networks (north-south) Other important considerations were:

- The local context of each case study and the aim to aggregate them at an internationally comparative level.
- To determine whether this is a long-term collaboration (post-2019 when the Mistra funding ends), and how that may affect the project planning process.
- There is a need to relate this project to the other comparative projects within the network.

The specific aim of this project is to develop the collaboration between three platforms within the Realising Just Cities Framework which is Mistra Urban Futures overall Research Strategy. The specific emphasis is put on the integrated planning of urban development and transportation. The research questions that guided this project were:

- What is the role of transport planning and transport interventions in realising just cities?
- What types of knowledge, methods, or tools can be developed to better understand this role?
- How can cases of individual transport projects from each of the local contexts in Sweden, Kenya and South Africa be used to interrogate processes and pathways towards realising just cities?

Specific research questions related to the theme of transport justice and its role in Realising Just Cities are:

- How has the role of transport changed across the different contexts and geographical scales?
- How does each case represent the state of the transport justice discourse in each city?
- Which social justice issues are being addresses in the different contexts?
- What is the equity proposition of each rail-based transport intervention?

The comparative analysis with regard to transport justice is based on case studies of three transport interventions, one in each of the cities: Landvetter S dra in Gothenburg (LVS), Blue Downs Rail Link in Cape Town (BDRL), and the Standard Gauge Railway (SGR) in Kisumu.

Based on the varied aims and objectives of the project, the research activities were grouped around two primary focal points:

1. Expanding the Urban Station Community knowledge process by utilising co-creative methods in new contexts.
2. A deep analysis of the transport system, and the state of the discourse around transport justice, in each city using socio-technical transitions perspectives and analytic tools.

## Knowledge co-production and co-creation

Knowledge co-production and co-creation is a crucial component of the project. By doing comparative work together, we can develop our common knowledge illuminate common challenges, and explore new perspectives on key issues within the different local contexts. However, each of the comparative projects were embedded in the local contexts of the different platforms and viewed through a local lens by members of the local interaction platforms. This is a necessary base for the subsequent aggregation of international knowledge and the basis for effective research collaboration. The focus of the project has been on both its direct local impact and more regional or societal effects. Such challenges, by nature, affect or

engage a variety of stakeholders, decision-making levels, local- global contexts, disciplines, and sectors, as well as their respective social values, political ideologies, urban conditions, and academic or bureaucratic structures. No single actor has the capacity or power to solve these challenges and fully grasp the complexity of these challenges (Polk, 2015).

In order to meet these challenges and work towards more sustainable cities there is a need for more inclusive research processes that can better capture the situated understandings of sustainability that exist in certain contexts by the variety of urban actors. Polk (2016) calls this knowledge co-production, described as non-linear, collaborative approaches to knowledge creation that draw upon interactive and participatory research approaches to societal problem solving. Furthermore, it is a collaborative research approach, where different actors and interest groups come together with researchers to share and create knowledge that can be used to address the sustainability challenges while at the same time increasing the research capacity to contribute to societal problem solving in the future. The experiences from co-production in the city of Kisumu has been demonstrated to be linked to the governance system. The City has seen multilevel co-production that has evolved over time as the various stakeholders and players within the city’s complex system positioned themselves to influences to policy and practice (Onyango, Dymitrow, Oloko and Agong 2021)

## A co-creative R&D process

The collaborative and co-creative R&D process was developed continuously. The idea for this project arose in connection with a workshop at the first RJC conference in Gothenburg in 2016. The discussion was further developed during the RJC conference in Kenya in 2017. During this workshop a number of key, common issues were identified, including the financing of public transport (capital and operational costs), multi-level governance, formal versus informal roles of public transport operators, transport-led urban restructuring, and measuring of public transport performance or success.

In May 2018, a 3-day workshop was organized in Gothenburg, which started with the exchange of knowledge and experiences between the cities and platforms. The second day was a field trip to Härryda and Mölnlycke where the group learned more about Landvetter Södra and the transport investments planned in the region. Tools for analysis and scenario development were also applied to the Kisumu and Mölnlycke cases during the second workshop day to explore the role that co-creation methods and tools could play in the project. The idea of building an international knowledge network between the cities was launched around what role transport interventions could play in realising just cities. During these three days of intensive workshops, it became clear that tackling the issues of realising just cities from a transport

<b>Replicated activities</b>	<b>SGR Kisumu</b>	<b>Blue Downs Rail</b>	<b>Landvetter Södra</b>
<i>Learning process of each case</i>	Site visit to old and new station	Site visit to Maitland, in depth presentation of Blue Downs Rail**	Site visit to Mölnlycke with in depth presentation of Landvetter Södra*
<i>Co-creation process</i>	Scenario workshop around the old station plus multi-criteria analysis	Walk-and-talk tour in Maitland	Walk-and-talk tour in Mölnlycke
<i>Knowledge seminars</i>	Internal seminar	Internal seminar	Internal seminar
<i>Stakeholder focus groups***</i>	Focus group in Kisumu 26 March 2019	Focus group in Cape Town, April	Focus group in Landvetter, April

\* Landvetter Södra in currently undeveloped land not fit for a site visit.  
 \*\* Due to external circumstances a site visit wasn't able to be conducted to the Blue Downs  
 \*\*\* The focus groups are representatives from important stakeholders involved or affected by the transport intervention for each case.

Figure 1: The collaborative and co-creative set-up for the R&D

perspective would require very deep collaboration and knowledge exchange between the platforms, as well as between academia and government officials.

This led to a process of preparation for the RJC conference in Cape Town in 2018, wherein a co-creative session was to be organised around the three cases. Additionally, a site visit to the Maitland Station was used as a testbed for multiple of the co-creation and scenario analysis methods used in the Gothenburg workshop. The session aimed to test whether the methods were as useful in a South African setting as they have been in the Sweden. The urban station communities project in Gothenburg was also finalized in 2019, partly with inspiration by experiences from the international collaboration in this project. During 2019, the results of the transport justice research that stemmed from this project was compiled into an academic conference paper and a separate project report.

The main part of 2018 was set aside to identify project objectives and research questions, in order to be able to set-up truly comparative research. Even though the project team did not have in mind a specific idea of replication, there were still components that were replicated at each activity. See Figure 1 for an overview of the replication activities.

The replication process was mainly conducted when the whole project team was physically gathered, providing a valuable space to learn from each other about the context, challenges, and opportunities for transport intervention in the respective cities. This enabled mutual learning processes between the platforms/cities.

For each of the activities, a local team was assigned to plan for content and sessions based on local knowledge and understanding. That team set up a programme co-organised with the project leader. The structure of the programme was similar for each activity, with site visits, co-creative planning methods, internal knowledge seminars, and stakeholder focus groups. Each activity needed to be adapted to its local context. There was also a change of focus for the RJC Conference in Cape Town and workshops in Kisumu compared with the Gothenburg workshops, where the latter focused more on bringing the group together while the other focused on setting up a project plan and conducting actual research. The stakeholder focus groups conducted in each city aimed to capture different perspectives of what role transport interventions can play in realising just cities, and what that means for the transition to a more sustainable future.

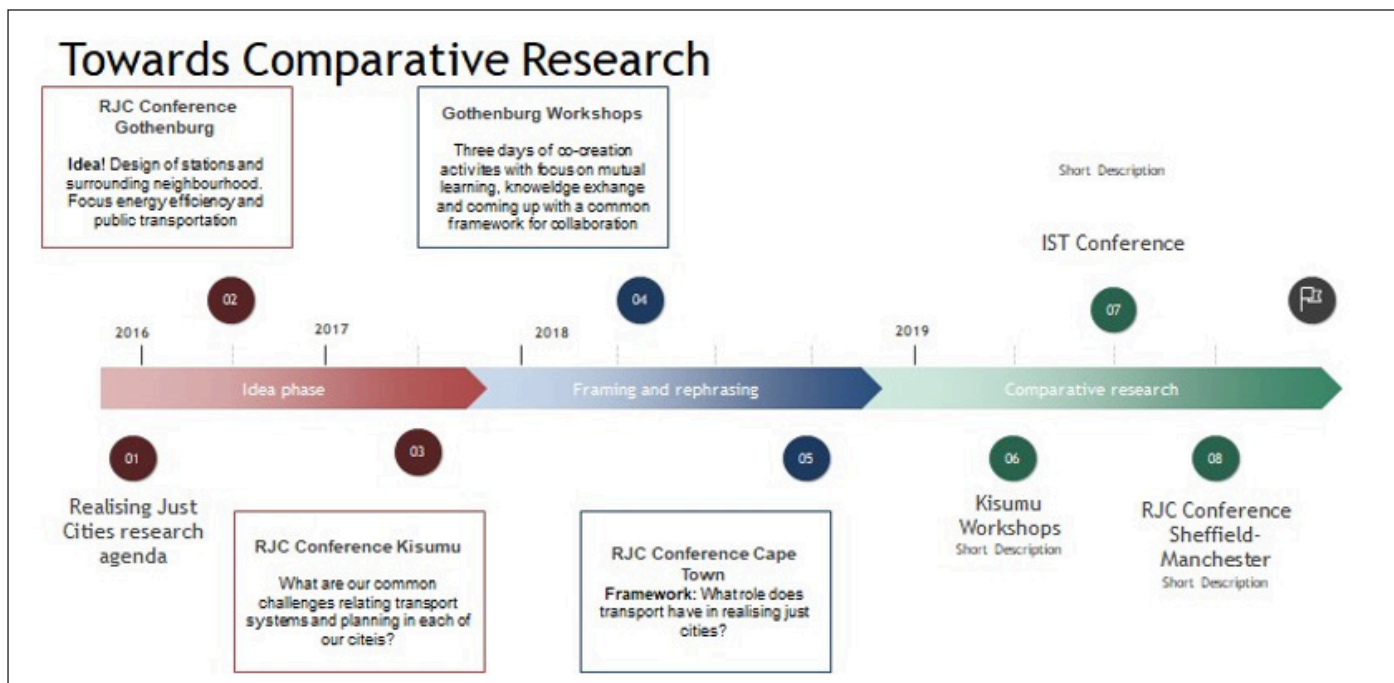


Figure 2 Overall presentation of activities within the project related to the RJC conferences and common workshops. The Kisumu workshop in 2019 was due to different reasons replaced by video conferences.

## Organisation of the project

The project was performed by the following team from three platforms GOLIP, KLIP and CTLIP. The team has produced a number of draft reports and PMs which have been presented at conferences and other events. This final summary report has been written by Professor Ulf Ranhagen, based on the different draft reports and new

sections to illustrate the interlinkage points between the different research activities. Sean Cooke has been the main author for the chapter “Analysing the transition to transport justice”. Jan Riise, former Engagemnt Manager at Mistra Urban Futures has been involved in the process of editing and publishing the report.

<b>Name</b>	<b>Title, function</b>	<b>Organisation</b>
Elma Durakovic	Project coordinator	GOLIP
Ulf Ranhagen	PhD Professor Researcher/ Process leader, main author of the final report	GOLIP
Anna Gustafsson	Process leader	GOLIP
Stephen Gaya Agong	Professor, Platform Director	KLIP
George Mark Onyogo	PhD Researcher	KLIP
Fredrick Owino	PhD Researcher	KLIP
Sean Cooke	PhD Researcher/ Research Leader, main author chapter analysing transport justice	CTLIP
Craig Davies	PhD Researcher	CTLIP
Kapil Singh	City Official	CTLIP
Maria Lejdebro	City Official	GOLIP



# Urban Challenges

Cities such as Gothenburg, Cape Town, and Kisumu are all subject to rapid urbanisation and local challenges such as inequalities, infrastructure deficits, housing shortages, etc., and, simultaneously, are trying to cope with global challenges, such as climate change. Achieving sustainable futures involves creating an urban environment where the ecological aspects are included in everyday life, while building infrastructure and mobility services that are accessible to all. The Mistra Urban Futures framework talks of realising just cities, by planning cities where ‘green’, ‘accessible’, and ‘fair’ are important principles for the creation of urban spaces.

*“How to realise just cities is more complicated. There are several profound obstacles standing in the way of achieving the utopian image. Governance and decision-making processes are one aspect, policy and litigation are others. The legal system can, for example, be pushed to a more progressive agenda. Strengthening civil society and creating public engagement through public participation and co-creation mechanisms are also of importance.*”

*Spatial transformations are also necessary, changing how the urban built environment is designed, for example public spaces and streets or whole neighbourhoods. Key elements are accessibility to efficient and affordable integrated public transport, and designing multifunctional urban areas that provide residential, employment and services in close proximity, thereby reducing the need for constant travel.”*

(Mistra Urban Futures, Realising Just Cities Framework 2016-2019)

As noted above, one key component of realising just cities is accessibility, which is highly correlated to the planning of transport services and infrastructure. At the same time, transportation is also related to other key aspects of just cities, such as housing, attractiveness, ability to plan, and urban governance. The key issues and challenges identified in a collaborative co-creative process among the participants can be summarised in Figure 1. The process behind this figure is further explained in co-creation activities chapter below.



Figure 3 Overview of the Urban Challenges of relevance in the project

Attractive and sustainable city:  
Urban form and design

Just issues:  
Gentrification  
change of behavior

Economical and financial issues

Participatory methods and collaborations

Politics, governance and institutional settings/organizations

The rapid urbanisation into cities creates multi-dimensional challenges in transport development and planning processes. Urban form and urban design play a critical role in creating sustainable transport, just as it is crucial in creating attractive urban station precincts. At the same time, it is important that the urban form speaks to the nature of the transport system. In the context of Kisumu and Cape Town, which have both formal and informal public transport, the urban form needs to be in conversation with the ongoing transport modernisation process.

How we plan new urban station precincts and transport interchanges is a question of who we are planning for. Who will have access and who will be the primary user groups of public transport service? In Cape Town and Kisumu, public transport is often perceived to be related to poverty and lower standards of living, whereas car ownership is seen as aspirational. Planning for a more sustainable transport system in cities is also a question of how change the culture, perceptions and norms that exist in each context.

One of the key challenges of transport development and planning in many cities is the issue of land, revenue, and ownership. How should transport infrastructure projects be funded? Who should own the public transport infrastructure? Who should build, operate, and maintain it? The funding methods are very different in the different cities, so what knowledge can be exchanged across the different contexts? What land-based financing mechanisms (e.g. land value capture) are being used across the cities?

Creating a sustainable city means including and integrating different perspectives in the planning processes, such as public and private officials, academics, civil society, and communities that are affected by the development. How are the cities working to tackle the challenges of transdisciplinary work in the different contexts? What methods are available to support participatory transport planning and are they applicable in the different contexts and stations?

Gaining political support for a more sustainable transport planning is crucial to pursuing transport justice and realising just cities. The challenge is how to integrate and increase the collaboration between the different levels of government (national, regional, and local), particularly in relation to ownership and governance responsibilities. Transdisciplinary and co-productive research spaces can provide neutral ground for government officials to engage outside of their conventional

# Case Studies

Based on general discussions and analyses of the challenges faced in achieving fair, green, and accessible urban form in each city, case studies were selected in order to explore these challenges further in the three different contexts. These case studies have served as a basis for identification of commonalities and differences among the challenges, objectives, solutions, and implementation strategies for realising just cities. The context each case study is summarised briefly in the sections below. The in-depth study of transport justice has been published in a separate report, but is partly presented in the following chapter as a comparison between the three cases studies.

## Cape Town: Blue Downs Rail Link

### **Background and challenges**

The railways in South Africa are mainly for freight, they are often located at locations that are not accessible for the common traveller. Which is different from the railways in Europe, where the train station has another function than “just” to transport people in a community.

Today in Cape Town public transportation is very much associated to poverty while car ownership is closely related to wealth and success. To be able to plan for sustainable cities we also need to work with how to change cultural patterns and behaviour. An embedded cultural pattern is hard to change. The same goes for housing, as people move from poverty, they are keen on having the opportunity owning their own houses instead of living in multi-story apartment blocks houses. Which makes densification in the city area and around stations problematic.

Through visits in France and collaboration with AfD – the French development agency which is a rail entity lots of new perspectives on urban development and transportation came up. Some valuable experiences have been drawn from the exchange about how to plan differently around stations aiming at mixed-use structures. In South Africa the rail stations are focused on transportation, not the development of urban places and nodes which often means that the rail stations are dark, frightening and disconnected from the rest of the community.

Development of housing and buildings typologies are structured aiming at meeting flexible and incremental growth along the housing and economic ladder covering different densities. Three types of hubs for the stations precincts in a hierarchy have different roles: destination hub with high order facilities, local access hub and community hub with social services shops.

### **Aim and purpose of the project**

The Blue Downs Link is aimed to build a corridor between two areas in Eastern Cape Town to reduce the transportation time. This area is somewhat exposed but

with great development opportunities. It is planned for three different stations along the eastern rail link through CBD 2 Belleville. At the same time there are plans to dig down the railway through central Cape Town (CBD 1). Right now, there is the question of what services and facilities are needed at each station. But also, how to handle different values and break cultural patterns and norms in order to create new ones around transportation and housing.

### **Short facts about the different stations along the Blue Downs Rail Link**

There are three different stations that are suggested in the plan, Wimbledon, Blue Down and Mfuleni stations. The different stations have different problems and possibilities. For example, the Wimbledon station has right now housing on one side and the other side is an industry area. The possibilities in the area based on trying to get the public sector to invest and build in the area at first and hopefully the private investors will follow. Making it problematic to plan for, if the private sector doesn't invest then the public won't follow at the same time the private sector will not invest in areas where there is nothing. There is an idea to make the stations more as complete communities offering different services which in turn creates an attractive area.

While the Blue Downs has a lot of possibilities for development since the city owns a lot of the land in the area. Today the area lacks a lot of basic public services such as schools, medical care and other basic services, people have to transport themselves to other areas for these types of services. A very interesting feature of this station is the hub programme which includes different commercial and public functions in a three-story building on top of the railway line and station. Since the workshop in Gothenburg in May 2018 the City has decided on going forward with the Blue Downs station in the further development the Rail Link.

## Key issues for the future

- How to deal with the question of maintenance of the services and the area at large?
- How to transform the informal business to a more formal businesses? One idea is to build smaller cubicles for the businesses to use rent free. By doing so this might create a sense of ownership for the area.
- How to handle the issues of safety? Bridges of the rail lanes are often quite unsafe and inaccessible.
- How to create a system that is affordable and accessible to all? Different transport systems have different paying systems making the public transportation inaccessible for the public.
- How to handle informal settlements along the railways in Cape Town? Today there are a lot of problems with informal settlements along the railways in Cape Town related to the ownerships of land. The issue of how to move these settlements is at most of an ethical matter. And how to deal with these issues is a big obstacle to overcome. There are waiting lists to formal housing, but the queues are long.

- How can public participation be promoted in the planning process? The City is the driver of the project, this is still a first step in the planning process, meaning that not many people know about the project. But there is already a group within the City looking into the learning facilities and how to approach the public with the project.

## Maitland Station

The Maitland station area was chosen for the co-creative workshop during the RJC conference in Cape Town in 2018. The planned stations along the Blue Downs Rail Link was considered too far away from the conference site and also not available due to on-going planning etc. However, the location and properties of this semi-central urban area in Cape Town is highly relevant for the theme of the project. The area is situated along a number of important transport networks connecting the Cape Town city bowl to the rest of the city. A railway line runs through middle of the suburb and a highway is situated on its northern boundary. The area has always been an important transport hub for the city and since 1845 one of the first roads from Stellenbosch through this area was completed. The total population of the 4 km<sup>2</sup> large area is about 10 000 people. A considerable share of the areas is occupied by different kinds of workplaces including commercial and cultural service functions. The population density of the area is 2500 person/ km<sup>2</sup>.

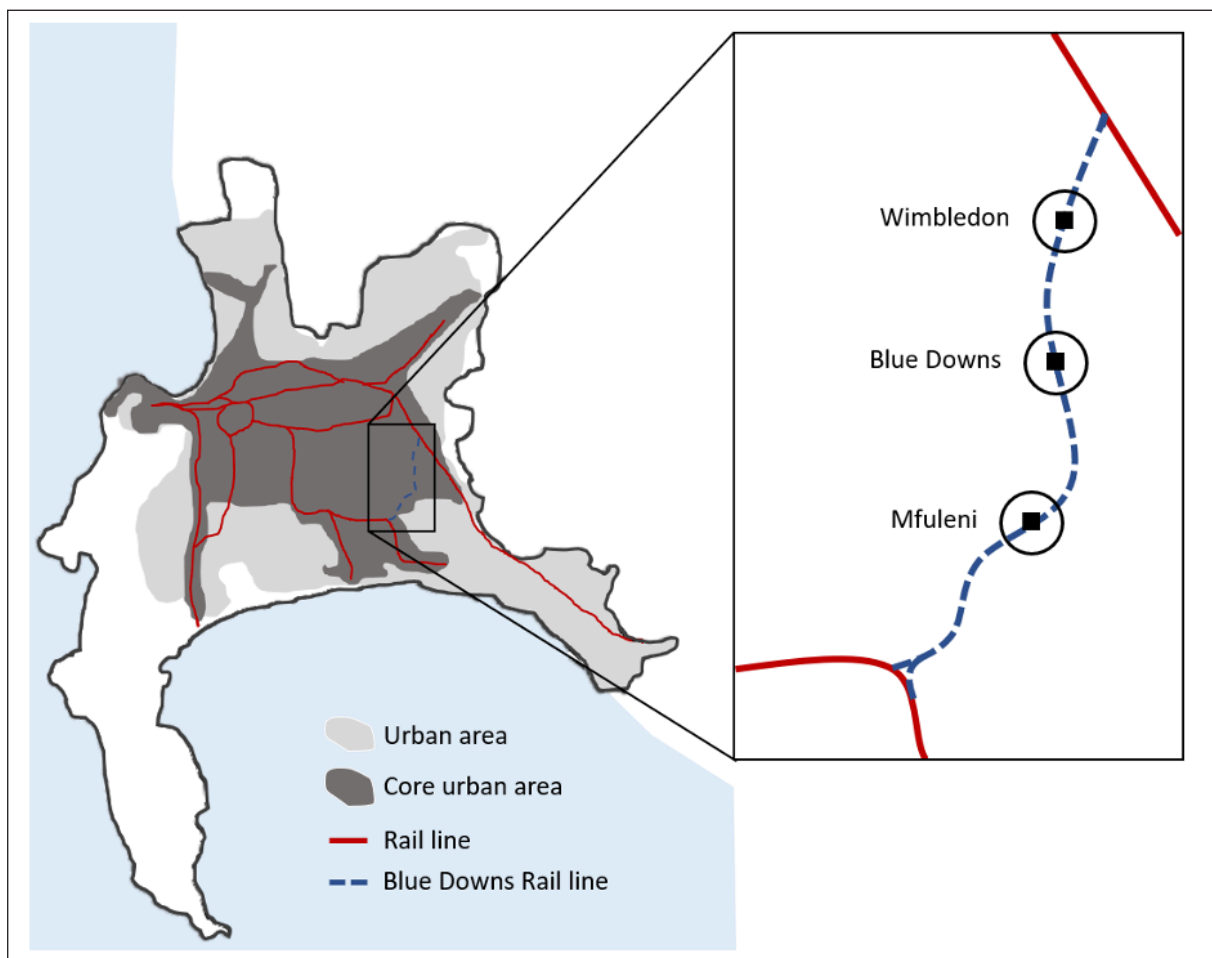


Figure 4: Map of Cape Town, South Africa, and the Blue Downs Rail Project

# Kisumu: Standard Gauge Railway

## Background

The old railway between Mombasa and Uganda (Kampala) passing Kisumu is the result of the decision of the colonial British parliament. Large tracts of land were acquired around the station to support the colonial economic instruments. A lake steamer was previously connected with the railway and the station in Kisumu harbour in order to admit roll on and roll off transportation by the Victoria Lake. The railway has a great importance for the development of country, city of Kisumu but also business development and creating possibilities for people in the surrounding area. Historically Kisumu has grown around the railway station in the CBD with the establishment of prime locations and to support services and residential purposes.

The Chinese stakeholders are now planning a new railway infrastructure between Mombasa and Lake Victoria. One of the stations along the new railways is planned for in Kisumu. The new station will be located in a peripheral location outside of the city centre. Land has been sold to private developers around the station, but the city owns strategic land for TOD (Transit-oriented development) and the intention is to buy back land to allow for a more balanced land use planning. It is also discussed to expropriate back land that has been sold in order to develop linkages between the city and the station area. Land administration issues as leasehold and freehold are under discussion.

Challenges related to the station area development  
The experience from urban development and transportation planning in Kisumu is that transport planning is often subject to miscommunication between different levels of governance and institutions. Plans are not integrated and often parallel where different institutions don't talk

to each other. Other main challenges identified related to the station area development are:

- Not accessible and affordable for the people
- The railways are surrounded with fences which divide communities and does not improve the development of certain areas.
- It's expensive to take the train compared to other forms of informal transportation. For example, in order to get to the station, the price is higher than to take a matatu (privately owned minibuses) from Kisumu to Nairobi.
- There are no plans for how people will connect to the new station.

## Key issues for the future

- There are of course possibilities with having the station outside of the city centre, for example it creates opportunities to develop the surrounding communities. A number of key issues for the future planning were identified
- How can the users of public transportation be involved in the planning of railway and urban developments linked to the railway when the intention is to achieve as standard gauge railway in 2022?
- How can the planning be developed in collaboration between city planners, railway planners and other actors?
- How to handle the problem that the city sells land and will be forced to buy it back to a much higher price later?
- It's more profitable to invest in freight train than passenger trains, therefore there is always a risk that the passenger train will not be prioritized.

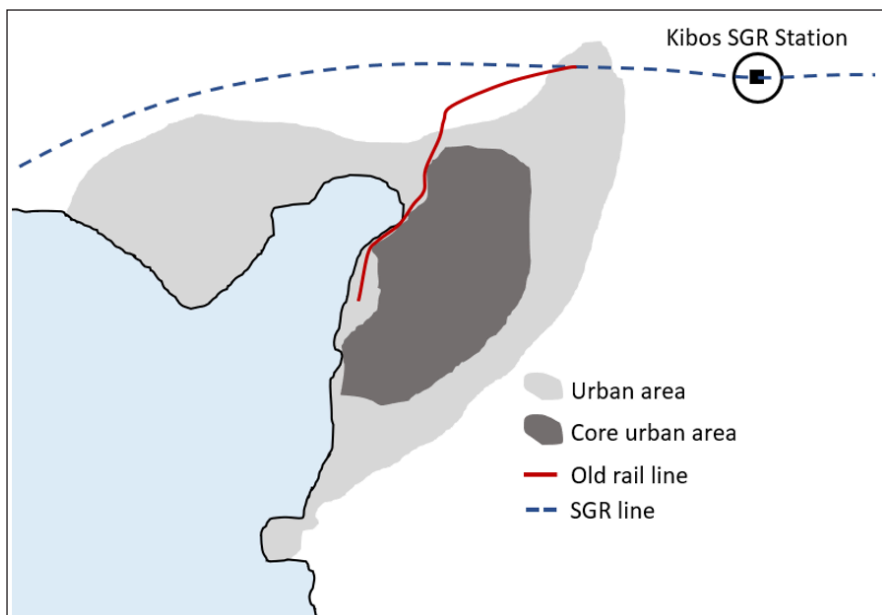


Figure 5: Map of Kisumu, Kenya, and the standard gauge rail project

# Gothenburg: Landvetter Södra

## Background

The Swedish government has set a major plan to develop the railway infrastructure in Sweden. The main objective being a railway system that is old and can't handle the demand of the system. One of the major investments is the rapid train railway system between Gothenburg to Stockholm, called Gotlandsbanan. Others being to make it possible to travel faster between major Swedish cities, make it possible for people to commute.

The Gothenburg-Borås Railway track is one of Sweden's most heavily frequented commuter trains with 9.5 million commuters per year. With a new double-track railway, the journey time can be decreased by half and the number of trains and trips would increase substantially. The track is part of the Götaland railway (Gothenburg-Borås-Jönköping-Linköping-Stockholm). The plans include a phase being Mölnlycke-Bollebygd via Landvetter Airport. For the Gothenburg region one of the major transport developments is the development of a new city district Landvetter Södra and a station along the new railway track. The plan is to have one station at the Landvetter Airport and one station in Landvetter Södra. At present (2021) it is very uncertain if it is possible to realise these plans at all.

Of this reason it is also very important to strengthen the potential within the municipality to densify and upgrade the areas around existing stations, primarily Mölnlycke urban centre.

## Why Landvetter Södra?

The region around Gothenburg is expanding more and more. The reason are many one being that the Landvetter Airport have plans to expand in the near futures with about 225 000 sqm office space (about 4500 workplaces) and 460 000 sqm space for logistics and commerce according to the planning programme from 2011. The other being that there is an increasing demand on housing in the area. The inhabitants are expected to increase in the municipal by at least 5500 people during 2014 – 2024 (population forecast). This means there is a need to build more and densify the current area. But there is also need in a regional context for new housing areas. The long term potential in Södra Landvetter is at least 25000 new citizens except from different kind of small scale work places, except from the Airport area.

## Mölnlycke Urban Centre

The central part of Mölnlycke urban centre encompasses about 1sqkm about 1800 persons are living mainly outside areas close to the station. The density is approximately 20 inhabitants/ha which is considered as a low density in a centre close to a station. Except from housing there are a number of workplaces in the urban centre, such as the municipal office and schools but also commerce, service and offices, partly mixed with housing. A large senior high school for 1750 pupils and a n intermediate school for 450 pupils are located close to the urban centre. Along the railway there is a industrial/workplace area for small and medium-sized companies. The railway station is co-located with the bus terminal since 2003.

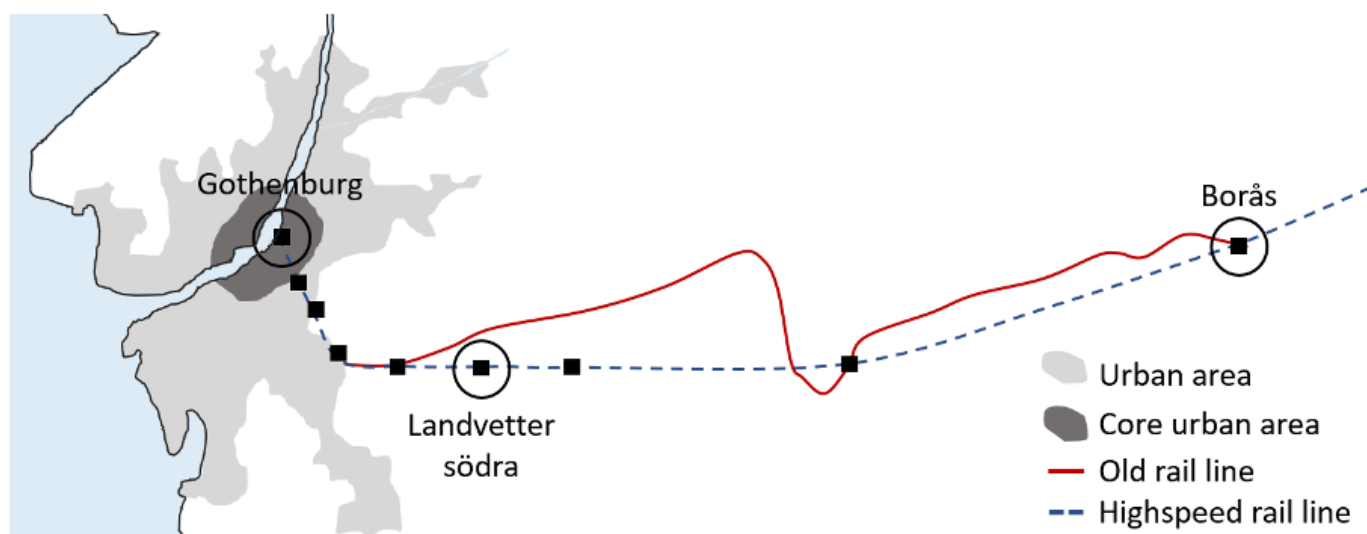


Figure 6: Map of Gothenburg, Sweden, Mölnlycke Urban Centre, and the high speed rail project

# Expanding the Urban Station Community project: Co-Creation Activities

## Introduction to the urban station communities knowledge process

The Urban Station Community (USC) at GOLIP is a knowledge process whose overall purpose is to increase the knowledge of the complex aspects of planning and create conditions for the development of urban station communities. It aims to revitalize and support ordinary planning processes in municipalities in the Gothenburg region. It also aims at planning and developing a transport efficient region with attractive/dense station communities, as well as to initiate and support R&D (research and development) and RDI (research, development and innovation) projects focused on co-creation between academy and practitioners.

The knowledge process works with co-creation as the core of all activities. When you create possibilities for a closer interplay between theory and practice and transdisciplinary collaboration among stakeholders from public sector, academia and the civil society you also make it possible to produce some useful results for both practice and research. The “co” objective is a crucial part of the knowledge process, from co-initiation, co-design, co-reflection and co-implementation.

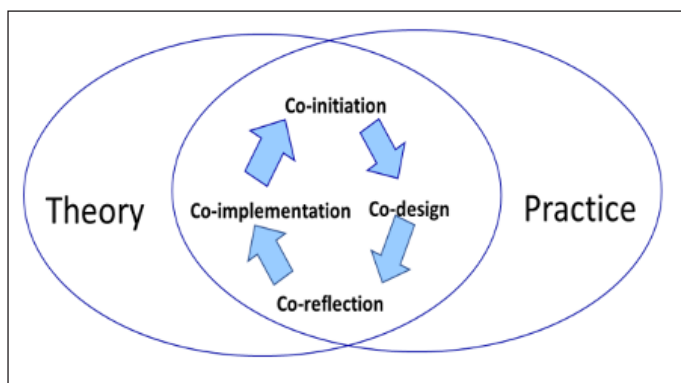


Figure 7 Co-creation is important for a closer interplay between theory and practice

In the USC project different forms of co-creation have been a common denominator for transdisciplinary collaboration between a wide range of stakeholders related to a number of planning cases on different levels. The process, the theories and methodologies used and its result within GOLIP are presented in a number of reports and papers. Ranhagen (2020a and 2020b), Ranhagen et.al 2017, Ranhagen 2017 and Ranhagen & Gustafsson 2020)

In a theoretical frame of reference for co-creation (Ranhagen 2020a) five elements that influence the overall dynamics associated with co-creation are lifted forward: Purpose? Ownership? Formal or informal settings?

Incentives? Meeting places? The reference frame identify four phases in co-creation: co-initiation, co-analysis, co-design and co-implementation. Three types of research input are identified as important for co-creation in collaboration between practice and research (theory): Action research, research-by-design and research focusing on the past and present.

A number of different planning and design methods and tools have been used in the USC knowledge process. The co-creative approach using a combination of planning and design tools has the potential to raise a number of different perspectives and experiences of the stakeholders involved, when considering accessibility and associated ecological, socio-cultural and economic factors. The results for this process can serve as a valuable supplement to desk top analysis of sustainability factors when planning urban areas for example close to transportation nodes.

One important research method which has been applied in both the overall project and in the comparative study is co-production. This research method has its roots in the overall direction of the urban station communities knowledge process within the Mistra Urban Futures platform. Co-production in action is considered of key importance in the pathways towards realizing well planned and inclusive cities. Co-production is a solution to the need of bringing together researchers, practitioners and other experts in transdisciplinary teams to handle and find solutions for complex challenges (Polk 2016).

In the urban station communities knowledge process co-creation was used as the main premise to describe and label the transdisciplinary collaboration which is essential for there to be co-production. The incentives for co-creation as a research concept and method can be found in communicative planning, interactive action research, design theory, research by design and participative back casting (Ranhagen et.al 2017).

With co-creation as an “umbrella” for the research, the work performed in the project is an example of interactive action research combined with research by design, as the stakeholders involved have worked together and created a common result in the four phases of co-creation presented above. The inspiration for this research is taken from research related to citizen engagement in urban planning, urban governance and urban living labs (see for example Davis and Andrew 2017, Puerari et.al 2018 and Hedenstedt Lund 2017).

An important part of the research method is to use tools that allow the practitioners involved to express their tacit knowledge and to mobilise their creativity thus achieving new, innovative solutions and conclusions in strong interaction and collaboration in a transdisciplinary way. Donald Schön asserts that in general, professional practitioners know more than they can express in words (“tacit knowledge”) and demonstrate what he calls “knowing in practice” (see for example Innes and Booher 2010 and Schön 1991).

## Overview of co-creative methods and tools

The basic methods and tools applied in the urban station communities knowledge process are related to a larger toolbox or model known as the 4/20 methodology and the SymbioCity Approach (Ranhagen 2012 and Ranhagen & Groth 2012) as well as to specific applications of the toolbox in urban station communities (Ranhagen et.al 2015, Ranhagen 2017, Ranhagen & Gustafsson 2020, Ranhagen 2020a and 2020b) The following methods and tools, which were applied in this project, are explained more in detail in the mentioned reports. For the presentation below the term tool has mainly been chosen instead of method in order to underline the practical applicability in co-creation which means that there often are several steps when using a tool. On a more detailed level there are also some advices given for use of practical tools a charts, maps etc.

**Tool 1** The walking tour for place and path analysis facilitates the investigation and collects participants’ experiences of an urban station area

**Tool 2** Map-based SWOT-analysis has been used for the compilation of qualities, deficiencies and ideas generated by the participants during the walking tours, on maps of an urban station area.

Back casting is a methodology that facilitates a long-term view on an urban centre and also to discern possible alternative paths from the present situation to a future. Participative back casting was used in combination with scenario technique as the stakeholders involved create the long-term scenarios in an intense creative process.

**Tool 3** is the scenario-matrix that is a useful way of structuring different scenarios by choosing two important structural aspects as axes in the matrix. By combining extreme positions for each aspect four different scenarios can be conceptualized.

**Tool 4**, A multi-criteria analysis (MCA) was used for the evaluation of scenarios, where chosen criteria for evaluation were given weights by distributing 100 points between eight criteria extracted from comprehensive sustainability criteria defined in the municipal planning process.

## Application of Methods and Tools for Co-Creation in a collaborative Workshop in Mölnlycke Urban Centre

As part of a three days meeting in Gothenburg in May 2018 involving project group participants from Cape Town, Kisumu and Gothenburg, some of the tools for co-creation developed and tested within the urban stations communities knowledge process in Gothenburg were applied. During the second day of the meeting the project group did a study visit to Mölnlycke in Härryda Municipality which is a 20-minute bus ride from Gothenburg center. The project group met with representatives from the Härryda Municipal, both politicians and planners working with the planning and the development of both Mölnlycke urban centre and Landvetter Södra new city district. The purposes of the combined study visit and workshop and were:

- to learn more about Urban Station Communities knowledge process and the different methods and tools available within the tool box
- to test one tool for mapping and analysis of site prerequisites and conditions – the walking tour tool for field studies using Mölnlycke urban centre as a case
- to test tools for synthesis related to the development of future scenarios (backcasting and scenario methodology) and evaluation of scenarios (multi-criteria analysis) on the Kisumu case in order to gain experiences of the relevance and universal applicability of the methods/tools

When presenting the applied tools in the workshop below a general presentation introduces each section followed by the specific applications in the workshop

### Walking tours for place and path analysis

As a supplement to quantitative analysis of the urban structure of a station community, experience-based methods can be applied for qualitative analysis of the spatial structure including different kinds of urban areas, parks, street, paths and public places of importance for livability, sustainable transportation and safety/security, environmental disturbance, aesthetics/beauty etc. Routes and stops on these routes are prepared on maps as well as in path protocols in order to facilitate for the teams and for the participants to take notes on strengths/positive impressions, weaknesses/negative impressions and ideas for improvement. After the walking tour the participants compile their impressions on maps and aerial photos using post-its and stickers (de Laval 2014, Ranhagen & Gustafsson 2020).

The walking tour method/tool may also be labelled “The Walk and talk tool” as it showcases a participatory and experienced-based approach on site investigation and analysis related to the planning of urban stations communities. The free discussion of experiences among



the participants when moving through the specific site combined with systematic registration of both positive and negative impressions is an important component in making the tool both joyful and useful. An important part of the method is to walk around in a specific area to experience the surroundings in a tangible way which is often more difficult and abstract when just using maps for analysis purposes.

The purpose of the walking tour exercise at Mölnlycke urban centre was

- To jointly apply, test and assess the walking tour method in order to catch different stakeholder's subjective experiences and perceptions of the physical environment.
- To catch subjective experiences that cannot be substituted by a map nor by quantitative methods.

### Practical aspects on the use of the walking tour method

The routes proposed for the walking tour should not be too long since the participants should be able to have

time for reflections and discussions. In the Mölnlycke case a 1,7km long tour was proposed covering important sections of the urban environment close to the station.

During the walk participants were encouraged to document different reflections. In this case green, yellow and red dots were used, representing strengths, ideas for improvement and weaknesses /flaws.

The walking tour method/tool (Walk and talk method/tool) can be used and combined in different ways in order to both get the 2D and the 3D/4D experiences of a place/area. After the walking tour the experiences from the tour are gathered and summarized on maps in groups, based on the individual protocols that everyone has conducted during the walking tour

Walking tours can be combined with systematic path analysis. By conducting walking tours with planners together with ordinary citizens other perspectives of the urban area and how people perceive the station and its surroundings can be added. In this way, it is possible to get different perceptions of the same urban area for comparing purposes.

**Practical Tools needed**

- Map of the area with specific route marked (no longer than 1,5 – 2 km)
- A laminated protocol for the documentation of strengths, weaknesses as well as ideas for improvement and where each stop is marked (1, 2, 3...)
- Green, yellow and red sticky labels



Figure 8 Walking tour protocol applied at Mölnlycke urban centre with six proposed stops. Positive factors (strengths, qualities, positive impressions) as well as negative factors (weaknesses, flaws, negative impressions) are registered for each stop or if needed for stretches between those stops. It is also important to register ideas for improvement as well as general reflections. To the right is an example of a tour protocol with registration of remarks regarding positive and negative factors as well as symbols for positive factors (green sticky label) or negative factors (red sticky label)

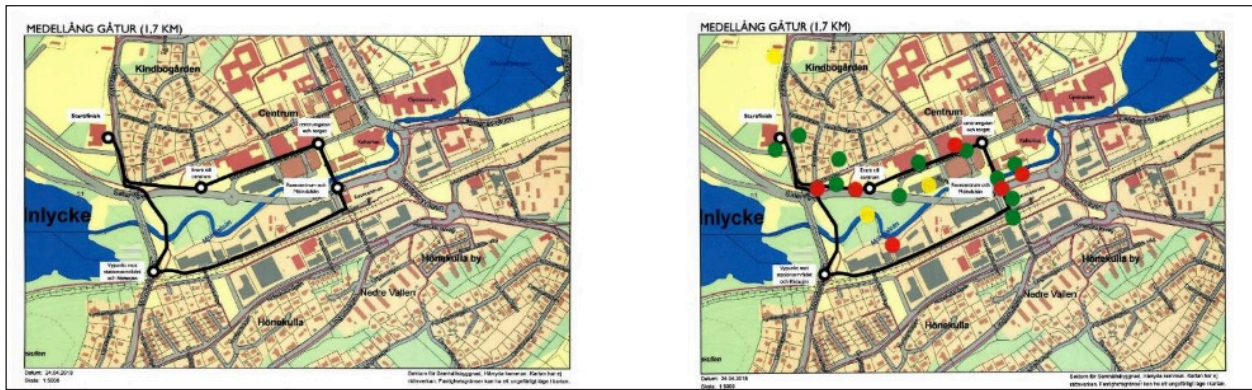


Figure 9 Maps of Mönlycke urban centre with the six proposed stops and the linkages between them. To the right is an example of a summarised evaluation of experiences along the walking tour with both positive and negative factors as well as ideas represented by red, green and yellow sticky labels referring to the more detailed notes in the walking tour protocol.



Figure 10 Photo from the walking tour in Mönlycke Urban Centre



Figure 11 Photos from the co-creative process of compiling positive and negative factors as well as ideas for change on maps based on experiences from the walking tour

## Backcasting and scenario methodology

Instead of making projections into the future from a present position, back-casting starts by sketching out images for the future that depict possible long-term solutions to a societal challenge in this case a future urban station community.

Backcasting is thus an approach within research and practice that enables stakeholders to explore future options for urban development by sketching possible future visions and solution to societal problems. To be able to work with backcasting there are some key aspects that need to be fulfilled,

- a) the time horizon must be in the distant futures for qualitative changes to be possible,
- b) there is a need to break free from the acute problems in the near future and
- c) clear goals and key issues should be formulated as a starting point. (Ranhagen et.al 2017).

After delimiting interesting long-term images for the future, possible alternative paths from the present situation to a future situation can be sketched out. In co-creation participation-oriented and action-oriented back-casting methods are of specific relevance.

In the practical applications in the urban station communities knowledge process different kinds of scenario-matrices have been used as tools for back-casting. Two important structural aspects are chosen as axes in the matrix which facilitates the overall design of extreme case options by combining extreme positions for each aspect. Examples of axes in the matrices are regional or urban structure – polycentric versus monocentric, paths/nodes - dense paths versus strong nodes along paths. One way of working with back-casting in transdisciplinary, participative co-creation is to try to conceptualize two extremely different alternatives/scenarios diagonally in the scenario matrix and then supplement with the other two scenarios. (Ranhagen 2020a, Ranhagen & Gustafsson 2020)

### Practical Tools needed

- 1 A1 sheet with four axes
- 4 Map of the same area printed in A4
- Sketch paper
- Colour pens
- Post-it notes

## Case for the method

To apply the method/tool in the collaborative workshop we used the case of the old train station in Kisumu by the old harbour. For this workshop, participants worked in 2 groups where each group could choose what themes they wanted to work with in their matrix (See Box A). The participants received 4 printed maps of the specified string to draw options A, B, C and D as shown in the figure 13 below.

### Steps for conducting the method

The scenario axes were discussed in order to grasp factors that can be related to overall important structural elements for the future urban development of the urban areas surrounding Kisumu station.

After having decided the choice of scenario axes the principal content and design of the scenarios were discussed by putting ideas related to each scenario in the four quadrants. The groups were advised to start to discuss possible extreme scenarios diagonally in the four-field matrix in order to grasp the span of future options for the development of the harbour area.

After having generated a number of ideas regarding scenarios in each of the four quadrants the teams started to illustrate spatial scenarios by overall sketching of different patterns of future of land-use, important paths for walking, bicycling, bus and car traffic, urban parks, urban nodes in the surrounding areas, interplay urban-and rural areas etc. The tool admits creative development and combination of a multitude of different ideas. In this step the focus is on exploring future possibilities and to allow all kinds of ideas to flourish. In the next step, evaluation and assessment, there is a focus on critical review and analysis of impacts and consequences of different scenarios, see next section.

After having produced scenarios each team were advised to give the scenarios a label/name – using metaphors etc – in order to strengthen the identity and the overall character of each scenario.

### BOX A: Possible scenario axes

- High density – medium/low density
- Polycentric – monocentric (“few-centric”)
- Large scale – small scale transportation or energy systems
- Mixed use on area level – mixed use on block/building level
- Concentric - radial development (path or starshaped development) around the station

## Results from the different groups

The groups choose the following scenario axes which they found relevant for Kisumu old station area:

- Scenario matrix 1: Monocentric and polycentric structure (axis 1) versus max transit/public transportation – max walking and bicycling (axis 2)
- Scenario matrix 2: Concentric densification and radial densification (axis 1) versus max transit/public transportation – max walking and bicycling (axis 2)

In the first scenario matrix the group illuminated that two types of monocentric development are possible:

- a concentrated development around the station allowing for maximum walking and bicycling or an oblong development along a transit line in parallel with the waterfront of Victoria Lake
- a polycentric development around nodes either in a network pattern or mainly oriented towards the waterfront

In the second scenario matrix concentrated densification combined with focus transit respectively walking and bicycling resulted in similar kinds of grid network densification patterns close to the station but with paths of different capacities to meet the demand for different transportation modes. As for radial densification, the combination with transit resulted in stronger radial paths also on longer distances from the station, while the combination with walking/bicycling implied a more fine-meshed network adapted to slow traffic modes.

## Evaluation and Assessment of Scenarios

Even if the evaluation of scenarios is only one part of planning, it is such a central activity that it should permeate all parts of the planning process. It is thus important to perform evaluations successively in such a way that overall and general scenarios will be assessed and that a limited number of alternatives then will be reassessed using more and more specific criteria and indicators. In the USC knowledge process at least three tools have been introduced, tested and evaluated by the municipalities:

- Effect profiles for ranking alternatives
- Spider diagram for qualitative evaluations
- Multi-criteria analysis for more streamlined and specific comparisons of alternatives (MCA)

MCA has been the most widely used method as it includes both

- 1) ranking of alternatives for each chosen evaluation criteria or indicator and
- 2) weighing of the chosen criteria/indicators in relation to each other by distributing 100 points.



Figure 12 Co-creative work with scenario matrices for the case Kisumu old station area

By using an excel chart for the MCA-process it is easy for the participants and the working group as a whole to put in numbers for 1) and 2) and also to make a robustness analysis (RA). By performing a RA it is possible to test if a certain alternative keeps its position even if the weights of the criteria/indicators are changed. This is an important remark as the numbers should be seen as not absolute but more as representing relative judgments of how well the alternatives fulfil the chosen objectives.

When the groups had finalised their different scenarios for Kisumu train station areas, the next step was to evaluate the different options. A simplified version of MCA was chosen to admit for both ranking of alternatives and also weighing of goals in order to prepare for a RA.

The first step in the evaluation processes was to distribute 100 points between the different goals that had been pre-defined before the workshop (see figure 14). In this case these goals were used as possible goals. For real cases it is recommended doing a structured brainstorming workshop to define common key issues, goals/targets/indicators more in depth.

It is up to each group how they choose to distribute the 100 points, for example a group can choose to put all the points on one goal meaning that all the other goals would be ranked as zero. Alternatively, if they think all goals are equally relevant, they have the opportunity to distribute the points equally between the different goals.

When each group had agreed on the ranking and the distribution of weights between the goals the next step was to multiply ranking points with weights. Figure 15 illustrates the ranking of scenarios and weighing of goals proposed by group 1, working with scenario-matrix 1.

Goals	Grade
Ecological	15
Social	15
Cultural	13
Economic	15
Spatial	9
Institutional	9
Human	9
Equity	15
Other?	
<b>SUM</b>	<b>100</b>

Figure 13 Example of distribution of points between the chosen overall goals in the workshop

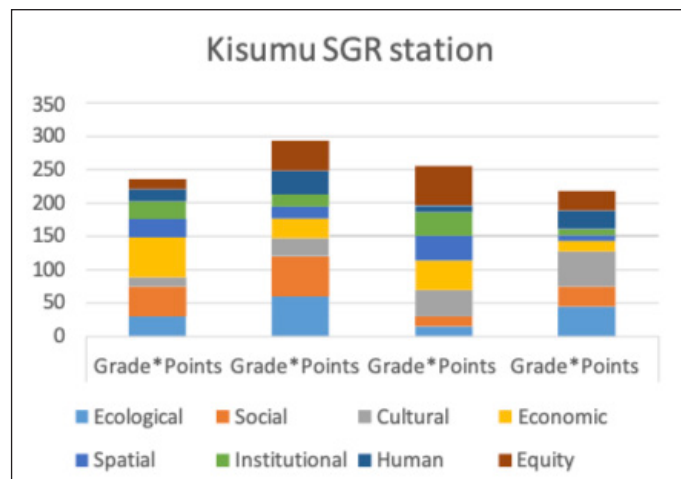


Figure 15 Bar chart presenting the first ranking of scenarios combined with the distribution of 100p for relative weighing of goals, numbers taken from figure 15. Scenario B (radial densification around the station combined with max bicycling and walking) was considered the best option, followed by scenario C, scenario A and D.

The ranking of scenarios was done according to each goal at a time in a horizontal manner in the excel-chart so for example if alternative A is considered best concerning economic issues then that alternative gets 4 points. If Alternative C is seen as the second-best option according to the groups opinion, it gets 3 points and this process continues until all scenarios have been ranked according to all goals.

This tool enables the participants to test the outcome of different combinations of scenario ranking and weighing of goals. By combining this matrix with a bar chart, it is possible to visualize the different total points where ranking is multiplied by weights for the respective goal. To test how robust the best option is, it is also possible to adjust the weights of the goals to discern if the order between the scenarios are changed or not (robust analysis) as has been described above.



Figure 16 One of the groups working with the evaluation of scenarios by starting to put weights on the goals in the excel-sheet in the computer, then analysing pros and cons of the scenarios, followed by the ranking of scenarios and multiplication of weights and ranking points into a combined result, which is done automatically in the excel-sheet.

GROUP 1									
Goals	Grade	Alt A		Alt B		Alt C		Alt D	
		Points	Grade*Points	Grade*Points	Grade*Points	Grade*Points	Grade*Points	Grade*Points	Grade*Points
Ecological	15	2	30	4	60	1	15	3	45
Social	15	3	45	4	60	1	15	2	30
Cultural	13	1	13	2	26	3	39	4	52
Economic	15	4	60	2	30	3	45	1	15
Spatial	9	3	27	2	18	4	36	1	9
Institutional	9	3	27	2	18	4	36	1	9
Human	9	2	18	4	36	1	9	3	27
Equity	15	1	15	3	45	4	60	2	30
Other?			0		0		0		0

Figure 14 Application of MCA excel chart- group 1/scenario-matrix 1

## Structured brainstorming

Structured brainstorming can be used in order to define key issues regarding a certain planning task for an urban station community. The participants are recommended to start the process by individually reflecting on what they view as key issues in the current planning task. The key issues are written down on post-its and are then placed on a notice board and are finally structured in various main thematic groups of issues (clustering). The individuals in the groups may then prioritize the key issues by distributing a number of stickers between the various key issues. The five key issues with the highest priority can be further used as basis for the formulation of a common vision for the planning area. The result may be used as a basis for comparing and linking the most important key issues according to a certain stakeholder group to official objectives expressed on an international, national, regional or local level.

The third day of the 3-day collaborative session in Gothenburg in May 2018 was focused on trying to identify the project groups common challenges and key issues as a basis for the collaboration between Cape Town, Kisumu and Gothenburg Platform. The key issues and challenges discussed at the RJC in Kisumu in 2017 was the basis for the workshop exercise. The tool used was the above presented structured brainstorming. As noted previously this tool can also preferably be combined with the other methods/tools describe above.

### What is a key issue?

A key issue is an important question which should be analyzed and handled in the planning and design process in order to;

- To consider both internal qualities and external options for future development regarding a general or a specific topic for example integrated urban and transportation development

- Eliminate both external threats and internal deficiencies regarding the chosen topic

The project group had the following overall question for reflection when writing down their key issues:

Take the presentations of different projects in the platforms and your own experiences from R&D and practical planning as a starting-point when discussing key issues for integrated urban planning and transportation aiming at realising just cities.

First step in the method was to reserve 3-5 minutes to write down individually key issues that are of relevance for the chosen topic/question at hand. Based on the individual key issues, the group then went through all the key issues and categorized them together in themes (labelled as clustering, the number of themes may of course vary from case to case)

The different key issues in each cluster were then prioritized. Each member of the group could distribute 15 points each among the themes. The post-its were rearranged so the prioritised key issues within each theme could be placed in the upper parts of the columns

After that the prioritization was conducted a number of sub themes could be discerned as important areas within the seven themes could be integrated into five common themes and a number of main key issues for the collaboration.

The result from that workshop was also integrated and used as a basis for the picture presented in figure 3 in the urban challenges chapter above illustrating the overall vision realizing just cities connected to five main challenges/topics/issues for further consideration, discussion and research. Environmental issues and innovation were left out in the overall presentation of themes supporting the vision as these themes were considered as overall aspects that should have influence and permeate all themes.



Figure 17 The work sheet for the structured brainstorming divided into a number of possible themes that can be identified after clustering of the individual notes on post-its

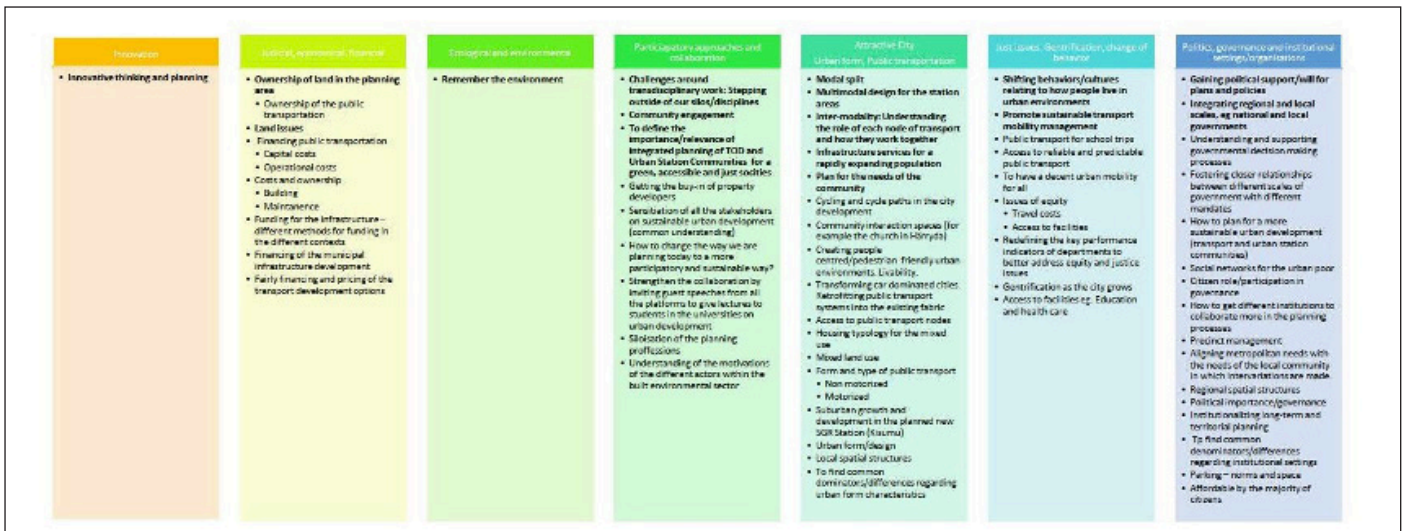


Figure 18 Documentation of the main themes and the key issues formulated by all participants

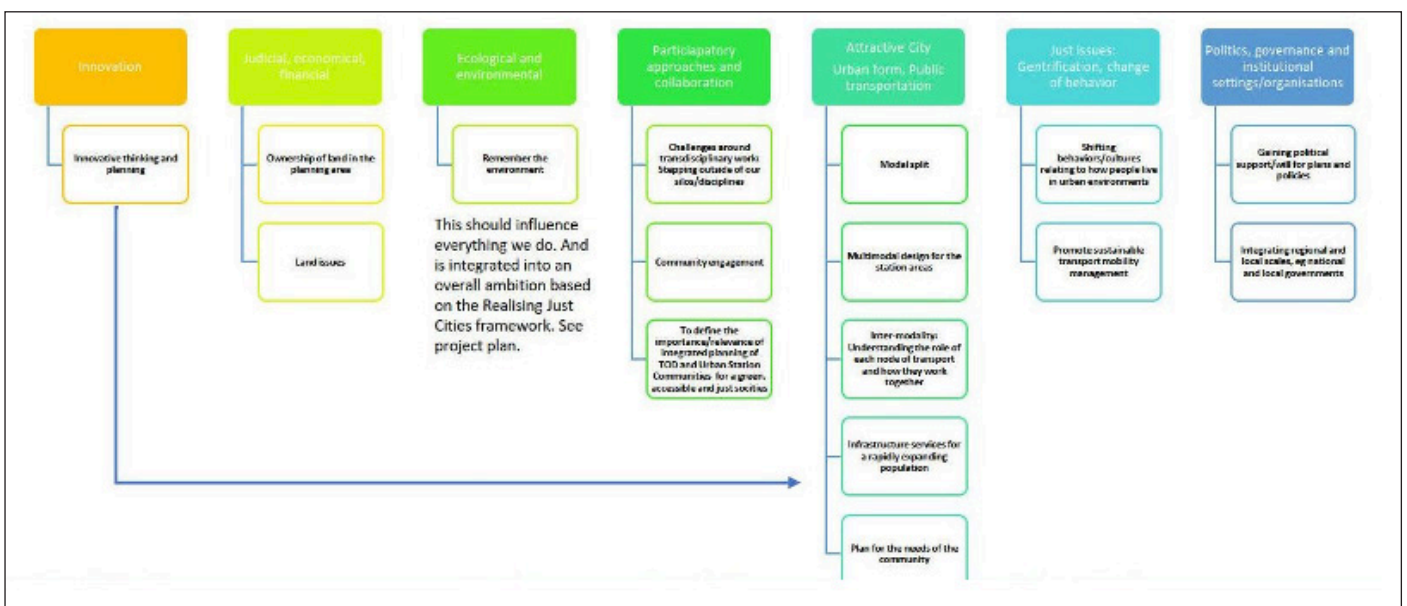


Figure 19 A number of sub themes were discerned as a result of the prioritization and integration of key issues.

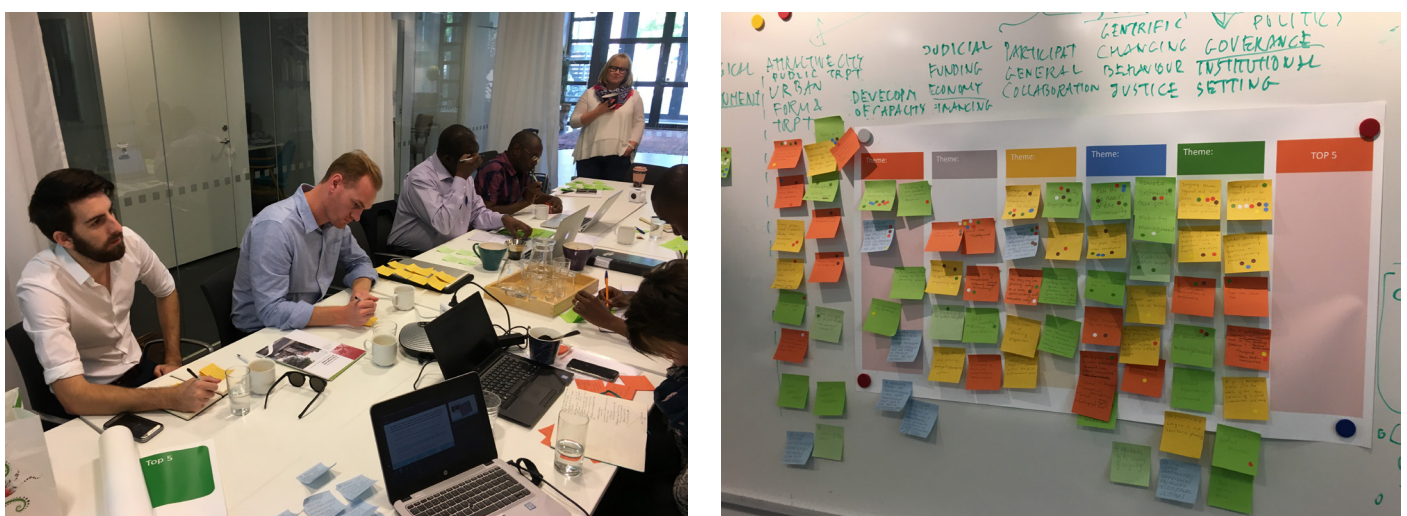


Figure 20 Photos from the co-creative workshop using structured brainstorming as a method/ tool

## Application of structured brainstorming at RJC conference in Cape Town nov 2018

In order to get input from a larger group of stakeholders and actors involved in Mistra Urban Futures an external session was organised in the conference in order to get a wider input on challenges and opportunities with regard to urban development and transportation. Each case was

presented by representatives from each city. Transdisciplinary focus groups were organised. The groups had mixed composition whereby people from many countries could bring in their general and specific views on the cases.

Blue Downs Rail		SGR Kisumu		Landvetter Södra	
Challenges	Opportunities	Challenges	Opportunities	Challenges	Opportunities
Relationship with PRASA	Grade separated integration of transport modes	Costs (high investments)	Job creation	Create enough jobs for people to have and work there	There is order
Burning infrastructure	Expropriate land in well-located areas	Management (Chinese to manage the system for a couple of years ahead)	Lake Victoria connecting with the East African countries and the port in Mombasa (Kenya, Tanzania, Uganda)	Strategic placing for jobs - competing with the airport?	Knowledge intense jobs
Creating barriers in the communities	Generatic and known	Planning, design, implementation and financing	Competition (Bus and railway) - better quality services	The horses	Owning much of the land
PRASAs fragility (high risk)	Rail link had the rail reserve land	Cost (elevated railway line)	Tourist locations for example Massai Mara (connectivity)	If the high speed train: Few stops and LS may not be a stop on the line	Create a sense of close to the nature
Uncertainty in vehicle availability	incorporate existing settlements in the new developments	Land ownership	Cost of transport	Making the area liveable during the building process	Identity with the nature
Political apprehesion to get involved in the land market	stakeholder engagement from a early stage	Resistance to change	Competition for example quality of buses	Social aspects	Strengthening the connection to existing Landvetter



Underground element creating conflict	fundamentallt improve the accessibility and affordability for some of people within the city with the greatest need	Logistics	Development of city metros (Mombasa, Nairobi, Kisumu)	Creating an identity	Possible to preserve the nature in the plan
Land inclusion and speculation (same for SGR) Compensation	Vastly improve the efficiency of the transport network	Design (raising of the railway line) for example national parks and residential estates (housing)	Popularity (Railway transport vs Road transport)	Justify localisation, invest where it is most needed	
Airport in the way	Environmentally friendly development		Multiplier effect	Do not increase traffic congesting, risk of more traffic	
Eviction of Wimbledon community	Pilot cut and cover design		Major towns (Kisumu - Nairobi - Mombosa)	Social infrastructure - what comes first?	
Fears of land invasion	Monorail			Future increase in amount of people living there (25 000 - 50 000 more inhabitants)	
Lack of proximate land for housing	Expropriation				
Land ownership					
Timing and sequencing					
Integration with a larger spatial plan					

Land availability/ownership - Politics and land questions
Unilateral decision making - multi-level governance issues
Engagement across different spheres of governance
<ul style="list-style-type: none"> <li>Conflicting rationalities</li> <li>- impact on power dynamics</li> <li>- How to navigate politics of the intervention</li> <li>- Conflict at the local scale</li> </ul>
Controversy over location of stations and development
<ul style="list-style-type: none"> <li>Time horizon, phasing, sequencing</li> <li>- Complexity delays the planning process</li> </ul>
Commonality of uncertainty

Figure 21 Summary of the external session in Cape Town nov 2018

### Application of methods and tools for co-creation at Maitland station area in Cape Town

The Maitland urban area was used as a case for a brief application and test of some of the methods and tools presented above during the RJC conference in Cape Town in 2018. About 20 interested people from the conference who were curious about the co-creative methods and tools participated. The team from South Africa prepared the workshop with support from the Swedish team. Some of the methods and tools tested more in depth at the workshop in Gothenburg in 2018 was applied.

At first a walking tour was performed along a pre-defined walking route which made it possible to document experiences in a protocol and on maps. The station area and its connections to the surrounding neighbourhoods and blocks were studied and discussed. The walking tour served as a basis for a structured brainstorming. Key issues generated by a structured brainstorming this workshop were among other things:

- Who are the people living and working in Maitland?
- What are their stories and how could these stories take place in the “new” Maitland?
- What is the identity of Maitland and how could the culture, history and ethos of the place be understood?

- How to avoid gentrification when densifying and reorganising the city district?
- How to include people outside the formal social system and how to make it possible for them to both work and live in the future area?
- How can public transportation be improved when developing the urban structure and contribute to inclusiveness?

The third part of the workshop included the generation of long-term visions for the area. A number of ideas came up which indicated huge future potentials to upgrade the area successively. However, the revitalization of the area should consider the key issues raised above in order to avoid evacuation of residents and other negative consequences, especially from a social point of view. The conclusion of this exercise is that efforts should be done to plan for an inclusive and integrated urban planning and transportation process involving stakeholders from civil society, business sector and public sector.



Figure 22 Picture from walking tour, walk and talk tour within the Maitland area



Figure 23 Picture from the design exercise aiming at exploring long term potentials for intensification of the Maitland area

# Analysing the transition to transport justice

## Transport planning transition to accessibility

Transport planning theory has undergone significant transformation over the past decades and practice looks primed to follow suit. There has been an increasing recognition that the modernist, ‘predict-and-provide’ techniques for transport planning and their mechanistic, positivist approaches to optimisation has produced many undesirable, unintended futures (Goodwin et al., 1991, Owens, 1995, Graham & Marvin, 2001, Venter). These techniques foregrounded technological advances in transport vehicles, road design and infrastructure, leading to the isolation of the profession from the other urban sciences (Graham & Marvin, 2001). The culmination of this evolutionary line of transport planning was the domination of most public space by the automobile in many cities of the Global North (Rode, 2018).

To break from this evolutionary path, transport planning scholars revisited the fundamental premise of urban passenger transport. The traditional, mobility perspective centres movement between two points in space as the *raison d’être* for transport systems and the profession as a whole. However, the movement through space usually provides little utility to the users of a transport system. Transport demand derives from the desire for a good, activity or experience that isn’t available within proximity of the user; it is a derived demand. The extent to which a combined land use-transport system enables an individual to reach a desired activity or destination—or a company to reach individuals—by means of a transport mode is called accessibility (Van Wee, Annema & Banister, 2013).

The support for accessibility as a planning premise has grown significantly in the past few years, but this emergence has largely remained confined to academia (Gutman et al., 2017). Golub & Martens (2014:1) propose that accessibility is “the most appropriate measure of benefits from transportation plans and investments, and thus should be the focus of any effort to understand and measure the impacts of transportation investment programs.”

To take this proposition further, Martens (2016) introduced a framework for transport investment based on the notion of an equitable distribution of accessibility among the users of the system, called ‘transport justice’. This approach focuses on the strategic allocation of transport investments and programmes to target ‘access poverty’ (Golub & Martens, 2014). A poverty of access is defined as an unacceptable difficulty in reaching key opportunities and services within a reasonable ease, time

and cost (Lucas et al., 2016). There are many factors that affect a user’s level of access, see Litman (2015), but chief among them are the demographic characteristics of the user (age, gender, income etc.) and the distribution of land uses or activities that the user is trying to access (Geurs & van Wee, 2004).



Figure 24: Access illustrated as an ‘ideal’ nexus between the transport, land use and finance systems of a city, adapted from Gutman et al. (2017)

Figure 25 illustrates that accessibility is a common language between transport planning, spatial planning and municipal finance (Gutman et al., 2017). The traditional transport planning approach, and its emphasis on operational optimisation as a solution to access challenges, has isolated the field from the other urban sciences (Rode, 2018). In contrast, accessibility-focused transport planning is an inherently transdisciplinary approach. Shifting the transport sector toward a future that prioritises access over mobility and equity over efficiency will require fundamental changes that are both structural and systemic in nature.

Research around how to initiate or guide this paradigm shift to accessibility-based planning policies and techniques at the practitioner level remains in its infancy. This can be seen in the current interpretations of SDG 11.2, that access to public transport, through proximity, is the appropriate metric for success rather than the level of accessibility that the public transport can provide each user (Brussel et al. 2019). This interpretation, and the wording of SDG 11.2, are undermining the paradigm shift that is being proposed. This transition from modernist, ‘predict-and-provide’ transport planning approaches to interdisciplinary, equity-driven accessibility approaches requires a robust framework for managing the com-

plexity and uncertainty of this systemic change. The value of a systemic change framework, necessary to achieve a more sustainable future, is not unique to the transport sector, and has, in part, given rise to the research field of 'sustainability transitions' (Canitez, 2019).

## Accessibility and transport justice

This report will also explore what stage of development the concept of equitable access or transport justice occupies in each city. The MLP (Multi-Level Perspective) framework allows an explorative comparison of the perspectives on accessibility from different actors within each city. To assist in understanding these perspectives, the study bridges analytical approaches by including initiative-based learning from practitioners in each of the city governments (Geels & Berkhout, 2016). Each city happens to be in the process of planning a major rail initiative, which presented itself as an opportunity to examine and compare perspectives on accessibility across very different contexts.

All three cities are on the verge of planning and implementing major transport intervention, Landvetter Södra in Western Gothenburg, Standard Gauge Railway in Kisumu, and Blue Downs Rail in Cape Town. These interventions are not only subjects of infrastructure but also rise other questions related to emerging transition field and transport justice. For example, accessibility under what premises and for whom? How does accessibility take form for different people in the city and in the different context? For example, an elderly lady, living in poverty on the periphery of Cape Town has many characteristics that affect her level of accessibility. Her age precludes her from walking far distances, her gender prevents her from travelling late at night, her peripheral location and low income reduce the number of opportunities that she can access within her travel budget. All of these factors affect her level of accessibility, and entrench her poverty, so the transport justice approach dictates that her accessibility should be prioritised as it would fall below the sufficient minimum. Using accessibility and transport justice may also be a proxy for how issues of poverty and poverty reduction are tangled in the different global south.

The rapid urbanisation into cities and global challenges of climate change, poverty etc contribute to multi-dimensional challenges in the planning processes of transportation in and around our cities. There is a complexity of how to plan for an energy efficient transportation system that is both affordable and accessible for everyone. Accessibility having different meanings in different contexts and for different people, for example people using public transportation have different abilities to move around and access transportation services. In cities such as Cape Town and Kisumu there is also the challenge of integrating the informal public transportation as an integrated

part of the overall public transportation system, which raises the questions of livelihood, security, accessibility and governance as an important aspect of how transport interventions are developed and implemented/realised. A common challenge that was identified as crucial for the cities, Gothenburg, Kisumu, and Cape Town, is the question of governance and a need for political support in creating possibilities for transition to a sustainable and just transportation system. Creating a need for more transdisciplinary and cross-cutting collaborations, both within institutions at local, regional, national but also global level. How do different levels of government, particularly in relation to ownership, finance, and responsibilities, related to governance?

Accessibility is also a question of access to land, in each of the cases the land issues are heavily debated. Land and the value of land is increasing globally, making transport interventions a costly investment. Funding of transport intervention becomes a crucial challenge that needs to be solved in order to solve the questions of affordability and accessibility. Other important questions that rise from this are, the question of ownership and maintenance of the infrastructure? Is it a public good, and therefore the responsibility of the government or a question for the private sector? The funding methods differs between the three cases. In Gothenburg and Sweden overall, there is an established funding system, while Cape Town and Kisumu are still struggling with issues of cost and ownership for public transportation.

At the same time the question of affordability and pricing system is very much a challenge in Gothenburg as well as in Kisumu and Cape Town. How to create a pricing system that is affordable and accessible for all? Since land value is increasing, the costs of new infrastructure are getting higher in all three cities, leading to the question who are we planning for, if it is even possible to create an affordable and just transport system? Who will have access to the public transportation if it's not affordable? In Cape Town and Kisumu public transportation is often related to poverty and lower standards of livelihood, whereas car ownership is often related to higher standard of living. What role does transport planning have in realising a transportation system that is both accessible and just?

Martens (2017, p.7) raises two perspectives in relation to this, 1) should transportation planning give priority to investment in the most inclusive transportation modes or 2) should transportation planning seek to design and deliver a system that can offer the cheapest service to most people? Whatever or however these questions are answered there is a high likelihood that there will be trade-offs between people, groups and in some sense also technology, some modes of mobility will be excluded from the system. Groups such as the most marginalised and poor, people that are often the ones most relying on

the public transportation, are the ones that most likely to be excluded from it, due to issues such as lacking accessibility and affordability.

## Transition theory and the Multi-Level Perspective

Transport systems are not a new focus for transition researchers, but transition theories and frameworks are still nascent among transport planning researchers. In a literature review regarding the transition of mobility planning towards sustainability, Nikulina et al. (2019) found that the transport planning and transition scholars have distinct, separate epistemic communities that are seemingly not collaborating. Only one of the 444 publications they reviewed mentioned planning for transitions (Nikulina et al., 2019).

In the application of transition theories to transport systems, transition scholars have primarily focused on analyses of the past, see Geels (2002, 2005). What these historic analyses of transport mode transitions have shown is that the frameworks are effective in exploring the complex rationale of these transitions and, in part, explaining how the ST-regimes in these transport sectors came to be dominant (Nykqvist & Whitmarsh, 2008). In contrast, planning scholars typically look forward, favouring long-term-focused visioning, backcasting and scenario planning (Nikulina et al., 2019). Some transition scholars have taken similar approaches, with Elzen et al. (2002, 2005); Kemp & Rotmans, 2004 and Geels & Schot, 2007) all analysing future transport mode shift and technological change scenarios.

The applications of transition theory to transport systems have helped explain rise, stability and decline of existing and previously dominant regimes. However, Temenos et al. (2017) highlight that despite transition theorists believing that transitions involve significant change to almost all of the components of a regime, the empirical research tends to focus on technological change (fuel, vehicles, infrastructure, ICT) to the detriment of the other components. Changes related to the cultural regime, such as an increasing focus on equity, and the science regime, such as planning processes premised on accessibility, receive far less attention, or are addressed indirectly. The ability of transitions theory to incorporate changes to the more complex and uncertain components of a regime is among its most valuable traits, yet the opportunity to do so regarding transport systems remains largely untaken (Temenos et al., 2017).

This preliminary analysis aims to combine research trends and approaches from both epistemic communities. A Multi-Level Perspective (MLP) is conducted on the accessibility regime of each of the three cities. The purpose is to examine the historic developments in each system, drawing insights about their transition pathways to a more or less just provision of access. The method

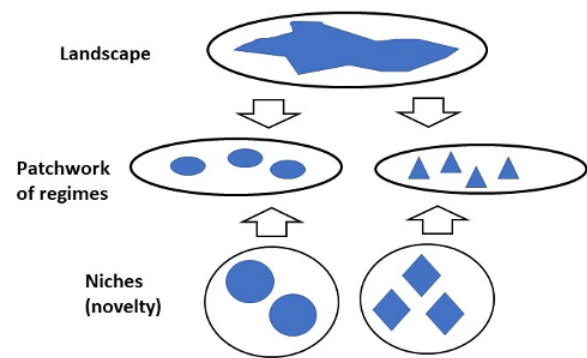


Figure 25 Multiple Layers as nested hierarchy. The picture made by the research team, but it is directly inspired by a picture by Geels (2002).

expands upon the MLP approach used by Geels (2018), in their study of passenger mobility transitions in Great Britain. The extensions to the MLP logic that Geels (2018) proposed for that study reflect the specific challenges in understanding mobility or access regime transitions. Rather than an approach that ‘zooms in’ to a particular innovation, the study ‘zooms out’ to analyse the system as a whole, an important, but understudied topic (Geels, 2018). Geels (2018) acknowledges that transition within the mobility regime is more likely to be gradual system reconfiguration than any one singular disruption. Extensions to the MLP include the analysis of multiple landscape dynamics and multiple niche-innovations that variably influence the multiple regimes that make up the mobility system. This whole system perspective aligns more closely with integrated land use-transport and accessibility planning approaches, which will ideally lead to a greater cross-pollination of ideas.

## Multi-level perspective as a trans-disciplinary approach

The multi-level perspective is necessary if the ambition is to understand the complexity of integrated land-use and transportation challenges in general but also more specifically when the issue of transport justice is addressed. The relationships between the landscape level, the socio-technical regimes and the technological niches determine the barriers but also the opportunities for future change towards improved transport justice. The urban and spatial dimension should also be included when looking upon future options for integrated urban and transportation planning with focus on transport justice. A transdisciplinary approach using co-production and co-creative methods and tools is fruitful as it admits the participants to express their specific perspectives, knowledge and ideas but also to amalgamate a wide variety of perspectives, knowledge and ideas to a synthesis. By systematic co-evaluation criteria related to transport justice as well as to other sustainability dimensions it is also possible to

discern conflicts as well as possible synergies between the landscape, socio-technical and the technological levels as well as between different stakeholders and other sustainability aspects. One example of a useful tool for transdisciplinary evaluation of integrated spatial and transportation scenarios is multi-criteria analysis (MCA) which was applied in small scale in the evaluation of the scenarios developed for the Kisumu station community

in the Gothenburg workshop in 2018. The tool has also been applied in the urban station communities knowledge process in Gothenburg (Ranhagen et.al 2017) The comparative project has resulted in valuable experiences combining the MLP perspective and an co-creative transdisciplinary approach but there is a huge need for further exploration of the field, see conclusions and further research.

# A multi-level perspective of each city's accessibility regime

Accessibility regimes are complex networks of actors spanning multiple sectors, disciplines, and scales. Geels (2018) examines the techno-economic developments of the mobility regime of Great Britain and divides the various actors into four social groups (firms, consumers, policymakers, wider publics). The case studies have followed a similar method, with the addition of the insights from the rail initiatives being planned in each city.

## Cape Town, South Africa

### Landscape pressures

South African cities went through a period of intense urbanisation after the advent of democracy in 1994 and the abolition of Apartheid restrictions on the freedom of movement. Cape Town, the country's second largest city, increased in population from 2.5 million in 1996 to 4.2 million in 2017 (City of Cape Town, 2012; 2018). This period saw a strong trend toward suburbanisation by the wealthy around existing economic nodes and vast low-income settlements developing on the cheaper land at the urban periphery. This trend, coupled with the Apartheid legacy of the forced relocation of working-class families from the older, better located neighbourhoods, has exacerbated the spatial dislocation of the

majority of residents from the available opportunities and services in the historic economic nodes (Visser, 2001). In recent years, wealth has begun returning to the inner suburbs and gentrification is gaining momentum, which could further intensify the disparity in the distribution of access (Lees, Shin & López-Morales, 2015; Hwang & Sampson, 2014). The spatial fragmentation, long travel distances and access inequity that most residents of Cape Town endure have highlighted the flaws in the traditional, mobility-focused planning techniques used in the city. Due to Apartheid spatial planning, the land use system in Cape Town has not been able to provide access through proximity for most of its residents (City of Cape Town, 2017). Hence, access is largely dependent on mobility. The spatial fragmentation of the city has also had significant, negative effects on the operational efficiency of this system; undermining its financial viability and restricting the city's ability to finance the necessary improvements in accessibility. The national and local governments of South Africa have pledged to transform the urban form of their cities to reduce segregation and access inequity but lack a holistic framework to guide them toward transport justice.

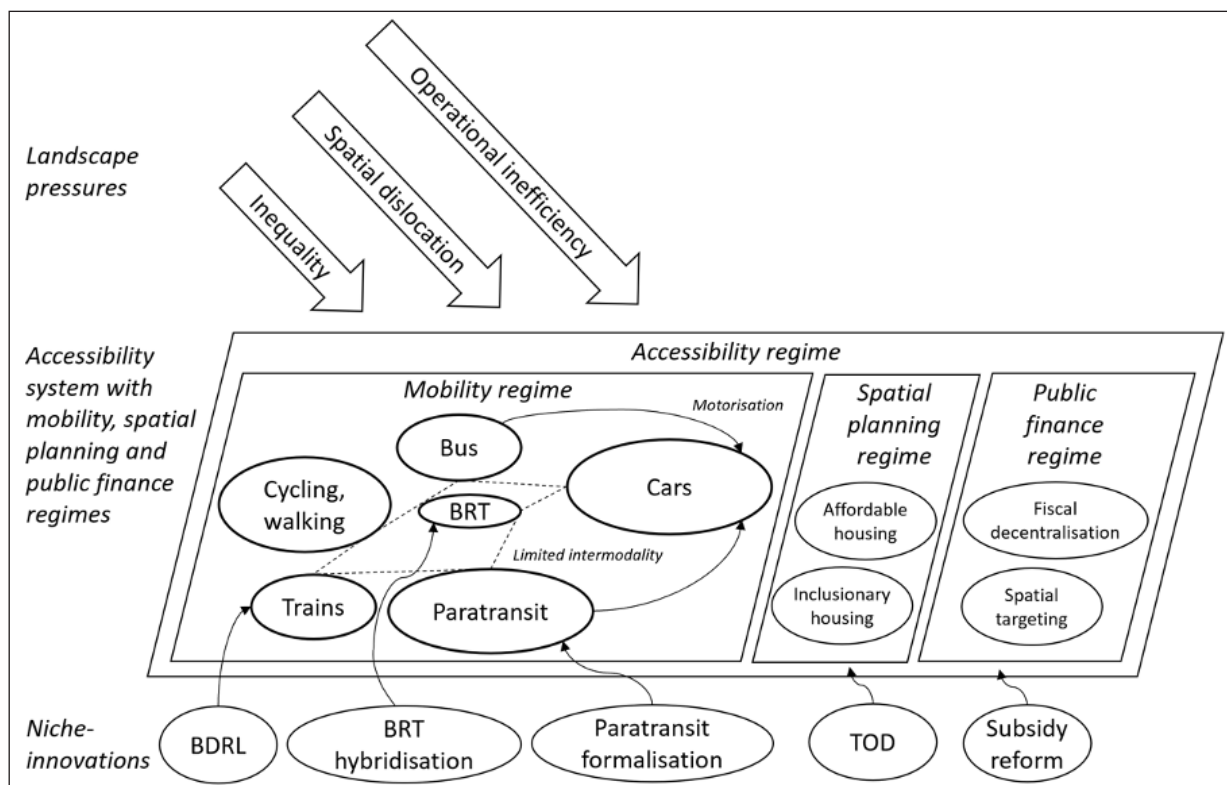


Figure 26 MLP-conceptualisation of the accessibility system configuration in Cape Town. BDRL = Blue Downs Rail Link. Adpated from Geels (2018)



## **Socio-technical regime**

### **Techno-economic developments**

Cape Town's accessibility regime has undergone significant change since the advent of democracy. The formal bus and rail networks, legacies of the Apartheid mobility system, have been hindered by aging infrastructure and underinvestment. Rail usage in Cape Town has halved in recent years due to a lack of rolling stock and low reliability (Transport and Urban Development Authority, 2017). Paratransit, informal public transport services, proliferated to cater to the increasing demand and decreasing supply of access by bus and rail. The paratransit industry conveyed 66% of all daily public transport trips in South Africa's six largest cities in 2014 (Hunter Van Ryneveld, 2014). The leverage that the state has over this industry to specifically target access improvements remains limited as their operations are not actively controlled nor subsidised.

Hence, during the 2000s, the prevailing perspective was that the industry needed to be formalised or replaced by a niche-innovation that emerged at the time, Bus Rapid Transit (BRT) (Department of Transport (RSA), 2007). Initial financial modelling, based on Latin American examples, suggested that BRT services would also be subsidy-free in their operation and significant capital resources were allocated to dedicated infrastructure within the city (Transport for Cape Town, 2015). However, the spatial dislocation within the city, and related operational inefficiency, has overwhelmed any technological advantage that BRT claimed to possess over paratransit and the services have proven to be financially unviable (Del Mistro & Bruun, 2012; Seftel & Peterson, 2014). Consequently, recent plans call for the slower transition of the paratransit industry to a new, hybrid system, through the incremental introduction of BRT characteristics to existing services (Transport and Urban Development Authority, 2017).

### **Actors and institutions**

#### **Industry/firms**

The firms operating within Cape Town's accessibility regime consist of a fractured landscape of state and non-state actors. Spatial planning is coordinated by the local government, but state housing in the city is provided by both local and provincial governments (Transport and Urban Development Authority, 2018). Transport planning is within the local government's mandate and it contracts BRT services on the dedicated infrastructure, under its ownership (Transport for Cape Town, 2015). However, conventional bus services are contracted by the provincial government, and the rail system is owned and operated by a national government entity (Transport and Urban Development Authority, 2017). Paratransit services are licenced by the local government but primarily self-regulated through collective 'associations'. Roads in the city are owned by local, provincial or national government depending on their function.

### **Consumers**

For most residents, access is provided by the public transport system, as low incomes have limited private vehicle ownership. Paratransit use continues to increase due to the operational issues faced by the rail, bus and BRT networks. As paratransit services are provided without subsidisation, and do not benefit from the economies of scale, they remain more expensive for the urban poor than most rail and bus services. Consequently, the average household in the bottom income quartile in Cape Town spends 27% of their income on transport to employment (City of Cape Town, 2014).

### **Policymakers**

The policymakers in Cape Town have not explicitly named accessibility as a focus but have highlighted spatial dislocation and transport affordability as key challenges to address through integrated planning. In 2016, the City posited Transit-Oriented Development (TOD) as a viable approach to sustainably finance access improvements. Simultaneously, national and local government departments have proposed that TOD could create more viable and affordable public transport services by increasing the efficiency of the public transport demand patterns (City of Johannesburg, 2013; City of Cape Town, 2016; Republic of South Africa, 2016; Venter, 2016). Cape Town's TOD approach does not reference equity or accessibility specifically, but it does allude to the alignment of transport, spatial planning and social objectives, which underpins accessibility-based planning. A strategy that does reference equity and accessibility more directly is the draft inclusionary housing policy, that aims to create housing opportunities in well-located suburbs for low income residents (City of Cape Town, 2019). An initiative to provide free travel to employment seekers on the City's BRT network during off-peak hours also speaks to the transport justice principle of prioritising those with the least access (MyCiti.org.za, 2017).

### **Public discourse**

Accessibility-based planning and transport justice are yet to enter the public discourse in the form of these terms, but their principles of equity, capability and sufficiency have become staples in Cape Town's public debates. Public advocacy groups, such as Reclaim The City, the Social Justice Coalition and Ndifuna Ukwazi, have foregrounded spatial justice, well-located affordable housing and the 'Right to the city' in the public discourse (Feruglio, 2017; Diani et al., 2018). Public discourse initiatives, such as the Integration Syndicate, have brought together universities, civic organisations, and members of the public to debate potential paths to overcome the spatial injustice rooted in the fabric of Cape Town (Moore, 2017).

## **Rail initiative**

The City of Cape Town is looking to expand its rail network for the first time in decades through the Blue Downs Rail Link project (BDRL). The BDRL consists of a 10km rail line, with three new stations, connecting the neighbourhoods of Khayelitsha and Mitchells Plain to the city's second largest economic node, see Figure 27. (Transport and Urban Development Authority, 2018). These two neighbourhoods have among the lowest levels of income and accessibility in the city. The rail service would shift trips from existing bus and paratransit modes and generate trips to the three new stations along the line. The project prompted the creation of an interdisciplinary, interdepartmental team to analyse the integration of land use and transport in the rail corridor, based on the principles of TOD. Furthermore, as rail is within the mandate of national government, the team consisted of members from two of the three spheres of government.

## **Gothenburg, Sweden**

### **Landscape pressures**

Since the 1970s, the population and built footprint of the Gothenburg region has been expanding steadily. The city has responded through suburbanisation and increasing polycentrism. This decentralising trend has increased travel times and distances, weakened historic economic nodes, and created a higher dependency on the car for work and school commutes (Hagson & Mossfeldt, 2008). The growth of the region is putting pressure on existing infrastructure, housing stock, employment opportunities and transport services (Trafikanalys, 2017). The regional government, Västra Götalands Region, has, in its Transportation Programme 2017-2020, identified that there is insufficient capacity in the current transport system to meet the growing demand (Trafikanalys, 2017). Since the 1990s, Sweden has made a radical shift in housing policy, from a welfare driven housing policy to a more market-based one (Hedin, et al., 2012). This trend of economic liberalisation of accessibility-related sectors has led to increased social and economic polarisation in cities such as Gothenburg. Swedish cities are experiencing an intensification of gentrification, where the redevelopment of industrial areas, the infill of existing neighbourhoods and the establishment of new residential areas are all targeting middle- and upper-income residents (Thörn & Thörn, 2017). The ideals of the transport plans appear to be misaligned with the liberalisation of the housing market and the continued development of satellite commuter suburbs. Another threat to the accessibility system in the city is climate change, but not just as the existential threat that faces most cities. 61% of rail infrastructure, 62% of roads and 64% of tramways are at risk of flooding due to sea level rise (Ivari, 2015). It gives further impetus to the need for a transition to sustainable transport use.

## **Socio-technical regime**

### **Techno-economic developments**

The mobility regime in the Gothenburg region consists of a diverse range of options, including walking, cycling, private vehicles, buses, trains, and trams, as seen in Figure 28. Approximately 46% of the transport infrastructure in Sweden is made up of highways, by length, and 86% of all trips are road-based (Trafikanalys, 2011). In Gothenburg, only 25% of work commutes are done using public transportation, compared to 43% in Stockholm (Ottemark, 2017). This may be due to the fact that rail travel times are on average 1.3 times longer than those by car (Trafikanalys, 2011). Like Stockholm, Gothenburg introduced a congestion charging scheme to reduce car use, but it has had far less success (Börjesson & Kristoffersson, 2015). The main alternative to the car, the railway system, is ageing and in great need of intensive maintenance and investment. Without a reallocation of budget toward the public transport system to create more viable access mode alternatives, the congestion charge largely remains a regressive tax on car users.

### **Actors and institutions**

#### **Industry/firms**

There are three levels of governance in Sweden, the national government, responsible for setting national plans and targets, the regional government, responsible for setting policies providing public transport services, and the local government, which is responsible for planning, local investment and the maintenance of road infrastructure (Hellberg & Jonsson, 2014). All long-distance railways are planned and developed the national level through the Transport Administration (Rye & Wretstrand, 2019). Public transport in the Gothenburg region is provided by Västtrafik, a publicly owned company. Private operators then compete for some of the services in the public transport market through Västtrafik's procurement processes (Västra Götalands Region, 2016). Most housing and spatial planning is coordinated between the regional and local governments.

#### **Consumers**

Consumers in Gothenburg are willing to travel longer distances for work, school and leisure in order to live in suburban neighbourhoods that have cheaper housing opportunities. The cost of housing is a primary determinant in Swedish residents' relationship with access. Gentrification has pushed many public transport dependent consumers out of the well-located inner suburbs. Particular attention is paid to the socio-demographic characteristics of residents in Swedish cities as correlations between age, gender, parenthood and immigrant status with accessibility levels have been highlighted (Haugen & Vilhelmsen, 2013).

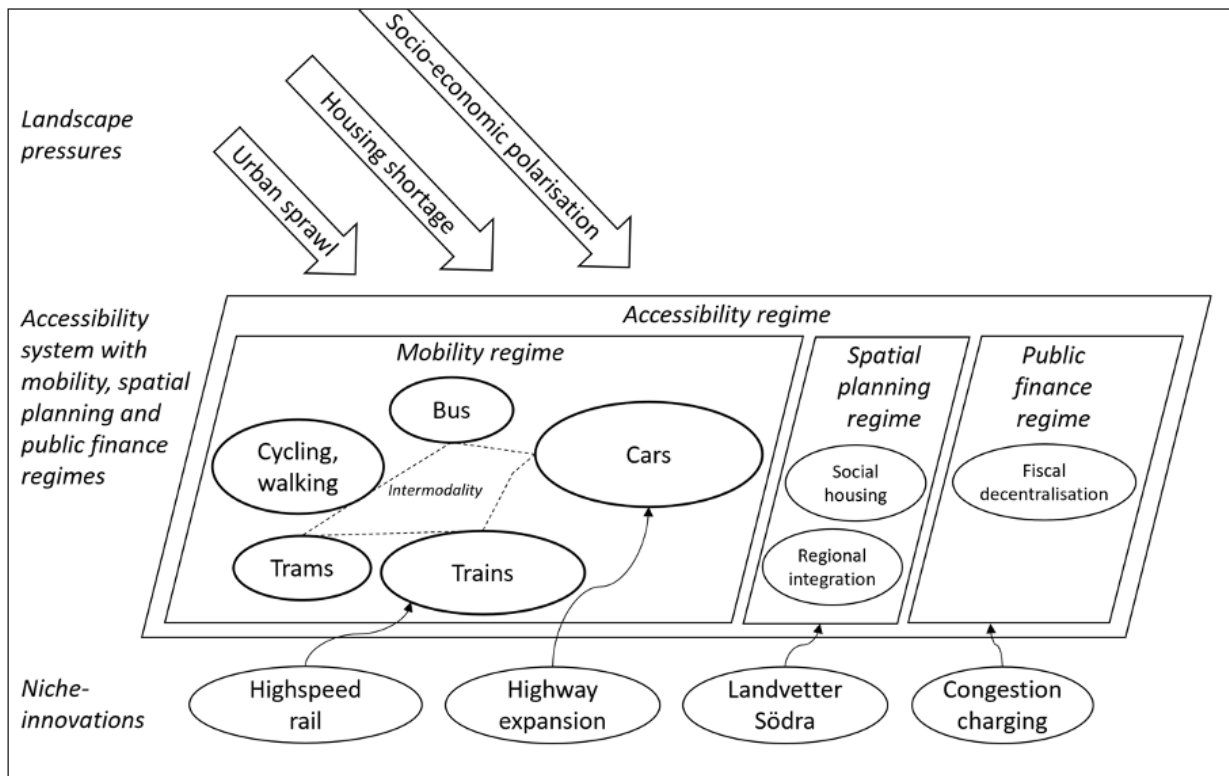


Figure 27 : MLP-conceptualisation of accessibility system configuration in Gothenburg, adapted from Geels (2018)

### Policy makers

The Gothenburg 2035: Transport strategy for a close-knit city reveals a mature and deep understanding of the principles of access and accessibility-based planning (Hellberg & Jonsson, 2014). The first objective of the strategy is to create an “easily accessible regional centre where it is easy to reach key places and functions irrespective of the mode of transport and other conditions” (Hellberg & Jonsson, 2014:5). The strategy mentions the need to increase access to neighbourhood services, such as local meeting places, by prioritising walking and cycling through community planning. The transport strategy has been developed in conjunction with a Development Planning Strategy and a Green Strategy, illustrating their perspective on the interrelatedness of these regimes. The Gothenburg transport department acknowledge that the evolution of the mobility regime also depends on the actions of non-state stakeholders (Hellberg & Jonsson, 2014). The strategy desires to create a city that is equally accessible to all. While still using mobility-based planning and design techniques, the policymakers of Gothenburg appear to fully support accessibility as the primary transport planning premise. It raises interesting questions, then, to see that, despite this strategy and these statements by the policymakers, satellite, suburban, car-dependent developments continue to be approved. The distinct disjuncture between policy and action adds a unique dynamic to the accessibility system.

### Public discourse

The concepts of accessibility and transport justice have not gained as much popularity in the public discourse

as they have in the policy realm. Rather, social justice movements have been on the increase as a response to gentrification and socio-economic polarisation (Thörn & Thörn, 2018). The discourse around housing affordability and the ‘right to the city’ bring principles of accessibility and equity into the public domain. Whether the wider public adopt similar arguments to the policymakers remains to be seen.

### Rail initiative

The Swedish national government has set ambitious targets for the improvement of the railway system. One of the projects with the highest priority is the highspeed rail line from Gothenburg to Borås, see Figure 28. Increased capacity and reduced travel times could contribute to significantly higher accessibility levels in the Gothenburg region (Swedish Transport Administration, 2019). This unique opportunity has enabled a new collaboration with the municipality of Härryda, to develop a new commuter town, Landvetter Södra, along the rail line. The project is expected to meet many of the landscape challenges that the region is facing: urbanisation, urban sprawl, socio-economic polarisation and the housing shortage. However, an additional commuter town, reinforcing the suburbanisation trend, seems to be a counterintuitive solution to access inequity. The planning process has involved integrated co-creation and backcasting methodologies which have enabled cross-sectoral collaboration between city officials, planners, politicians and researchers (Ranhagen & Gustafsson 2020, Ranhagen 2020a, Ranhagen 2020b).

## Kisumu, Kenya

### Landscape pressures

Kisumu is the third largest urban centre in Kenya with a population of approximately 500,000 people (County Government of Kisumu, 2018). The City has grown rapidly over the years right from its inception as a railway terminal over 100 years ago. The railway line—dubbed the Uganda Railway—has determined the growth of the cities in Kenya to a great extent. Kisumu has historically been a transport hub for Western Kenya, Eastern Uganda and Northern Tanzania with connections through road, rail and water transport (County Government of Kisumu, 2018). The Kenya Vision 2030 reiterates Kisumu as a key node in the national spatial framework of the Northern Transport Corridor (Republic of Kenya, 2007).

Kisumu was planned as a garden city with low densities in the upmarket areas, extensive intra-urban distances, large housing plots and lavish recreational space developed in the colonial town. This forms the urban core. Around the core, emerges a belt of informal housing, with limited access to the employment nodes. Further out is a vast rural hinterland, providing much of the commuting labour pool, with poor roads and even lower accessibility (Onyango 2018). The rise of the automobile has led to the development of business districts outside of the historic CBD, setting the basis for urban sprawl (Republic of Kenya, 2013).

The railway system, around which Kisumu was built, collapsed around the year 2000 and had a significant, negative impact on the local transport system (Republic of Kenya, 2007). This collapse, coupled with the rapid rise in motorisation since the collapse, has induced increasing congestion problems throughout the city (Onyango 2018). Despite the increase in the use of motorised vehicles, urban road infrastructure has seen minimal improvement (Republic of Kenya, 2007). The urbanisation and spatial expansion of the city have also contributed to the increasing pressure on the trunk roads and CBD. Vast tracts of well-located land adjacent to the CBD and along the lakefront, which could be used to stem the urban sprawl, are under the stewardship of the Kenya Railways Corporation and show little signs of being unlocked in the near future (Republic of Kenya, 2013).

### Socio-technical regime

#### Techno-economic developments

The public institutions within Kisumu's mobility regime are fixated on road investments, and the control thereof; no level within the hierarchy of government has made significant investments into public transport in Kisumu (Cirolia, 2019). Consequently, accessibility largely relies on walking, cycling and an elaborate system of paratransit, including Matatus (small buses), Tuk Tuks (motorised Rickshaws) and Boda Bodas (motorcycle and bicycle taxis). Matatus operate on regular routes and can be

grouped into two categories: intra-city 'town service' and regional 'distance' service (Cirolia, 2019). There have been proposals to establish a Bus Rapid Transit (BRT) system that would compete with the Matatu services, but it risks pushing the Matatus out of business on their trunk routes (Institute for Transportation and Development Policy, 2017).

The rail system is run by Kenya Railway Corporation; attempts to outsource its operation to a private company has stagnated (Republic of Kenya, 2013). Kisumu Central station, Kibos and Kisian stations have become moribund facilities. The Kibos and Kisian station buildings have been illegally utilised by private entrepreneurs as sites for commercial and social activities. Whereas the premises of the Kisumu station have been leased out by the Kenya Railways Corporation for direct commercial activities, including a popular restaurant.

### Actors and institutions

#### Industry/firms

Kenya has three levels of governance, the national, county and local. The mobility regime is primarily governed and funded by various entities at the national government level, which individually oversee rail, highway and urban road development. Apart from road building, there is no state-run or state-funded entity that has the mandate to provide for the local accessibility needs of the residents of Kisumu (Cirolia, 2019). This gap in governance and funding has fueled the development of the myriad of private sector paratransit operators (Opondo & Kiprop, 2018). While the mobility and public finance regimes are strongly tied to the national government, spatial planning is conducted by the county and governments (Cirolia, 2019). This disjuncture has created intergovernmental tension as the objectives of local spatial plans are routinely disregarded by national government entities.

#### Consumers

The mobility system in Kisumu is a consumer-led solution space that was collectively created to meet their mobility needs. The paratransit industry is interwoven with the other sectors of the informal economy, within which most residents operate (Cirolia, 2019). The role of mobility producers within the structure and social capital flows of the communities means that consumers have a more complex relationship with the regime than those of a more formal system. Specifically, bicycle and motorcycle taxi operators have become key players in the transport system and their proliferation means that they now play an important role in the provision of accessibility, especially for low income consumers (Opondo & Kiprop, 2018). Millions of young Kenyans have ventured into the business as the ease of entry and low capital requirements make it an attractive enterprise (Opondo & Kiprop, 2018).

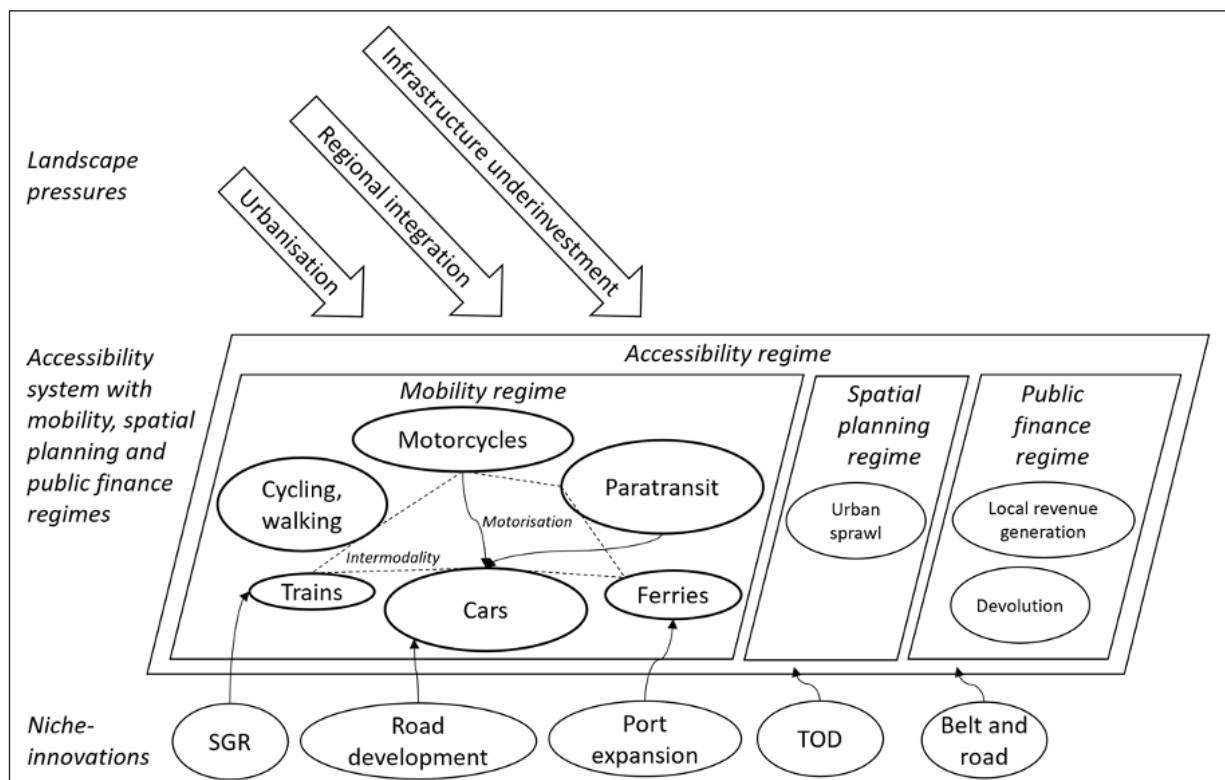


Figure 28: MLP-conceptualisation of accessibility system configuration in Kisumu, adapted from Geels (2018)

### Policymakers

The County Government of Kisumu has developed a number of plans and strategies related to reconfiguring the accessibility regime. TOD and BRT are among the solutions offered to improve the efficiency, financial viability and affordability of access provision (Institute for Transportation and Development Policy, 2017). The City Council of Kisumu has developed an Integrated Strategic Urban Development Plan. It emphasises the need for sustainable urban growth while at the same time promoting and enabling economic growth, industrialisation, knowledge production, and a modernised transport system (Cirolia, 2019). However, the tendency for policy institutions to operate in silos has seen Kenyan Railway Corporation and the Kenyan Highway Authority, the primary providers of mobility infrastructure, operating with little input from local local or regional government (Republic of Kenya, 2013, Onyango 2018).

### Public discourse

Employment and income are intricately tied to what access options are available to users in Kisumu. The public discourse centres primarily around the deteriorating transport infrastructure and access to affordable housing. Discussions around equity and transport justice have not been framed in these terms but there is a strong culture of collectivism that exists in these communities. The focus of government expenditure on the highway and road network has reinforced common car-related aspirations, which undermine public support for a more equitable

allocation of infrastructure and road-space among the transport modes.

### Rail initiative

The national government of Kenya has, together with Chinese investors, developed a comprehensive plan for development of a new railway system in Kenya. The Standard Gauge Railway (SGR) is to connect Mombasa to Kisumu ,through Nairobi, and onwards to Malaba. The SGR will run parallel with the existing Kenya-Uganda railway line. The investment is part of the East African Railway Master Plan that aspires to link all the East African countries through standard gauge railways (CPCS Transcom, 2009). The SGR has been funded through loans under China’s ‘Belt and Road Initiative’, with aims of opening up the region to international trade and investments (Wissenbach & Wang, 2017). Kisumu’s SGR station will be in the village of Kibos, a few kilometres outside of the city’s urban footprint. Improvements to the road network linking Kibos Station to the rest of the city is currently under development (Republic of Kenya, 2013). It is anticipated that improving the road network will provide sufficient accessibility options from Kibos Station to the rest of the city. However, the average level of access to the station will still be significantly lower that the level currently provided by the position of the original rail station.

# Comparative analysis of Transport Justice

## Comparative analysis of transition to transport justice according to transition theory

### Landscape pressures

The landscape within which each of the accessibility systems operate is unique and very context-specific. Kisumu faces rapid urbanisation, Cape Town is trying to overcome the legacy of Apartheid spatial planning and Gothenburg is dealing with an entrenched suburbanisation trend. Despite the diverse contexts, some landscape challenges were applying pressure on the accessibility regimes of all three cities. The most prominent of these was the rising inequality and economic polarisation that was revealed within each of the regimes to be one of the most significant drivers of change. The consolidation of power and resources by the car-dependent upper income residents partially explains the disproportionate allocation of budget toward road construction, in direct contrast to the tenets of transport justice and accessibility-based planning.

The trend of urban sprawl in each city has highlighted the disjuncture between the three regimes that make up the accessibility regime. The continued construction of residential and employment opportunities on cheaper, peripheral land meets many of the cities' spatial planning (housing) and finance objectives but undermines the overarching accessibility objective. The departmental and professional silos that characterise each of the three regime also create conflicting performance measures that need to be systematically revised. Accessibility-related decision-making processes by the respective city governments appear to still be entrenching access inequity rather than accelerating a transition toward solving them.

### Techno-economic developments

In a historical analysis, the rise of private actors and the decline of state intervention, to the detriment of average accessibility levels, has been present in each city. Cape Town and Kisumu have seen marked system reconfiguration in favour of paratransit operators, to account for the decreasing reliability of their underinvested rail services. Each of the cities is at different stages of consideration for BRT as a part of their accessibility regime. The Kisumu county government perceives it to be a modernised alternative that will subsume the paratransit competitors. Cape Town city government found pure BRT to be financially unviable and are seeking to hybridise it with paratransit characteristics and paratransit operators. Whereas the Gothenburg regional government sees BRT as an incremental upgrade to existing advanced bus services. Three very different perspectives on a transport innovation that provides insight into their attitudes toward technology transitions.

### Actors and institutions

Each city, and actor within the city, engages with the concepts of accessibility, transport justice and equity to a different extent. Often, the level of engagement is correlated with the geographic scale that the institution had a mandate for. Each of the local spatial planning departments expressed a desire to move toward more accessible, equitable cities, whereas the nationally governed entities, responsible for rail or highway management, have explicit references to mobility-focused planning and movement-based performance indicators. This conflict in planning rationale could be resolved through the devolution of planning and financial management for transport infrastructure to the local government—an ongoing process in Cape Town and Kisumu—or a purposive realignment of change trajectories between the different scales of governance.

The engagement from consumers around access and equity, and its manifestation in the public discourse, is strongest in Cape Town. It has risen parallel to the long-standing discourse around its history of segregation and consistently high inequality. Therefore, the discussion is very spatially-focused. The urban form is seen as the largest contributor to inequitable access and has been foregrounded by both social justice advocates and policy-makers. In Kisumu and Gothenburg, the income and affordability aspects of accessibility seem to be paramount. The relationship between income, transport mode use and level of accessibility is strong in the mind of consumers. Decoupling this association will require more than just reducing the subsidies and preferential treatment for car use. The socio-cultural dynamics within the accessibility regime need to be addressed in order to accelerate a transition toward transport justice.

### Rail initiatives

The rail initiatives in each city have different aims, geographic scales and target user groups, but each reveals insight into the nature of the actors within each accessibility regime. In Kisumu, the initiative is being prescribed to the county government from the national sphere as the larger project has national and regional connectivity goals. The potential effect of the SGR (Standard Gauge Railway) on local transport has been an afterthought. In part, this appears to be in cognisance of the inherent flexibility and responsiveness of the paratransit industry that provides the bulk of the local access services. This may be an 'abrupt' transition, as defined by Elmqvist et al. (2019), but the informal sub-systems, including the paratransit services, are complexly interwoven and

dynamically resilient which gives them a chance to adapt, as they did when the rail system first went into decline. Furthermore, the leasing of the old train station already demonstrates the potential for the reuse of any stranded infrastructure.

In contrast, Gothenburg's accessibility regime doesn't appear to have the same flexibility, especially considering the lock-in, structural inertia and undesired resilience of their car-dependent infrastructure. If the regional government attempts to force an abrupt transition to the new regional rail service, by restricting car use through measures like expanding the city's congestion charge system, there may be substantial stranded assets in both the car and bus regimes (Börjesson & Kristoffersson, 2015). Similarly, if changes to the urban form or housing market are not enacted in parallel, gentrification around the new stations would compound the negative distribution effects that have been observed due to the current congestion charge (West & Börjesson, 2018). Regional accessibility levels are predicted to significantly increase due to the high-speed rail, but the distributional effect on local accessibility levels is less clear.

The accessibility regime in Cape Town is a complex mix of formal and informal, planned and reactive, deterioration and innovation. Unlike the other two initiatives, which add new modal regimes to the mobility landscape, the Blue Downs Rail Link is a major addition to an existing regime. Like Kisumu, the services that are likely to be displaced are those in the paratransit industry, and have the ability to adapt by serving demand elsewhere. And like Gothenburg, the local government will need to support the transition to prevent unsustainable competition. However, the change from flexible services to one with significant infrastructure lock-in, creates questions around the effect of resilience. Levels of accessibility are likely to rise, due to low income residents have direct access to a major employment node, but there is a risk that the new link will suffer from the same reliability issues as the rest of the network. Trading resilience and reliability for average accessibility doesn't speak to the principle of transport justice, even if it speaks to the common metrics. A hybrid system, similar to that being explored for the city's BRT, could bolster the resilience of the new link to operational and exogenous shocks.

## Transition pathways to transport justice

Trying to locate any of these accessibility systems in the transition to transport justice seems to depend largely on which actor you're analysing and what metric you're measuring. The Gothenburg regional government is very explicit in its support for equitable access among its residents, but the infrastructural legacy of its car-dependent history creates an inertia that will be difficult to overcome. The ideals of the transport plans appear to be misaligned with the liberalisation of the housing market

and the continued development of satellite commuter suburbs. The transition pathway to transport justice would need to include a much stronger collaboration among the spatial and transport planning regimes, with shared accessibility performance metrics. The creation of a high-speed rail service does not appear to significantly support, nor hinder, this transition, but has the opportunity to be a catalyst for the introduction of these changes. The ideas of accessibility-based planning and transport justice have taken root within the system but they need to be upscaled to induce system reconfiguration.

The standard gauge rail project in Kisumu is aimed at boosting regional and transnational commerce and connectivity. Its effects on the local accessibility system have not been adequately considered. While drawing economic opportunities outside of the city limits may solve some of the congestion issues in the CBD, it could also increase the accessibility divide by favouring the car users and the recent highway upgrades. Currently, the demand-responsiveness of the paratransit system and its diverse range of mobility offerings appear to provide a surprisingly high level of accessibility, especially for an unsubsidised service. If the mobility system formalises, with the introduction of BRT and tougher regulation, accessibility may actually decrease. Furthermore, Kisumu's urban form is not dissimilar to that of a South African city—colonial centre, low densities and peripheral informal settlements—so it may run into the same financial challenges in the operation of more rigid, BRT-like services. Although, the SGR has started a more robust discourse between national government entities and local planning bodies, which could indirectly bear fruit in the future. Accessibility and transport justice are at the incubation stage of idea development in Kisumu, meaning it could be years before systemic reconfiguration occurs, but the culture of collectivism related to its paratransit industry should prime it for the transition.

Cape Town may be furthest, of the three cities, from transport justice, but it may also be the most likely to transition to accessibility-based planning. The striking level of inequality in the city is pushing innovative and progressive ideas to the fore, as the conventional planning techniques have failed to address the widening gap. The Blue Downs rail link is an incremental improvement to the accessibility system but could have very positive distributional effects. However, this improvement is to a transport mode that is steadily deteriorating. The accessibility effects of improvements to networked infrastructure, like suburban rail, can be thwarted if the rest of the network is in decline. As the network is under the control of the national government, this may add even more uncertainty to the city government's accessibility planning system. Allowing paratransit services to run in parallel with the new rail link will reduce its financial viability but may increase the resilience of the system as a whole.

This would be in direct conflict with the traditional, efficiency-focused optimisation processes that govern most mobility networks. Accessibility-based planning as a concept is gaining traction with certain actors within the accessibility regime. Those that support this approach to transport, spatial and financial planning will need to scale it by creating collaborations across more of the departmental and professional silos within the city government.

## **Main conclusions from the transport justice research activities**

This research activity aimed to apply the Multi-Level Perspective (MLP), and bring insight from the field of sustainability transitions, to a potentially fundamental change in transport planning. The study sought to build upon the extended-MLP framework that Geels (2018) used to examine a low-carbon transition of a mobility regime through system reconfiguration. As accessibility-based planning knits together the transport, spatial and financial planning processes, the idea of nested regimes was explored. Unlike the parallel regimes that affect the mobility system, proposed by Geels (2018), the creation of a coherent, overarching accessibility system would require those regimes to undergo a similar reconfiguration to that of the mobility system.

The whole system reconfiguration approach provides a useful framework to combining institutional, planning, and engineering perspectives. The ability to address multiple landscape dynamics, multiple niche-innovations and multiple interdependent regimes provides capacity to account for the complexity of access planning and access governance. There are many more applications in the transport and urban planning fields for which the whole system reconfiguration approach will be relevant and valuable. The approach proved to be a useful tool in explaining the transition to accessibility-based planning to transport planning practitioners in each of the three cities. It became a method of knowledge co-production, providing common reference points for discussion between the academics and practitioners in the study team. This became especially valuable for the academics and practitioners from the three different urban contexts to compare their transport planning experiences and perspectives. The addition of initiative-based learning,

through a focus on rail projects, brought in the perspectives of stakeholders and the wider public. Bridging these analytical approaches provided vital insight into the performance of the accessibility systems from non-state actors. The transition to accessibility-based planning is likely to be a gradual, incremental reconfiguration of a complex system. Insights from the three cities showed that the transition has begun, to various extents, and that the increments through which the systems are changing are not the same across different contexts. The transition is unlikely to be a linear, chronological evolution. Different actors are transitioning at different speeds, according to each context.

- In Gothenburg, the policymakers have an advanced understanding of transport justice and access equity, but the consumers continue to demand suburban housing and car-based mobility opportunities.
- In Kisumu, the paratransit regime is well-attuned to the differential accessibility needs of the communities that it serves, but it still relies on the infrastructure provided by government entities with very narrow perspectives on mobility.
- In Cape Town, the disparity in the transition seems to be between policy and implementation. Many of the actors within the regime are calling for a more equitable distribution of access in the city. However, the budget allocation still favours road infrastructure and BRT expansion over salvaging the rapidly deteriorating rail system and supporting the burgeoning paratransit industry.

The differential transition could create as much tension within the regime as the landscape challenges, opening up ‘windows of opportunity’ for the laggard actors to be disrupted. An example of this type of niche-innovation would be municipally-issued green bonds to finance accessibility- and sustainability-focused infrastructure projects that conventionally fall within the purview of national government financing. The City of Cape Town issued Africa’s second ever municipal green bond in 2017, after Johannesburg in 2014, for ~\$70 million, from which funds were directed to bolstering underfunded accessibility projects, among others (Gorelick, 2018).



# Combined conclusions and lessons learned from the Transport Justice and Urban Station Communities comparative research activities

The main conclusions and lessons-learned from the comparative projects are presented below in a number of general bullet points. The specific conclusions and discussions of the case studies can be found in earlier chapters.

## Knowledge, methods, and tools for co-creation

- The co-creative approach using a combination of planning and design tools had the potential to raise a number of different perspectives and experiences of the stakeholders involved, when considering accessibility and associated ecological, socio-cultural, and economic factors.
- The methods and tools for analysis were useful in order to formulate, systematize, and prioritize both city and country specific challenges, as well as common denominators for the three different contexts, resulting in an overall summary of the most important challenges regarding transport and sustainable urban development in each city.
- The use of co-creative tools on specific urban sites illuminated the potential for experienced-based, participatory analysis as a necessary supplement to quantitative, desktop methods and tools in order to involve multiple kinds of experts and citizens in all three cities.
- Methods and tools applied for co-creative development and evaluation of future scenarios and visions regarding urban areas close to stations had the potential to bring forward and visualize transformative ideas for an integrated development of urban form and transport infrastructure, including socio-economic and socio-cultural perspectives with regard to equity and inclusiveness.

## Approaches for studying transport justice

- The transition theory approach proved to be a useful method in explaining the paradigm shift to accessibility-based planning to transport planning practitioners in each of the three cities. It became a method of knowledge co-production, providing common reference points for discussion between the academics and practitioners in the study team.
- The approach became especially valuable for the academics and practitioners from the three different urban contexts to compare their transport planning experiences and perspectives.

- The addition of initiative-based learning, through a focus on rail projects, brought in the perspectives of stakeholders and the wider public. Bridging these analytical approaches provided vital insight into the performance of the accessibility systems from non-state actors.

## Differences and similarities between from the three case studies

- Despite the significant differences between three studied cities with regard to institutional, economic, socio-demographic, and environmental conditions, the transition theory approach showed that the interconnections between the landscape pressures, techno-economic developments, actors and institutions, and transition pathways are actually quite similar.
- The trend of urban sprawl, which exists in different ways in the three cities, has highlighted the disjuncture between the three sub-regimes that make up the accessibility regime. The continued construction of residential and employment opportunities on cheaper, peripheral land meets many of the cities' spatial planning (housing) and finance objectives but undermines the overarching accessibility objectives.
- Each of the cities is at different stages of consideration for BRT as a part of their accessibility regime. They represent three very different perspectives on a transport innovation that provides insight into their attitudes toward technology transitions.
- Each city, and actor within the city, engages with the concepts of accessibility, transport justice, and equity to a different extent. Each of the local spatial planning departments expressed a desire to move toward more accessible, equitable cities, whereas the nationally governed entities, responsible for rail or highway management, have explicit references to mobility-focused planning and movement-based performance indicators.
- The rail initiatives in each city have different aims, geographic scales, and target user groups, but each reveals insight into the nature of the actors within each accessibility regime.

## How can transport contribute to realising just cities?

- A ‘transport justice’ approach starts with accessibility as the primary premise for transport planning and infrastructure investment. A central tenet of this perspective is that there is a minimum level of accessibility that a transport system should provide every user, irrespective of their income, gender, age, spatial location, or any other characteristic. Through this approach, accessibility acts as a proxy for poverty and other forms of injustice.
- Transport interventions that serve those with the lowest access should be prioritised and subsidised in order to raise their accessibility to the minimum level. Similarly, improvements to the transport system that largely benefit people with high levels of accessibility—usually wealthy car owners—should be optional and self-financing.
- The upgrading of the existing and new transportation systems should be planned and implemented in parallel with mixed-use and accessible urban developments, close to transportation nodes, including a multitude of commercial, social, and cultural services.
- The real estate markets should be sufficiently incentivised and regulated to facilitate more equitable access provision, through the facilitation of affordable housing and entrepreneurship around new or existing public transport stations.
- A rail system, with its important capacity to restructure cities, is a key tool in counteracting inequality and access inequity in the long term.

## Future Research and Development

There are many research questions left outstanding by this preliminary study, and many limitations that would

benefit from further research. Due to the early stage of this research and the proof-of-concept nature of this study, a deeper analysis of each accessibility system should be conducted in subsequent studies. The effect that the trends of fiscal decentralisation and governance devolution are having on the planning systems of cities needs to be examined in greater detail. Nationally coordinated and centrally funded mobility infrastructure programmes may be a key obstacle that will need to be navigated to achieve more equitable and sustainable access outcomes.

The combination of integrated land use-transport modelling and transition frameworks could provide a robust scenario-testing toolbox for decision-makers within the transport and spatial planning professions. There are many avenues available to expand on the MLP approach taken in this study. A trend that wasn’t included under the accessibility regime in this study but will have a substantial impact on accessibility levels in the future, is that of digitalisation. As more employment opportunities, services and activities are being digitised, the demand for access through movement is likely to decrease, or the trip-purposes will change significantly.

The resilience and adaptability of the accessibility system of a city is a topic that deserves increasing amounts of research interest. The methods and tools for co-creation that have been introduced and tested by the representatives from the three platforms—and also by wider groups in their respective cities—have proven themselves valuable in grappling with an exceptionally daunting challenge that permeates across extremely different contexts. Transdisciplinary co-creation and co-production methods have a bright future as the boundaries between disciplines blur and the complexity of the challenges continues to grow.

# References

- Börjesson, M. & Kristoffersson, I., 2015. The Gothenburg congestion charge. Effects, design and politics. *Transportation Research Part A: Policy and Practice*. 75:134-146.
- Canitez, F., 2019. Pathways to sustainable urban mobility in developing megacities: A socio-technical transition perspective. *Technological Forecasting and Social Change*. (June 2018):0–1. DOI: 10.1016/j.techfore.2019.01.008.
- Cirolia, L., 2019. Accounting for the C/city: analyzing Kisumu's fiscal configurations. Doctoral dissertation. Cape Town, South Africa: University of Cape Town.
- City of Cape Town, 2012. Cape Town Spatial Development Framework. Cape Town, South Africa: City of Cape Town.
- City of Cape Town, 2016. Transit Oriented Development: City of Cape Town TOD Strategic Framework. Cape Town, South Africa: City of Cape Town. DOI: 10.1017/CBO9781107415324.004.
- City of Cape Town, 2018. State of Cape Town. Cape Town, South Africa: City of Cape Town.
- City of Cape Town, 2019 (Unpublished). Draft Inclusionary Housing Policy. Cape Town, South Africa: City of Cape Town.
- County Government of Kisumu, 2018. Kisumu County Integrated Development Plan, 2018-2022. Kisumu, Kenya: County Government of Kisumu.
- CPCS Transcom, 2009. East African Railways Master Plan Study - Final Report. Bridgetown, Barbados: East African Community.
- Davis A and Andrew J C 2017 Co-creating urban environments to engage citizens in low-carbon future *Procedia Engineering* 180 pp.651-657.
- De Laval, S., 2014. Gåtturer – metoder for dialog och analys. In English: Walking tours – method for dialogue and analysis. Svensk Byggtjänst. Stockholm.
- Del Mistro, R. & Bruun, E., 2012. Appropriate operating environments for feeder-trunk-distributor public transport services. In 31st Annual Southern African Transport Conference. Pretoria, South Africa: Southern African Transport Conference.
- Department of Transport (RSA), 2007. Public Transport Strategy. Pretoria, South Africa: South African Department of Transport.
- Diani, M., Ernstson, H. & Jasny, L., 2018. “Right to the City” and the structure of civic organizational fields: Evidence from Cape Town. *VOLUNTAS: International Journal of Voluntary and Nonprofit Organizations*, 29(4), pp.637-652.
- Elmqvist, T., Andersson, E., Frantzeskaki, N., McPhearson, T., Olsson, P., Gaffney, O., Takeuchi, K. and Folke, C., 2019. Sustainability and resilience for transformation in the urban century. *Nature Sustainability*. 2(4), p.267.
- Elzen, B., Geels, F., Hofman, P. & Umist, K.G., 2002. Socio-Technical Scenarios as a tool for Transition Policy: An example from the traffic and transport domain. In the 10th International Conference of the Greening of Industry Network. Göteborg, Sweden. 1–25.

- Elzen, B., 2005. Socio-technical scenarios: A new method to explore transition paths towards sustainable mobility. In 6th Open Meeting of the Human Dimensions of Global Environmental Change Research Community. Bonn, Germany.
- Feruglio, F., 2017. Do More Empowered Citizens Make More Accountable States? Power and Legitimacy in Legal Empowerment Initiatives, Making All Voices Count Research Report, Brighton, UK: IDS.
- Geels, F.W., 2002. Technological transitions as evolutionary reconfiguration processes: A multi-level perspective and a case-study. *Research Policy*. 31(8–9):1257–1274. DOI: 10.1016/S0048-7333(02)00062-8 T4 - Cita-vi.
- Geels, F.W., 2005. The dynamics of transitions in socio-technical systems: A multi-level analysis of the transition pathway from horse-drawn carriages to automobiles (1860-1930). *Technology Analysis & Strategic Management*. 17(4):445–476. DOI: 10.1080/09537320500357319.
- Geels, F.W., 2018. Low-carbon transition via system reconfiguration? A socio-technical whole system analysis of passenger mobility in Great Britain (1990–2016). *Energy Research and Social Science*. 46:86–102. DOI: 10.1016/j.erss.2018.07.008.
- Geels, F.W., Berkhout, F. & Van Vuuren, D.P., 2016. Bridging analytical approaches for low-carbon transitions. *Nature Climate Change*. 6(6):576–583. DOI: 10.1038/nclimate2980.
- Geels, F.W. & Schot, J., 2007. Typology of sociotechnical transition pathways. *Research Policy*. 36(3):399–417. DOI: 10.1016/j.respol.2007.01.003.
- Geurs, K.T. & van Wee, B., 2004. Accessibility evaluation of land-use and transport strategies: Review and research directions. *Journal of Transport Geography*. 12(2):127–140. DOI: 10.1016/j.jtrangeo.2003.10.005.
- Golub, A. & Martens, K., 2014. Using principles of justice to assess the modal equity of regional transportation plans. *Journal of Transport Geography*. 41:10–20. DOI: 10.1016/j.jtrangeo.2014.07.014.
- Goodwin, P., Hallett, S., Kenny, F., & Stokes, G., 1991. “Transport: The New Realism.” In *Transport— The New Realism*. Church House, London, March 21, 1991. Accessed March 27, 2019. <https://www.tsu.ox.ac.uk/pubs/1062-goodwin-hallett-kenny-stokes.pdf>
- Gorelick, J., 2018. Supporting the future of municipal bonds in sub-Saharan Africa: the centrality of enabling environments and regulatory frameworks. *Environment and Urbanization*, 30(1):103-122.
- Graham, S. & Marvin, S., 2001. *Splintering urbanism: networked infrastructures, technological mobilities and the urban condition*. London/New York, Routledge.
- Gutman, J., Tomer, A., Kane, J., Patel, N. & Shivaram, R., 2017. *Delivering Urban Access: A Framework to Guide Researchers, Policymakers, and Practitioners Working in Urban Transport*. Washington, D.C. Available: <https://www.brookings.edu/wp-content/uploads/2018/01/delivering-inclusive-access.pdf>.
- Hagson, A. & Mossfeldt, L., 2008. Analysis of accessibility, traffic work and transport choice as a function of road investments. Report. Gothenburg, Sweden: Chalmers University of Technology.
- Haugen, K. & Vilhelmson, B., 2013. The divergent role of spatial access: The changing supply and location of service amenities and service travel distance in Sweden, *Transportation Research Part A*. 49:10–20. DOI: <https://doi.org/10.1016/j.tra.2013.01.001>

- Hedin, K., Clark, E., Lundholm, E. and Malmberg, G., 2012. Neoliberalization of housing in Sweden: Gentrification, filtering, and social polarization. *Annals of the Association of American Geographers*. 102(2), pp.443-463.
- Hedenstedt Lund D 2017 Co-creation in Urban Governance: From Inclusion to Innovation *Scandinavian Journal of Public Administration* 22(2): pp. 27-41
- Hellberg, S. & Jonsson, P., 2014. Gothenburg 2035. Transport Strategy for a Close-Knit City. Gothenburg, Sweden: Trafikkontoret.
- Huang, R., Grigolon, A., Madureira, M. & Brussel, M., 2018. Measuring transit-oriented development (TOD) network complementarity based on TOD node typology. *Journal of Transport and Land Use*. 11(1). DOI: 10.5198/jtlu.2018.1110.
- Hunter Van Ryneveld, 2014. Expenditure and Performance Review of South Africa's Public Transport and Infrastructure System. Pretoria, South Africa: Hunter Van Ryneveld.
- Hwang, J. & Sampson, R.J., 2014. Divergent pathways of gentrification: Racial inequality and the social order of renewal in Chicago neighborhoods. *American Sociological Review*. 79(4):726–751. DOI: 10.1177/0003122414535774.
- Innes, J.E. & Booher, 2010, Planning with complexity. An introduction to collaborative rationality for public policy. Routledge London.
- Institute for Transportation and Development Policy, 2017. Kisumu Sustainable Mobility Plan. Nairobi, Kenya: ITDP Africa.
- Ivari, M., 2015. Traffic in Gothenburg. In *Making Cities Resilient: New Orleans-Gothenburg Exchange*. Baton Rouge, USA: Stephenson Disaster Management Institute.
- Kemp, R. & Rotmans, J., 2004. Managing the transition to sustainable mobility. System innovation and the transition to sustainability: theory, evidence and policy. 137–167.
- Lees, L., Shin, H.B. & López-Morales, E., 2015. *Global Gentrifications*. Policy Press.
- Litman, T., 2015. Evaluating Accessibility for Transportation Planning Measuring People's Ability To Reach Desired Goods and Activities. Report for the Victoria Transport Policy Institute. Victoria, Canada.
- Lucas, K., Mattioli, G., Verlinghieri, E. & Guzman, A., 2016. Transport poverty and its adverse social consequences. *Proceedings of the Institution of Civil Engineers - Transport*. 169(6):353–365. DOI: 10.1680/jtran.15.00073.
- Martens, K., 2016. *Transport justice: Designing fair transportation systems*. Routledge.
- Ministry of Enterprise and Innovation, Swedish Government, 2016. Infrastructure for the future – innovative solutions for strengthened competitiveness and sustainable development Stockholm, Sweden: Swedish Government. Available: [https://www.government.se/4af2b7/contentassets/cd607378923c4bb0a22fd-66fee352b8/20161212\\_faktablad\\_infraprop\\_eng\\_webb.pdf](https://www.government.se/4af2b7/contentassets/cd607378923c4bb0a22fd-66fee352b8/20161212_faktablad_infraprop_eng_webb.pdf)
- Moore, K., 2017. Unpacking the spatial paradox. UCT News. Available: <https://www.news.uct.ac.za/article/-2017-09-27-unpacking-the-spatial-paradox>

- MyCiti.org.za, 2017. <https://myciti.org.za/en/about/media-marketing/myciti-news/myciti-helps-jobseekers-with-free-travel-opportunity/>. Accessed: 13:34 27/05/2019.
- Nikulina, V., Simon, D., Ny, H. & Baumann, H., 2019. Context-adapted urban planning for rapid transitioning of personal mobility towards sustainability: A systematic literature review. *Sustainability*. 11(4). DOI: 10.3390/su11041007.
- Nykvist, B. & Whitmarsh, L., 2008. A multi-level analysis of sustainable mobility transitions: Niche development in the UK and Sweden. *Technological Forecasting and Social Change*. 75(9):1373–1387. DOI: 10.1016/j.techfore.2008.05.006.
- Onyango, G. M., 2018. Urban public transport in informal settlements: Experiences from Kisumu City, Kenya. *Bulletin of Geography: Socio-economic Series*. 40:145-156
- Onyango, G.M., Dymitrow, M., Oloko, M., Agong' S.G., 2021, Co-production of Urban Knowledge: Context Approach for effective and efficient Governance of cities. *Acta Sci.Pol., Administratio Locorum* 20(1), pp 19-33
- Opondo, V. & Kiprop, G., 2018. *Boda Boda Motorcycle Transport and Security Challenges in Kenya*. Nairobi, Kenya: Jomo Kenyatta Foundation.
- Ottermark, M., 2017. *K-märkt eller Utmärkt* (Swedish). Gothenburg, Sweden: West Sweden Chamber of Commerce. Available: <https://www.vastsvenskahandelskammaren.se/globalassets/formular/infrastruktur/rapporter/k-market-eller-utmarkt-final-v2.pdf>
- Owens, S., 1995. From 'predict and provide' to 'predict and prevent?': Pricing and planning in transport policy. *Transport Policy*, 2(1): 43–49.
- Polk M 2016 *How to manage complexity:co-producing knowledge for urban change in Palmer H and Walasek H eds* (Gothenburg: Mistra Urban Futures)
- Puerari et.al 2018 *Co-creation in Urban Living Labs Sustainability* 10 2018 p4
- Ranhagen, U. & Groth, K., 2012. *The SymbioCity Approach A Conceptual Framework for Sustainable Urban Development*. Stockholm, Sweden: SKL International. [http://www.symbiocity.se/PublicDownloads/The%20SymbioCity%20Approach/SCA\\_20full%20version%20\(6%2C1%20Mb\).pdf](http://www.symbiocity.se/PublicDownloads/The%20SymbioCity%20Approach/SCA_20full%20version%20(6%2C1%20Mb).pdf)
- Ranhagen U 2012 *Four big leaps and 20 small steps. Conceptual Guidelines on sustainable spatial planning* (Eskilstuna: Energy Agency Publication ET 2012:14)
- Ranhagen U, Dahlstrand A and Ramstedt A 2017 *Co-creation in urban station communities – findings from working seminars involving the collaboration of transdisciplinary agents 2015-2016* (Gothenburg: Mistra Urban Futures Report 2017:2) pp. 9-30
- Ranhagen, U, 2017, *Process tools in co-creative processes*. Mistra Urban futures. Working paper 2017:4
- Ranhagen U et.al. 2017 *Attractive Living Environments and Flows. Eight themes in planning good cities of the future* (Stockholm: IVA Royal Swedish Academy of Engineering Sciences) pp.25-39
- Ranhagen & Gustafsson, 2020, *The Urban Station Community: Towards a Resource-efficient Transport System*. Mistra Urban Future Report 2020:6
- Ranhagen, U., 2020 a, *Co-creation in Urban Station Communities – summary of three lecture and findings from the project 2017-2019*. Mistra Urban Futures Report 2020:5.

Ranhagen, U, 2020b, *Densification of station areas in order to promote sustainable mobility, health, well-being and energy efficiency – opportunities and obstacles. The case study of Mölnlycke urban centre in Gothenburg region, Sweden.* Conference paper. IOP Conference Series, Vol 588.

Republic of Kenya, 2007. *Kenya Vision 2030: A globally competitive and prosperous Kenya.* Nairobi, Kenya: Government Printer.

Republic of Kenya, 2009. *Integrated National Transport Policy: Moving a Working Nation.* Nairobi, Kenya: Government Printer.

Republic of Kenya, 2013. *Kisumu Integrated Strategic Urban Development Plan.* Nairobi, Kenya: State Department of Urban Development and City of Kisumu.

Republic of Kenya, 2018. *Traffic Act Chapter 403.* Nairobi, Kenya: Government Printer.

Republic of South Africa, 2016. *Integrated Urban Development Framework: A new deal for South African cities and towns.* Pretoria, South Africa: Republic of South Africa Available:

Rode, P., 2018. *Urban infrastructure in transport studies and planning.* In *Governing Infrastructure Interfaces: Cities, technical systems and institutional connections.* V. 02. London, UK: LSE cities. 1–6. Available: [https://files.lsecities.net/files/2018/09/Governing-Infrastructure-Interfaces\\_Urban-Infrastructure-in-Transport-Studies-and-Planning-PhilippRode.pdf](https://files.lsecities.net/files/2018/09/Governing-Infrastructure-Interfaces_Urban-Infrastructure-in-Transport-Studies-and-Planning-PhilippRode.pdf).

Royal Haskoning DHV & City of Cape Town, 2014. *Household Survey Report.* Cape Town, South Africa.

Rye, T. & Wretstrand, A., 2019. *Swedish and Scottish National Transport Policy and Spend: A Social Equity Analysis, Sustainability.* 11(7):1894. DOI: <https://doi.org/10.3390/su11071894>

Schön D A 1991 *The Reflective Practitioner – How Professionals think in Action* (London: Avebury Ashgate Publishing)

Seftel, L. & Peterson, B., 2014. *Achieving Sustainability in BRT Implementation in the City of Johannesburg.* In *33rd Annual Southern African Transport Conference.* Pretoria, South Africa: Southern African Transport Conference.

Svensson, T et.al., (2020 forthcoming) *Co-creative urban planning for energy efficient and sustainable urban station communities.* KTH, Chalmers and LTU Sweden.

Traffic Administration of Sweden, 2019. *The Gothenburg–Borås Project.* Available: <https://www.trafikverket.se/en/startpage/projects/Railway-construction-projects/The-Gothenburg-Boras-Project/>

Temenos, C., Nikolaeva, A., Schwanen, T., Cresswell, T., Sengers, F., Watson, M. & Sheller, M., 2017. *Theorizing Mobility Transitions: An Interdisciplinary Conversation.* *Transfers.* 7(1). DOI: 10.3167/TRANS.2017.070109.

Trafikanalys, 2011. *The Current State of the Swedish Transport System – Challenges and Opportunities* (Swedish). Stockholm, Sweden: Trafikanalys. Available: [https://www.trafa.se/globalassets/rappporter/2010-2015/2011/transportssystemets\\_tillstaand\\_utmaningar\\_och\\_moejligheter\\_en\\_nulaegesanalys.pdf](https://www.trafa.se/globalassets/rappporter/2010-2015/2011/transportssystemets_tillstaand_utmaningar_och_moejligheter_en_nulaegesanalys.pdf)

Trafikanalys, 2017. *Correlation between measures in the transport field and accessibility, productivity, growth and employment* (Swedish). Stockholm, Sweden: Trafikanalys. Available: [https://www.trafa.se/globalassets/pm/2017/pm-2017\\_10-sambandet-mellan-atgarder-inom-transportområdet-produktivitet-och-sysselsattning.pdf](https://www.trafa.se/globalassets/pm/2017/pm-2017_10-sambandet-mellan-atgarder-inom-transportområdet-produktivitet-och-sysselsattning.pdf)

Transport and Urban Development Authority, 2017. Integrated Public Transport Business Plan. Cape Town, South Africa: City of Cape Town.

Transport and Urban Development Authority. 2018. Municipal Spatial Development Framework. Cape Town, South Africa: City of Cape Town.

Transport for Cape Town, 2015. MyCiTi Business Plan 2015 Update. Cape Town, South Africa: City of Cape Town.

van Wee, B., Annema, J.A. & Banister, D., 2013. The transport system and transport policy: an introduction. Edward Elgar Publishing.

Venter, C., 2016. Assessing the potential of bus rapid transit-led network restructuring for enhancing affordable access to employment – The case of Johannesburg's Corridors of Freedom. *Research in Transportation Economics*. 59:441–449. DOI: 10.1016/j.retrec.2016.05.006.

Visser, G., 2001. Social Justice, Integrated Development Planning and Post-Urban Reconstruction. *Urban Studies*. 38(10):1673–1699. DOI: 10.1080/0042098012008481.

Västra Götalands Region, 2016. Transportation Programme (Swedish). Gothenburg, Sweden: Västra Götalands Region. Available: [https://alfresco.vgregion.se/alfresco/service/vgr/storage/node/content/workspace/SpacesStore/e682ad42-ea07-4be6-8c86-00367082a037/Trafikf%C3%B6rs%C3%B6rjnprogr\\_VGR\\_20161220\\_webbversion-1.pdf?a=false&guest=true](https://alfresco.vgregion.se/alfresco/service/vgr/storage/node/content/workspace/SpacesStore/e682ad42-ea07-4be6-8c86-00367082a037/Trafikf%C3%B6rs%C3%B6rjnprogr_VGR_20161220_webbversion-1.pdf?a=false&guest=true)

West, J. & Börjesson, M., 2018. The Gothenburg congestion charges: cost–benefit analysis and distribution effects. *Transportation*. 1-30.

Wissenbach, U. & Wang, Y., 2017. African politics meets Chinese engineers: The Chinese-built Standard Gauge Railway Project in Kenya and East Africa. Washington, DC, USA: Johns Hopkins University, Washington, DC. Available: <https://www.tralac.org/images/docs/11805/african-politics-meets-chinese-engineers-cari-working-paper-june-2017.pdf>



Mistra Urban Futures' research agenda 2016–2019 was called “Realising Just Cities”  
aiming to contribute to cities which are Accessible, Green and Fair.

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