Rethink travel

A shift from the car to sustainable transport

Research Plan | **Thomas Kaasschieter**

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Introduction

The Corona pandemic was an eye opener for major cities around the world. The once car-dominated streets became empty, an opportunity for the city to finally breath. Some cities have implemented measures to constantly decrease car usage, after the pandemic faded away. Paris has permanently removed lanes for cars and given them to cyclists and pedestrians, removing pollution and noise out of the city (Galloway, n.d.). London has not yet significantly gone through this transformation. The city was, and still is, notorious for having a car-centric streets with dangerous cycling infrastructure (Business Insider, 2017).

Despite this focus on cars, London has a world-class public transport network, with fast connections to the outreaches of the city and beyond. The London Underground is one of the most recognisable elements the city. Sequential, the implementation of this network resulted in transit-oriented development, where a chain of developed islands next to the stations emerge and exist. This is explained by the fact people want to walk to their destination from the station. Outside of the walking circle around these stations, the level of development drops drastically.

Cycling could be used to overcome this stark contrast in development and connect neighbourhoods further out of the stations. If people cycle from the station to their destination, we do not have to consider only walking circles, but can stretch this border way further. Furthermore, the level of development will become more of a gradient because of this, making the neighbourhoods a more equal place.

This topic is especially important to improve the health of the people and the city, and of course the planet. People not having to take the car makes them more flexible and more likely to come across other people.

To research this topic the following question will be answered: *how can cycling and public transport infrastructure be used to connect London's outer neighbourhoods to the rest of the city?* To further zoom in on the topic, there are three sub questions: *how do different transport systems serve the city?* Which will help defining the theoretical methodology. *What effect does infrastructure have on the surrounding streets and neighbourhood?* That will help explain the research methodology. And: *what is needed to implement the new infrastructure, both in street and architectural design?* Which covers the design methodology.

Theoretical Framework

The books *Building the Cycling City: The Dutch Blueprint for Urban Vitality* of Bruntlett & Bruntlett (2018) and *Copenhagenize* of Colville-Andersen (2018) give a very detailed inside about cycling infrastructure in respectively the Netherlands and Copenhagen, Denmark. In both books, the history of cycling in both countries is discussed, further giving infrastructure-focussed, but also urban-focussed information. They do this with a one-sided focus in favour of cycling infrastructure.

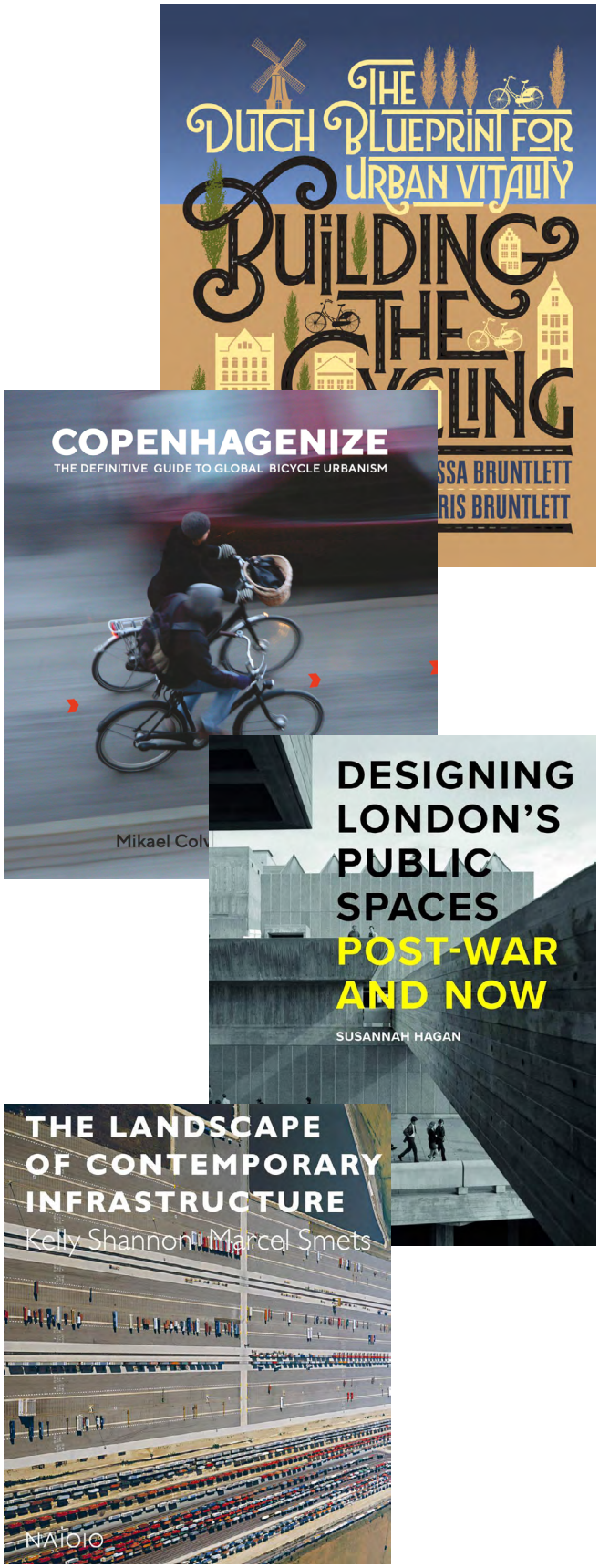
The *15-Minutes City Project* is a concept developed by Luscher (2020), mostly based on the city of Paris. The project is a treasure chest of information about walking and cycling mobility in cities. It gives clear information about the concept and how to reach it. It does not only involve infrastructure, but a lot more, such as economics and politics.

Books on infrastructure often focus on the civil engineering side of the topic. This is most true for books as *The Landscape of Contemporary Infrastructure* by Shannon & Smets (2016) and the *Urban Bikeway Design Guide* by National Association of City Transportation Officials (2014). The first is an architectural canon about infrastructure projects, or the buildings part of it. The last explains every detail of laying out cycling lanes.

The book *Designing Londons Public Spaces* by Hagan (2019) gives an inside about public spaces in London. It will help understand the choices that were made whilst designing the London streetscape.

Scientific information about numbers and facts of cycling infrastructure is mostly found in papers, such as the one from Daniels & Mulley (2013). This is informative when discussing travel times or other factors that will influence the street design.

As discussed later in this text, there are some cities that will be used as precedents, such as the Barcelona Superblocks Eggimann (2022). There are books, papers, and videos about this. Although some of them present their own city as the ideal situation, it is worth noting that it is only one of several solutions.



Terminology

The term **transit-oriented development** (short: TOD) is used to describe urban developments around public transport lines. Development mostly happens around each station, so the areas surrounding the stations will become a chain of more developed islands very well interconnected, which can lead to extensive densification and gentrification (Ibraeva et al., 2020). The term is often used and implemented but does have some major flaws to it. Knowing it is important for the theoretical research, related to the first sub question as stated in the introduction.

Proximity in a city is important, one might want to live close to their work, the shops, and friends. Proximity can be described in distance, but also in time. The notion of hyper-proximity is important when talking about infrastructure, as two places far away in distance might be very close to each other when looking at proximity in time. Luscher (2020) described it short, but catchy "Things must be close." The concept of proximity is in the heart of the topic and therefore used to explain the research-focussed second sub question.

The practise of **commuting** and **travelling** are complementary terms that describe the different ways people can travel. Users of public transport also experience a better (mental) health than car users. Travel time also plays a big role in this (Chng et al., 2016). It is important to get people to commute without their car, as this not only improves the city atmosphere, but also the health of the people commuting. The two terms are in the centre of the research and will eventually be part of the design. The two terms define the design-based last sub question.

The research will include different design scales. Infrastructure is an essential part of the city, that has macro and micro effects. The city might profit from infrastructure, whilst smaller neighbourhood will deteriorate from it. It is important to know the infrastructure of the city, to know which areas are connected to which other parts. The small scale, on street level, is important for the architectural design, because there the travellers experience the transport. It is also the scale where an architect might have the biggest impact, as buildings surrounding infrastructure tap on the line, without influencing it a lot.

In the research different scale levels will come by, starting with infrastructure on the national level, for this you must think about national railways and highways. After this the city level, and then the neighbourhood level come by. An interesting example of a bad example on this scale is Robin Hood Gardens, which was demolished in 2018. In the film by Dorschner & Beyer (2018) it was clearly stated this had largely to do with the dominant infrastructure around the site. The smallest level is on the street scale, where changes can improve the situation for the surrounding shops (Mueller et al., 2020).

Methods and methodology

Literature readings and **review** are part of the theoretical methodology and will mostly be used to answer the first sub question (*How do different transport systems serve the city?*). The specific literature is specified in the theoretical framework.

It is needed to get a grip on the matter of cycling and public infrastructure, to understand the underlaying layers of the subject. The foreknowledge is mostly focussed on architecture, so the literature will broaden this to other disciplines, such as civil engineering, London demographics and urbanism. These readings will give inside about the details, numbers and trends going on in these fields, but also give precedent examples. The results will be used in the other steps of this methodology. The literature will also give inside in the changing dynamics in the city, shifting to more sustainable modes of transport. The precedent projects will also partly follow out of the literature review.

Figure 1.1: Walking times around each station of the Elizabeth line.

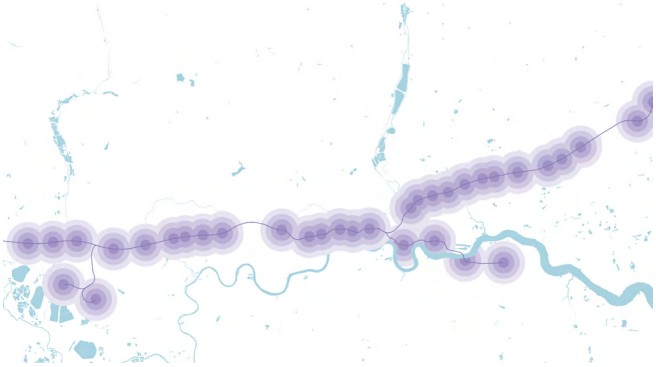
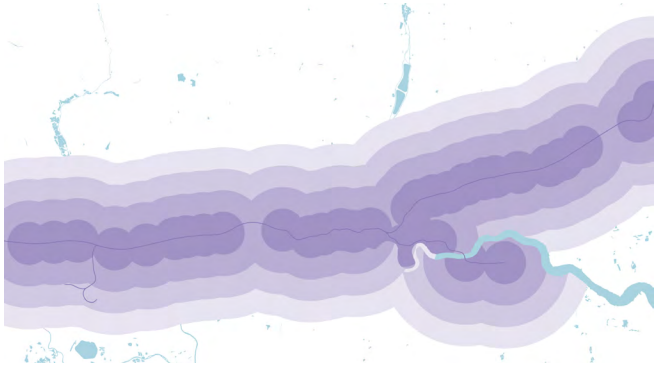


Figure 1.2: Cycling time around the same stations. Each colour circle represents 5 minutes of travel time.



Mapping is part of the research methodology (second sub question: *What effect does infrastructure have on the surrounding streets and neighbourhood?*) will be a big part of understanding London and integrating the research of it. It is a very important factor in the studio, as it is needed to understand the complex urban landscape.

Different modes of transport are public transport networks, such as busses and trains, but also private transportation, such as cars, walking and bicycles. These systems will also be mapped cartographically per sort and will form layers which can be placed on top of each other. An example of this is figure 2, where the rail network and the cycle infrastructure are visible. Interesting design sites might pop up where infrastructure meets each other. Figures 1.1 and 1.2 are the initial maps on this topic, they show a combination of the Elizabeth Line with walking and cycling, making the hinterlands of the stations with walking and cycling visible.

Another layer will be usage of the lines and infrastructure. There is information available how many people take which kind of transport as their daily commute, mostly per ward. This will also be mapped and compared. The neighbourhoods with a high amount of cyclist might be a precedent, and a neighbourhood with a high percentage of car drivers might be a place with high potential. For some modes of transport, such as cars and the Underground the actual usage per line or road will be mapped. Roads with a very high traffic rate might unveil a high potential to reduce it.

Also, wealth data can also be included in the cartographic mapping. If this is placed behind the infrastructural layers, as described above, some overlap might be found, which can unveil a link between wealth and infrastructure.

The actors regarding the research are also mapped. The diagram (figure 3) is besed on the actor-network theory and was set up in a workshop with Erwin Heurkens. This way, it is made clear how the different interests can clash, in the process of implementing cycling infrastructure.

Another way to map, is to walk or cycle on the streets (experience it) and make photos. The photos will mainly be there to record the current situation, the amount of people, the atmosphere of the place. Giving the photos a GPS-tag, they can form a streak of photos, describing a route from a station to the neighbourhood from the eye of the commuter. The experiences will help understand the streets in an intuitive way.

Creating a signature drawing style for mapping streets is an extension of this. Whilst photos are good in interpretating a ‘real’ snapshot of the situation, these drawings can make the most important elements clear. The maps will be a section, but not of the street profile but in the length of the street. It is in a way a mind map with places

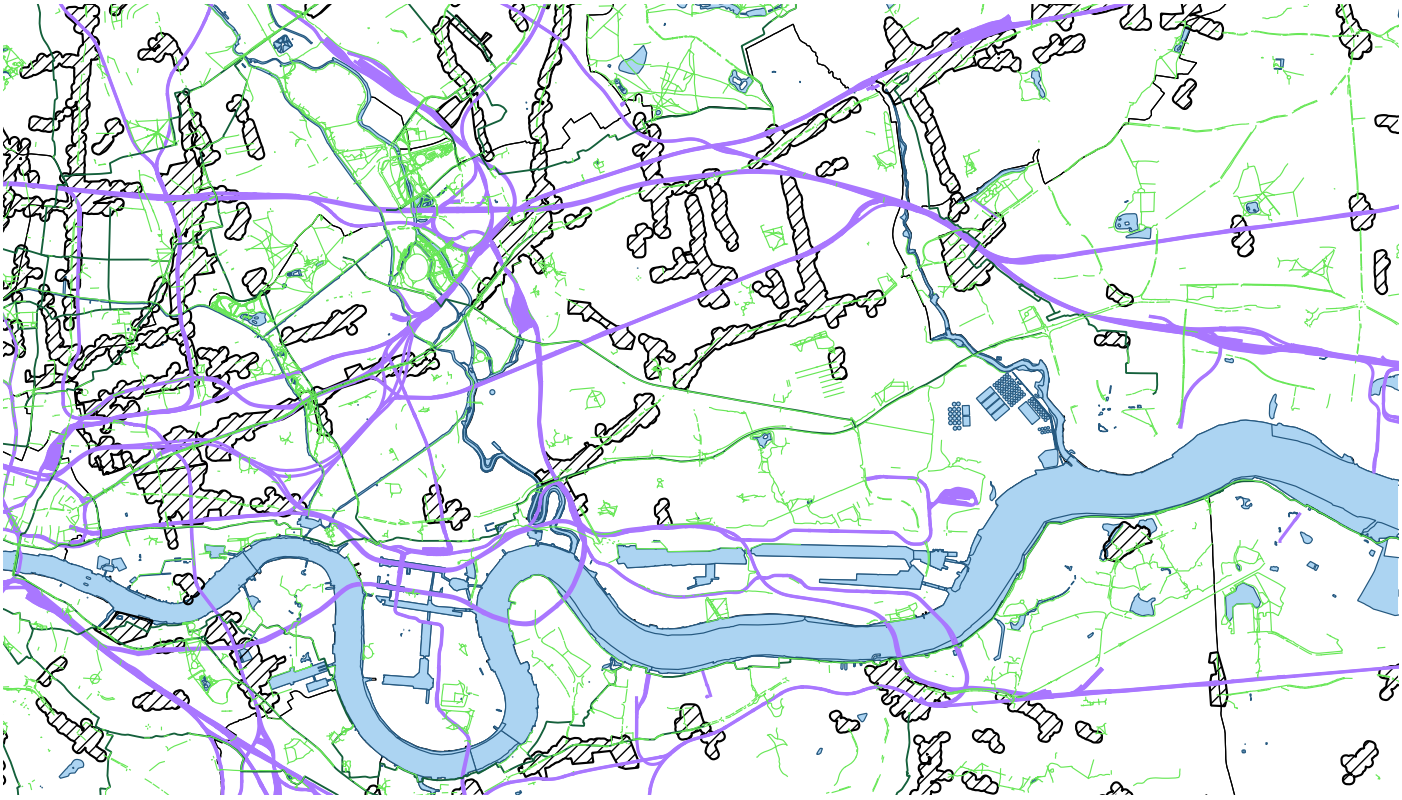
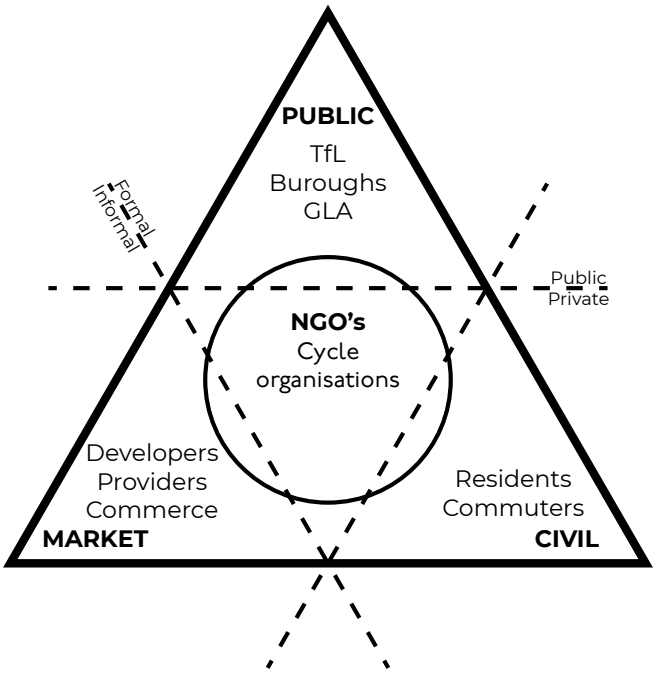


Figure 2: a map showing rail lines (tube and national railways alike) in purple, dedicate biking lanes and paths in green and the London main streets are the shaded areas. The places where the lines meet are points of interest.

of personal interest, which can be how narrow the sidewalk is, where there are shops around the road or how busy it is. They will help better understand the current situation and will help to implement a new design. These drawings can be made after the site visit. It might be valuable to 'practice' this drawing style with favourite streets out of personal experience, to create this drawing style.

The different ways of mapping will link the different scales, as described in the theoretical framework. The maps of the city will eventually have an influence on the small scale. They all need a different way of mapping. It will be very useful to utilise the signature drawing style throughout all mapping scales.

Figure 3: the actor diagram.



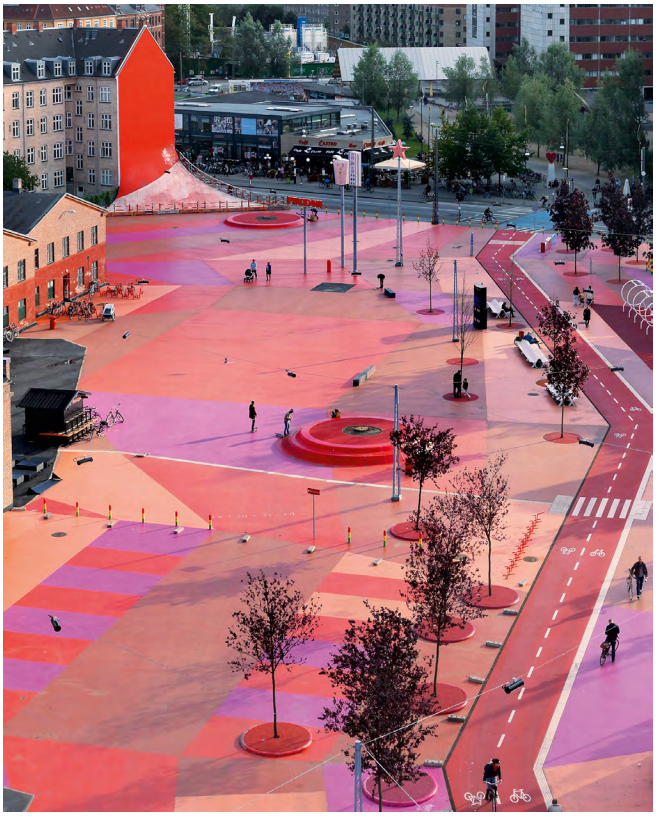
The findings from the other methodologies can be combined to form the last one, focussed on **design**. This will answer the last sub question (*What is needed to implement the new infrastructure, both in street and architectural design?*). In this methodology the focus will be to come up with some possible design options to implement the findings, which will be the rest of the process of the design studio.

First, the site must be determined. For that, maps like figure 2 will be used, to find the stations with the least existing cycling infrastructure, and with an abundance of cars. Also having a centre function to its neighbourhoods. The site must preferably be on the Elizabeth Line, as this line offers an interesting new situation.

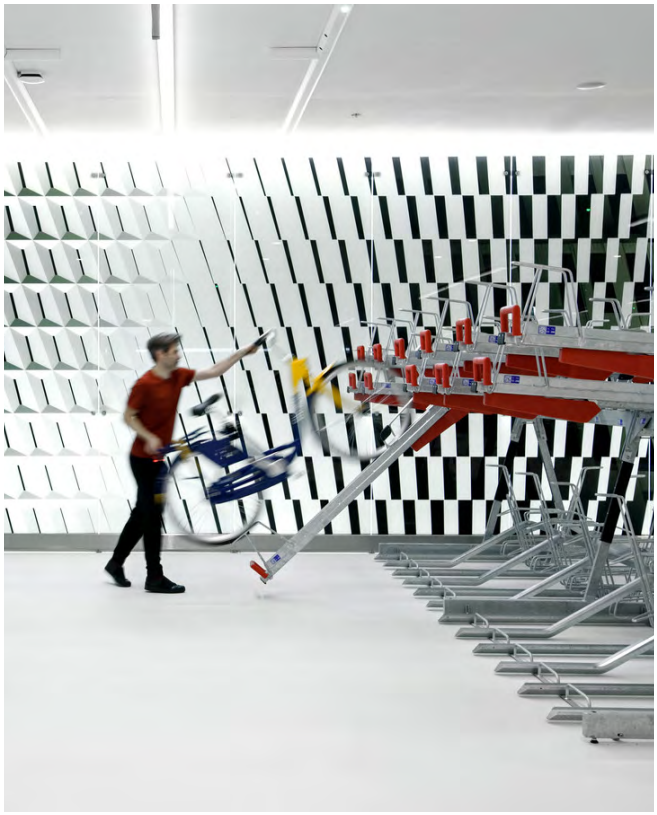
After, the findings will be bundled in design guidelines. The mappings will be combined, to sum up the most useful information. It will not only help understand the city but will also guide in finding the best site for the design. Choosing the right site, with the most representing and interesting situation will boost the design. The design guidelines will form the base of the design following this research. The guidelines will help define and constrain the design (elements). The findings will be used in the design phase of the studio.

The final design stage of the studio will combine all the findings and will be research on itself. Designing is a way of researching. Although design research is merely an approximation of the best solution (Van Doorn, 2013), the last sub question can only be answered when the design and thus implementation is ready.

Superkilen in Copenhagen is a architectural design precedent (photo: Baan (ca. 2012).



The underground bicycle parking garage of The Hague central station, shows how cycling and architecture can be combined (photo: Brink (2021).

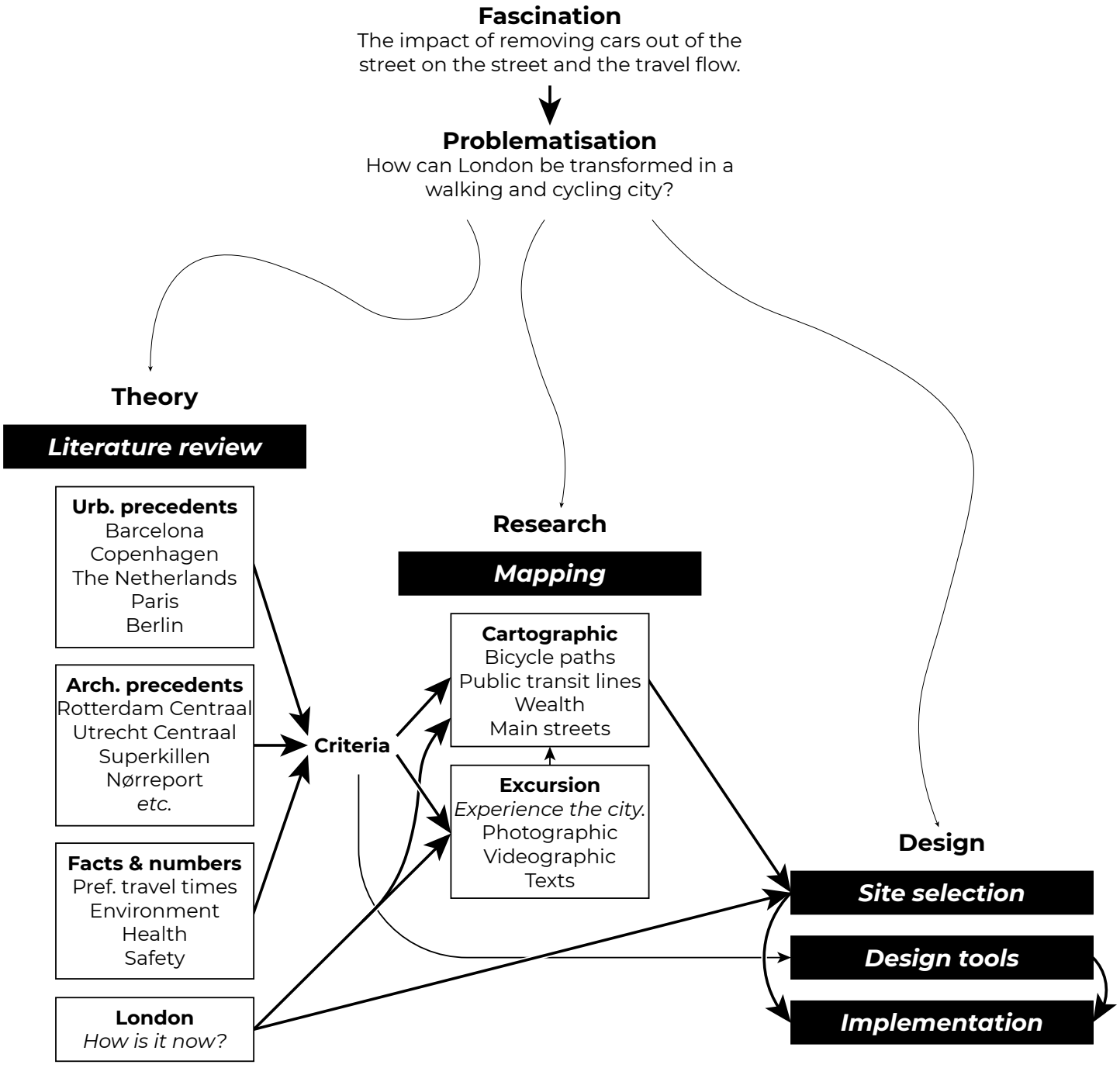


Ilford: in green the highly developed areas surrounding the stations, the orange areas are outside the walking circle and thus not as developed. You can see a clear contrast.

A simple scetch how a redesign street next to the Ilford station could look like.

Research Diagram

The diagram lays out the rough order of research elements conducted. It is prone to change later in the process. The three sub questions are represented in the three columns.



Arguments on relevance

As stated earlier, the contemporary infrastructural situation in London, especially in the outer boroughs, is not working properly. It is serving cars and not people, although not as bad as in the USA. The implementation of bicycling infrastructure is taking place as we speak, however it is still work in progress and we might have to wait for several more decades for it to be fully developed, if it even does in the first place.

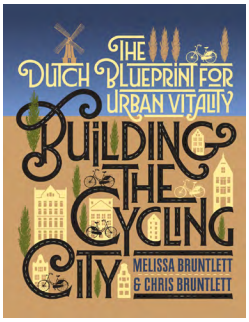
It is very easy to naively look at London's situation through the Dutch perspective and conclude that London just needs to implement the Dutch or Danish standards, after which Londoners will all start cycling to work. I am aware of this and know that it is not possible to just implement cycling infrastructure and expect everybody to use it.

In addition to this, the city of London is different from Dutch cities, there might other additional means needed to get people out of their cars. For this reason, a diverse range of European cities are researched. So that eventually there is general thought about what is bad and what is good street design, what works and what not.

Annotated bibliography

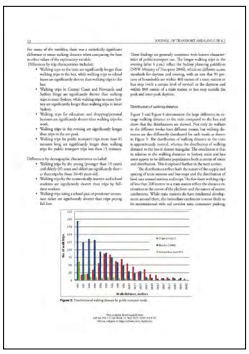
Bruntlett, M., & Bruntlett, C. (2018). Building the Cycling City: The Dutch Blueprint for Urban Vitality (Illustrated). Island Press.

The Dutch cities were not always the bike friendly places they are today. The Bruntletts describe the history, design choices and politics of cycling in the Netherlands. They compare it to cycling in the USA, where it could be implemented. London is also very cyclist unfriendly, and therefore this book is relevant to research cycling in the British capital.



Daniels, R., & Mulley, C. (2013). Explaining walking distance to public transport: The dominance of public transport supply. Journal of Transport and Land Use, 6(2), 5. https://doi.org/10.5198/jtlu.v6i2.308

This paper gets technical about the walking times to public transport stops and stations. It findings explain the hard border in a circle around the stations of London, where the developments instantly stop and the old city neighbourhoods are still fully in place.



Colville-Andersen, M. (2018). Copenhagenize: The Definitive Guide to Global Bicycle Urbanism. Amsterdam University Press. https://tudelft.on.worldcat.org/oclc/1030307082

This is very much alike the book Building the Cycling City: The Dutch Blueprint for Urban Vitality. It describes the history, politics and (road) design details about cycling in Copenhagen. It is written in an informal, storytelling way, which makes it pleasant to read. The writer gives a good inside about choices made in road design for cyclists, without becoming too technical. The book gives a good inside about why the roads in Copenhagen look the way they are and how it can be exported to other cities.

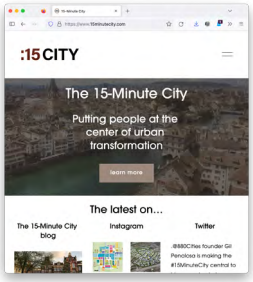
Dorschner, A., & Beyer, T. (Directors). (2018). Robin Hood Gardens. Beyer & Dorschner.

This documentary about the council housing in east London gives an interesting inside about the history of the now demolished complex. It was built on a spot, right in between of 4 busy roads, becoming an isolated urban island. The architects tried to solve the problem of the roads, but not with the desired results. The residents disliked the building a lot, which resulted in it becoming neglected. It makes it painfully clear that (car) traffic can really destroy an architectural intervention, even with the best intentions.

Eggimann, S. (2022). The potential of implementing superblocks for multifunctional street use in cities. Nature Sustainability, 5(5), 406–414. https://doi.org/10.1038/s41893-022-00855-2

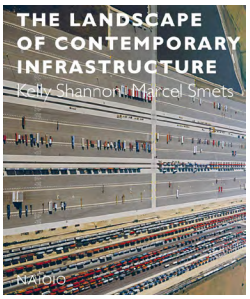
The city of Barcelona has taken a radical turn in their roadscape. The city grid used to be a collection monotone blocks of car-roads, which are now changed to superblocks, combining several blocks to change the interior to a car free area. Although the change has had a lot of attention in the media, not a lot is written about it. This paper fills a part of this gap, describing the real-life impact of the change, and giving handles to also implement the system in other cities, one of the examples is London.

Luscher, D. (2020, June 17). Introducing the Project. 15-Minute City. https://www.15minutecity.com/blog/hello



The 15-minutes city is a concept developed by Dan Luscher, mostly based on the city of Paris. The project is a treasure chest of information about walking and cycling mobility in cities. It gives clear information about the concept and how to reach it. It does not only involve infrastructure, but a lot more, such as economics and politics.

Shannon, K., & Smets, M. (2016). The Landscape of Contemporary Infrastructure. Macmillan Publishers.



This canon book about infrastructure projects around the world sheds light on the coming of and most striking features of the structures. The projects include stations, but also bridges and infrastructure lines. The projects are sorted in category, with an introducing text, with every project having a short but strong explanation. When designing infrastructure projects, that need a clear architectural signature, this book is a valuable source.

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