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# **The role of motivations and perceived ability to cycle as a mode of transport in an emerging cycling culture**

**The case study of Cork Metropolitan Area, Ireland**

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SGEM08  
Spring/2023

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## ABSTRACT

Cycling as mode of transport can be seen as a sustainable and active mode of travel that can be part of the solution for climate change and urban congestion. Many cities in Europe are now investing in cycling to reduce their carbon emissions and make their spaces more liveable and accessible. Some cities have arguably already achieved an advanced cycling culture where cycling is normalised and woven in the lived experiences of a person's biography. However, for cities with an emerging cycling culture that are determined to increase the modal share of cycling, there is a lack of consensus as to how to most efficiently approach this and what obstacles must be addressed to encourage cycling uptake. To understand how an emerging cycling culture can progress towards an advanced cycling culture, this thesis investigates the determinants of taking up cycling as mode of transport in the emerging cycling culture of Cork Metropolitan Area, Ireland. Utilising the Theory of Planned Behaviour from Psychology and the Politics of Mobility from Human Geography, the role of motivations and perceived ability to cycle are explored to investigate what are the most important factors that explain why people do and do not cycle. Such analysis is supported by a human and physical infrastructure lens where mobility and its material and immaterial dimensions are highlighted to understand travel behaviours. This thesis contributes to literature in the new mobilities paradigm and knowledge of mobility as a fundamental spatial process interconnecting people and places. It highlights how geographic movement becomes entangled in the way societies and cultures assign meaning through practice and representations. From dissemination of an online survey on travel behaviour and perceptions of cycling, to conducting semi-structured interviews with cyclist and non-cyclist students at University College Cork, it was found that perceived self-efficacy to cycle is more important than the motivations for why students do and do not cycle. More specifically, convenience appears to be the foundation for all travel behaviour decisions. For cyclists, convenience is the main reason they expose themselves to the dangers of the road, while for non-cyclists, the convenience of their current mode of transport is the main reason for not taking up cycling. The identification of encouraging and discouraging factors for utilitarian cycling and why people do and do not cycle in Cork can provide guidance for

decision makers in Cork City Council as to how to encourage cycling uptake efficiently and address the barriers that some may face when attempting to cycle in the Metropolitan Area.

**Key words:** travel behaviour, mobility, utilitarian cycling, human infrastructure, built environment, Theory of Planned Behaviour, Politics of Mobility.

**Word Count: 19,504**

## ACKNOWLEDGEMENTS

I am very fortunate to have personally met the cycling community in Cork at the Cork Cycling Symposium, ranging from academics at University College Cork (UCC), to members of the Cork Cycling Campaign, to cycling enthusiasts who are determined to make the city a more accessible and liveable space. Special thanks to Eileen Hogan for introducing me to this lively and welcoming bunch, and to Stephan Koch for his guidance in the preliminary phases of my work.

Much appreciation to all who supported me in the dissemination of the survey and interviewee search within UCC and thank you to all who participated as a respondent or interviewee in my research. Your insights and experiences are valued and are the core of the findings.

Additionally, I would like to express thanks to my supervisor Till Koglin for his critical advice and entrusting me to take the reins of my work. Last but not least, thank you to my friends and family for providing such supportive conditions to conduct my thesis, as well as a second pair of eyes to review my written material.

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## CHAPTER 1 - INTRODUCTION

### 1.1. Towards more active transportation systems – the benefit of the bike

Cycling as a mode of transportation has an abundance of environmental, health, economic, and social benefits to the individual. Although there are various classifications of the cyclist, this thesis focuses on the utilitarian as opposed to the recreational cyclist, where the former is characterised by someone who cycles to their place of work (Heinen et al., 2011).

Utilitarian cycling is seen as a solution to the problems of climate change and urban congestion. Much of the physical space of cities is and has been devoted to cars, limiting the movement of cyclists, pedestrians, and public transport (Aldred and Jungnickel, 2012).

Additionally, the threat of climate change is driving cities around the world to transition to more sustainable transportation systems that maximise the space for mobility, whilst increasing connectivity and accessibility. There is a large untapped potential to increase cycling for short journeys in urban areas to contribute to relieving traffic congestion and reducing transport's contribution to global carbon emissions (Jones, 2012).

Since the early 2000s, there has been an explosion of bike share systems, bus rapid transit, and light rail projects that aim to decrease the use of automobiles (Sheller and Urry, 2016). In recent years, post-pandemic, there was a huge surge in investment in cycling infrastructure across Europe. The Government of Flanders appropriated 150 million euro to stimulate bicycle use and invest in cycling infrastructure on municipal roads in 2021 (Vlaanderen, n.d.). With a budget of 290 million euro in the same year, Paris announced a 5-year plan to increase the number of protected cycleways in the city and boost bicycle parking spaces (O'Sullivan, 2021; Reid, 2021). This momentum has indicated cycling's potential to become a core part of mobility in Europe. In more advanced cycling countries such as the Netherlands, efforts are being directed towards developing cycling infrastructure to improve the safety of cyclists. In less advanced transport systems, a common challenge is how to implement a new cycling network within the existing infrastructure whilst encouraging a favourable shift in societal attitudes to cycling. Cork Metropolitan Area, Republic of Ireland, is one such example of the latter and is the geographical setting for this thesis.

## **1.2. Advanced and emerging cycling cultures**

The level of cycle uptake and the prioritisation of cycling by urban planners can be understood through the concept of mobility culture. Mobility culture consists of both material (the built environment) and symbolic factors (norms and attitudes) (Klinger and Lanzendorf, 2016), because both affect people's consciousness about mobility and movements and their everyday mobility patterns (Latham and Wood, 2015; Koglin, 2017). Given the influence of governments on the urban planning of cities, evidently mobility culture is partly a product of civic planning and policy (Haustein et al. 2019). A cycling culture can be perceived as being present if the normalisation of cycling is understood to be both consciously and unconsciously constituted (den Hoed and Jarvis, 2022). A place that has cycling culture can be identified when cycling is taken for granted and passes without comment, when it is woven in the lived experiences of a person's biography (Berg et al., 2014). To exemplify, the Netherlands is known for its developed cycling culture, where cycling is taken to be the norm (Nello-Deakin and Nikolaeva, 2021). There are also places with emerging cycling culture where cycling as mode of transport is beginning to be practiced, demonstrated through the presence of cyclists on the roads or the introduction of dedicated physical cycling infrastructure. Additionally, in an emerging cycling culture, cycling can be met with resistance or criticism from society, where this mode of transport is not yet accepted as a form of mobility and part of their lived experiences. Utilising the case study of Cork Metropolitan Area, Ireland, this thesis explores how the built environment and social practices surrounding cycling constitute an emerging cycling culture and what forms of resistance exist towards cycling from the perspective of cyclists and non-cyclists.

## **1.3. Research aim and questions**

This thesis seeks to understand how an emerging cycling culture can progress towards an advanced cycling culture as seen in the Netherlands. Its approach is to investigate the determinants of travel behaviour, specifically cycling. Identifying encouraging and discouraging factors towards cycling and why people do and do not cycle in Cork can provide guidance for decision makers as to how to stimulate cycling culture at the Metropolitan Area scale. Kaufmann (2002) posits that one's capacity to be mobile is dependent upon a variety

of social, political, and cultural contextual variables and that an individual's perceived accessibility to a certain mobility and the skills and competency required to appropriate this access are evaluated and transformed into mobility. What can be comprehended from this understanding is that multiple factors can determine one's choice of transportation, and these factors can be weighed and evaluated in relation to each other. To holistically approach the decision-making process of why people choose to cycle or not in Cork, this thesis uses a framework adapted from Ajzen's (1991) Theory of Planned Behaviour and Creswell's (2010) Politics of Mobility. From this framework, travel behaviour can be explained by one's motivations and perceived self-efficacy to perform that behaviour. The former factor can be described as constituted by both the extent to which one evaluates the behaviour favourably (attitude) and the social pressures that the individual may experience when choosing to or to not perform the behaviour (societal expectations). The latter factor can be understood as the perceived ease or difficulty of performing the behaviour. To explore this topic, a survey was disseminated, and semi-structured interviews were conducted with students at University College Cork (UCC). This thesis answers the following research questions:

1. To what extent does cycling in Cork come with ease?
2. What are the motivations to cycle in Cork?
3. How is the (potential) performance of cycling influenced by motivations in relation to perceived ability at the individual and societal level?

The findings of this thesis contribute to the mobility and transport literature on the determinants of travel behaviour. What is unique to this approach is the holistic overview that is taken to understand why one does or does not cycle by investigating the influence of both the physical environment and the psycho-socio-cultural milieu on travel behaviour.

## **1.4. Thesis outline**

Following this introduction, this thesis continues with Chapter 2 - Methods and methodology to provide a detailed account of how the data was collected through a survey and interviews with the students at UCC. Proceeding is Chapter 3 - Literature review, which assesses relevant academic literature, first through a focus on the new mobilities paradigm, followed by a discussion on what factors encourage and discourage cycling, and then an evaluation of the Theory of Planned Behaviour (Ajzen, 1991) as a framework of approach. Chapter 4 - Framework concludes that the Theory of Planned Behaviour is most appropriate to this thesis with support from Creswell's (2010) theory on the Politics of Mobility. After briefly explaining the case study of Cork Metropolitan Area, Ireland, that is used to explore the significance of motivations and perceived self-efficacy to cycle in Chapter 5 – Case study, the results of the survey and interviews are presented and contextualised by relevant literature in Chapter 6 - Findings and discussion. Finally, Chapter 7 – Conclusion summarises the findings and the implications of these for Cork City Council, articulates the ways in which it has contributed to geographic knowledge, and points out directions for future research whilst acknowledging its current limitations.

## CHAPTER 2 - METHODS AND METHODOLOGY

### 2.1. Research Design

To approach the research questions and aims of this thesis, the perceptions of cycling and experiences of travelling behaviour from students (who do and do not cycle) at University College Cork have been gathered through a survey and semi-structured in-depth interviews. The different methods are suitable for different purposes as explained in Table 1.

Quantitative data from the survey can give a general understanding of the students' perspective. Interviews are best suited for developing a deeper understanding of the factors that influence/explain why the individual cycles or not, in relation to the built environment and social infrastructure of Cork. The two methods work together, where the survey acts to contextualise the interviews, whether it be to emphasise a theme or point to a different topic of discussion.

The thesis adopts a phenomenological approach where the data collected is not the ultimate truth or can claim total objectivity but attempts to understand the mobile realities in Cork. Phenomenology can be defined as the study of how people structure their experience of other people and the non-human world (Castree, Kitchin, and Rogers, 2013). Opposed to a positivistic or naturalist approach, a phenomenological study is concerned with essences of human experiences of space and place (Simonsen, 2013), and builds on the individual qualitative understanding of specific problems in society. In the context of this thesis, the conflict is safe and accessible mobility in Cork, specifically cycling. The influence of a phenomenological approach on the methodological thinking is reflected in the way in which the qualitative data from the interviews was built upon an understanding of how different people orientate themselves in their lived experiences and interpret cycling differently. Both the qualitative data from the interviews and the quantitative data from the surveys were analysed in such a way, which is further expanded upon in the subchapter 2.3. Methods of data analysis.

Given that the philosophy of science and methodology determine scientific research and are the foundation of the investigations conducted in research projects, it is important to clarify the philosophical foundations that have determined the research approach in this thesis. Its

epistemology takes an interpretivist position where the differences between people and objects of natural sciences require respect, and that social scientists must grasp the subjective meaning of social action (Bryman, 2001). Inspired by the philosophy of critical realism and in correspondence with the phenomenological approach, this thesis recognises that the researcher can only investigate and develop context-specific partial knowledge (Sayer, 2004). This thesis aims to produce partial knowledge on the determinants of cycling in the specific context of the Cork Metropolitan Area based on subjective interpretations from the respondents, of which the findings have the potential to be generalisable to an extent for other medium-sized cities with emerging cycling culture.

*Table 1 - Methods used for data collection (adapted from the work of Koglin, 2013).*

<b>Methods</b>	<b>Function</b>	<b>Type of information</b>	<b>Type of data</b>
Interview	Increased understanding of the motivations towards and perceived self-efficacy of cycling as mode of transport in Cork	First-hand information from students (cyclists and non-cyclists) of University College Cork	Qualitative data
Survey	Increased understanding of the motivations towards and perceived self-efficacy of cycling as mode of transport in Cork	First-hand information from students (cyclists and non-cyclists) of University College Cork	Quantitative data

## 2.2. Practices of data collection – survey and interview

### 2.2.1. Target group

This thesis aims to understand how the motivations and perceived ability to cycle influences the decision to cycle as a means of transport. Students at University of College Cork (UCC) were chosen as the demographic to investigate the perceptions of cycling and cyclists in the Cork Metropolitan Area. The decision to investigate perceptions of students at UCC was based on the idea that students make up a significant part of the city's population: 20,542 students in the 2020/2021 academic year (UCC, n.d.) and a total of 305,222 people in the Metropolitan area in 2017 (UK Population Data, n.d.). This demographic allowed me to access a group of people who likely have varying views on and experiences with cycling. Additionally, students are a relatively accessible group, especially at UCC which hosts multiple student societies and thus points of contact. Moreover, during my attendance at the Cork Cycle Symposium 2023 I found that cycle uptake amongst UCC students in the past five years has been remarkably low in comparison to the travel behaviour of UCC staff.

I specifically chose to gather the perceptions of both students who do and do not cycle regularly as a mode of transport in the Cork Metropolitan area. This is because to shift from an emerging cycling culture to a normalised cycling culture, it is important to understand what obstacles are faced by people who do not cycle but may want to do so (McCarthy, 2011). Moreover, a broader appreciation of the composition of cyclists and non-cyclists, and their differing preferences and attitudes will provide decision-makers with a deeper understanding of their travel behaviours and a better dialogue of potentially planned spatial change (Leyendecker, 2022). As the number of cyclists in Cork is relatively low where only 3% of its commuters consisted of cyclists in 2016 (Central Statistics Office, n.d.), it is likely that multiple barriers exist which de-motivate people from cycling and give the impression that it is not a mode of transport which can be easily accomplished. Additionally, the insights into current student cyclists' perspectives have a lot of value for this thesis because they can express what changes should be made to support an increase in cycle uptake from their first-hand experience on the road. Secondly, they can describe how they managed to get into cycling when the conditions were not optimal, and thus what kind of support is needed from UCC or the Cork City Council to encourage this.

To gain insight into students' travel behaviours and perceptions of cycling at UCC, I first disseminated a short 5-minute online survey to students who remain anonymous. The purpose of the survey is to gather a general impression of their perceptions, rather than to claim that the findings can be scaled up to represent the whole student population. To gain an in-depth understanding of students' motivations and perceived self-efficacy towards cycling, semi-structured interviews have been conducted. The survey works together with the interviews to contextualise what has been discussed by the interviewees.

### 2.2.2. Collecting data – survey

#### *Methodology for survey*

A survey was chosen as the method to collect an impression of students' travel behaviours and perceptions of cycling because it is a time-efficient way of gaining insight from many people. The decision to ask multiple-choice questions over short or long open-ended questions meant that the data could be quantified for a descriptive analysis.

#### *Survey contents*

Within this survey, multiple choice questions regarding students' perceptions of driving, walking, cycling, and taking public transport in relation to feelings of safety, efficiency, and frequency of usage were asked (*See Appendix A*). At the end of the survey, respondents had the possibility to leave their contact details for a follow-up interview.

It was important that whilst clearly communicating the objective of the survey, all students felt included to participate. Therefore, the survey questions avoided topics exclusively on cycling or expressing a criticizing tone towards those who may not cycle. Additionally, questions were asked about different modes of transport in Cork beyond cycling, including walking, public transport, and private car usage to ensure a holistic understanding of student travel behaviour and perceptions, to view the current popular modes of transport in relation to the bike.



## Dissemination

Table 2 - Societies contacted for survey respondents.

Society	Internal dissemination of survey	External dissemination of survey
Students' Union	X	X
SU Equality Working Group	X	
UCC Societies Guild		X
Motely	X	X
University Express	X	X
UCC Feminist Society	X	
UCC SÁMH Society	X	
UCC Europa Society	X	
UCC International Development Society	X	
UCC Fashion Society	X	
UCC Historical Society	X	
UCC Government and Politics Society	X	
UCC Club Sports Executive	X	
UCC Law Society	X	

To find respondents for the survey, I contacted various student associations at UCC to disseminate the survey externally through their social media platforms to reach a wider audience as well as to share it internally within their committee (*as seen in Table 2*). In addition, numerous staff members at UCC were contacted to ask for their support in disseminating the survey to their students through email and lectures. My attendance at the Cork Socio-Cycle Symposium in February 2023 provided the opportunity to become acquainted with three of UCC's staff. All three were from different academic fields and were contacted to spread the survey. To increase the student audience of the survey, I performed a brief online search of other professors at UCC who expressed interest in the cycling agenda in Cork. Three additional professors were contacted, two of whom were cycling advocates

and one who worked in the Planning and Sustainable Development department. Only the latter responded to the request for support and agreed to share the survey with their students.

In total, up to 100 email addresses were contacted for support towards internal/ external dissemination of my survey. Because respondents of the survey are anonymous, it is not clear which societies responded to or shared the survey.

### 2.2.3. Collecting data – interview

#### *Methodology for interviews*

A limitation of online surveys is that they do not offer the opportunity to gain an in-depth understanding of the individuals surveyed. Therefore, semi-structured interviews were also conducted with students to be able to ask a range of questions about their perceptions and experiences (if any) of cycling. A semi-structured interview is a verbal exchange where the interviewer attempts to elicit information from another person through predetermined questions, whilst also providing the interviewee with the power to explore the issues that they feel are important (Longhurst, 2003) which the interviewer may or may not have anticipated (Valentine, 2013). Several strengths of interviews as a method of data collection are that they can investigate complex behaviours and motivations, and collect a diversity of meaning, opinions, and experiences (Dunn, 2016). Therefore, semi-structured interviews in contrast to structured and unstructured interviews were chosen to allow me to guide the conversation to ensure that topics relevant to the study were being discussed whilst providing the opportunity for the interviewee to expand on matters that were important to them.

#### *Recruiting interviewees*

At the end of the survey, respondents had the possibility to leave their contact details for a follow-up interview on the topic of travel behaviour and perceptions of cycling. From the survey, 12 people expressed interest in participating in an online follow-up interview. All were contacted via email to arrange the interview. Six interviews took place, however one was with an employee of UCC. Thus, in total, five of the interviews were used for this thesis. Three of the five interviewees were found from the survey, one from an online search for

student cyclists at UCC through Instagram, and another through personal contact. In total, 2 students who don't cycle and 3 students who do cycle at UCC were interviewed.

#### 2.2.4. Interview guides

Two interview guides were created to support the discussion during the interviews (see *Appendix B and C*), one for students who cycle in Cork and one for students who do not or had little experience. The starting point for all interviews was the same. Participants were asked to categorise what kind of transport user they are on a day-to-day basis, a question that was required to be answered in the survey. This introductory point allowed me to get an understanding of how strong the participant's familiarity is with cycling and indicated which interview guide should be used for them. From there, the interview aimed to cover the themes of travel behaviour, safety, travel efficiency, attitudes towards cycling, and societal expectations. The ordering of questions followed a pyramid structure where the interview starts with easy-to-answer questions about the interviewee's engagement in an issue and more abstract and general questions are asked at the end (Dunn, 2016). Each theme had one or multiple related questions. Although the themes were the same in both interview guides, the questions were adapted for people with either little to no cycle usage or frequent cycle usage. Additionally, some questions were asked outside the interview guide when prompted with stimulating and unanticipated insights. At the end of the interview, the researcher aimed to summarise what had been discussed by asking the interviewee their overall deterrents and motivations to cycle, and what changes they believe should take place to achieve a societal shift towards a normalised cycling culture.

### 2.3. Methods of data analysis

#### 2.3.1. Survey

Because the purpose of the survey is to gather a general impression of UCC student travel behaviour and perceptions of cycling, the data should not be taken as a representation of the whole student population as the survey received 94 responses and the whole student population is around 20,542 (UCC, n.d.). However, it is arguably a large enough number to

offer a general impression of travel behaviour. I created frequency graphs to analyse the survey data. Descriptive statistics were used to provide an overview of what the most and least popular choices were for the multiple-choice questions. In addition, the survey ended with the opportunity for respondents to include any comments they wanted to express in relation to transportation in Cork. These comments were analysed inductively, where themes arose by the frequency of what was mentioned. An inductive rather than a deductive thematic analysis was performed here because there were a significant number of comments that focused on issues beyond cycling, which have equal value but less relevance to aim of this thesis. Some of themes that arose included: “improvement of public bus system”, “car dependency” and “dangerous car road behaviour”.

### 2.3.2. Interview

#### *Transcribing*

All interviews were transcribed manually to support the coding of the interviews. A transcript can be defined as a translation of oral discourse into written discourse (Brinkmann and Kvale, 2018a). The way in which the interviews were transcribed were through a denaturalism approach, where grammar is corrected and interview noise such as stutters and pauses is removed (Oliver, Serovich, and Mason, 2005). Rather than naturalism where every utterance is transcribed in as much detail as possible, denaturalism was selected because the focus of the interview in this thesis is what the interviewee discusses and less so the way they speak. As Gibson and Brown (2009a) articulate, the way in which the transcription takes place is through reflection on the nature of the data required to answer the research questions.

#### *Thematic analysis - concept-driven, top-down coding*

To understand the students’ motivations and perceived self-efficacy surrounding cycling in Cork, a thematic analysis was conducted on the transcripts. A thematic analysis aims to search for aggregated themes within the data through analysing the commonalities, relationships, and differences across the data set (Gibson and Brown, 2009b). Although it can be criticized as a poor substitute for the lived experiences to which they refer, it represents and recontextualises the data which can create new readings and knowledge

creation. Thus, although the transcripts are extracting certain information from the interviewees that may become generalised and decontextualized, it provides a way to link and juxtapose the diverse experiences of the student cyclists and non-cyclists.

The themes were influenced by the framework of this thesis - a collaboration of the Theory of Planned Behaviour and the Politics of Mobility, in addition to the literature on the city as a sociotechnical system which views the physical and social infrastructure of cycling as important constituents of (emerging) cycling culture (*See Chapter 3 – Literature review*). Thus, the two central umbrella themes are “*motivations*” and “*ability*”. Because the themes are directly determined by the framework of this thesis, the coding of the transcripts are concept-driven and top-down. Coding is a structured process of allocating themes to the data set around topics crucial to the research question (Peters, 2017). As opposed to data-driven coding (also known as open-coding/empirical coding/bottom-up coding) where the researcher approaches a text with no pre-set lists of codes and attempts to tease out what is happening (Gibbs, 2007), concept-driven coding (also known as closed-coding/Apriori coding /top-down coding) is when the codes have been developed in advance by the researcher through consultation with existing literature in the field (Brikmann and Kvale, 2018b). Thus, concept-driven coding applied to this thesis has produced the codes; “attitudes”, “societal expectations”, “representations”, “practice”, “social infrastructure”, “built environment”, “relationship between different road users”, and “normalising cycling culture” which are used as analytical tools to support the production of the main themes. The list of codes has been amended during the analysis to include any new ideas or new ways of categorising when detected in the transcripts.

## **2.4. Ethical considerations**

Ethical dilemmas are to be expected when researching in the field of the social sciences due to the positions of power that many researchers have in relation to the participants, gatekeepers, and informants (Hay, 2016). It is important to be an ethical geographer because it helps protect those people and places affected by the research.

One ethical concern that arose before the collection of data is the privacy of the survey and interview respondents. Their privacy was ensured by anonymising their identity. For the

survey, no identifiable information was asked from them. Although there was the option to leave their contact details (name and email address) for the follow-up interviews, the interviewees were completely anonymised during the write up of the thesis. After the analysis was written, all raw data from the survey and interviews was deleted.

## **2.5. Reflexive research - positionality of researcher and interviewees**

Reflexive research can produce a more accountable and transparent form of research because it considers its limitations and bias, as well as the politics that shapes it (Peters, 2017). To conduct reflexive research, it was important to critically consider my positionality as a researcher by asking how the characteristics that shape my position (e.g., nationality, age, experiences, beliefs) might influence the research I conduct. As Valentine (2013) highlights, sharing the same background, interests, or identity to the informant can facilitate the development of a rapport between interviewer and interviewee which can produce a rich discussion based on empathy and mutual understanding. There were multiple social positionings I had that supported the accessibility to in-depth conversation during the interviews. Firstly, in the last two years I have recently shifted from a person who never cycled at all to someone who cycles everyday as a main mode of mobility. Therefore, I can reflect on my experiences with cycling and relate to the perceptions and experiences of all interviewees in terms of familiarity with the bike. In some cases, it was helpful that I am of Irish background with family living in County Cork, to be able to discuss street names in Cork City and demonstrate the personal familiarity and attachment I have to Ireland. Additionally, the shared positionality of being a student between myself and the research participants may have potentially encouraged the students at UCC to participate in my survey as they may understand the importance of data collection for a fellow researcher or to open up more in the interview because we may be going through similar experiences.

Not only does reflexive research require us to look at ourselves and our place in the world, but also outwards at how the positionality of the interviewees shapes what information they share and how they do so (Peters, 2017), essentially at how situated knowledge is produced. Situated knowledge is the production of knowledge that is subject to reflexive consideration and has considered the politics of positionality. To support this production of knowledge, I

attempted to capture a holistic perspective of the interviewees' travel behaviour and perceptions of cycling in Cork by asking a range of questions as to why they do or do not cycle in Cork in relation to the built environment, their social circle, the car culture in the Metropolitan Area, and their perceived image of cycling. By accepting that knowledge is created from a particular position, this thesis has collected and worked with positioned knowledge that is partial and subjective, as opposed to universal.

## **CHAPTER 3 - LITERATURE REVIEW**

### **3.1. Transport in Geography – the new mobilities paradigm**

The study of transport became a central part of Geography during the late 1960s and early 1970s where gravity models and spatial interaction theory were used to understand and predict transport-aided movement (Cresswell and Merriman, 2011). A 'rational-mobile-person' was conceived who made careful decisions about when and how to move. Although mobility is not "very new" in this academic discipline (Giddens, 2000, p1), in the past two decades, there has been a shift in thinking within the social sciences that prioritises the concept of mobility (Castree et al., 2013). Such a shift can be labelled as the "mobility turn" or "new mobilities paradigm" (Urry, 2007), which views 'rational' and 'irrational' mobility as important and worthy of study through a critical analysis of such practices, spaces, and subjects (Cresswell and Merriman, 2011). Mobile practices are understood to constitute places and meaningful activities along extensive networks of flows and mobilities (Massey, 1993). Places are tied into networks of connections that stretch beyond each such place (Mayhew, 2015). Thus, mobility can be understood as a fundamental spatial process interconnecting people and places (Castree et al., 2013). Additionally, work within the paradigm is characterised by examination of different modes of mobilities and their complex combinations by theorizing them holistically and relationally (Sheller and Urry, 2016). It can be said that mobility is about how geographic movement becomes entangled in the way societies and cultures assign meaning through practice and representations (Cresswell, 2006).

### **3.2. Encouraging an uptake of cycling – the creation of cycling culture**

The way in which mobility is practiced and represented can be said to be influenced by the built environment and the cultural and societal norms of a place. Studies in the fields of Urban Planning and Transport Geography have often been premised on a theoretical distinction between physical and social factors in encouraging cycling (Forsyth and Krizek, 2010; Heinen et al., 2010). However, this thesis argues that a holistic approach that



considers both factors as intertwined and constitutive of explaining travel behaviour is important to understand why different societies have a low or high cycle uptake.

### 3.2.1. Limitation of only prioritising the physical environment

The mantra “*If you build it, they will come*” has been a popular expression to indicate that provision of cycling infrastructure will lead to more cyclists (Dill and Carr, 2003). Active transport research from an engineering perspective on low-cycling contexts has typically highlighted the need to invest in safer segregated cycle lanes (den Hoed and Harvis, 2022). However, in the past decade, research in the social sciences has demonstrated the limitation of the influence of physical environment alone in encouraging cycling uptake. Take the example of Copenhagen, where despite a large mass of cycling commuters and fairly decent cycle infrastructure (multi-bike lanes, segregated lanes, traffic lights), Freudendal-Pedersen (2015) found that cyclists themselves still often prefer the car over the bike because the former is perceived as a safer mode of transport. Interviews and focus groups with residents of Copenhagen found that parents who cycle to work frequently find it too dangerous to allow their children to cycle to school because of traffic, bike congestion, and aggressive behaviour from cyclists. Choosing to drive their children to school instead materialises the fear of dangerous roads. Such findings illustrate how places are continually practiced and performed through the movement and enfolding of people and things (Cresswell and Merriman, 2011). Moreover, the existence of cycle infrastructure by itself does not necessarily imply a high level of cycling uptake or favourable attitudes towards cycling in terms of feelings of safety.

That is not to say that good cycling infrastructure and networks are not important for increasing cycling in cities (Buehler and Dill, 2016; Pucher and Buehler, 2017). But there is a limitation in assuming that the built environment is the only determinant. It is also important to consider the influence of social and cultural dimensions on the agenda. A more cultural approach to understanding how to create a more cycle-friendly environment with a high level of cycling uptake emphasises the need to change the image of cycling, to construct a more favourable and attractive shared understanding of this mode of transport (den Hoed and Harvis, 2022). Paying close attention to the social attitudes and knowledge networks that shape mobility is a relatively new focus.

### 3.2.2. The role of human infrastructure in creating cycling culture

First introduced by Adonia Lugo (2013), the concept of **human infrastructure** can be understood as the social networks and cultural practices that can support the rise of cycling as mode of transport. Lugo argues that human infrastructure shapes and has the potential to change transportation behaviour. As something beyond the material, infrastructure is relational as it shapes and is shaped by the conventions of a community of practice (Star, 1999). Infrastructure can thereby be described as a material interface between the wider city with social life, where people and social interactions play an important role in determining how people move (Jacobsen, 2003).

Nello-Deakin and Nikolaeva (2021) suggest that Lugo's (2013) concept of human infrastructure offers a useful lens to bridge the gap between the material and social factors in encouraging cycling, as these factors are entangled and co-constitutive. In their study approaching urban infrastructure and the city as a sociotechnical system (Nello-Deakin and Nikolavea, 2021; Amin, 2014), they qualitatively explored what makes Amsterdam a "cycling city" through semi-structured interviews with international newcomers. An important finding was that interviewees felt that the city feels built for cycling, which is partially the outcome of physical traffic infrastructure, but also of the shared social conventions which govern its use.

A further example of the entangled relationship between the built environment and human infrastructure on travel behaviour comes from Aldred and Dales' (2017) exploration of intangible constituents of 'ordinariness' in cycling mobility systems. They found that protected high-quality cycle infrastructure may help to 'normalise' the image of cycling because it reduces the dangers of cycling next to automobiles and thus the need for cyclists to wear protective gear and sporty accessories like high-visibility garments and helmets. Therefore, high-quality cycling infrastructure has implications for how cyclists mobilise themselves in terms of what they wear. These cyclists then are part of the human infrastructure which can shift the perception from cycling as a sport to cycling as a mode of transport, not only for the physical elite. This study exemplifies how people themselves can be seen as a form of urban infrastructure (Simone, 2004).

Furthermore, Jensen (2013) views urban mobility as an outcome of both staging "from above" by planners, engineers, and designers; and "from below" by people as they move

through the city. Cyclists and other road users can therefore be seen as a form of human infrastructure. Significantly, cyclists can contribute to shaping the politics of urban mobility which may transform streets and change minds (Henderson and Gulsrud, 2019; Macmillan and Woodcock, 2017) from their sheer presence and ability to influence political action as an organized collective. In practice and representation, cyclists as a form of human infrastructure play a crucial role in producing a place's cycling culture (Nello-Deakin and Nikolaeva, 2021). Human infrastructure can work positively to encourage cycling in the form of social networks and the presence of bike commuters, as well as negatively to discourage cycling in the form of aggressive motorist behaviours (Lugo, 2013).

### **3.3. Obstacles that discourage cycling for the (potential) cyclist**

The new mobilities paradigm interprets mobility within a wider context of established societal norms and ideologies which may or may not be common to a particular place (Adey, 2017). The meaningful and ideological coding of mobility can reflect contextual and societal attitudes and practices. Some representations of cyclists are reflected positively and can encourage uptake, such as the image of a cyclist as responsive to environmental issues, as rooted in one's locality, or as embodying a sense of independence and freedom (Aldred, 2010). However, much of the mobilities literature has pointed to negative interpretations of the practice of cycling contributing to a discouragement to cycle.

#### 3.3.1. Car culture

Mobility's relation to societal attitudes and social practices is raised in the discussion of the car and bike. The car should not be seen as an antithesis to the bike, nor does this thesis argue that the bike is a replacement for the car. However, this thesis argues that negative representations of cyclists from car drivers' perspectives from within a dominating car culture and the clash between cyclists and car drivers on the road are a result of the built environment and human infrastructure that contribute towards the creation of a negative perception of cyclists and cycling.

The rise of the car since the 1960s in Western countries has developed into a division of the private space of the car and the social space of the street, where those who habitually drive may not see the roads as a shared space (Lugo, 2013). To expand on these conflicting mobilities, it is helpful to use the concept of “habitus”, introduced by Bourdieu (1977), which can be defined as the internalization and repetition of societal norms and values through the body’s movements, practices, and routines. These practices and representations can be collectively orchestrated without direct conscious direction. Because of the dominating norm and value of car ownership, partly built upon the personalised and subjective temporalities that the car affords for people to move at a time and towards a destination of their choosing (Urry, 2000), the car has fused into the national consciousness through everyday mundane practices. It can be argued that as an entire culture it has transformed the landscape for all other mobility systems, which must find their place in a landscape predominately sculpted by it (Dennis and Urry, 2009). Thus, whilst the car provides an outlet of expression and emancipation for some, it restricts, excludes, and dominates others (Adey, 2017). From the internalised value of private automobiles, these drivers (consciously or not) play a role in the human infrastructure that disenables cycling mobilities.

### 3.3.2 Representations of cyclists and societal expectations

While an individual who cycles may not develop an identity around the practice, cycling carries social meaning and in certain spaces, particularly car culture, the socially constructed meaning can signify marginalization regardless of what cyclists themselves think (Lugo, 2013). Such marginalization in its numerous depictions can discourage acceptance of this mode of transport and its perceived self-efficacy.

Using the concept of stigma to explore cycling identities in the UK through interviews with cyclists, Aldred (2013) argues that people who cycle are caught between the threats of appearing too competent and appearing not competent enough, leaving them to negotiate a path between two problematic representations. In a world with roads that are not just a place of transit but an arena of identity formation, cyclists fear being recognised and stigmatised through the possession of sports gear (fluorescent jackets and helmets), yet simultaneously fear the consequences of not being seen and thus run over. This article demonstrates how transport modes can produce stigmatised social identities which are

mediated both by social environments and other social identities. Additionally, in the case study of Charleston, South Carolina (USA), cyclists spent as much time talking about their perceptions of anti-bike culture as they did about the challenges to their commute posed by the city's built environment (McCarthy, 2011). Cyclists engaged in sensemaking of their risks on the road in an unequal system in which drivers treat cyclists as outsiders, a key explanatory force behind why so many risks are associated with drivers and bike riders sharing the roads.

A final example of how representations of cyclists can challenge the idea that cycling is an easy, beneficial, and favourable mode of transport is from Bonham et al. (2020). In the context that novice drivers are now trained and tested on their ability to identify and correctly respond to traffic 'hazard cues' in Australia, Bonham et al. (2020) found that cyclists are constituted as 'hazards' by virtue of their presence on or near the road. Institutional bodies convey the representation of cyclists as hazards through driver licensing, transport, and motoring authorities. This representation materialises as raising doubts about cyclists as legitimate road users and provides reason for hostile views. Mobility is thus clearly shaped by and shapes political processes (Adey, 2017).

To summarise, multiple dimensions are at play that can influence one's motivations to cycle and their perceived self-efficacy. Physical and social infrastructure can both encourage or discourage cycling uptake. It is unclear which is more important, especially in an emerging cycling culture, but it is nevertheless essential to consider both factors. Additionally, there are representations of cyclists that have the potential to negatively scrutinize this mode of transport at the societal level. Evident here is the significance of exploring travel behaviour by considering a host of possible factors covering the physical environment and the psycho-socio-cultural milieu of the individual. However, there has been little work on the effect of attitudes towards mode choice and frequency with respect to cycling (Heinen et al., 2011). Moreover, understanding the wider set of factors that form a cycling culture would be highly valuable to cities aiming to stimulate cycling (Haustein et al., 2019).

### **3.4. Setting the scene for the framework**

The multiplicity of potential influences on travel behaviour, specifically cycling, are quite expansive. It could be argued that a conventional analysis of cycling behaviour may be a relevant approach for this thesis. Based on utility theory, this approach assumes that people decide on the best available transport mode by considering costs, time, and effort (Heinen et al., 2011). Although these socio-economic factors to some degree impact choice, they fail to explain why individuals in similar situations with corresponding socio-economic characteristics make different decisions about whether to cycle for utilitarian purposes. In comparison to socio-demographic segmentation (age, gender, occupation, ethnicity, income), theories that analyse the psychological determinants of travel mode choice explain more variance in this behaviour (Hunecke et al., 2010) and can be used to develop targeted services and campaigns to facilitate modal shifts (Haustein and Møller, 2016). Such conclusions can be supported by Haustein et al.'s (2019) study that compared cycling cultures in Stockholm and Copenhagen, finding that the difference in cycling levels between the two cities is related to the city's overall mobility culture (policies, norms, infrastructure), while socio-economic factors appear inadequate for understanding cycle uptake differences.

This thesis proposes that a holistic approach with a focus on the individual's motivations towards cycling and perceived self-efficacy to cycle can be used to encapsulate and explain the factors that determine the choice to commute by cycling over another mode, and vice versa. To reiterate, motivations are constituted by the factors that depict cycling as beneficial/detrimental or favourable/unfavourable. Perceived self-efficacy in this context is the extent to which an individual feels that they can or could cycle with ease, in relation to aspects of safety, accessibility, and affordability. From the disciplines of Psychology and Geography, this thesis utilises Ajzen's (1991) Theory of Planned Behaviour with support from Creswell's (2010) Politics of Mobility to investigate the attitudes and perceptions of cycling, the latter of which is expanded on in Chapter 4 - Framework.

### **3.5. What is the Theory of Planned Behaviour?**

The Theory of Planned Behaviour (TPB) can predict and explain human behaviour (Ajzen, 1991). It is a psychological attitudinal theory (Heinen et al., 2011) that postulates three

conceptually independent determinants that account for considerable variance in human behaviour; *attitude*, *subjective norm*, and *perceived behavioural control*.

**Attitude** can be defined as the individual's belief(s) about the behaviour in terms of the degree to which they evaluate it as favourable or unfavourable, and the importance that the individual assigns to each belief (Ajzen, 1991; Heinen and Handy, 2012). **Subjective norm** can be understood as the perceived social pressure to perform the behaviour, constituted by the likelihood that the people in the individual's important social circle (e.g., friends and family) may approve or disapprove of it (Ajzen, 1991). **Perceived behavioural control** considers "the perceived ease or difficulty of performing the behaviour" which reflects "past experience and anticipated impediments and obstacles" (Ajzen, 1991, p188). According to the TPB, the more favourable the attitude, subjective norm, and/or perceived behavioural control, the stronger the intention to perform the behaviour (Jones, 2012). In other words, the behavioural achievement of an individual depends jointly on the **motivation or intention** to perform this behaviour, constituted by the dimensions of attitude and subjective norm, as well as the **ability**, constituted by behavioural control (Ajzen, 1991). Both intention and ability can significantly influence the prediction and explanation of behaviour, but depending on the context, one may be more important, or only one of these factors may have influence.

To give an example of when only ability has an influence on behaviour: in a city with little to no investment in road infrastructure for cycling, an individual may be very motivated to cycle and value this mode of transport highly but won't cycle because they perceive it as too dangerous and difficult without segregated and extensive cycle lanes. Conversely, when motivations have an influence on behaviour and not ability, someone in the same scenario may be so enthusiastic to cycle that they adapt to the low quality or non-existent physical cycling infrastructure and cycle regardless. An example of when both intention and ability significantly influence behaviour is demonstrated by the case study of Amsterdam (Nello-Deakin and Nikolaeva, 2021), which found that immigrants to the city started to cycle because of both the advanced physical cycling infrastructure and the Dutch societal norm that everyone cycles as a mode of transport. As demonstrated, the TPB is useful for understanding mode choice decisions because it can holistically emphasise the significance

of individual motivations and perceived ability, in conjunction with the social and physical environment (Heinen and Handy, 2012).

### **3.6. Previous research on cycling behaviour and the TPB**

Several studies have used this theory to explore motivations and perceived self-efficacy towards cycling, to comprehend and predict intentions to cycle. These vary in how they adapt the theory to their research, and whether their research takes a quantitative or qualitative approach.

Haustein and Møller (2016) identified distinct subgroups among e-bike users to determine whether age or attitudinal factors are a better determinant for use of and a better target for achieving behaviour change. By quantitatively analysing their survey on regular e-bike users in Denmark with a principal component and cluster analysis, they found that the specific motivation to use an e-bike and users' general attitudes are more relevant than age for cycling patterns and achievable behavioural changes. One limitation of this research which the authors recognised was that the attitudinal factors of social norms and perceived constraints should be included, which could lead to more specific starting points for interventions.

Heinen et al. (2011) and Jones (2012) quantitatively researched cycling behaviour through the three original dimensions of the TPB, as well as habit, which this thesis argues provides a deeper understanding of travel behaviour than focussing only on attitudes. Heinen et al. (2011) conducted an internet survey of cyclists and non-cyclists on the effect of attitudes, subjective norms, perceived control behaviour, and habit on bicycle commuting amongst a sample of several large companies and residents in the Netherlands. Their statistical analysis found individuals largely based their decision to cycle on direct benefits in terms of time, comfort, and flexibility - demonstrating that attitudes and other psychological factors have a relatively strong impact on the choice to commute by bicycle.

Similarly, Jones (2012) adapted the original TPB to help identify whether proximity to traffic-free cycling paths encourages cycling for everyday travel amongst a community living adjacent to this space. In addition to the original three dimensions, two other measures are



suggested to explain and predict travel behaviour: past behaviour and anticipated regret. According to Jones (2012), past behaviour has an independent influence on future behaviour (Sutton, 1994) and can be understood in this context as the self-reported frequency of practical cycling in the past month. Based on regret theory, anticipated regret considers how people attempt to avoid decisions that could result in regret (Sandberg and Conner, 2008). These indicators of explaining and predicting travel behaviour structured the survey, which was disseminated in two neighbourhoods with different proximity to the traffic-free routes. A data comparison using the non-parametric tests of Mann-Whitney and Chi-square, found little support to conclude that that availability of the traffic-free path was the main factor for a higher rate of cycling in the neighbourhood of closer proximity. Thus, this study highlights the need to consider a host of possible explanations for travel behaviour including the physical environment and the psycho-socio-cultural milieu of the individual (Jones, 2012) such as transport connectivity, proximity of journey attractors, and individual desirability towards cycling in comparison to driving.

In contrast to these studies, Heinen and Handy (2012) take a qualitative approach to understand cycling behaviour. Interviews with bicycle and non-bicycle commuters in the Netherlands and California on their attitudes and subjective norms towards bicycle commuting were conducted to explore to what extent these motivations are similar and different in different settings and how they affect cycling behaviour. A key finding was that many non-cyclists did not perceive the benefits of cycling or attached low importance to them, but some non-cyclists did attach importance to them. Resultingly, this mismatch between their behaviour and attitudes suggests that even if attitudes and beliefs are important, they are not enough to overcome constraints and achieve behaviour change (Heinen and Handy, 2012).

### **3.7. Limitations of previous cycling research that utilised the TPB**

This thesis acknowledges the value of quantifying attitudes, subjective norms, and perceived behaviour control to achieve generalisations of a given population or demographic as seen in Jones (2012), Haustein and Møller (2016), and Heinen et al. (2011). However, the aim of this thesis is to highlight the importance of in-depth discussion to gain a sense of which factors

are most influential to an individual when it comes to travel behaviour. Albeit Heinen and Handy's (2012) qualitative work aligns most strongly with this thesis, its limitation is that it does not incorporate the dimension of perceived behavioural control. Focussing only on the motivational factors means there is a lack of consideration for the barriers individuals perceive when choosing their mode of travel, which has the potential in some contexts to be more influential than the motivations. As stressed by Haustein and Møller (2016), including all three dimensions of attitudes, norms, and perceived behavioural control can provide a fuller understanding and prediction of travel behaviour.

It can be argued that the addition of past behaviour to the TPB can also contribute to this objective, as seen in Heinen and Handy (2012) and Jones's (2012) work. However, this thesis supports Ajzen's (1991) understanding that past behaviour cannot be considered a causal factor in its own right because attitudes, subjective norms, and perceived self-efficacy are all residues of past experiences. The implications of choosing this approach for this thesis is that, for example, if someone has used public transport as their main mode of transport all their life, one could argue that habit is the most significant factor that influences future travel behaviour, since they will continue to do so. This thesis argues that in this example, the repetitive choice to take public transport is actually an outcome of the motivations and perceived ability surrounding that mode of transport in relation to the alternative ways of moving around at that time.

## CHAPTER 4 - FRAMEWORK

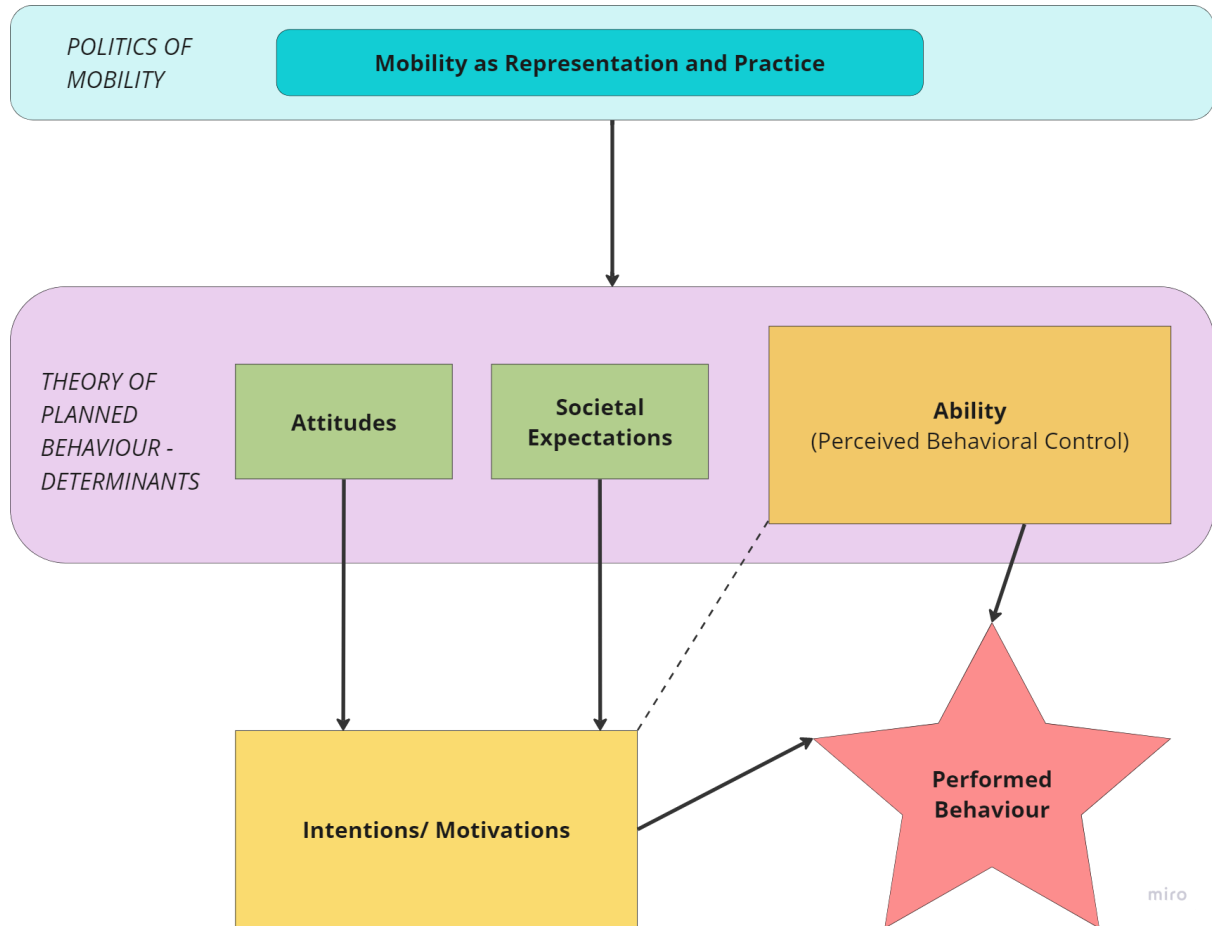


Figure 1 – Framework (Source: Author, 2023).

### 4.1. The application of the Theory of Planned Behaviour

Ajzen's (1991) TPB is used as a framework to approach the city as a sociotechnical system constituted by both the physical and social factors of cycling infrastructure. This thesis uses this framework to investigate the perceived various influences of social infrastructure and built environment on modal decision. It argues that both the existing social infrastructure and built environment, which constitute an (emerging) cycling culture, shape the individual's norms, attitudes, and perceived control behaviour towards cycling, which can explain their current transportation mode(s).

For example, one may feel that they are expected by society to drive to work. The factors that produce this expectation can be influenced by the social and physical environment, such as a culture where the private car is symbolic of status and wealth, or by the design of public roads prioritising the flow of car traffic over bikes or pedestrians. Another example can be that someone who does not cycle perceives this mode of transport as a risk to their safety, and thus views the ability to perform this behaviour as low. This perception of danger can stem from both the physical environment, such as a lack of segregated and extensive bike paths, as well as the social environment, like aggressive and offensive road behaviour from automobile drivers.

## 4.2. Politics of Mobility

The TPB is a very relevant and useful contextual framework for this study. However, what is ambiguous for the researcher is how to capture the perceptions of each of the theory's dimensions. Specific to this thesis, the researcher must figure out how to gain qualitative insight into the motivations and perceived ability to cycle as mode of transport. The Politics of Mobility theory by Tim Cresswell (2010) offers an approach to this shortcoming by considering how **representations** and **practices** of mobility influence motivations and perceived ease/difficulty of using this mode of transport, which in turn may impact the individual's actual travel behaviour. This theory understands mobilities as being both produced by and productive of the social relations that involve the production and distribution of power (Cresswell, 2010). Although there is a strong influence of structural power on mobilities in terms of capital's interest in specific mobility systems, the gasoline industry, and developers' interests to name a few, this thesis focuses on the power relations between the different road users in the Cork Metropolitan Area and the role of the local government in shaping their mobilities.

This theory views mobility as an entanglement of physical movement, representations, and practices. Importantly, these aspects of mobility are bound up with one another. Firstly, mobility as physical movement has a reality in which it can be measured and mapped. This is a positivist analysis of movement, and thus alone does not consider what mobilities are made to mean or how they are practised. For the relevance of this thesis, the two other two

concepts of representation and practice are of particular use for this thesis. Secondly, representations of mobility understand it as encoded culturally and socially. Considering the narratives around mobility helps us to understand how mobilities can be portrayed in certain ways, such as adventure, freedom, or threatening. For example, a study in London investigated why most cyclists were White despite 40% of the population being non-White (Steinbach et al., 2011). They found that media representations played a key role. From the perspective of Black women cyclists, a lack of media representation of Black people cycling cements the societal expectation that cycling is only for White people. Thirdly, mobility as practiced highlights the ways in which mobility is enacted and experienced through the body and thus considers the implications of one's (lack of) experience of cycling and/or interaction with cyclists. To bridge these last two aspects, Cresswell (2010) notes that our mobility practices may or may not conform to the representations that surround them, that there may be a dissonance between representation and practice.

### **4.3. Strength of utilising the Politics of Mobility theory**

By exploring the three dimensions of the TPB with the supporting lens of the Politics of Mobility (specifically the concepts of mobility as representation and practice), this framework takes a holistic approach to understanding what constitutes the motivations and perceived ability of an individual towards cycling (*See Figure 1*). The representations and practices of cycling are lenses to explore why certain opinions are held about cycling and why people choose to cycle or not. Arguably, this approach can be understood as holistic in relation to the previous research conducted with the TPB and their limitations, as this thesis explores the determinants of cycle uptake from all three determinants of this theory. Moreover, in contrast with the existing research on this subject, this thesis investigates the relationship between travel behaviour and the physical and human infrastructure of cycling, and its implications at the individual and societal level on mobility choices. The collaboration of both theories to produce this singular framework facilitates the evaluation of whether the motivations of an individual to cycle are more or less important than their perception of the extent to which they can cycle with ease, when it comes to deciding to cycle or not. Exploration of such analysis is important, because although a person may like the idea of cycling, it may not be explicit if the reason the individual doesn't perform this behaviour is

because they perceive it as being too difficult to do, or if they perceive it as relatively easy to perform, but there is not enough motivation to do it. Utilising the framework, this thesis aims to explore how the motivations and perceived ability to cycle, situated within the social and physical cycling infrastructure of an emerging cycling culture, influence the decision to cycle as a means of transport.

## CHAPTER 5 - CASE STUDY

### 5.1. Cork Metropolitan Area, Ireland

This paper will utilise the case study of Cork Metropolitan Area (CMA) in Ireland to explore how the motivations and perceived ability to cycle influence the decision to cycle as a means of transport in an emerging cycling culture. CMA is situated in the south of the Republic of Ireland (See Figure 2). In 2019, its city boundaries expanded to include bordering satellite towns as shown in Figure 3. Thus, this area includes Cork City, its suburbs, and the towns and rural areas in the immediate hinterland of the city as a single integrated unit (Creegan et al., 2020). CMA covers 820km<sup>2</sup> and has a population of just over 305,000 in 2016, where approximately 126,000 of its residents live within the Cork City boundary (Creegan et al., 2020). Cork City is a medium-sized European city and has the second largest urban population in Ireland (Cork City Council, 2020). It is projected that Cork will become the fastest growing city region in Ireland, with a 50% to 60% increase of its population by 2040 (National Transport Authority, n.d.).



Figure 2 – Location of Cork in the Republic of Ireland (Source: Author, 2023 – made in ArcGIS).

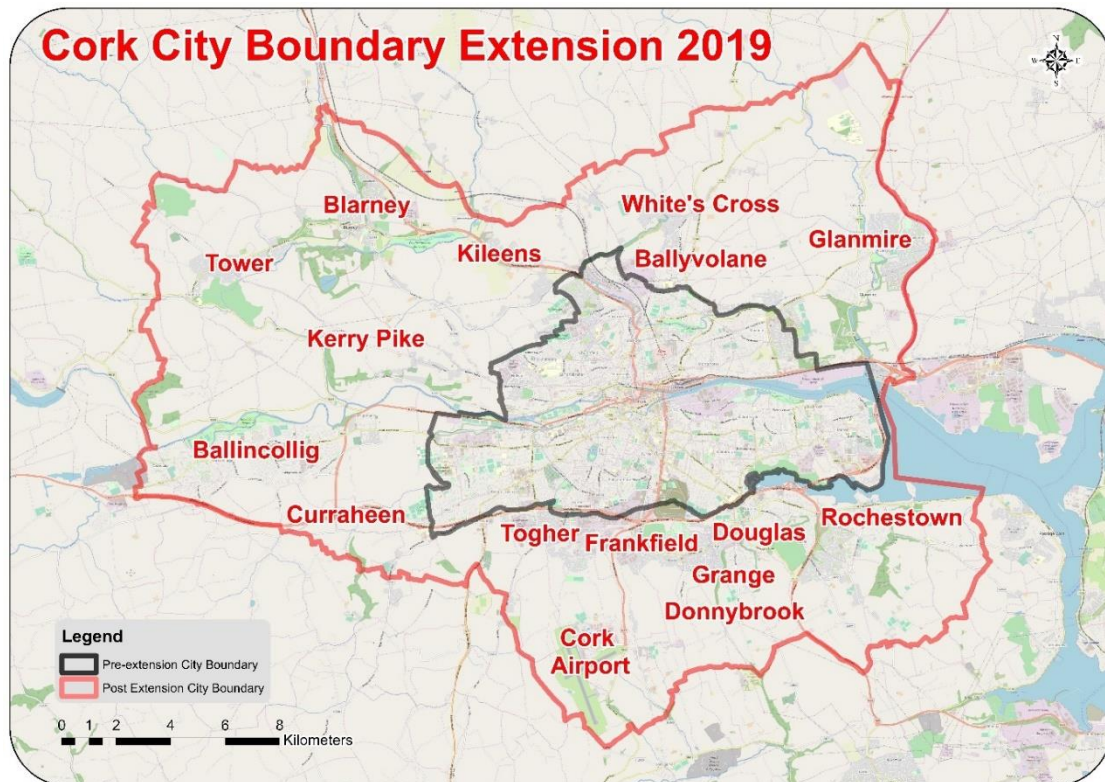


Figure 3 - Cork Metropolitan Area and city boundary (Cork City Council, 2019).

## 5.2. Weather and topography

Taken from averages between the years 1981 and 2010, the mean temperature in the CMA throughout the year is 9.9C (Met Éireann, n.d.). Summers are comfortable and partly cloudy, winters are long, very cold, wet, and mostly cloudy, and it is windy year-round (Weather Sparks, n.d.). On average, it rains a total of 1227.9mm a year with a mean of 11.3 days per year of snow or sleet (Met Éireann, n.d.). Rainfall occurs throughout the year and the most rain occurs in December with an average of 93.9mm (Weather Sparks, n.d.). Within Cork City, the minimum elevation is -3m and the maximum elevation is 177m with an average elevation of 66m (Topographic Map, n.d.) (See Figure 4). Topography 3km from the city centre contains only modest variations in elevation, with a maximum elevation change of 144m and within 15 km of the centre contains only modest variations in elevation (250m) (Weather Sparks, n.d.). Within 80km of the centre contains very significant variations in elevation of maximum 923m (Weather Sparks, n.d.)



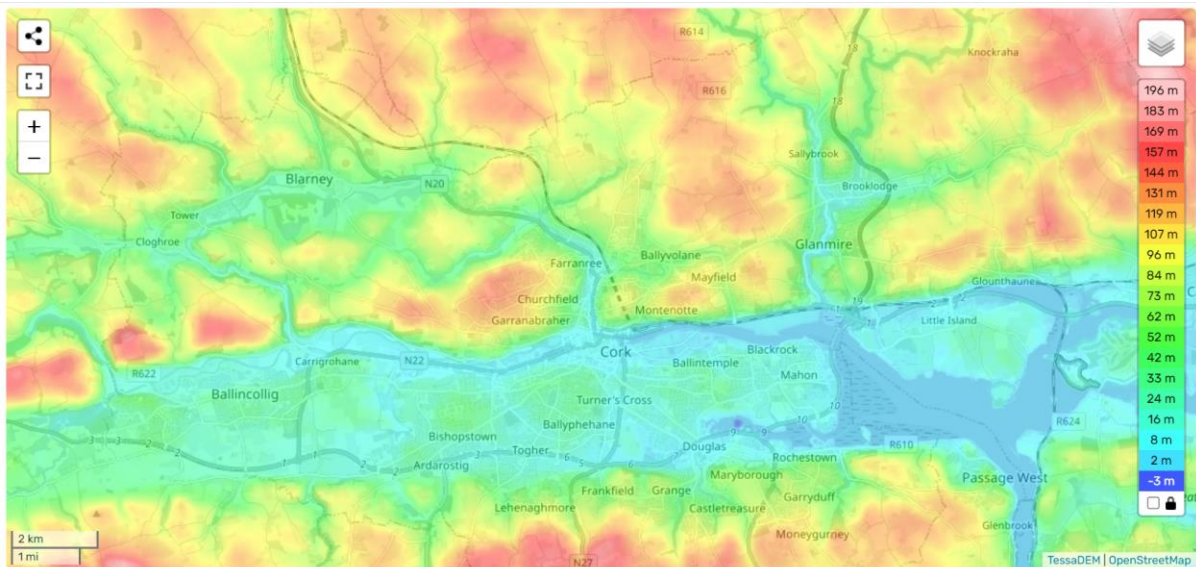


Figure 4 - Cork City topographic map (Topographic Map, n.d.).

### 5.3. Transportation and modal share

There are approximately 820,000 trips originating within the CMA on average each weekday (Creegan et al., 2020). The CMA has a legacy of high car dependency primarily due to dispersed settlement and employment patterns. 63% of Cork City’s population uses private transport (private car, van, lorry) to travel to work and education (Cork City Council, 2020). In Cork City and suburbs in 2016, almost 80% of households owned at least one car and over 25% of households owned at least two cars (Central Statistics Office, 2016). The second most popular means of travel in this area and year was walking, which took the share of 13.6% of all trips (Central Statistics Office, n.d). Third most popular means of travel for commuters was public transport (bus or train), consisting of 8.5% of the population or 7,166 people (Central Statistics Office, n.d). The number of people who cycled to work in Cork City and suburbs stood at just 2,330 in 2016, accounting for just 3% of all working commuters (Central Statistics Office, n.d.).

### 5.4. Cork City Council’s cycling agenda

Ireland has recently picked up momentum with developing a cycling culture. In 2020, it was announced that Ireland will invest 10% of the total transport capital budget on cycling, a

significant improvement from 2018's investment of 2% of the transport budget (Küster, 2020). And in December 2021, the Irish government approved detailed plans for the development of a major cycling network across the country as part of a wider strategy to deliver on climate action commitments (Delaney, 2022).

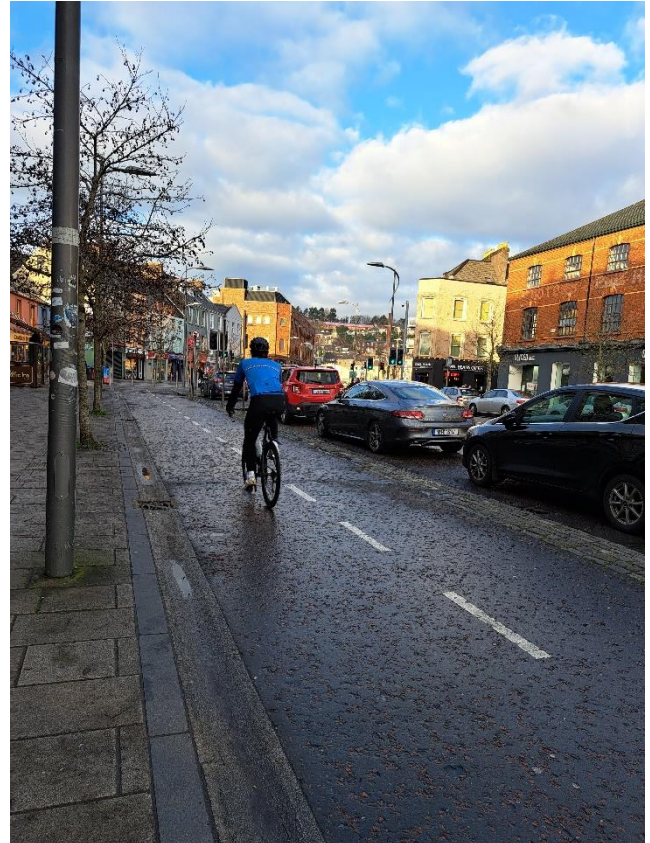
At the metropolitan level, there have been recent efforts to improve the transportation network. The Cork Metropolitan Area Transportation Strategy 2040 (CMATS) represents a coordinated land use and transport strategy for CMA (Creegan et al., 2020). It has been developed by the National Transport Authority in collaboration with Transport Infrastructure Ireland, Cork City Council and Cork County Council. A key principle for CMATS is to reduce dependency on the private car, increase the appeal of sustainable transport options, and support an efficient transport network. From this strategy, various challenges are highlighted that explain some complications for shifting from a car-dependent city-region to one that prioritises sustainable active transportation (Creegan et al., 2020). In terms of land use and physical constraints, CMA is confronted with steep topography in the suburbs. Additionally, there are many competing demands for scarce road and kerbside space for different road users because Cork's City centre is the major regional centre for employment, education, retail and leisure for a large geographical area. Consequently, there are a significant number of long-distance trips made primarily by car. In consideration of travel behaviour, there is an over-reliance on the private car for relatively short trips and low level of parking control which leads to commuter parking in residential areas. Furthermore, there is a relatively low mode share of cycling and limited dedicated physical cycling infrastructure.

The current physical cycling infrastructure can be visualised in Figure 7. Evidently, there is a large inconsistency of cycle paths in CMA, ranging from protected cycle lanes (*See Figures 5 and 6*), cycle lanes that share the space with the double decker public buses, and unprotected cycle lanes that share the road with all other road users. The map of Cork's physical bike infrastructure was produced by the Cork Cycling Campaign, an independent volunteer group working to make Cork a bike-friendly city. The Cork Cycling Campaign can be considered the only official organisation that works towards pushing the cycling agenda in Cork. The Campaign is part of Cyclist.ie, the Irish Cycling Advocacy Network, the European Cyclists' Federation, and the Cork City Public Participation Network. It works with local

councils, community groups, and other institutions to improve cycling infrastructure and to encourage people to cycle.



*Figure 5 - Photograph of cycle lane on South Mall (Source: Author, 2023).*



*Figure 6 - Photograph of cycle lane on Parnell Place (Source: Author, 2023).*

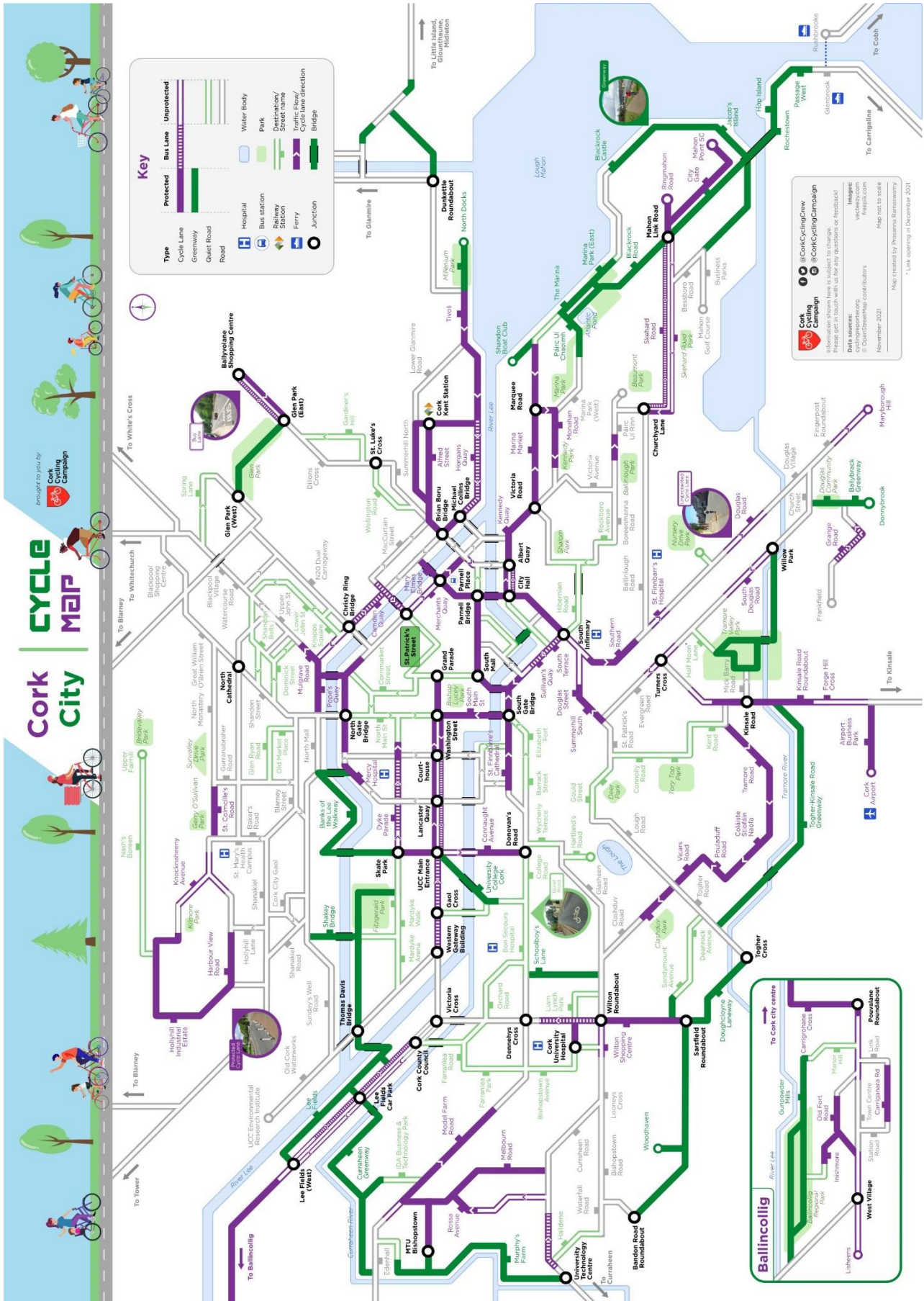


Figure 7 - Map of Cork's cycle network (Cork Cycling Campaign, 2021).

## CHAPTER 6 - FINDINGS AND DISCUSSION

### 6.1. Overview of survey results and interviewee profiles

#### 6.1.1. Survey results

The survey received 94 responses in total. More than half of the respondents (52%) (\*all percentages calculated to nearest significant figure) are between the ages of 17 and 20, followed by 29% between 21 and 25, and 14% between 26 and 35. The majority of respondents identified as women (66%), of Irish nationality (83%), and undergraduate students (85%). Of the four colleges at UCC, 65 out of 94 respondents are from the College of Science, Engineering, and Food Sciences and 24 from the College of Art, Celtic Studies and Social Sciences. 65% of respondents have been living in the Cork Metropolitan Area for over three years, 19% for 6-12 months, and 11% between one and three years.

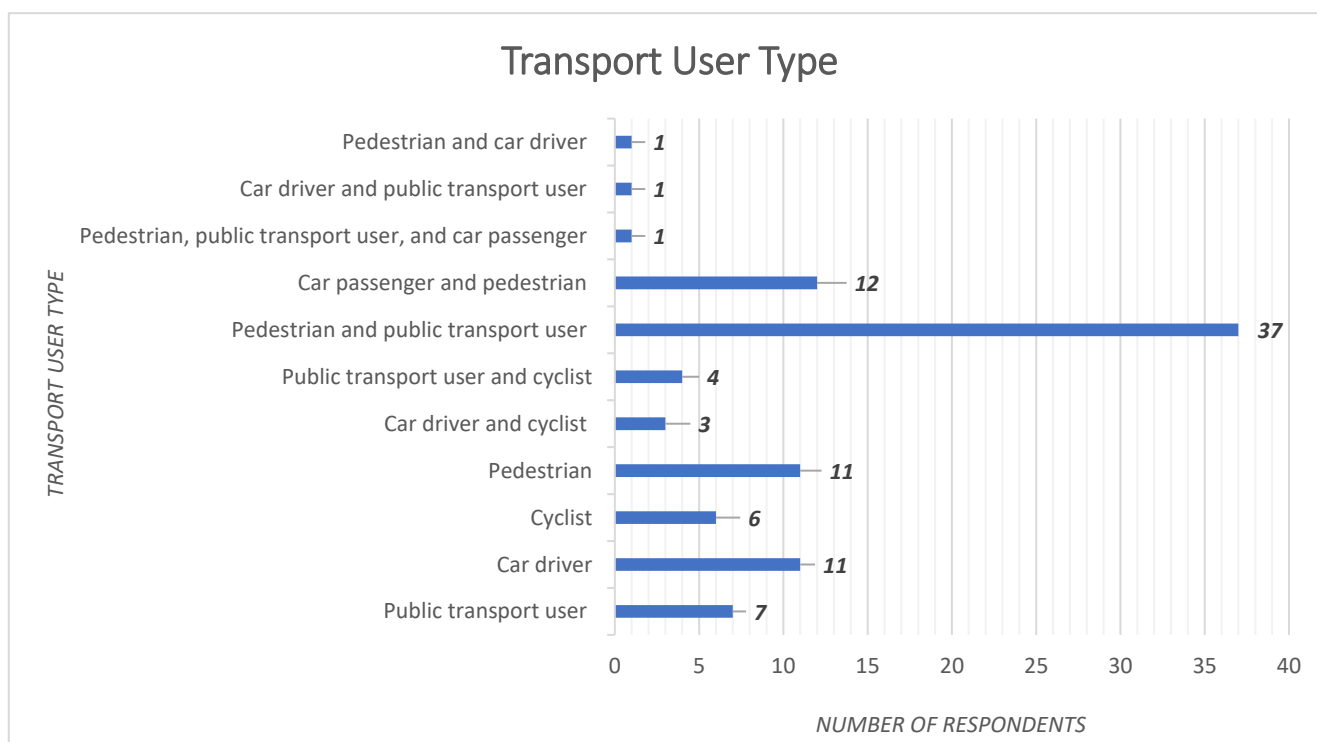


Figure 8 - Survey results: Transport user type.

By far, most respondents categorised themselves as pedestrian and public transport users (37 respondents), followed by car passenger and pedestrian (12 respondents), pedestrian (11 respondents), and car driver (11 respondents) (See Figure 8). Although 54% of respondents possess a driver’s licence and 58% have access to a car either always or sometimes, only 17% consider themselves a car driver. This self-classification is reflected in the average weekday commute results as shown in Figure 9, where walking is the most popular means of transport, followed by taking public transport.

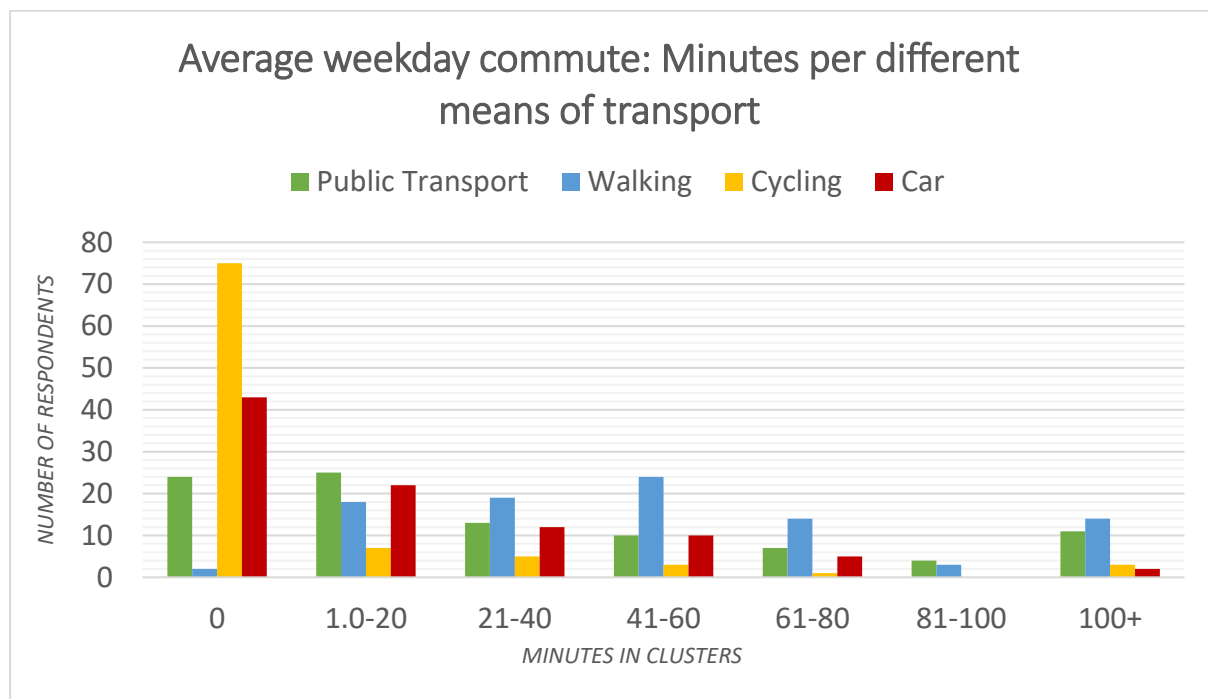


Figure 9 - Survey results: Average weekday commute: Minutes per different means of transport.

In contrast, cycling is the least popular mode of transport. 75 respondents on average spend no time cycling. The majority of those who cycle take short trips lasting between 1 and 20 minutes. Of all respondents, only 13 consider themselves as cyclists (6 as cyclists, 4 as public transport user and cyclist, and 3 as car driver and cyclist). However, 29 respondents indicated that they always have access to a functioning bike and 16 sometimes have access to a bike.

In summary, most respondents for this survey are Irish women between the ages of 17 and 20 who have lived in CMA for more than 3 years. Around half have access to a bike (always and sometimes) and half have a driver's licence. However, the majority consider themselves to be pedestrian and public transport users. Thus, cycling and car are the least popular mode of transport. Of the two, cycling is less common where 75 respondents on their average weekly commute will never cycle versus the 43 respondents that will never take the car.

#### 6.1.2. Profile of interviewees

In total, five students at UCC were interviewed about their commute to campus and habitual modes of transportation. Two considered themselves non-cyclists, one a pedestrian (code name John) and the other a train user and pedestrian (code name Jessica). Three categorised themselves as cyclists. One exclusively commutes with an e-bike (code name Alexa), the other travels either by train and bike or car (code name Stuart), and the last either cycles or takes the motorbike (code name Kevin). Alexa and Jessica identified as women and John, Stuart, and Kevin identified as men (*See Table 3 for more information*). None of the interviewees took the bus as their main mode of transport. Alexa mentioned that she took the bus only if weather conditions were poor.

Table 3 - Profile of interviewees.

Interviewee	Main mode of transport	Experience cycling as mode of transport	Time living in Cork Metropolitan
John	Walking	Walking is main mode of transport: 10 minutes to campus, + drives at home Knows how to cycle but never cycled in Cork, only in rural settings No one in social circle cycles	2 years
Jessica	Train and walking	Since moving to Cork in 2022, started walking as main mode of transport and continues to do so Commute to campus: train to city centre and then a 30-minute walk Can cycle but does not regularly; no one in social circle cycles	8 months
Stuart	Cycling and train or private car	Either bikes and takes train to campus, or goes by car Lives in commuter town, 30 min drive away or a 10 min drive from house to station, 20 min train ride, 15-20 min bike ride from station to campus Cycles almost everyday; in Summer, may cycle whole route which takes 1h10 Familiar with cycling since young age	Whole life
Kevin	Cycling or motorcycle	Cycles to campus twice a week and takes the motorcycle three times a week Cycles competitively as well as a mode of transport; familiar with cycling since young age Takes 1 hour each way to cycle (30 km)	Whole life
Alexa	E-bike	E-bike is main mode of transport (to go to campus, to visit friends, to do food shopping) Could be cycling to UCC 6 times a week via e-bike Started cycling from 2020 When rainy, will take the bus to avoid slippery roads on e-bike	Whole life



## 6.2. Research Question 1 – To what extent does cycling in Cork come with ease?

### 6.2.1. Obstacles to up-taking cycling

Perceived self-efficacy and the concept of ability can be understood as the perceived ease or difficulty of performing a behaviour which reflects past experience and anticipated obstacles. Several themes were mentioned as to why cycling is such a difficult behaviour to perform for both cyclists and non-cyclists, such as accessing and maintaining a bike. For non-cyclists, both John and Jessica expressed reasons why it would take a lot of effort to start cycling. Investment in time and energy to start this practice is one barrier for them. John specified how finding and maintaining a bike, knowing where to securely park it, and buying bike locks are an impediment to taking up cycling, whereas for Jessica it is more about finding the time to learn a potential bike route to campus where she can be on cycle paths most of the way. The three cyclists also weighed in on the topic of bike accessibility and maintenance. Jessica noted that the cost of bikes makes cycling inaccessible, especially for those on social welfare. Both Kevin and Stuart recalled their experiences of cycling to highlight how there is a need for more and better secure bike locking areas and observed that to maintain a bike on a budget you must learn to repair it yourself. An additional topic was how other modes of transport were seen as more convenient. Because of the time-efficiency of the car, Stuart has recently started driving more and cycling less to campus. For John because he lives a 10-minute walk away, it is easiest for him to walk. In addition, two respondents from the survey left the additional comments on the issue of Cork's topography and climate, that it is difficult to cycle because of the steep hills and the rain.

The central topic of ability and the difficulties of cycling brought up by the interviewees concerned issues of safety in terms of the physical infrastructure on the road and behaviour of other road users. Most of this discussion was brought up by cyclists rather than non-cyclists. Interviewees remarked on how the physical cycling infrastructure in CMA has many limitations. Because of the lack of connectivity of cycle lanes, and thus the weaving between cycle lanes and traffic, Kevin argues that *"sometimes it is just easier to skip the cycle lane altogether"*. Furthermore, the poor cycling network was perceived by interviewees as contributing to the dangers of cycling. Even as an experienced utilitarian cyclist, Stuart

acknowledged that it is difficult to cycle somewhere unfamiliar in the city due to the inconsistency of the bike lanes. From the perspective of John, a person of no experience cycling in Cork, he also recognised that the inconsistency between good bike infrastructure in some parts of city and then none in others makes it more difficult to cycle or be attracted to the idea of cycling. Cycling in traffic amongst the cars is what makes cycling “*kind of scary*” for Jessica, a problem which John argues could be mediated by dedicated cycle paths along the roads. As discussed in the active transport research, the value of safe, segregated, and continuous cycle lanes expressed by the interviewees reiterates the engineering perspective within academia, that the investment in this kind of physical infrastructure is crucial for cycle-uptake in low-cycling contexts (den Hoed and Jarvis, 2022; Buehler and Dill, 2016; Pucher and Buehler, 2017).

Interviewees not only associated a perception of danger with cycling because of the inconsistent cycling network, but also to the aggressive and disrespectful behaviour from other road users towards cyclists, producing a shared understanding that cycling in CMA is a difficult behaviour to perform. Cyclists Alexa and Stuart discussed how cars often park in cycle lanes, which can be dangerous when trying to manoeuvre out of the cycle lane and into the traffic, especially if the vehicles in traffic are not paying attention. This finding relates to the observations of Adey (2017) who argued that in places of dominant car culture, the internalised value of private automobiles consequently subordinates and restricts other modes of transport. Here, the car is quite literally taking over the bike through domination of space, and implicitly indicating that the bike does not have the right to the road. According to Stuart, this obstacle is more prevalent around the city borders and the suburbs than in the city. Alexa talked about how cyclists must be brave and confident on the road when having to interact with other road users:

*“If I am going in a high traffic time, you just have to not give a fuck and cycle forward because the cars aren’t going to give you any leeway unless they are a really nice person. That’s what make my routes in particular kind of inaccessible.” (Alexa)*

Reflecting on his experiences and society's perspective on cycling, Stuart explained how once you have cycled enough you become confident on the road – but the infrastructure to be and feel safe cycling is not there, which is a barrier to non-cyclists who have yet to develop this confidence. Indeed, John shared such interpretation by claiming how cycling in Cork is not worth the risk or the exposure to abuse from other road users. He understands that to cycle, you would “*have to have your wits (about you)*”. Alexa explained the difference in perceptions of safety between a cyclist and a car driver, how as a cyclist in a poor cycle infrastructure network your safety is your responsibility, whereas a car driver may feel automatically protected and in control of their own safety. As seasoned cyclists, Stuart and Kevin still avoid certain routes, particularly multiple lane roads at peak traffic times to avoid aggressive road behaviour of car drivers and thus ensure their own safety. Additionally, it is not only car drivers that endanger cyclists, but also pedestrians and buses. Kevin and Alexa expressed their frustration with pedestrians walking on the cycle lanes, and how there is then a responsibility for cyclists to avoid harming them, but like the parked cars, the pedestrians then force the cyclists to swerve around them. Cycle lanes that are shared with buses combined with inattentive bus drivers caused one interviewee to be hit by a bus, as well as a near miss for another interviewee. These observations support Lugo's (2013) theory on human infrastructure and the relationality of mobility, that people and their social interactions are a form of infrastructure that play an important role in determining how people move.

Additionally, Kevin stressed how the legal consequences for drivers of automobiles injuring cyclists are often weak, recollecting multiple cases where people were killed on the road cycling, and recalling how the people responsible for doing it received no jail time, only a couple of thousand euro fine. This point highlights how mobility culture is a product of power relations and policy that stretch beyond the place in which the mobility is practiced which can in turn abnormalize the practice of cycling (Haustein et al., 2019; den Hoed and Jarvis, 2022).

### 6.2.2. Why cycling is considered a behaviour of ease

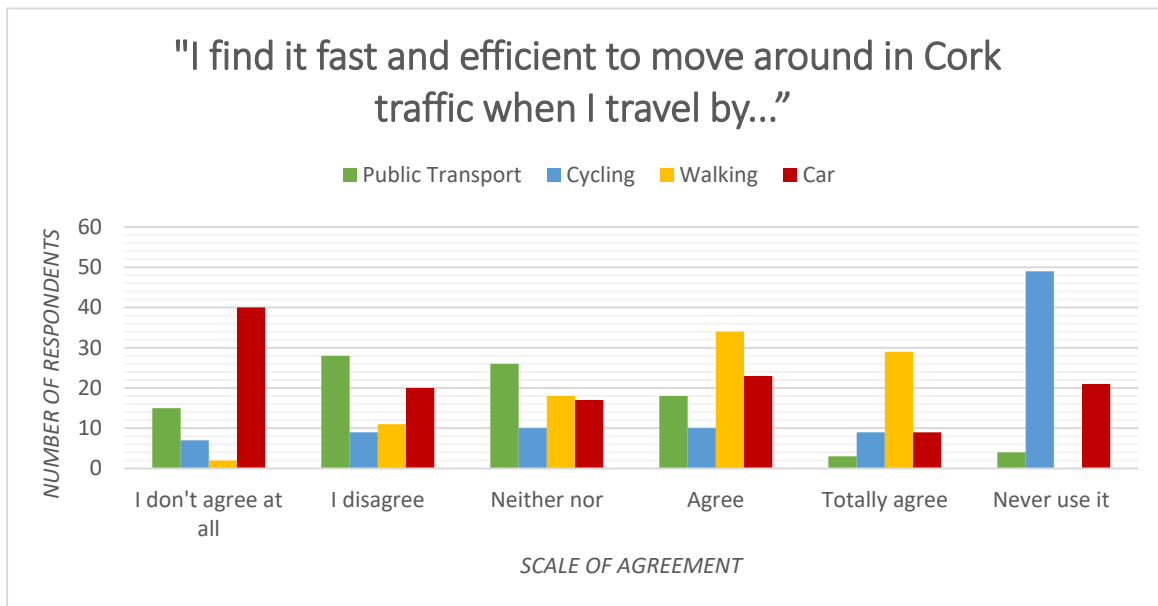


Figure 10 - Survey results: "I find it fast and efficient to move around Cork in traffic when I travel by..".

So far, the reasons why cyclists and non-cyclists perceive cycling in Cork as a difficult behaviour has been discussed. This section explores why cycling is also seen as a mode of transport that can be done with ease. Comparing the bike to the alternative modes of car and bus, cyclists Kevin and Stuart highlight the efficiency of the bike in getting around. Due to traffic congestion in the city, Kevin argues that with a bike it is more time-efficient to get to where you're going and find parking than with a car. In comparison to the bus, the bike is more affordable, faster, and reliable to get from the train station to campus. Stuart cycles this route which takes 15-20 minutes, as the bus journey could amount up to 40 minutes in peak time. After years of practice and experience cycling, both feel more comfortable, confident, and safer on the routes they take and being close to automobiles, which contributes to an increased sense of cycling as an easy mode of transport to carry out. Viewing mobility as practiced (Cresswell, 2010), clearly frequent patterns of cycling can contribute to a higher perception of the ability to perform this behaviour.

The results from the survey do not greatly reflect these sentiments from Stuart and Kevin. For the respondents that do regularly cycle in Cork, there was a relatively even spread of opinion about the extent to which they find cycling a fast and efficient way to move around

the city traffic (*See Figure 10*). One respondent who does not cycle reflected how although it is *“by far the most tiring means of getting around”* it is *“probably the quickest”*. The remarks that Kevin and Stuart made about the inefficiency of the car and bus are echoed by the survey, where 43 respondents either did not agree at all or did not agree that public transport is an efficient mode of travelling and 60 respondents did not agree at all or did not agree concerning the car.

An important point was made by Alexa who articulated how cycling can be the most convenient, efficient, and easiest way of getting around for some people, especially those whose mobility is challenged. The alternative option for Alexa to the e-bike would be to use the bus and to use a walking stick around campus. Not only is the e-bike a faster option, but it is also less physical effort because she is not having to put all the weight on her joints.

### 6.2.3. Summary

There weren't many reasons why cycling is considered an easy mode of transport to take. From the cyclists' perspective, the bike is a more time-efficient and reliable means of getting around relative to the alternative of the bus or the car. This sentiment was not shared by the majority of respondents from the survey who cycle, but this may be because they encounter many obstacles on their route like blocked or discontinued cycle paths and aggressive automobile drivers, which make the journey more challenging. Nevertheless, the interviewee cyclists did recognise that after years of experience cycling in traffic, they built up the confidence to cycle which reduced the obstacle of fear, to an extent, emphasising the experiential impact of enacting mobility at the scale of the body (Cresswell, 2010).

On the whole, discussions on the perceived ability to cycle in Cork with the interviewees gravitated greatly towards issues of why cycling is difficult to do, and the numerous obstacles that come with cycling as a beginner and experienced cyclist, in contrast to what makes cycling an easy mode of transport to take. For the non-cyclists, the initial barriers to taking up cycling are knowledge and material related - buying the necessary equipment and learning the routes by bike. As for the cyclists, issues of learning how to maintain the bike and adapting to a lack of secure bike parking areas were mentioned. However, the most significant obstacles raised, by both cyclists and non-cyclists, were problems of safety in

terms of the physical infrastructure on the road and the aggressive and disrespectful behaviour of other road users (including cars, buses, pedestrians). These findings matched the results from the survey on whether respondents felt safe from traffic accidents when travelling by bike. Not only did the inconsistent network of cycle paths disrupt the flow of cycling, but it caused more danger for the cyclists as it forced them to weave in and out of automobile traffic and be exposed to other road users. This perception that the cyclist must endure a degree of danger plays an important part in why non-cyclists are deterred from trying to cycle, and why cyclists are so frustrated. Here, fear materialises and reduces the potential uptake of cycling. This phenomenon was also found by Freudendal-Pedersen (2015) where in Copenhagen, parents who regularly cycled to work prohibited their children from cycling to school because they feared that it was too dangerous due to high congestion of cars and bikes, as well as the competitive behaviours of commuter cyclists.

To summarise, cycling in Cork is not an easy mode of transport to take up for those who have never cycled before in traffic for accessibility and maintenance reasons, but most importantly because of the fear of being hit or disrespected by other road users. Although the latter concern remains for the experienced cyclists, it does not prevent them from continuing to cycle because through practice they have developed a sense of confidence by habitually cycling under these conditions.

### **6.3. Research Question 2 – What are the motivations to cycle in Cork?**

This thesis understands motivations to be constituted by one's attitudes (favourable and unfavourable) towards cycling, the representations of cycling, and the approval/disapproval of cycling from their close social circle. Moreover, this thesis argues that attitudes can be constituted in part by the perceptions of ability, that these factors are entangled with each other. This relationship has implications for the ways in which an individual determines their travel behaviour.

6. 3. 1. Unfavourable attitudes towards cycling – competition for road space and concern for safety

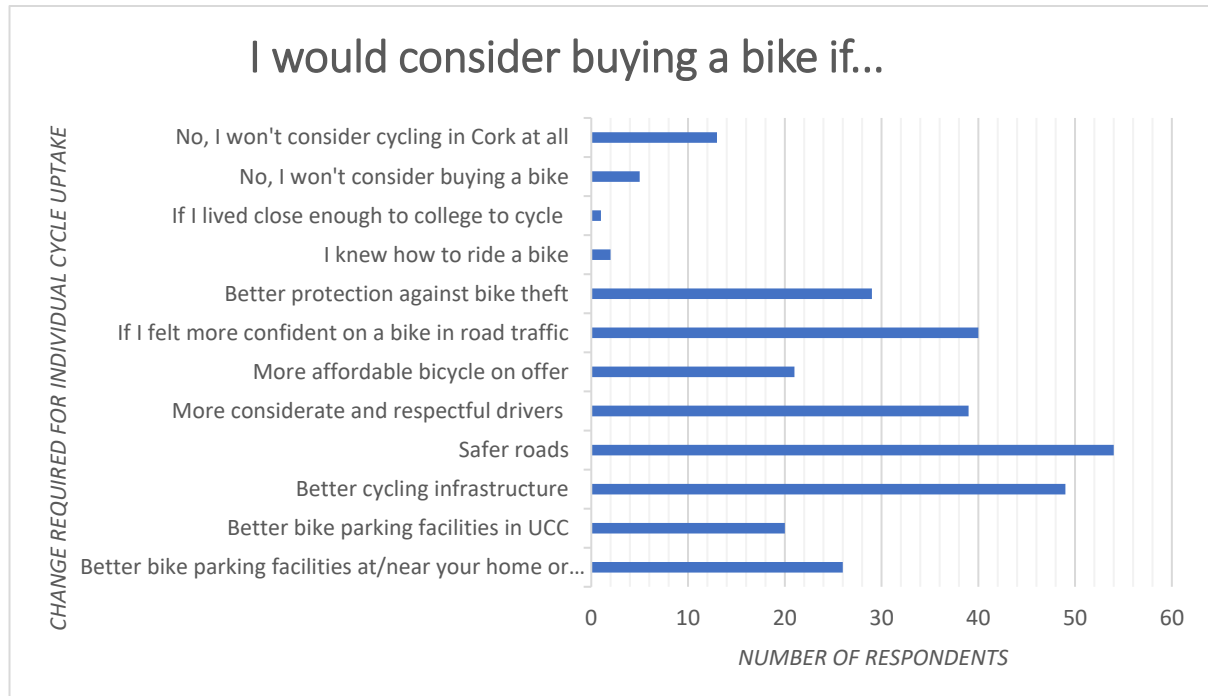


Figure 11 – Survey results: "I would consider buying a bike if...".

When observing the behaviours of the different road users, not only is there a distinct relationship between the built environment and human infrastructure of cycling, but also between motivations and perceived self-efficacy towards cycling. The motivations, especially attitudes, of an individual towards cycling can be constituted by their perceived ability to cycle, in the sense that when they identify cycling as a difficult behaviour to perform because of its associated dangers and risks, they will evaluate it as an unfavourable mode of transport. It is perhaps no surprise that most survey respondents expressed that they would consider buying a bike if the roads were safer (54 respondents) and if there was better cycling infrastructure (49 respondents), as shown in Figure 11. These conditions likely tie into how 40 respondents do not feel confident cycling in traffic. As the interviewees discussed, to cycle in Cork requires a lot of confidence, or from their social circles' perspective, "madness".

To expand, safety is one of the biggest issues surrounding cycling in CMA for both cyclists and non-cyclists. Of significance, both groups noticed how the built environment in terms of a lack of connected and segregated cycle lanes exposes cyclists to all sorts of road users of different weight and speed capacity. All these road users are forced to confront each other and delegate responsibility for one's safety because there is a lack of dedicated physical infrastructure in place to do this for them. Whilst competing for space, this causes confusion and conflict, and at worst, fatality. Automobile drivers are provoked to behave aggressively towards cyclists who seemingly intrude into their territory. This sentiment is especially strong for those who regularly drive and do not see the road as a shared social space (Lugo, 2013). The car can be seen as altering the role and function of public spaces, the streets, to the degree that they have erased the potential space to bring the private and public together (Sheller and Urry, 2000). Furthermore, the implication of the car is that the divisions between the private and public sphere are not so much connected by mobilities as completely obliterated by them (Adey, 2017). Such sentiments are found in survey results, where one respondent remarked on how *"transportation in Cork continues to be car-dominated"* despite efforts towards cycling and public transportation.

Simultaneously, cyclists tend to break the rules of the road and/or their actions are perceived as reckless because the physical infrastructure is so poor that they have no choice but to disrupt the flow of the cars to continue their journey. Alexa articulated her frustration that although she follows the rules of the road, car drivers perceive her as a reckless cyclist because they likely don't understand that cyclists do not always have a dedicated lane. On her commute from campus to home, she often encounters hostility from car drivers when trying to turn in a junction. Stuart also shared the same irritation with the physical cycling infrastructure when recollecting the time when he was hit by a car.

*"... usually I end up waiting for the pedestrian crossing to turn green or just no cars – I've been beeped at multiple times from either people coming from the way I'm turning, or the cars coming towards me as well from the opposite direction. It's so annoying because I am allowed to make a right turn here because the bicycle lane is on the very far left."* (Alexa)



*“... when I went through the red light it’s because I was going from one cycle lane to the other cycle lane, and it cut across a road. It was taking a chance on trying to get across that road on to the rest of the cycle lane. You are put in conflict with cars.” (Stuart)*

These insights portray mobilities constituted and patterned by immobility, that as a cyclist, you must endure a sense of immobility which can take the form of spaces and practices of waiting (Adey, 2017). These quotes also demonstrate the impact of the built environment on attitudes towards and social acceptance of cyclists. Because cyclists must adapt to the poor physical infrastructure and go against what is expected by car drivers or even traffic laws, this contributes to the narrative that cyclists are reckless road users. However, John puts forward an important point that as a car driver, having to be on the lookout for cyclists is *“constant and can get laborious”*. He recognises the pressure that is put on both cyclists and automobile drivers as a consequence of inadequate and unsafe road infrastructure:

*“What catches very badly is that you have stretches of good bike infrastructure and it’s very scarce. People cycling on that are merging on roads where the infrastructure is not so good but they have that mindset that they have their own space, but they don’t. From both sides then, the drivers are being over aggressive because they see cyclists thinking they can rule the road. But then sometimes cyclists do the incorrect thing on the road too. There are both sides to it.” (Jack)*

What is demonstrated here is how people are part of the infrastructure that enables or disables certain mobilities (Jacobsen, 2003). As theorised by Lugo (2013), human infrastructure in the form of aggressive motorist behaviour ranging from horn honking to crashing into cyclists has the power to discourage cycling. Evidently, mobility always involves immobility as well as individuals who make movement possible or not (Castree et al., 2013). Overall, the collective comments from the interviewees on the unfavourable attitudes towards cycling articulate how the way in which CMA does not feel built for cycling is an outcome of both the physical traffic infrastructure and the shared social conventions which

govern its use – a sharp contrast to the findings by Nello-Deakin and Nikolaeva (2021) and their qualitative exploration of what makes Amsterdam a ‘cycling city’.

### 6.3.2. Favourable attitudes towards cycling

Perhaps unsurprisingly, the three cyclists expressed positive attitudes towards cycling. All three drew upon the personal benefits they experience. Kevin and Alexa described how their cycling commute to campus is a great form of exercise. Cycling for Kevin is both a way of training for cycling competitions as well as a form of relaxation where he can listen to music and turn off the notifications on his phone. Stuart remarked that on the bike, “*you have a lot of freedom*”. The sense that you can go wherever you want is an important part of why he cycles, especially as it allows him to choose which routes to take depending on how much spare time he has. He described how he usually loops through the University to see if there are any activities occurring there. Alexa similarly shared the appreciation of being able to control what routes she takes depending on the kind of day she wants, and being able to cycle in the city and see what is happening there. The benefit of cycling as a way to actively participate in society was particularly felt by Alexa. As a person whose mobility is challenged and who is dependent on a walking stick, she really valued her e-bike because it allows her to get to more places, including classes, supermarkets, and events after class – all with less physical pain and tiredness. These findings are similar to that of Aldred (2010) who used in-depth interviews with cyclists in Cambridge, England, to explore how within heavily motorised countries, the practice of cycling might affect perceptions of the self in relation to natural and social environments. In this study, participants portrayed cycling as a practice that embodies freedom and independence whilst nourishing rootedness in their locality.

The two non-cyclist interviewees also described the potential benefits that they saw in cycling. Much of what was discussed by the cyclists was seen by Jessica. She identified cycling as a good form of exercise that allows the cyclist independence in the sense that they have their own mode of transport which can get them from point A to point B quickly. John shared this point of view, and as a first impression interpreted the bike as a “*clever way to get to places*”. He explained how in the tight spaces of the city, cycling would be handier than driving the car or getting the bus. Jessica also pointed to how the bike could provide

physical relief in weight from the things she has to bring to campus daily (bag, gym items, lunch, laptop) which she struggles with when she walks from the train station.

### 6.3.3. Representations of cycling

This thesis also sought to explore the extent to which representations of cyclists have a positive or negative effect on favourability towards cycling. From the interview discussions, two representations of cyclists were prompted: the environmentally driven cyclist and cycling as an inclusive mode of transport. These two representations were chosen because the way in which mobilities are portrayed are influenced by the narratives that they are embedded in (Cresswell, 2010). Given that city planners in Western countries are investing in active transportation networks to improve the environmental sustainability and accessibility of their cities, a focus on the image of cycling as environmentally and inclusively driven is quite relevant.

Interestingly, both non-cyclists put forward the perspective that cyclists are very much environmentally driven. John emphasised how the few cyclists he does know who cycle to university are “*always extremely green and environmentally focused*”. Two of the cyclists dictated how this image of cyclists in Cork is the common understanding in society, but that it is a misconception. Kevin believed that there are many different reasons why cyclists do so besides the environmental advantage. Alternatively, Alexa was unsure if the wider society believes in the stereotype of the environmental cyclist. Overall, the image of the cyclist as responsive to environmental issues is not a core representation that is personally felt by the cyclists, unlike in the study by Aldred (2010) where the cyclists strongly identified themselves as an environmental cyclist citizen.

As for the image of cycling as an inclusive means of transport, there was a range of responses. Both non-cyclists deemed cycling as inclusive in the sense that anyone would be able to do it, whether you are a man or woman, young or old. Cyclists were more critical of this representation. Stuart remarked that he was inspired by some people he works with who are women in their 50s-60s who cycle. However, he acknowledged that a lot of people are exposed to the image of the sport cyclist with Lycra and road bikes which creates a partial understanding of what a cyclist can be. On the societal level, Alexa also sees that

cycling is perceived more as a male-dominated exercise than as transportation. This contrasts with how she personally perceives cycling, as an inclusive mode of transport for those who are challenged mobility-wise:

*“... in general, I think in Cork cycling is seen more as a sport, specifically a male-dominated sport, which is not how I see it at all. I don’t want to race people. But I definitely see it as that and I definitely would think that people would nowadays maybe not know that I have a physical disability because I am cycling and because I don’t use my walking stick as much anymore. So they go “How does a disabled person go cycling?” and I go “Because I am able of that”.”* (Alexa)

The realities and the images of cycling here highlight how there can be a dissonance between representation and mobile practices (Cresswell, 2010). In addition, Kevin criticised the image of cycling as inclusive for the physically challenged on the topic of handcycles (a vehicle with three wheels that you ride by pushing the pedals with the hands). He argues that in Cork’s current physical and social infrastructure, a handcycle would be impossible to use because the vehicle requires the rider to be so low down, resulting in low visibility from the perspective of other road users. Ultimately, able-bodiedness is still a limiting factor for inclusive representations of cycling. A comment from the survey that recognised the potential for people with disabilities to use modified bikes argued that *“there should be greater awareness and inclusivity”* in the construction of bike paths.

A third representation of the cyclist was unprompted by the researcher and introduced by the interviewees; the reckless cyclist. Both non-cyclists recounted from their experience how cyclists often perform behaviours against the rules of the road. As a pedestrian commuter, Jessica highlighted how cyclists will often carry on through a red light at a pedestrian crossing, whereas cars will stop. Although Stuart admitted that his confidence when cycling on the road often involves an “aggressive” or “reckless” approach, the other two cyclists Kevin and Alexa confirmed that they cycle responsibly and obey the traffic laws. Kevin attempted to explain the source of this negative image by drawing on the behaviours of food delivery service cyclists. He noted how they blaze through the city and ignore red lights

because their work is so time-dependent, which consequently produces a negative image of cyclists for the other road users.

Unlike in the study of Steinbach et al. (2011) where representations of cyclists, specifically a non-inclusive image of cycling, created unfavourable attitudes towards cycling as something that is unattainable for certain demographics, the various representations of cyclists in Cork played a minor role in why the interviewees do and do not cycle. Moreover, the representations were neither the most important factor in encouraging or discouraging the non-cyclists to up-take cycling, nor the most significant factor in encouraging the cyclists to start or continue to cycle.

#### 6.3.4. Societal expectations

From the framework's approach, societal expectations can be defined as the perceived social pressure to perform the behaviour, specifically the potential approval or disapproval of the behaviour from the individual's close social circle. Here, the social circle includes friends and family. The most common response when I asked the non-cyclists how their social circle would react if they started cycling or what the cyclists' social circle thinks of them cycling is centred on concern for the interviewee's safety. Interestingly, many reactions of the interviewees' social circle discussed here are reactions from those who do not cycle. Alexa reflected upon a common dialogue between her and her partner about her safety on the road:

*“Every so often there is a little mention. I’ll say to my partner “Oh this bike was a dick”, and they would be like “Oh you maybe could have gone slower”, and then I would say “Well I shouldn’t have to go slower because the car wasn’t paying attention”. (Alexa)*

The general reaction Stuart received would be the question, *“Are you mad?”*. Even as a student of architecture with the shared aspiration towards 15-minute cities, Stuart's classmates criticized his choice of transport because the roads are deemed too dangerous.

Both Stuart and Jessica mentioned how their mother either does or would want them to wear a helmet.

Various other points were made about interviewees' societal expectations on cycling. John thought that amongst his closer friends, they would not have an opinion if he were to start cycling. However, in a wider group he believed that *"they would ask why and what you are gaining from it... it would be why are you putting in this effort?"*. Although Stuart still cycles to campus, he drives a lot more than he would like, partly because his social circle asks to be driven or to help move items for work. It should be acknowledged that indeed the private car allows a sense of flexibility and control in how one manages their commute and routines (Adey, 2017). This likely plays a role in why not cycling is the norm and more socially accepted in Cork than doing otherwise. Additionally, Kevin believed that if he stopped using the bike as a mode of transport and found an alternative, it would not be too concerning.

#### 6.3.5. Summary

This thesis understands motivations to be constituted by one's attitudes (favourable and unfavourable) towards cycling, the representations of cycling, and the approval/disapproval of cycling from their close social circle. At the centre of why the cyclists and non-cyclists perceived cycling with an unfavourable attitude is because of the concerns for their safety. This concern is strongly tied in with the built environment, where the lack of safe physical cycling infrastructure forces all road users to share the road and produce a hostile and conflicting space, which has negative implications for conception of cycling as a mode of transport that can be performed with ease. Multiple aspects of cycling that were perceived as positive were indicated by both cyclists and non-cyclists. The cyclists remarked on how cycling is a relaxing mode of transport and good form of exercise that allows you the freedom to choose your route on the day. Additionally, it can facilitate active participation in society. Although these insights were reflected from the cyclists' experiences of cycling, the non-cyclists also identified these potential personal benefits of cycling. Despite the multiple representations of cyclists and the varying opinions on whether these representations are held at personal and societal level, this dimension did not have a significant influence on the overall attitudes towards cyclists. The same can be said for societal expectations, which consisted primarily of concern for the interviewees' safety. However, it is the favourable

attitudes towards cycling that has a lot of value for why the cyclists cycle and why non-cyclists think that cycling could be worth trying, if it were not for the obstacles that came with it.

#### **6.4. Research Question 3 – How is the (potential) performance of cycling influenced by motivations in relation to perceived ability at the individual and societal level?**

##### 6.4.1. Influence of interviewees' motivations and ability on travel behaviour

Now that the motivations and ability towards cycling and the relationship between them have been fully explored, this section will attempt to answer Research Question 3 by distinguishing the extent to which one of the two may be more influential on the interviewees' decision to cycle.

Starting with the non-cyclists, although John saw cycling as a *“clever way of getting around”* – despite a lack of support on the idea from his inner social circle, his main mode of getting around is walking and not cycling for two reasons. Firstly, he perceived cycling as too dangerous to try, and secondly because it is currently very convenient to walk everywhere. Both factors of motivation and ability are important here, where walking is perceived as much easier to do than cycling – especially when the dangers of cycling conflict with its image as an inclusive mode of transport that can be used by anyone. As for Jessica, her decision to walk was also primarily down to ability but for different reasons. Jessica also had a positive attitude towards cycling and saw its personal benefits. But she is more comfortable walking to campus from the train station as it is more convenient than taking the bus. Additionally, to start cycling would require time and motivation to learn the route, which is made difficult by the lack of connectivity of the cycle lanes. For non-cyclists, there are multiple barriers to the perception that cycling is a behaviour that can be done with ease, specifically the danger inflicted by the built environment and social interactions on the road, as well as the personal investment to start a new mode of transport. They also indicated that walking currently meets their needs to get to places, so they do not have an urgent desire to start. All these factors: perception of cycling as dangerous; the temporal and

material investment to start cycling; and the convenience of walking all outweigh their positive attitudes towards cycling and can explain why they do not do so in Cork. These findings are similar to the work of Heinen and Handy (2012) who interviewed bicycle and non-bicycle commuters on their motivations to cycle and found that there is a mismatch between their behaviour and attitudes. To expand, although many of the non-cyclists did not perceive the benefits of cycling or attached low importance to them, some non-cyclists did attach importance to them. Therefore, this thesis concurs with the findings of Heinen and Handy (2012), that even if attitudes and beliefs are important, they are not always enough to overcome the constraints that reside with up-taking cycling.

From the cyclists' perspective Stuart felt that the bike is an accessible, cheap, and reliable mode of transport which trumps the fear of danger that it exposes him to. His years of experience cycling in traffic support his confidence when in confrontation with other road users or poor physical cycling infrastructure. Although his inner circle is concerned for his safety, the convenience of the bike - the perceived self-efficacy to cycle - for him is the most important factor as to why he cycles to campus. However, he explained how his car use has recently challenged the frequency of his bike usage as the former is more convenient in terms of supporting his work and being more time efficient as someone who lives in the suburbs of CMA. Stuart did highlight the experienced personal benefits of cycling, but with Kevin this played a stronger role in why he cycles. His perception that cycling is fun and relaxing, in addition to the convenience of cycling to campus as a form of training for cycling competitions, outweighs the safety risks. Both ability and motivation are very important for his choice to cycle as mode of transport. Similarly, Alexa's decision to cycle is dependent on both ability and motivations, where the e-bike as the most time efficient mode to get to places while permitting a sense of freedom and active participation in society, is of more importance than the obstacles that she encounters on the road. The balanced weight of the conversations the cyclists led in the interviews which was more or less equally distributed between their perceptions of anti-bike culture and the challenges posed by the built environment was also found in the study by McCarthy (2011) set in Charleston, South Carolina, USA.

There are numerous reasons for why cycling is seen as a difficult mode of transport which negatively impacts interviewees' motivations towards cycling. These understandings can be



traced back to issues of safety or personal investment and appear to be the root of why non-cyclists do not want to do so. For the cyclists, these obstacles do not hold as much influence, as their perceptions that cycling is an easily accomplished behaviour and that cycling has many personal benefits holds a more significant value. Interestingly, a shared value that determines interviewees' travel behaviour is that of convenience, an aspect that this thesis argues constitutes the concept of ability. For the cyclists and their choice of mobility, an important factor is that cycling is convenient for them in some way. For Alexa, it is the fastest option for her to get around with her physical disability. For Kevin, cycling to campus is also a form of training for cycling competitions, and for Stuart it is faster and cheaper than taking the bus. For non-cyclists, both Jessica and John find walking the most convenient way of mobilising in the short distance that they have in their daily routine. The study by Heinen et al., (2011) who also used the TPB to understand determinants of cycle up take reflects the findings of this thesis. For the cyclists in this study, their decision to commute by bike was based largely on direct benefits in terms of time, comfort, and flexibility.

To summarise, motivations and ability work together to develop a certain travel behaviour for the interviewees. When discussing issues of safety and cycling, it is difficult to allocate this perception to only ability or only motivation, as the understanding that cycling is a difficult behaviour to perform for safety-related obstacles corresponds with motivations that cycling is not socially accepted or favourable. That said, it can be interpreted that overall, ability is more important than motivations because convenience consistently appears to be the foundation as to why the interviewees do or do not cycle.

#### 6.4.2. Change required for increase of cycling uptake at societal level

When questioned on what change is needed for a societal shift towards an increase in cycling uptake in CMA, interviewees stated that to address the dangers of cycling and make it a more convenient mode of transport for all, it is Cork City Council that has the responsibility to make the city more liveable and bike-friendly through the prioritisation and implementation of a connected cycle network for the whole Metropolitan Area with segregated lanes.

To unpack this, it is important to first understand first that cyclists made a link between the role of the built environment in determining how people move. Kevin pointed out how road design is *“ingrained in culture”*, where Cork’s landscape has prioritised the flow of cars which creates a dependency on this mode of transport against others. Alexa noted how *“infrastructure could prevent the other dangers there”*, especially as she predicted that cars would continue to be popular in the foreseeable future. Aware of how the built environment determines the mobility of others, the cyclists criticized the lack of progress made by the City Council towards creating a bike-friendly city. Alexa recognised that although there are national policies in place that support this agenda, local government has the biggest impact on Cork’s infrastructure and in her opinion, while they are doing some work, they should be doing more. Stuart also supported this stance and criticized the City Council for *“backsliding”*.

*“One year they will promise everything, the moon and stars for cycling and getting around the city. If they get a few complaints from reactionary councillors, they start rolling it back. The solutions that get implemented are these crappy plastic bollards on the side of the road. They are so dumb. People can just drive over them and park there if they want to.”* (Stuart)

According to Stuart, the City Council must take decisions that may not be popular initially, such as the implementation of a full connected cycling network with segregated lanes. He explained that this agenda is resisted because of short-term viewpoints by political bodies, which is a problem nationwide.

There is debate and a lack of consensus in the mobility field as to whether ‘culture’ needs to precede the building of cycle lanes, or whether cycle lanes will stimulate bike culture (Emanuel, 2012). Sheller (2012) argues that simply inserting a few bike lanes into existing patterns of automobility will resist transformative change because it leaves unchallenged the underlying culture of autonomous mobility and its spatial and social relations. Additionally, Cartensen and Ebert (2012) warn that constructing bicycle path networks will in themselves not necessarily make cycling grow steadily, rather that cultural mainstreaming may be a possible way forward. However, in this case study of an emerging cycling culture,

interviewees and survey respondents indicated that the act of implementing a high-quality cycle network can shape traffic and travel practice which could have a more lasting long-term effect than relying on the ups and downs of biking popularity, and in itself contribute to a cultural mainstreaming of cycling as mode of transport. Thus, enacting change to institutionally embedded mobility regimes has the potential to cause wide-scale change on everyday behaviour (Sheller and Urry, 2016). This thesis supports den Hoed and Jarvis's (2022) emphasis on how the transition from low- to high- cycling cultures and practices are contingent upon co-constitutive changes including cycling identity, the social and material infrastructures that shape the logic of the situation, and the perceptions of risk and social inclusion. Furthermore, a combination of improving the physical infrastructure with public education campaigns that normalise utilitarian cycling from transport planners may enhance the success of creating bike-friendly communities (McCarthy, 2011). The multiplicity of changes that must be made to encourage cycle uptake in an emerging cycling culture such as in CMA reflects how one's capacity to be mobile is dependent upon a variety of social, political, and cultural variables, alongside the perceived accessibility to a certain mobility (Kaufmann, 2002).

Challenging the culture of autonomous mobility, two interviewees posited that an approach to increasing cycle uptake could be in improving the public transit system of the Metropolitan Area. Kevin and Jessica predicted that a more accessible and reliable public transport system would reduce the number of cars and give more space to cyclists, perhaps also giving cycling a more feasible and safer image. One survey respondent shared the anecdotal observation that *"cars take a lot of space in bike and bus lanes"*. The value of prioritising other modes of transport over the car are present in the survey results, where many respondents felt that Cork is very car-dependent, and all other modes are *"subservient"* to it. The majority of survey respondents (40) believed that car is the most prioritised mode of transport and most (45 respondents) believed it should be least prioritised in relation to public transport, walking, and cycling (See Figures 12 and 13). Overall, the majority felt that currently, the car (40 respondents) is being prioritised most by Cork City Council, with walking (35 respondents) third and cycling (40 respondents) last. Walking and public transport tied for second place at 32 respondents. In contrast, most respondents felt public transport (41) should be prioritised first, followed by cycling (40),

walking (29), and the car (49). A few respondents articulated that whilst de-prioritising the car, Cork should diversify their public transport system to include light rail/tram lines.

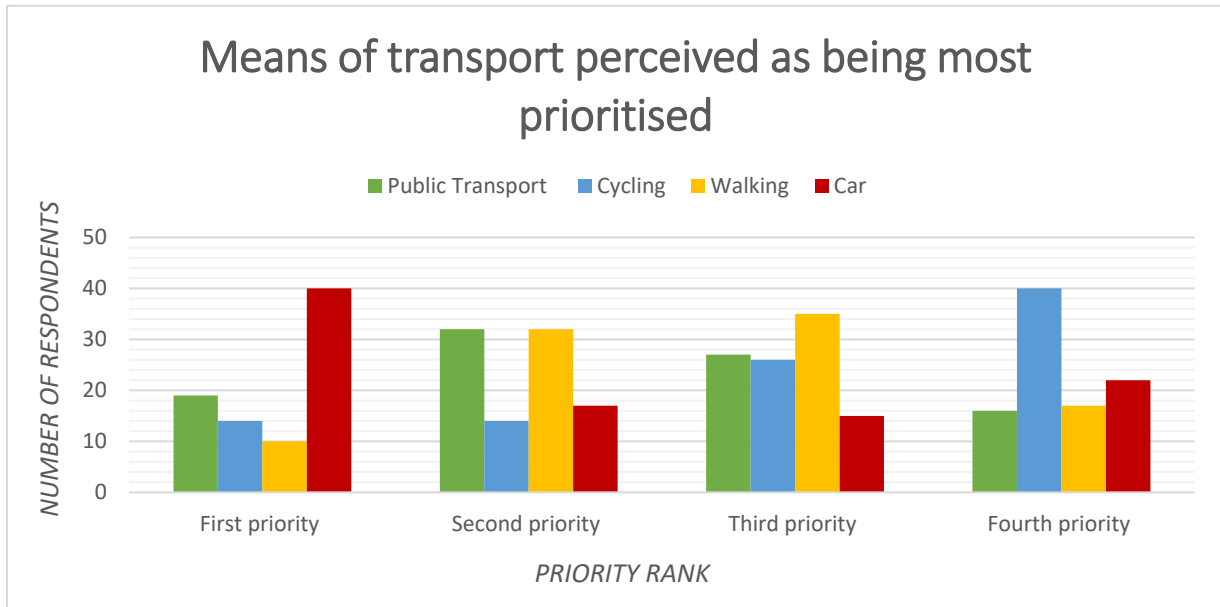


Figure 12 – Survey results: Means of transport perceived as being most prioritised.

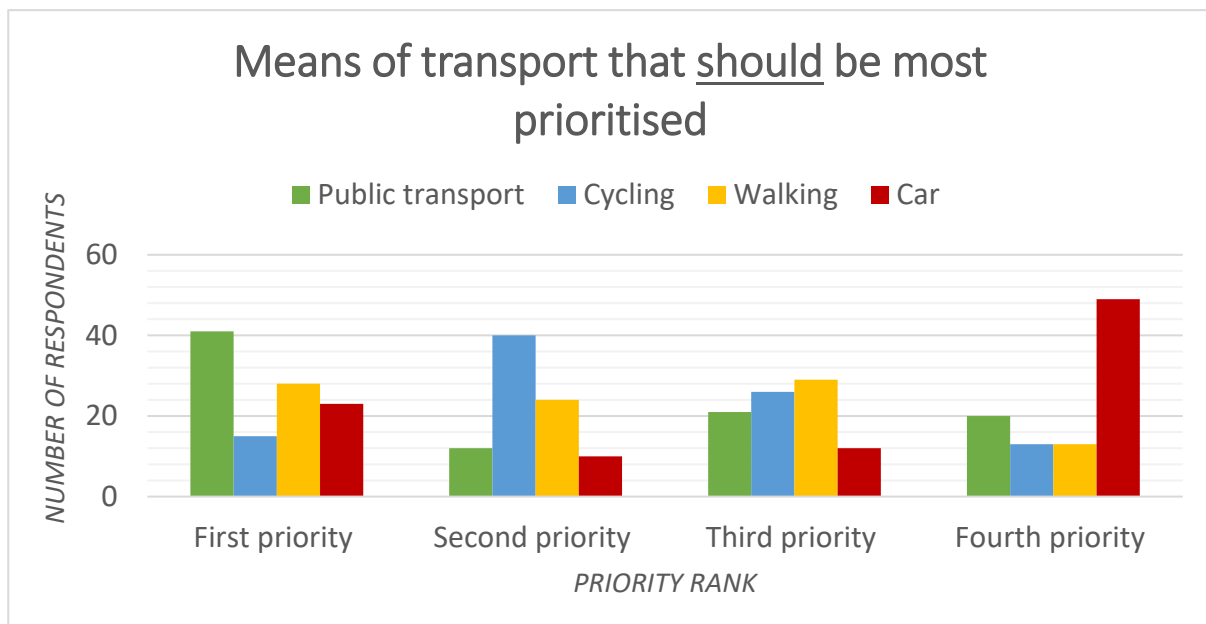


Figure 13 – Survey results: Means of transport that should be most prioritised.

## CHAPTER 7 - CONCLUSION

### 7.1. Concluding thoughts

To summarise, cycling in Cork is not an easy mode of transport to take up for those who have never cycled before in traffic for accessibility and maintenance reasons, but most importantly because of the fear and likelihood of being hit or disrespected by other road users. Although the latter concern exists among experienced cyclists, it does not prevent them from continuing to do so because through practice they have developed a sense of confidence when cycling in these conditions. Interviewees identified representations of cyclists including the reckless cyclist, the environmentally driven cyclist, and cycling as an inclusive mode of transport. These representations were often contested between cyclists and non-cyclists. In contrast, there were shared responses on the topic of societal expectations, where the majority of the interviewees' close inner circle were concerned for their safety and perceived cycling as against the societal norm. Both representations and societal expectations played a minor role in why the interviewees do and do not cycle. Rather, attitudes (negative and positive) and perceived self-efficacy towards cycling are the main determinants of interviewees' travel behaviour.

To explain the extent to whether motivations may hold more weight than ability, or vice versa, it was necessary to explore how the attitudes of an individual towards cycling can be constituted by their perceived ability to do so. This relation is exemplified by the interviewees identifying cycling as a difficult behaviour to perform because of its associated dangers and risks, and thus evaluating it as an unfavourable mode of transport. Therefore, the perception that cycling is a dangerous mode of transport (because of the poor physical cycling infrastructure and aggressive road behaviour of automobile drivers) influences and is influenced by both motivations and ability and was felt by all interviewees as well as the majority of the survey respondents. For the interviewees, the motivations and ability work together to develop their specific travel behaviour. Favourable attitudes towards cycling in terms of perceived personal benefits (relaxation, freedom, active participation in society) holds a lot of value in determining why cyclists cycle and non-cyclists think it would be worth trying. Nevertheless, it can be interpreted that overall, ability is more important than motivations because convenience consistently appears to be the foundation for why the

interviewees do or do not cycle. For cyclists, convenience is the main reason they expose themselves to the dangers of the road, while for non-cyclists, the convenience of walking is the main reason for not taking up cycling. A call by interviewees to make cycling more convenient through a connected cycle network with segregated lanes as a dual solution to improve the flow of the cycle journey and prevent aggressive confrontation between different road users, was also supported by the survey respondents.

## **7.2. Contribution to knowledge in Human Geography**

The conclusions from this thesis contribute to the literature on mobility, on how geographic movement becomes entangled in the way societies and cultures assign meaning through practice and representations (Cresswell, 2006). Using the lens of human and physical infrastructure, mobility can be understood through both its material and immaterial dimensions – through the influences of social interactions on and off the road, as well as the existing road networks which reflect certain modes of transport being prioritised over others. Specific to the case study of CMA, this thesis also adds to the limited existing literature on stimulating cycle uptake in medium-sized cities with emerging cycling culture. Additionally, most scholarly research in Ireland has focussed on the capital, Dublin. Observation of CMA brings insight to other areas of Ireland that have received relatively less attention and momentum concerning the cycling agenda in both the academic and urban planning fields. A final point is that this thesis has produced new interdisciplinary knowledge by bridging the Psychology and Human Geography fields through its framework using Cresswell's (2010) Politics of Mobility as a supportive theory to Azjen's (1991) Theory of Planned Behaviour. This has offered a holistic and relational approach to understanding the determinants of cycling as mode of transport and to explore mobility as a fundamental spatial process interconnecting people and places.

## **7.3. Implications for Cork City Council**

Developing policies and creating change in the urban landscape to increase levels of cycling requires knowledge of the determinants of bicycle commuting (Heinen et al., 2011). As the findings of this thesis indicate, the most significant factor that could increase cycle uptake is the implementation of an expansive and well-connected cycle network with segregated

lanes. With this change, the fight for space on the road would be reduced and thus the stimulant for aggressive automobile driver behaviour. This responsibility falls on Cork City Council, as the mobility regime for the whole Cork Metropolitan Area must be developed. Drawn from the perspective of the cyclists and non-cyclists from the interviews and surveys, the importance of improved physical cycle infrastructure is the most crucial change that must occur to increase cycle uptake. Cork City Council can take the findings of this thesis as a basis to propel momentum towards greater funding and long-term planning that prioritises this mode of transport alongside public transport, to make Cork an accessible and liveable city for all. Specifically, CMATS 2040 should acknowledge that it is not enough to simply add a few cycle lanes where the traffic is most accumulated. The cycle network must be continuous and prevalent around the whole Cork Metropolitan Area. Not only will this improve the journey flow of the journey and reduce the immobility of cyclists, but it will also signal to other road users that cyclists have the right to be on the road. Creating physical division between automobile and cyclist has the potential to reduce dispute and aggression. With a lack of competition for space and improved flow, the convenience of cycling could be significantly enhanced and encourage others to start cycling too.

#### **7.4. Limitations and future research**

Although this thesis gained insight into travel behaviour determinants across a range of transport users, there is a lack of perspective from students whose mobility is dependent solely on the car. 26 respondents identified themselves as either car drivers or car passengers (and not cyclists) in the survey, and on the Metropolitan scale, driving the car is the most popular way of getting around Cork in relation to the area's population. Therefore, the findings of the thesis are somewhat limited in terms of not obtaining the perspective students who are dependent on the car and who do not cycle. Such perspective would further knowledge on the narrative of car culture and the extent to which it may feel like whilst driving in Cork you are competing for space with the cyclist. Furthermore, it would be interesting to see what car drivers or passengers perceive as constraints to taking up cycling and whether they see cycling as a dangerous mode of transport. Further studies should investigate the perspectives of all kinds of transport users, especially including those of automobile drivers who are not familiar with cycling.

Furthermore, although the interviews did indeed gain insight into interviewees' motivations and ability to cycle and was an appropriate method to approach the research aim and questions, arguably it is a partial way of trying to address how mobility is done and experienced (Spinnery, 2011). Other qualitative methods could be used to explore attitudes and ability to a deeper degree, to capture the transient nature of movement. Further research could take a more-than representational approach to mobility and use in-person methods to better capture the feelings and experiences of the participants on their commute (Adey, 2017). For example, the researcher could join the research subjects on their commute to campus and document these experiences with video and journaling. While this approach may not be necessarily relevant to understand the influence of societal expectations on travel behaviour, witnessing or taking part in the mundane mobilities of everyday life could contribute to a deeper understanding of why people choose to move in the way they do.



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## APPENDICES

### APPENDIX A – Survey questions

# Travel behaviour and perceptions of cycling in Cork

My name is Nieve Greene, I am a Master's student of Human Geography at Lund University, Sweden, currently doing my thesis that aims to understand travel behaviour in Cork, with a focus on cycling as a mode of transport. My research argues that safe, connected, and extended cycle infrastructure has an important role in the increase of cycle uptake, but additionally so do the individual attitudes and societal norms surrounding this mobility type.

To explore this topic, I am investigating the perceptions of cycling from the perspectives of UCC students who do and who do not cycle. The medium-sized city of Cork was selected because of its fast-emerging cycling culture and my Irish background.

The findings of this research can potentially contribute to the knowledge of what obstacles students face in terms of those who do cycle or are interested in trying, and why it is currently not a preferred mode of travel. This can provide insight into how an increase in cycling uptake can be supported amongst students.

I would appreciate any student of UCC living in Cork to fill in this 5-minute survey on travel behaviour and perceptions of cycling. All participants of the survey will be completely anonymous, and the data collected will be deleted after the analysis has been made. For those that would like to expand on their experiences in a follow-up interview, please fill in your contact details at the end of the survey.

You can contact me or my thesis supervisor if you have any questions about my research.

#### Contact details

Researcher: Nieve Greene  
Master's student of Human Geography at Lund University  
Email: ni8468gr-s@student.lu.se

Thesis supervisor: Till Koglin  
Senior Lecturer at Lund University  
Email: till.koglin@tft.lth.se

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\* Indicates required question

Questions on travel behaviour and perceptions of cycling in Cork

1. What is your age? \*

*Mark only one oval.*

17 - 20

21 - 25

26 - 35

36 - 45

46 - 55

56 - 70

70 +

2. What is your gender? \*

*Mark only one oval.*

Woman

Man

Non-binary

Prefer not to say

3. What is your nationality?

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4. What would best describe your student status in UCC? (Select all that are applicable) \*

*Check all that apply.*

- Undergraduate
- Postgraduate
- Visiting Student (e.g. Erasmus)
- Daytime Student
- Night-time Student
- Full-time Student
- Part-time Student

5. Which of the UCC Colleges are you a part of? (Select all that are applicable) \*

*Check all that apply.*

- College of Art, Celtic Studies and Social Sciences (CACSSS)
- College of Science, Engineering and Food Sciences (SEFS)
- College of Business and Law
- College of Medicine and Health
- Other: \_\_\_\_\_

6. How long have you lived in Cork? \*

*Mark only one oval.*

- Less than 6 months
- 6 - 12 months
- 1 - 3 years
- 3+ years

7. Do you have a driver's licence? \*

*Mark only one oval.*

Yes

No

8. How often do you have access to a car? \*

*Mark only one oval.*

Always

Sometimes

Seldom

Never

9. How often do you have access to a functioning bike? \*

*Mark only one oval.*

Always

Sometimes

Seldom

Never

10. If you don't have access to a bike, or you don't cycle in Cork on a regular basis, would you consider purchasing one if there were... (Select all that are applicable)

*Check all that apply.*

- Better bike parking facilities at/near your home or term accommodation
- Better bike parking facilities in UCC
- Better cycling infrastructure
- Safer roads
- More considerate and respectful drivers
- More affordable bicycles on offer
- If I felt more confident on a bike in road traffic
- No, I won't consider buying a bike
- No, I won't consider cycling in Cork at all
- Better protection against bike theft
- Other: \_\_\_\_\_

11. On average, approximately how many minutes do you spend transporting in Cork on a weekday for each means of transport? \*

*Mark only one oval per row.*

	0	1 - 20	21 - 40	41 - 60	61 - 80	81 - 100	100 +
<b>Public transport</b>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<b>Walking</b>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<b>Cycling</b>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<b>Car</b>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

12. State your opinion about the following statement: "I find it fast and efficient to move around in Cork traffic when I travel by..." \*

(1 = don't agree at all; 3 = neither nor; 5 = totally agree)

Mark only one oval per row.

	1	2	3	4	5	Never use it
<b>Public transport</b>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<b>Cycling</b>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<b>Walking</b>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<b>Car</b>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

13. State your opinion about the following statement: "I feel safe (from threat, violence, unpleasant encounters, etc.) in Cork traffic when I travel by..." \*

(1 = don't agree at all; 3 = neither nor; 5 = totally agree)

Mark only one oval per row.

	1	2	3	4	5	Never use it
<b>Public transport</b>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<b>Cycling</b>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<b>Walking</b>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<b>Car</b>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

14. State your opinion about the following statement: "I feel safe (from traffic accidents) in Cork traffic when I travel by..." \*

(1 = don't agree at all; 3 = neither nor; 5 = totally agree)

Mark only one oval per row.

	1	2	3	4	5	Never use it
<b>Public transport</b>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<b>Cycling</b>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<b>Walking</b>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<b>Car</b>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

15. Rank from 1 (most) to 4 (least) the means of transport you feel **are** being prioritized in Cork today. \*

Mark only one oval per row.

	1	2	3	4
<b>Public transport</b>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<b>Cycling</b>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<b>Walking</b>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<b>Car</b>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

16. Rank from 1 (most) to 4 (least) the means of transport you feel **should** be prioritized in Cork today. \*

*Mark only one oval per row.*

	1	2	3	4
<b>Public transport</b>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<b>Cycling</b>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<b>Walking</b>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<b>Car</b>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

17. I essentially see myself as a: \*

*Mark only one oval.*

- Public transport user
- Car driver
- Cyclist
- Pedestrian
- Car driver and cyclist
- Public transport user and cyclist
- Pedestrian and public transport user
- Car passenger and pedestrian
- Other: \_\_\_\_\_

18. Do you have any additional comments to make on transportation in Cork?

\_\_\_\_\_

### Follow-up Interviews

Thank you for time!

The researcher of this project will be arranging 30 minute online interviews (between the 27th - 31st March) with participants interested in expanding on their experiences of transporting in Cork, particularly on the perceptions of cycling and/or cyclists in relation to your current mode of transport. If you are interested in participating you can leave your contact details (name and email address) below.

#### 19. Contact Information

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## APPENDIX B – Interview Guide: Cyclist

### INTERVIEW GUIDE – STUDENT CYCLIST

#### INTRODUCTION

- Contextualise study aim
- Mention broad themes that the interviewer would like to go over + will expand on some of the survey questions

#### Introduction questions

1. How do you define yourself as road user based on the most frequent modes of transport? (E.g. car driver, pedestrian, car passenger, cyclist)
2. How do you determine your mode of transport?

#### MAIN THEME - Culture and norms

##### Societal expectations/ norms

- To what extent do important people in your surroundings think you should travel by bicycle to work?
- What would you expect to be the reactions of your friends and family members if you were to switch your main mode of transport?

##### Culture

- Do you feel that Cork socially and infrastructurally prioritises car usage?
  - If so, in what ways do you think that affects the image of the cyclist?
  - If so, in what ways has this affected your cycling experience?

#### MAIN THEME – Travel behaviour

##### 1. Safety

- How safe do you feel cycling in Cork?
  - To what extent is this feeling of safety dependent on the cycling infrastructure
  - To what extent is this feeling of safety dependent on the behaviour of other road users?
- Do you think you or other cyclists cycle recklessly?

##### 2. Efficiency of the bike

- To what degree do you consider it possible and preferable to travel your entire commute by bicycle?



### 3. Shifting mindset

- How were you able to shift from not cycling to cycling in Cork (practically and attitudinally)?
  - What were some of the biggest motivators for cycling in Cork?
  - What were some of the most difficult obstacles to overcome when beginning to cycle and what obstacles remain?
- To what extent do you believe that your decision to cycle now as a student is dependent on student life?
  - → If you do not have a car now and hypothetically will purchase one in the future, do you foresee that this will reduce your cycle frequency?

#### MAIN THEME - Feelings towards cycling (emotions)

- How do you feel when cycling?
- How do you perceive cycling and the image of the cyclist?
  - How do you think non-cyclists perceive cycling/ image of cyclist?
- To what extent do you think cycling is “not cool” or “for kids”?
- Do you think that students who cycle at UCC are likely to be affiliated with environmentalism?
- Do you think cycling as mode of transport has a masculine/ fit-bodied association attached to it?

#### SUMMARIZING QUESTIONS

- To what extent do you see cycling as an accessible and attractive mode of transport?
- Why do you think cycling has not yet become a normalised mode of transport in Cork?

## APPENDIX C – Interview Guide: Non-cyclist

### INTERVIEW GUIDE – STUDENT NON-CYCLIST

#### INTRODUCTION

- Contextualise study aim
- Mention broad themes that the interviewer would like to go over + will expand on some of the survey questions

#### Introduction questions

1. How do you define yourself as road user based on your most frequent mode of transport? (E.g. car driver, pedestrian, car passenger, cyclist, public transport user, combo)
2. How do you determine your mode of transport?

#### MAIN THEME - Culture and norms

##### Societal expectations/ norms

- What would you expect to be the reactions of your friends and family members if you were to switch your main mode of transport e.g. bike?

##### Culture

- Do you feel that Cork socially and infrastructurally prioritises car usage?
  - If so, in what ways do you think that affects your decision to not cycle?

#### MAIN THEME – Travel behaviour

##### 1. Safety

- How safe do you feel it is to cycle in Cork?
  - To what extent is this perception of safety dependent on the cycling infrastructure and the behaviour of other road users?

##### 2. Efficiency of the bike

- To what degree would you consider it possible and preferable to travel your entire commute by bicycle?

#### MAIN THEME - Feelings towards cycling (emotions)

- What do you feel when you see other people cycling in Cork?
- How do you perceive cycling and the image of the cyclist?
- To what extent do you think cycling is “not cool” or “for kids”?

- Do you think that students who cycle at UCC are likely to be affiliated with environmentalism?
- Do you think cycling as mode of transport has a masculine/ fit-bodied association attached to it?

#### SUMMARIZING QUESTIONS

- To what extent do you see cycling as an accessible and attractive mode of transport?
- To what extent are you motivated to try and cycle in Cork?
- What are the most important factors that dissuade you from cycling in Cork?
- What are the changes that you would have to see happen on an individual and/or societal level for you to uptake cycling?