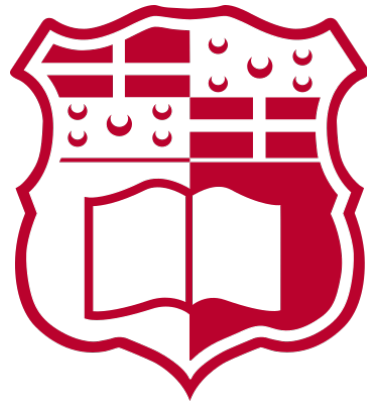




An Appraisal on the Increase of Cycling Infrastructure in Malta and its Influence on the Promotion of Cycling

Luke Bartolo

June 2023

Master of Engineering (Civil Engineering)



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To my parents Joseph and Marianne
and to my partner Sarah

Acknowledgements

I would like to express my gratitude towards my supervisor Dr Odette Lewis, who has greatly contributed to this dissertation throughout the past year.

My thanks also go to the participants that helped provide the required information and data without which this dissertation could not be completed.

I acknowledge that this research study is not perfect and take full responsibility for any shortcomings in this dissertation.

Abstract

With an annual increase in population, Malta's transport demand has reached astronomical levels. Possessing a modal share of over 80%, personal vehicles have become the dominant form of transportation. To address the issue of capacity in our road network, the government announced substantial investments in 2018 to upgrade several links and nodes. The vast majority of road upgrades completed so far have thus prioritised this increased number of motor vehicles. Yet, certain projects also included the incorporation of alternative modes of active mobility through cycling infrastructure.

Even with the adoption of several new road-widening projects, the issues of congestion have still persisted. This has raised questions about whether recently completed road projects have only contributed towards a vicious cycle of induced demand. Despite the ongoing issues of congestion and the provision of new cycling infrastructure, the general public has still refrained from resorting to such alternative modes of transport. Understanding the reasons why the incorporation of new cycle routes has not instigated a modal shift is the underlying aim of this dissertation. The appraisal of three specific recently constructed cycle routes provides further insight and helps build upon readily available literature related to transport in Malta. The analysis of existing strategic plans (including maps) is accompanied by surveys and interviews with members involved in the cycling community. These research methods help attain a greater understanding of the barriers affecting the promotion of cycling in Malta.

The results confirm that the construction of new cycling infrastructure provided only a marginal contribution to the promotion of cycling as a mode of transport, even amongst already established cyclists. Multiple barriers as to why this is the case are also discovered. The correlation of all the acquired data highlights the fact that shortcomings still exist within these routes. Most of them have resulted in issues of connectivity. Hence their design and execution have been highly questioned by the cycling community. The interviews also show that the government's recent proposal of new active mobility routes holds a lot more promise. This is due to certain shortcomings that are now being addressed, such as the lack of public consultation with end users. Yet, the results show that a pertinent issue remains both for existing as well as future cycling routes. This is the lack of legally binding standards for cycling infrastructure. The publication of standards is the key to safeguarding the quality of cycling infrastructure on our islands. While other measures related to disincentivising car use will also be required, ensuring that Malta's cycling infrastructure is up to standard is the first step to properly instigate a modal shift in the transport sector.

Keywords:

Cycling Infrastructure, Active Mobility, Modal Share & Modal Shift

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Glossary

Active mobility	Active mobility is regular physical activity undertaken as a means of transport. It includes travel on foot, by bicycle and other vehicles which require physical effort to get moving.
Intermodality	Improving the efficiency and attractiveness of a single trip or journey through the use of more than one transport mode.
Micro mobility	A means of transportation over a short distance, normally through the use of a single vehicle such as a bicycle or scooter.
Shared Space	A street or place designed to improve pedestrian movement and comfort reducing the dominance of motor vehicles and enabling all users to share the space rather than follow the clearly defined rules implied by more conventional designs (UK Department of Transport, 2011)

Abbreviations and Acronyms

AADT	Annual Average Daily Traffic
BAG	Bicycle Advocacy Group
BSPs	Bike-share programs
DMRB	Design Manual for Road and Bridges
ELOS	E-bike Level of Service
EU	European Union
EV	Electric Vehicle
ICE	Internal Combustion Engines
IM	Infrastructure Malta
KM	Kilometres
LOS	Level of Service
MFF	Multi-Annual Financial Framework
MPT	Malta Public Transport
NACTO	National Association of City Transport Officials

NCS	National Cycling Strategy and Action Plan*
NGO	Non-Governmental Organisations
NHTS	National Household Travel Survey
NTMP	National Transport Master Plan 2025
NTS	National Transport Strategy 2050
NSO	National Statistics Office
PEDELCS	Paddle Assisted Bicycles
SUMP	Sustainable Urban Management Plan
SMITHS	Sustainable Multi-Intermodal Transport Hubs
TEN-T	Trans-European Transport Network
TFL	Transport for London
TM	Transport Malta
VRU	Vulnerable Road Users

* The National Cycling Strategy and Action was released in November 2018 as a draft for public consultation and is not the finalised document.

Chapter 1 - Introduction

Background

Transportation is a quintessential component of any growing community. Historical remains such as the carts ruts in Malta show us how transportation was a necessity even for the earliest forms of civilisation on our island (Trump, 1998). Throughout the years, with the formation of different localities across Malta, a network of links and nodes started to emerge that helped connect one locality to the other. This network continued to expand into the road network that we know today, transforming itself as the predominant form of travel infrastructure on our islands. The total extent of roads in Malta and Gozo has now reached 2,410km, with around 762km of roads/100 km². This has made Malta home to the densest road network in the European Union (TM, 2016b).

Throughout its evolution, our network has predominantly targeted car-based mobility, resulting in induced demand. By the end of 2021, the National Statistics Office (NSO) revealed that there are over 400,000 vehicles registered in Malta (NSO, 2022a). The prioritisation of personal vehicles has blurred the distinguishment between streets and roads. While roads prioritise the movement of people and goods, streets also include lively civil spaces that contribute to important space qualities and provide meaning for local communities (NSW Government, 2023). Unfortunately, car-centric design over the years has resulted in our residential areas and town centres becoming estranged from such desirable qualities. This has also negatively affected the growth of active and micro-mobility within our transport sector.

When considering the substantial urban sprawl during the last few decades, infrastructure for alternative modes of transport has been given little priority. With issues of congestion becoming astronomical, alternative modes such as cycling have now been given greater importance over recent years. Yet such a behavioural change is a challenging prospect for a culture that has always leaned towards private vehicle use. While it is indeed difficult, it is still essential to strive towards such changes to adequately address the root of the problem (Pace, 2019).

Malta was never known to have a well-established cycling community, especially in relation to commuting. The increase in car use has also limited cycling numbers due to issues of safety being perceived as greater than they have ever been before (Attard, 2019). With a very limited number of specially dedicated cycle routes, cyclists are required to use motor carriageways for the majority of the road network. With cars being given higher priority on most of our roads, even residential ones, space to practice cycling safely has become even more limited. Younger generations have had fewer opportunities and exposure to learn how to ride a bicycle. This detachment has made the prospect of active mobility even more foreign to the general public.

Over the past twenty years, our road network has also witnessed the construction of new cycling routes. Yet, the 2021 National Household Travel Survey (NHTS) recently published that Malta's modal share for cycling was only about 0.7% (NSO, 2022b). This is still a very poor modal share when compared to other Mediterranean cities such as Seville which boasts a cycling modal share of 9% (Marqués et al., 2014).

The fact that our active modal share has remained below 1% leads to the question of whether the strategies and infrastructural projects adopted so far have had any effect on the promotion of cycling. This dissertation intends to study this particular matter in further detail and assess the barriers that need to be overcome to instigate an increase in cycling within Malta's transport sector.

Goals

The goal of this dissertation is to perform an appraisal of some of the most recently constructed cycling infrastructure and determine whether they have had any effect on the promotion of cycling in the local context.

Objectives

This dissertation sets out to study Malta's existing transport network and its current limitations. It reviews successful international practices which could potentially be adopted on our islands. To further reach the dissertation's goals, the performance of three specific cycle routes is assessed to understand what barriers might be preventing active mobility from flourishing in Malta.

Research Questions

Four research questions have been devised, whose answers shall provide explanations of how our cycling infrastructure is conceived by the cycling community and whether it has lived up to its role to inhibit alternative modes of transport. The questions are:

- i. Has there been an increase in cycling activity with the incorporation of new cycling infrastructure over the past few years?
- ii. Have these routes been well received by the cycling community?
- iii. Are there any instances in which cyclists are still using motor vehicle carriageways despite the presence of cycle lanes in the vicinity of their cycling route and why is this the case?
- iv. What barriers might be preventing a modal shift from happening?

Overview of the Research Methods

The research started with assessing available literature sources and documents. Certain shortcomings were identified which required further questioning and research. Given the vastness of the studied subject, multiple research methods were adopted to fully answer all the research questions. These included geographic mapping, on-site observations, cyclist counts, surveys and interviews. When correlated together, their results provided a more comprehensive picture of what is required for cycling to progress within Malta's Transport Sector.

Dissertation Structure

This dissertation is divided into the following five chapters:

Chapter 1 – Introduction

The Introduction defines the scope of this dissertation providing a brief background on the topic of cycling in Malta and why it requires further studies. The objectives, goals and research methods are presented along with the dissertation structure.

Chapter 2 – Literature Review

The second chapter starts off by discussing Malta's existing situation in relation to transport and how it is currently coping to satisfy the ever-increasing demand for mobility. While discussing Malta's local policies and road network, it also delves into what measures have been taken on board up till now to try and level the playing field for other modes of transport such as cycling.

The second half of the Literature Review looks at international case studies and examples which could also be adopted on our islands. It includes a discussion on the role of cycling standards and innovative technologies that could help push cycling forward. By comparing the local context with such international practices, the existing gaps in Malta's existing cycling strategy and network are identified. The provisions to address these gaps are discussed at the end of this chapter.

Chapter 3 – Methodology

This chapter acknowledges that desk studies alone did not provide sufficient information and hence an explanation of the adopted research methodology is provided. The selection of research methods ensured that all research questions are adequately answered. The research includes both quantitative and qualitative research tools.

Chapter 4 – Analysis of Results

The Analysis of Results discusses the findings from all the methods of research used. After discussing each data set individually, the entire data is then correlated together to provide a greater understanding as to what are the barriers that are affecting the performance of the studied cycle routes.

Chapter 5 - Conclusion

The final chapter summarises the findings of this dissertation and discusses the way forward to overcome the limitations that were discovered. It also suggests what areas of future research may be required to further expand on this study.

Chapter 2 - Literature Review

2.1 An Overview of Malta's Transport Sector

This first section of the Literature Review gives background information on the topic of transport and active mobility in Malta. It highlights what measures have been proposed to promote active mobility and whether they have been successfully implemented. The second half of the chapter then discusses what advancements have been made in relation to cycling on an international level. This assisted in highlighting the existing gaps for active mobility in Malta.

2.1.1 Transport Demand in Malta

As our local population increases every year, travel demand has also increased at a significant rate. By occupying the highest population density in Europe (Eurostat, 2021), Malta's travel demand record is being broken every year. We are also reaching staggering records of newly registered vehicles on our roads (NSO, 2022c). Hence, the higher demand on our road network has drastically increased traffic congestion over the past few years. This has also become detrimental to the quality of our urban spaces (Camilleri, 2020).

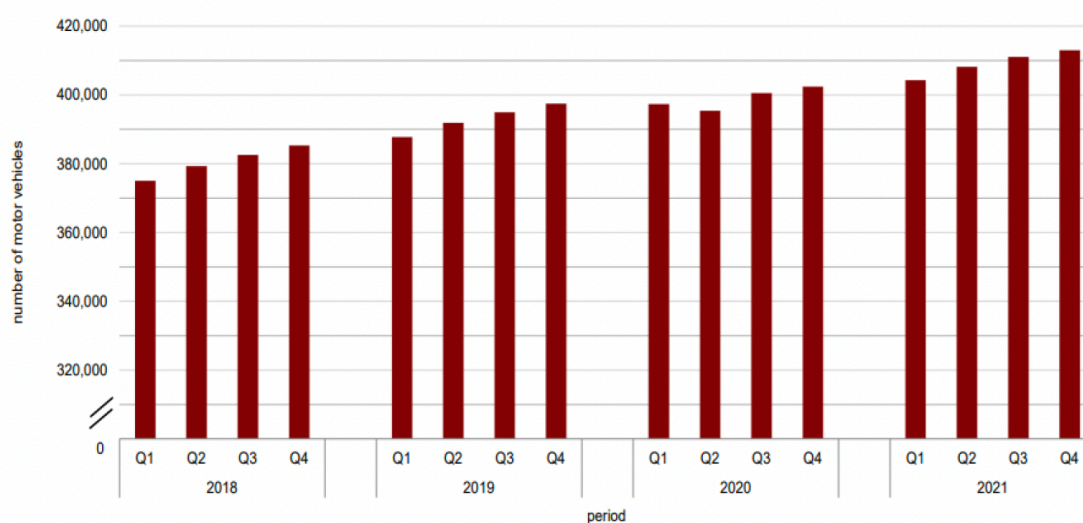


Figure 2.1 Stock of Licensed Motor Vehicles (Q1.2018–Q4.2021)

Source: National Statistics Office, 2022

The significant increase of foreigners residing in Malta is one of the main contributors to the increase in travel demand around the island. Our overall population has increased by around one hundred thousand inhabitants during the past ten years, with the majority of the increase being due to immigration (NSO, 2021b). Through the effects of globalisation, new cultures and perspectives may influence how society reacts to its everyday needs, including transport. When commuting, it is interesting to note how alternative modes of transport such as bicycles and scooters are predominantly used by foreigners who might have a different mindset compared to the local car-centric mentality.

With sea transport only serving 0.4% of total travel, domestic transport is mostly served through the use of our road network (NSO, 2022b). The highest travel demand can be seen during the morning peak hour from 07:30 a.m. to 08:30 a.m. This particular hour alone contributes to around 11% of the total daily traffic during weekdays. The majority of commutes within this peak hour are either to travel to work or to travel to an educational institution. Over the past thirty years, travel demand across the entire network has gone up by 55% (TM, 2016b). Such a significant increase in travel demand has put a significant strain on our road network with multiple links and junctions no longer being capable to efficiently accommodate such a substantial increase in traffic.

This issue has been acknowledged by the main authority for land, sea and air transport, Transport Malta, and a strategic plan under the name of “National Transport Strategy 2050” has been devised to try and adapt our transport system more sustainably. Supporting documents have also been released that specialise in the short-term goals that should be achieved by the end of 2025, these include the “Transport Masterplan, 2025” and the “National Cycling Strategy and Action Plan”^{*}.

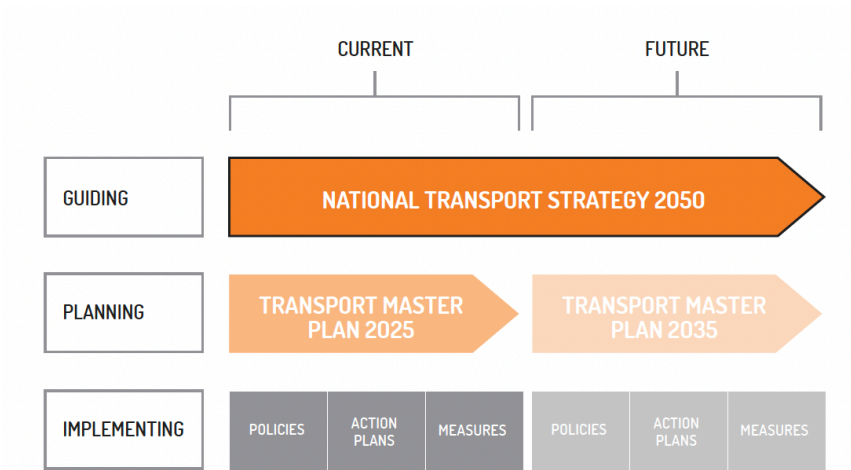


Figure 2.2 Hierarchy of documents used to adopt a Strategic Framework for Transport

Source: National Transport Strategy 2050

^{*} The National Cycling Strategy and Action was released in November 2018 as a draft for public consultation and is not the finalised document.

2.1.2 Malta's Main Mode of Transport

The latest National Household Travel (NHTS) that was carried out in 2021 shows that 82.8% of the population in Malta opt to use personal vehicles for the majority of their commutes. This equates to around 220,000 trips daily (NSO, 2022b). The statistics of NHTS were gathered during the Covid-19 pandemic, a time when travel demand might have been hindered to promote social distancing and where people may have opted to shift to other modes of transport. Such a high demand for automobile travel has resulted in multiple road-widening projects across our islands. The main intention of these projects is to increase vehicle capacity. As a consequence, limited space is being provided for alternative modes of transport such as cycling (TM, 2016b).

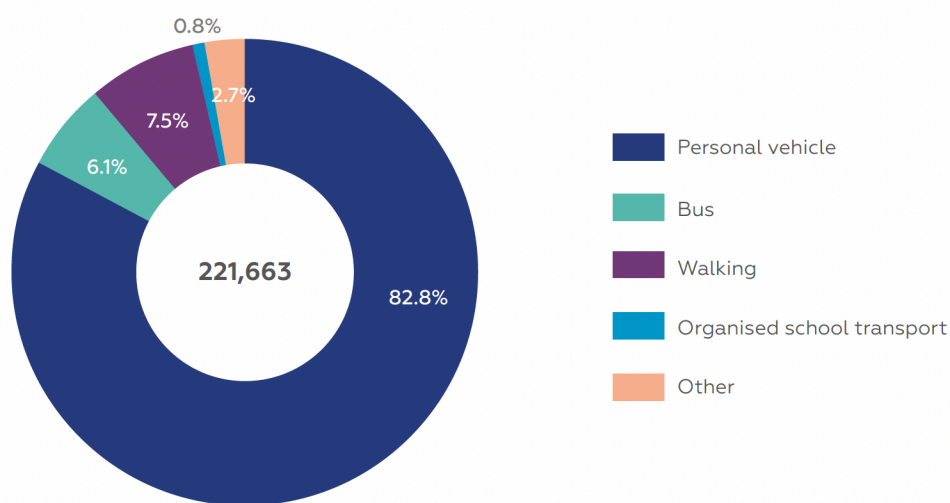


Figure 2.3 Malta's modal share for domestic travel

Source: NHTS 2021

Despite the pressing issues of capacity, regulations to disincentivise private vehicle use are still lacklustre. The prevalent car-centric mentality is not being challenged. The overwhelming number of vehicles on our roads is also discouraging vulnerable road users (VRU) from practising their right to travel within our road network. The level of safety from such users has also been perceived to be very low (Grixti, 2022).

2.1.3 Micro & Active Mobility in Malta

2.1.3.1 Pedestrians

The increased number of vehicles on our roads and the biased design of road infrastructure towards such vehicles have hindered the right of access for micro-mobility users. Pedestrians should have a right of passage when travelling within our residential areas and town centres, yet unfortunately in most localities, roadside public spaces and off-street areas have been victims of increased parking infrastructure. As a result, access to basic amenities and town centres has become increasingly difficult, with walking and cycling being perceived as unsafe (Attard, 2019). Our town centres need to be redesigned in a manner that encourages walking and cycling. Urban streets need to prioritise pedestrians and shift motor traffic away from city centres. Only then can our towns and villages become more sustainable and attractive to live in.



Figure 2.4 Example of car-orientated urban space allocation in the centre of Birkirkara Malta.

Source: Maria Attard / *Transportation Research Procedia* 45 (2020) 352–359

Photo credit: Steve Zammit Lupi (2018)

2.1.3.2 Cycling

With cycling-friendly infrastructure also being very limited, most often cyclists are required to use the motor carriageway. This disproportional balance towards cars makes the prospect of riding a bicycle safely on our roads still inconceivable on most of our road network. The highest percentage of modal share in Malta has always been inclined towards motor vehicles, and this trend was even evident in the late 80s. While the percentage of car drivers continued to grow over the past thirty years, the modal share for cycling has always been negligible, as can be seen in Figure 2.5 (Attard, 2019). The bar chart shows that with the increase in transport demand, Malta has never possessed an established cycling culture when compared to other modes of transport (TM, 2010).

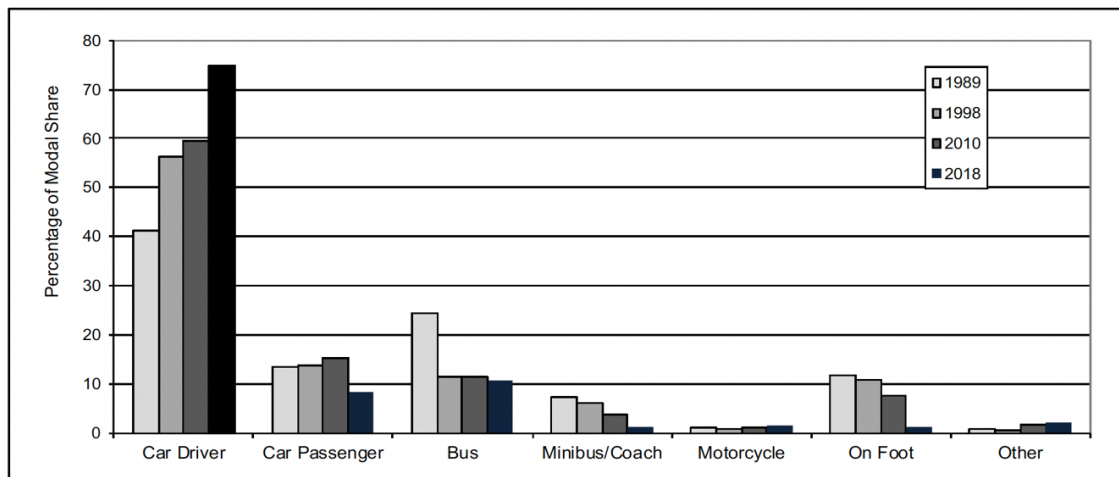


Figure 2.5 Percentage of Modal Share trips in Malta between 1989 and 2018.

Source: Compiled data from Transport Malta (2010) and Project Aegle (2018)

Of all EU member states, Malta has the lowest cycling rates according to the Eurobarometer published in 2019. A further worrying statistic is that nearly half of Europeans never exercise or practice any form of sport such as cycling (Eurobarometer, 2019). The development of a stronger cycling community could address such pressing issues. With the average distance travelled by car during the peak hours being 5.5km (TM, 2016a), cycling in Malta has the possibility of becoming an alternative mode of transport that is efficient, and environmentally friendly. This could only be possible however if a holistic network is constructed across the island with safe and interconnected junctions from one continuous link to the other. In April of 2023, the Minister for Transport, Infrastructure and Capital Projects published details on the first phase of new active mobility routes with a €35 million investment. The first routes are to connect Valletta, Blata I-Bajda and Sa Maison in Pieta. The fact that such a proposal is being brought forward, brings hope that the necessary changes will take place to push forward active mobility in Malta.

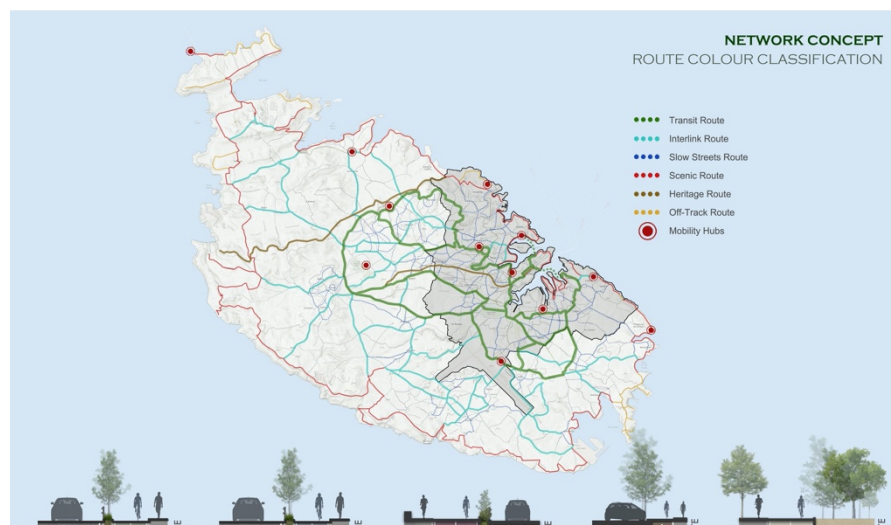


Figure 2.6 Concept of Active Mobility Network Proposal

Source: Daniel Scerri Periti

2.1.3.3 Electric Kick Scooters

E-Scooters are one of the newest forms of micro-mobility and were first commercially available in Malta in 2018. Similar to abroad, most trips by e-scooters are commuted using shared mobility services (Grixti, 2022). In Malta, scooters are not allowed to be driven on arterial and distributor roads (LN352, 2019). Hence, they also face a similar issue of insufficient provision of dedicated infrastructure. Subsidiary Legislation 499.67, released in 2019, also states that scooters can also be driven through cycle paths as well as footpaths but only at a speed limit of 10km/hr (LN352, 2019). Despite the presence of regulations, drastic improvements are still required, especially in relation to design standards for active mobility and parking management of shared scooters.

2.1.4 Hierarchy of the Maltese Road Network

Similar to other countries, Malta's road network consists of multiple links and nodes. The highest element within the hierarchy is the arterial road network that caters for the fastest and longest distances on the island. Arterial roads also feed into distributor roads and provide connections to urban roads as well as local access roads. These final two road types are the lowest in the hierarchy and are intended to provide access to the urban sprawls that are present around the island. Depending on these road categories, the design speeds and priority flows vary accordingly. Pedestrians and cyclists are to be given far greater priority on urban roads when compared to arterial and distributor roads (TM, 2016a).

Key links of Malta's road network also form part of the Trans-European Network –Transport (TEN-T). The development of this network is mostly split in two, the Comprehensive network which ensures accessibility and connectivity to all EU regions, and the Core network which is a representation of the most important nodes and links within the network itself. The upgrading of this network forms part of the EU's initiative to develop an efficient Trans-European Transport Network (TEN-T) that serves as a key element for competitiveness and employment in Europe. This network is multi-modal and ensures connectivity for all transport modes including air and maritime (TM, 2016a).

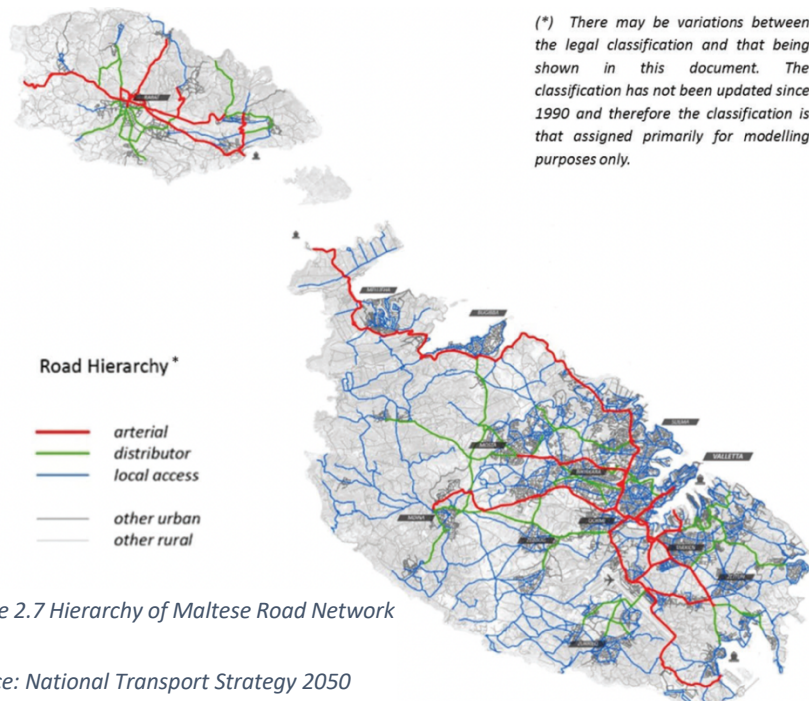


Figure 2.7 Hierarchy of Maltese Road Network

Source: National Transport Strategy 2050

Parts of the TEN-T network also house several links from Malta's cycling network. In 2018, Transport Malta stated that Malta's cycling network was 25km long and a further 7.7km of cycling lanes were to be constructed. This statistic needs to be updated since new cycle lanes have been constructed along with new routes that are being proposed. The main issue with Malta's current cycling network is that it is very fragmented and not interconnected. The fact that the cycling routes constructed so far were all included as parts of road upgrading projects resulted in a series of links that were not ever planned to be connected. No infrastructural project in Malta has ever been solely dedicated to the design and implementation of a cycling route that ensures a route is complete from origin to destination. Remarks on this issue have been made in the "National Cycling Strategy and Action Plan" which also sets itself to propose solutions for these issues (TM, 2018).

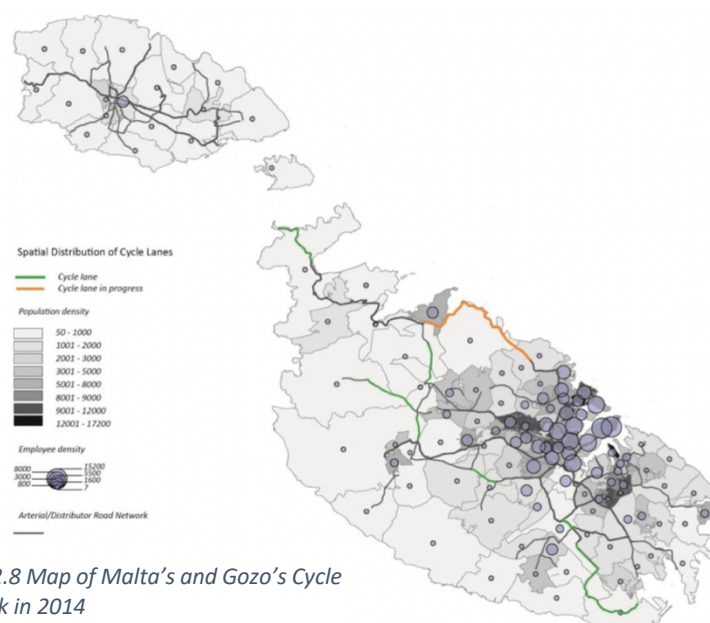


Figure 2.8 Map of Malta's and Gozo's Cycle Network in 2014

Source: National Transport Strategy 2050

2.1.5 Road Infrastructure Design Standards in Malta

For the design and construction of road infrastructure in Malta, local design standards heavily relied on international standards such as the UK Design Manual for Road and Bridges (DMRB). It was only until the year 2003 that the first design manual for roads was published in Malta. The document titled “Design Manual for Roads and Bridges” by Prof. Dr.-Ing. Heinrich Semar (Semar, 2003) is still being used to design our arterial and distributor roads to this day. Unfortunately, standards for the design of urban roads and cycling infrastructure still have not been published as of yet. Therefore, with no standards or regulations on cycling infrastructure, little priority has been given to the matter only until the recent publication of the NTMP and the NCS by Transport Malta. While these documents provide recommendations on the type of infrastructure and cycling routes that Malta could potentially adopt, they are still not legally binding documents on how cycling infrastructure should be designed in Malta. Hence, national cycling standards need to be published if we are to ever establish a holistic cycling network.

2.1.6 EU Policies on Sustainable Mobility and Cycling

In 2011, the EU published a white paper document titled: Roadmap to a Single European Transport Area – Towards a Competitive and Resource-efficient transport system. The roadmap consisted of 40 initiatives to help develop a competitive transport system, with a heavy emphasis on cycling as an alternative and greener mode of transport. All 40 proposals are envisaged to reduce Europe’s dependency on imported oil and cut carbon emissions in transport by 60% by 2050 (European Commission, 2011).

The Paris Agreement that was signed between 196 Parties (including Malta) at COP 21 in Paris, put even greater importance on EU countries to adopt greener initiatives to limit the effects of global warming. The agreement required all member states to devise strategies for climate action to be published by 2020 that will help achieve the reduction in greenhouse emissions (United Nations, n.d). With 25% of the EU’s greenhouse gas emissions being generated from transport, the adoption of Sustainable Urban Mobility Plans has become critical if we are to reach the mid-century target, especially since the EU has now updated its target to become the first climate-neutral continent by 2050 (European Commission, 2022b).

The EU has also acknowledged the important role of cycling for a carbon-neutral continent with its recent European Cycling Declaration in 2021. The declaration states that an EU-wide approach to cycling is still lacking and pledges that coherent policy support and consistency across all EU member states must be achieved. EU member states are to provide the European Commission with data on active mobility while increasing the network of safe cycle lanes. The

Executive Vice President of the European Commission Frans Timmermans stated that “Solid plans will get priority access to funding” (Sutton, 2022). Malta has already gained substantial funding of around 135 million euros, for multiple infrastructural projects thanks to the European Structural and Investments Funds 2014-2020 (European Commission, 2022a). It remains to be seen if any future investment is allocated specifically towards the newly proposed cycling infrastructure through the Multi-Annual Financial Framework (MFF) 2021-2027.

2.1.7 Recognition for alternative modes of Transport

To some extent, our local governing bodies have acknowledged the importance of cycling towards a sustainable modal shift. The 2022 Budget measures even included a grant scheme to incentivise the cost of converting a normal bicycle into a pedelec (paddle-assisted bicycle). A total of €3,400,000 were allocated towards this scheme (TM, 2022a). But is this enough to increase cycling numbers in Malta? The release of the NCS was meant to provide a strategy to help push forward active mobility. Yet with only a draft for public consultation being released, its proposals cannot follow through unless it is finalised. Even at consultation stage, how vigorous are the proposals mentioned within the document?

The NCS document states that through its devised strategies, cycling numbers in Malta are intended to double, yet the basis of how this was calculated is not very clear, especially since the existing percentage of cycling trips in Malta is not even acknowledged within the document. The 2021 NHTS reported that cycling in Malta contributed to around 0.7% of total trips (NSO, 2022b). So even if this doubles to 1.4%, it is still very low compared to other European cities where the modal share even goes up to 38% in certain cities (*EU Cycling Strategy*, 2017).

A total of three new pilot cycling corridors were even proposed between the NCS and the NTMP 2025. These included the corridors from:

- Sliema to Valletta
- Sliema to Fgura
- Mosta to University

These routes were chosen to try and alleviate traffic in the most congested zones as part of its wider proposal to transform the Marsamxett and Grand Harbour areas into a new transport hub. This proposal sufficed due to the highest density of urban mobility occurring in these zones (TM, 2016b). When the Minister for Infrastructure announced the new cycle network, the only detailed route that was presented was from Valletta to Sa Maison. The nationwide

network was only presented in its concept stage and is still being finalised. Therefore, it still needs to be confirmed whether the specific routes from the NCS will be included in the network proposal. *its*

The NCS specifically stated that “Transport Malta opted for the concept of infrastructure sharing (such as street sharing and promenade sharing) as opposed to the creation of explicitly delineated cycle lanes” (TM, 2018). It was believed that cycle lanes along the proposed routes were only possible intermittently, and it was decided that these cycling routes are to be shared with pedestrians and vehicles accordingly. Promenades and particular stretches of roads, sometimes even in contraflow, are to house these cycling corridors. Descriptions on how to retrofit these specific promenades are also included in the NCS. The changes include modifications in levels and finishes, along with the relocation of planters and benches to facilitate the use of such routes.

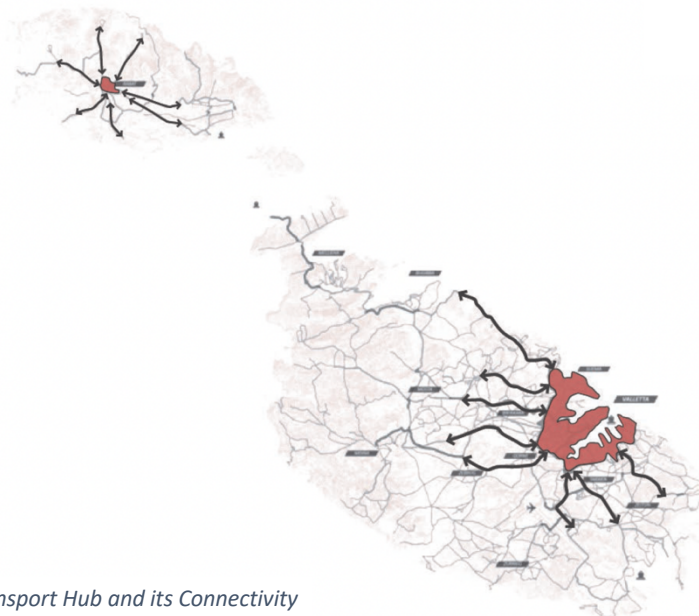


Figure 2.9 Transport Hub and its Connectivity

Source: National Transport Masterplan 2025

As of 2022, the described changes for these pilot corridors have not taken place. The NCS states that two of the three corridors would have been financed under the 2014-2020 ERDF Budget. However, this did not materialise. Therefore this raises the question if these proposals have been either shelved, delayed or incorporated into the newly proposed cycle network. In October 2022, the Infrastructure Minister did state that the network should span between 50-60km, making it even more possible that the proposed routes within the NCS could be integrated within this network (Arena, 2022a). The total length of the newly proposed network is far greater than what is proposed in the NCS. Therefore, the network is expected to be far more extensive than what has already been published in the NCS.

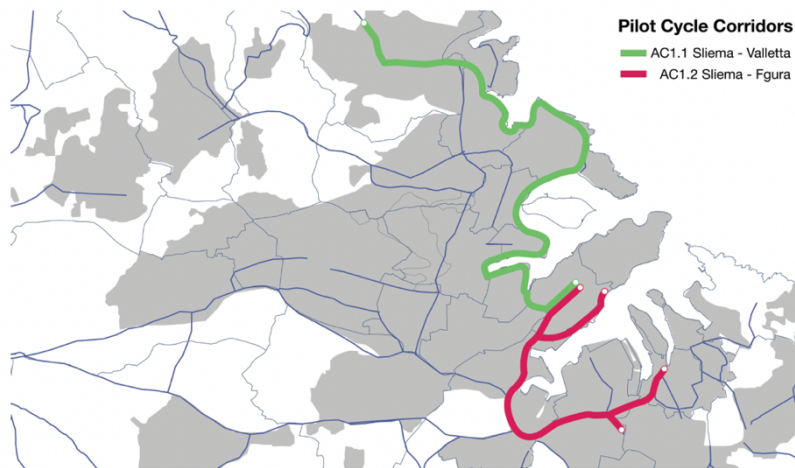


Figure 2.10 Pilot Cycle Corridors 1 & 2

Source: National Transport Masterplan 2025

To further encourage cycling, a series of short terms objectives were also set in the NTMP. These included developing a national bicycle-sharing scheme, designing guidelines for safety measures regarding bicycles and better provision of space for the use of bicycles (TM, 2016b). While bicycle-sharing systems have been implemented, design guidelines still have not been introduced. There is also no information on recorded bicycle racks in Malta, hence making it difficult to assess if these have increased. It is rather contradictory to establish better provision of space for bicycles, yet not propose any specially dedicated cycle infrastructure within the NCS. A new web-based app for real-time cycling journey planning and a new platform to bring various stakeholders together were supposed to have been set up, yet no news or information is available to the public regarding their fruition.

The former president of the Non-Governmental Organisation Rota, Michelle Attard Tonna stated in an interview with The Malta Independent that in their view, the NCS is not written by members that form part of the cycling community. Therefore, the proposals are not sensitive enough to address the true needs of cyclists. In the interview, she further states that the document was written in a “piecemeal kind of approach – a cycle lane here, a cycle corridor there, or places where you can tie the bike – but nobody spoke about the whole experience from when you leave home with a bicycle to when you arrive at your destination alive and unhurt” (Tonna, 2022) (Galea, 2019).

The publication of such strategy documents is a step in the right direction towards active mobility. But we must ensure that such proposals are truly endorsed and followed through. The proposed shift in mobility will not suffice especially if such documents are simply published and then put aside to collect dust. The proposal of an active mobility network is also a further step in the right direction, but from the information that is available to the public, it is very unclear if such a proposal is being adopted from the recommendations of the NCS or is being devised independently.

2.2 Advancements in Cycling Globally

The following second half of the Literature Review discusses different concepts and principles of cycling on an international level. The discussion on such principles will then help assess the applicability and relevance of these concepts in Malta. By comparing multiple reports, reviews and guidelines, Malta's existing strategies and approaches can be better analysed in relation to international practices. This will help highlight which components in Malta's existing cycling framework require restructuring for the local cycling community to flourish.

2.2.1 Seville's Rapid Transformation into a Cycling Hub

In a span of five years, the city of Seville managed to increase its cycling rates from practically 0% up to 9% of total trips within the city. In 2006, Seville had only around 12km of mostly unconnected cycle paths. This quickly changed when the municipal government adopted new active policies that catered for the incorporation of a holistic cycling network through the construction of segregated cycle paths. By 2011, the cycling network continued to grow to around 120km of bike lanes. This further expanded to 180km by the end of 2018 (Euronews, 2018).

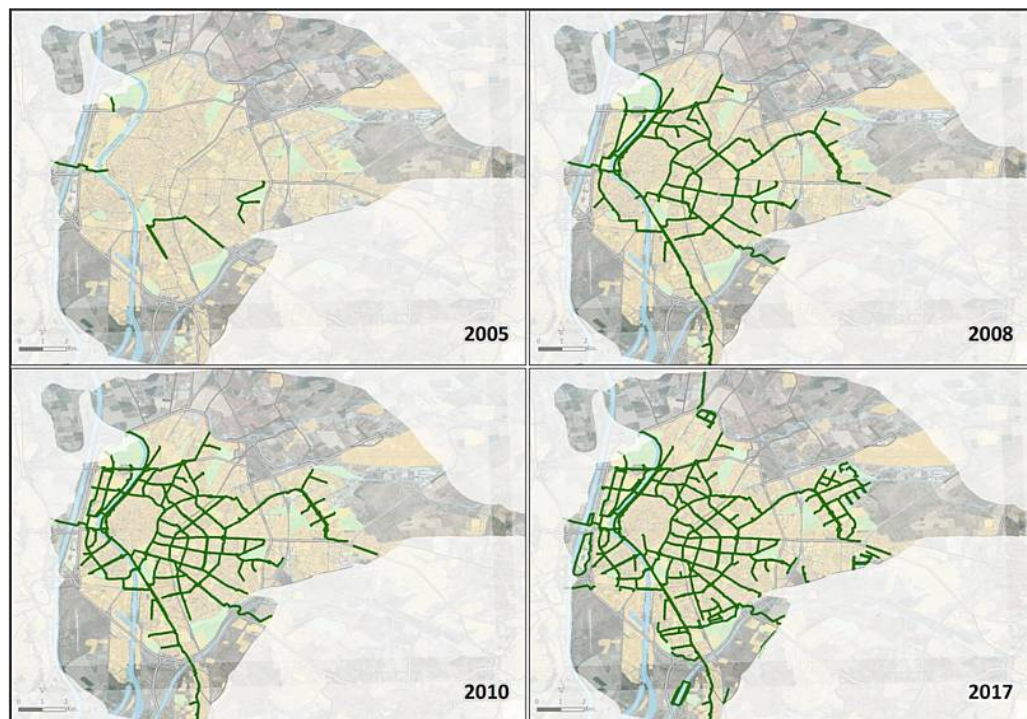


Figure 2.11 Evolution of the cycle paths in Seville

Source: Municipality of Seville

The strategy to incorporate newly segregated cycle paths was mostly achieved by transforming multiple parking bays into cycle lanes. The width of the former parking bays also allowed the cycle lanes to be bidirectional. The cycle lanes were also raised to the same level as the sidewalks. This increased cyclists' safety and also guaranteed that future governors would not so hastily transform the cycle lanes back into parking bays. These resilient measures

not only targeted the city's infrastructure but also its policies. Such mechanisms proved particularly useful when a change in local government between 2011 to 2015, shifted mobility priority back towards cars. A reversion to the previous governing body in 2015 brought back a resurgence to bicycle promotion policies and included a new bicycle plan for the city. The new plan also emphasised the provision of bicycle parking infrastructure throughout the city (Euronews, 2018).



Figure 2.12 Before and after photos of one of the most used cycle paths in Seville

Source: Municipality of Seville

The adoption of a new cycling strategy was also supported by a wider programme on active mobility, where new pedestrian zones were introduced in the historic city centre. Very few dedicated cycle paths were proposed in the historic city centre since the priority was to implement traffic calming measures rather than specially dedicated cycle paths. This goes to show that the provision of safe cycling spaces can be adapted depending on the use and characteristics of the area in question. The construction of such an accessible network also brought about the immediate success of public bike-sharing systems, where the demand is still very high to this present day. It is also worth noting that an increase in cycling numbers also boosted intermodal travel. An increase in public transport use was noticed in areas where cycling is more accessible within the city (Marqués et al., 2014).

The city of Seville, therefore, shows us that in a span of a few years, substantial gains can be made with regard to active mobility. Even cities that never possessed a tradition of utilitarian cycling can be transformed into a cycling-oriented community. This all depends on what is truly given priority and importance with respect to our roads.

2.2.2 Cycling Corridors in Pedestrianised City Centres

The case study of Seville placed an emphasis on segregated cycle paths, but it also acknowledges that established cycle routes can also be provided in shared streets given adequate traffic calming measures are also provided. Figure 2.11 shows that dedicated cycle lanes were not incorporated within the historic centre of Seville in favour of shared mobility spaces. The town of Ferrara in Italy with only 140,000 inhabitants has around 5 hectares of pedestrianised zones within its historic centre and no dedicated cycle lanes, yet it boasts a bike modal share of around 30% (Dekoster & Schollaert, 1999). To further facilitate cyclists, Ferrara's city council decided to replace older paving stones in the city centre with wider and flatter stone paving slabs to improve rideability. This goes to show a cycling network does not only need to be facilitated by specially dedicated cycle lanes but must adapt according to the specific needs within an area.

2.2.2.1 Woonerf

The woonerf/home zone concept balances the priority between pedestrians and cyclists over motor vehicles, hence making it a plausible solution for cycling corridors where space for dedicated cycle lanes is limited. The goal of the woonerf is to establish a peaceful coexistence between all types of road users such as children safely playing in the street. This is achieved by eliminating continuous kerbs in streetscapes and merging the division between pedestrian and auto space. This automatically forces automobile drivers to reduce their speed and drive more cautiously (Collarte, 2012). The limitation in vehicular speed not only provides a greater sense of safety to cyclists and pedestrians but also allows better use of public spaces. With the adaption of Woonerf principles, street furniture such as planters and benches can be incorporated more easily into our streets. Hence contributing towards more attractive and liveable spaces for all road users (Paja, 2015).



Figure 2.13 Image displaying the Woonerf design principles

Source: Appleyard and Cox 2006,31

A common set of principles should be followed when designing a new street in the form of a home zone. These include:

- **Having clearly marked entrance signages into home zone streets** to make automobile drivers aware to drive more slowly and cautiously.
- **Elimination of continuous kerbs** to homogenise different types of road users
- Implement further traffic calming measures such as chicanes, curvilinear road layouts and road humps to reduce traffic speed.
- **Provision of parking spaces in an intermittent manner** and not continuously, serving as a statement that vehicles are not the dominant mode of transport within the street.
- **Incorporation of outdoor furniture** to further calm down traffic and provide amenity value (Collarte, 2012).

Despite these guidelines, woonerfs cannot be seen as a one size fits all approach. Each country has taken the core principles of the Woonerf and adapted them according to their respective demands and needs. The most successful redesigns of home-zoned streets are attributed to direct input from local citizens (Biddulph, 2001). Hence why each country has to adapt its residential road design according to the specific needs of the local community.

2.2.2.2 Complete Streets

Complete Streets are a set of policies intended to alleviate the needs of all road users, particularly cyclists and pedestrians, with other forms of transport. It ensures that “streets are safe, balanced and inclusively support diverse economic, cultural and environmental uses” (Bas et al., 2021). Complete street principles can be applied to a single street, as well as an entire network of streets. A network-based approach gives greater versatility as to which streets will be able to provide specific services. Therefore, in the form of a network, a more comprehensive view is taken to achieve safe and comfortable commutes for residents. When considering a network, a single street may not be able to accommodate the needs of all road users, but it could be designed in conjunction with a parallel route where a different balance of transport modes can be utilised (Orange County Council of Governments, 2016).

The components that help make a street ‘complete’ varies from one street to the other, and no street is ever the same, especially when different communities may require different needs. Hence Complete Streets are essentially a sustainable approach to how we design our streets (National Complete Streets Coalition, 2022). In terms of cycling, this indicates that a cycling network does not necessarily have to expand to every street within a town but it must be devised as part of a holistic network that caters for multiple forms of sustainable mobility. While not all streets may need to be cycling-friendly, through Complete Streets, it would still be possible for a cyclist to travel from one location to the other safely and efficiently.

2.2.3 International Cycling Standards

Similar to residential roads, no local standards exist for the design and construction of cycle paths in Malta. As arterial and distributor roads are designed according to established standards, so should our cycleways. Standards alone are not enough. A policy framework needs to be established which is then supported with the guidance of cycling standards (CROW, 2016). To some extent, objectives have been published through the NCS, but no supporting guidelines exist to pursue this ambition. Policies need to be adopted to satisfy the specific needs of our communities. It is then through the guidance of local standards that we are able to fulfil the policies' objectives. Hence, understanding the design principles from other international standards is crucial to adopt our very own guidelines. The National Association of City Transport Officials (NACTO) even acknowledged that before publishing its own guidelines, it went through extensive research on other international guidelines and real-life case studies (NACTO, 2022).

Multiple cycling standards exist on an international level, with some of the most renowned standards being published by Transport for London (TfL), CROW (Netherlands) and NACTO (North America). A common set of driving principles can be found in all of these established cycling standards. Safety is the number one highlighted priority, but these guidelines also strive for directness, comfort, coherence, attractiveness and adaptability in cycling infrastructure (TfL, 2014a). Most of these standards have a similar structure for multiple topics. The main themes include:

- Designing of a cycle network
- Cycle lanes and tracks
- Junctions and intersections
- Bicycle signals
- Signs and markings
- Cycle parking
- Evaluation and Assessment
- Maintenance

These guidelines are crucial since they not only help design specific cycle routes but also provide guidance on the design of a holistic cycling network. Parameters are also specified for the assessment of a proposed cycling route in terms of its adequacy. These include area porosity analysis, mesh density analysis, cycling level of service audit and more (TfL, 2014b).

Factor	Indicator	Critical'	Basic CLoS (score=0)	Good CLoS (score=1)	Highest CLoS (score=2)	Score
Safety						(48)
Collision risk	Left/right hook at junctions	Heavy streams of turning traffic cut across main cycling stream	Side road junctions frequent and/or untreated. Conflicting movements at major junctions not separated	Fewer side road junctions. Use of entry treatments. Conflicting movements on cycle routes are separated at major junctions	Side roads closed or footway is continuous. All conflicting streams separated at major junctions	
	Collision alongside or from behind	Nearside lane in range 3.2m to 4.0m	Cyclists in wide (4m+) nearside traffic lanes or cycle lanes less than 2m wide	Cyclists in dedicated cycle lanes at least 2m wide	Cyclists separated from motorised traffic	
Directness						(8)
Journey time	Ability to maintain own speed on links		Cyclists travel at speed of slowest vehicle ahead (including other cyclists)	Cyclists can usually pass other vehicles (including cyclists)	Cyclists can always pass other vehicles	
	Delay to cyclists at junctions		Journey time longer than motor vehicles	Journey time around the same as motor vehicles	Journey time less than motor vehicles	
Value of time	For cyclists compared to private car use (normal weather conditions)		VOT greater than private car use value due to some site-specific factors	VOT equivalent to private car use value: similar delay-inducing factors and convenience	VOT less than private car use value due to attractive nature of route	
Coherence						(6)
Connections	Ability to join/leave route safely and easily		Cyclists cannot connect to other routes without dismounting	Cyclists share connections with motor traffic	Cyclists have dedicated connections to other routes	
	Density of other routes		Network density mesh width >400m	Network density mesh width 250-400m	Network density mesh width <250m	
Comfort						(20)
Surface quality	Defects: non cycle friendly ironworks, raised/sunken covers/gullies	Major defects	Many minor defects	Few minor defects	Smooth, high-grip surface	
Surface material	Construction		Hand-laid asphalt or unstable blocks/sets	Machine laid asphalt concrete or HRA; smooth blocks	Machine laid asphalt concrete; smooth and firm blocks undisturbed by turning vehicles	
Attractiveness						(12)
Impact on walking	Pedestrian Comfort Level (PCL)		Reduction in PCL to C, D or E	No impact on pedestrian provision or PCL never lower than B	Pedestrian provision enhanced by cycling provision or PCL A	
Greening	Green infrastructure or sustainable materials incorporated into design		No greening element	Some greening elements	Full integration of greening elements	
Adaptability						(6)
Public transport integration	Smooth transition between modes or route continuity maintained through interchanges		No consideration for cyclists within interchange area	Cycle route continuity maintained through interchange and some cycle parking available	Cycle route continuity maintained and secure cycle parking provided. Transport of cycles available.	
TOTAL (max 100)						(100)

Figure 2.14 Parts of the Cycling Level of Service assessment matrix

Source: London Cycling design standards Chapter 2: Cycling Level of Service assessment

What helps retain the relevance of these standards is that they need to be updated accordingly to highlight new emerging practices. The rise of electric scooters is an example of how cycling infrastructure might need to adapt to also cater for this new form of micro-mobility. Standards on how to design for the different forms of micro-mobility, such as “The Micromobility Street Design Manual” (Buro Happold, 2022), have already been published and are continuously updated. As transport and mobility evolve, so must our guidelines. But for standards to remain relevant, we must always place ourselves in the shoes of the end user. By maintaining a grasp of what is required, we can then truly address any existing issues and design our infrastructure accordingly (CROW, 2016).

Options for micromobility lane/corridor separation to cars

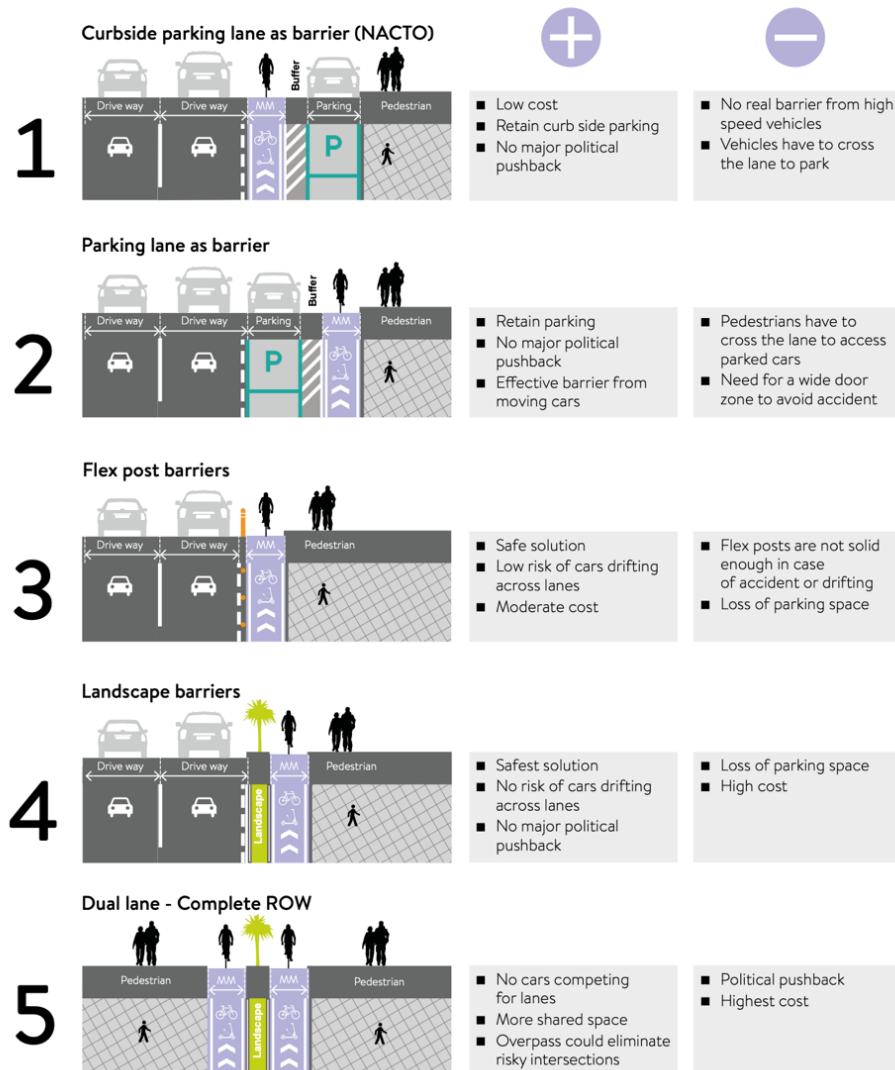


Figure 2.15 Options for Micro-mobility Lane/Corridor Separation to Cars

Source: Burro Happold – Micromobility Street Design Manual

2.2.4 Electric Bikes

With the rapid advances in technology, the purchasing of electric bikes has increased rapidly all over the world in the last few years (MacArthur et al., 2014). With drastic improvements in battery longevity, component modularity, and economies of scale, electric bikes are now capable of travelling long distances in a faster and more feasible manner. Between 2000 and 2010, over 150 million e-bikes have been sold, resulting in the most rapid uptake of alternative-fuelled vehicles in the history of motorisation (Jamerson & Benjamin, 2013).

From a transport and fitness point of view, e-bikes are capable of reaching and maintaining speeds with less effort when compared to a conventional bike. In the European Union, electric bicycles are split into two categories, pedelecs and powered cycles. Pedelecs assist paddling and have a motor power limit of 250W, while powered cycles are throttled powered with a range from 250-1000W (Macarthur & Kobel, 2014). The government grant that was discussed in section 2.1.7 is specifically dedicated to pedelec bicycles (TM, 2022a). The NGO Rota highly encourages the use of pedelecs especially to assist riders that may be required to cycle through steeper slopes. A key advantage of pedelecs is that the level of assistance when pedalling can be adjusted accordingly to your desired intensity. This means that far less physical effort may be required when compared to a conventional bike (Rota, 2022).



Figure 2.16 Diagram showing the difference in power control between pedelecs and powered cycles

Source: Xplorer Technologies

E-bikes have the potential to increase cycling rates all across the globe, especially concerning utilitarian trips such as commuting and work. The fact that e-bikes allow for longer-distance trips with less effort when compared to bikes, provides untapped potential for the expansion of our cycling community. Once again, while grants for pedelecs could make e-bike purchases more attractive, the increase in cyclist numbers will not suffice if they are not supported with the necessary infrastructure.

2.2.5 Bike Sharing

The popularity of bike sharing only increased recently, thanks to technological advances. At the time of writing, bike-sharing is currently in its fourth generation system with the incorporation of GPS technology and smartphones assisting to make the entire experience smoother and easier for riders (Ma et al., 2020). Globally bike-sharing systems are divided into two categories: docked bike sharing and dockless bike sharing (Liu et al., 2018). The only service provider for bike sharing in Malta operates using a docked bike-sharing system.



Figure 2.17 Photo showing a docked Bike Sharing Station at the University of Malta

Source: University of Malta Newspoint

On an international scale, the incorporation of such systems has assisted in a modal shift with a direct impact on private vehicle use, public transport, as well as other active modes of transport such as walking and cycling (Daniel et al., 2013). Similar to conventional cycling, bike-sharing systems could also improve the quality of urban design by alleviating traffic congestion, reducing carbon emissions and enhancing our physical well-being (Ma et al., 2020). In a journal written by Xinwei Ma titled: “Bike-sharing systems’ impact on modal shift: A case study in Delft, the Netherlands”, having a dockless system without a fixed pick-up location proved to be a popular motivator for the use of bike-sharing services. This raises the question if such a system would help increase the popularity of bike sharing in Malta.

The journal by Xinwei Ma acknowledges that bike-sharing systems are not explicitly designed to reduce car numbers, but are a plausible solution to instigate a modal shift. It was also noted that the use of trains increased significantly in areas where bike-sharing systems were introduced. This gives further strength to the principle of intermodality. As there is interest to increase public transport use in Malta (TM, 2016b), increasing interconnectivity with bike-sharing systems could be a plausible solution. For this to suffice, we require further investment in cycle infrastructure, both in terms of strategically located bicycle stations as well as safer and more established cycling routes.

2.2.6 How to Bridge the Gap in Malta's Cycling Infrastructure?

The previous sections have discussed multiple principles and concepts for cycling which our islands are merely accustomed to. Malta cycling's culture is very limited when compared to international case studies such as Seville. But we must also acknowledge that even Seville was in a similar situation to Malta before it adopted new active mobility policies. The main differences are that the governing body acted in favour of active mobility and the public decided to follow suit. A clear vision and action plan supported with guidelines were established to push the city forward. This is an occurrence that is still yet to take place in Malta.

We have already discussed how both the EU and the NCS expressed their desire to establish a more active cycling community. This is not only achieved by educating the public but by also providing the necessary infrastructure. Therefore, a policy framework needs to be set in place before we can expect any significant modal shifts towards cycling. These policies need to be supported by guidelines that are based on successful international case studies as well as already-established cycling standards. The plausibility of what can be incorporated into our road network could then be assessed. These guidelines need to be specified according to the country's specific needs and requirements. Such guidelines are not only required for cycling infrastructure but for urban streets in general. Concepts such as the Woonerf and Complete Streets principles should also be adopted into these guidelines. It is only then that we can proceed with the design of a functional cycling network for the Maltese islands.

It is also important that stakeholders and cyclists are actively involved in the uptake of these standards. Consultation with the cycling community is key to the successful implementation of cycling routes. If a healthy relationship is not maintained, the devised strategies will never truly be capable of addressing the needs of the community.

For some, Malta's climate is considered to be too extreme to perceive cycling as a viable and popular mode of transport. While Malta's climate can be challenging, it does not mean that adaptive solutions do not exist against such issues. Seville, which is also a city with a Mediterranean climate, still managed to drastically improve its cycling numbers by efficiently incorporating cycling infrastructure. The location and environment in which we place our cycling routes should provide better comfort for cyclists against the elements. Landscaping and urban greening could help provide better shelter against the sun while cycling. Seville's cycling transformation adopted these principles and hence devised cycling measures that ensured maximum efficiency and connectivity for cyclists. On certain roads, the highest priority was given to VRUs as opposed to motor vehicles. This is a principle which is still fairly limited in the local context.

Another perceived setback is that Malta has multiple slopes included in its road network. This is seen as a detriment to some, but the incorporation of pedelec bikes is an effective solution to this problem. That is why grants for electric bicycles have been provided by the government (TM, 2022b). But grants on their own are still insufficient to increase cycling numbers. A significant push is also required to establish a framework with clearly defined measures and strategy plans.

Similar to Malta, Seville also faced issues of limited space for the incorporation of cycling infrastructure. A decision had to be made to sacrifice on-street parking for dedicated cycle paths. Unfortunately in Malta, certain examples such as the reconstruction of the Marsaskala promenade yielded opposite results. A timed cycle lane was devised adjacent to the sidewalk. Over time, this permanently transformed into on-street parking bays due to greater pressure and demand for on-street parking (TM, 2018). This once again shows how political will is crucial for the manifestation of cycling infrastructure on our islands. Our policies and regulations are still not reflecting the desire to improve and maintain cycling infrastructure.

The example of the Marsaskala promenade also shows how strong the car-centric mentality is in Malta. The removal of on-street parking is considered sacrilege for some, especially because schemes to disincentivise car use such as paid on-street parking have never been introduced. These schemes have been used to great effect abroad to reduce motor vehicles and promote active mobility. Such schemes should therefore be included strategically when designing our urban roads. In areas where parking demand is still high, alternatives such as multi-level car parks and park & rides could be offered as alternatives.

The only existing regulation regarding urban streets is that the maximum speed limit is 50km/hr (TM, 2012). Significant contributions are required especially if we are to adopt slow street principles to our residential roads. The principles from Complete Streets and Woonerfs are crucial to provide a better balance in priority for all road users. Similar to how not all urban roads need to be cycling friendly, not all roads need to be slowed down to pedestrian priority. Complete streets work best when an entire network of roads operates in tandem and strike a balance between different transport modes available. This means our cycling network ought to be expansive rather than exhaustive in its outreach for an intermodal transport system.

By providing a better balance in priority for active modes of transport, phenomena such as bike sharing can prosper. International case studies have proven that such technological schemes can be very attractive and successful, given that they are supported by a solid backbone of cycling infrastructure. After adopting a proper cycling network, we can then start pushing the boundaries of such innovative services.

The increase in automobile demand is straining our road network to new extremes. This has also compromised the quality of our open spaces including our streetscapes. Unfortunately, multiple limitations in our existing cycling network need to be addressed. While cycling is not going to be the saving grace for all our transport-related issues, it still has a significant role to play in achieving a resilient transport system in Malta. But for this shift to suffice, both the government and the community must understand how these principles of active mobility not only benefit the efficiency of our transport system but also improve the environment that we live in. By acknowledging these factors, we can strive towards the necessary changes for a more attractive and sustainable way of living.

The founder and former president of Project for Public Spaces Fred Kent, once stated, “If you plan cities for cars and traffic, you get cars and traffic. If you plan for people and places, you get people and places” (Kent, 2005).

Summary of the Main Findings from the Literature Review:

Theme of Intervention	Topics	Points for further Research
Policies and Guidelines	The need for introduction of local standards for Residential Roads – Incorporating Woonerfs and Complete Street Principles	Gain an understanding as to why this has not materialised yet and if there are any developments on the matter
	The need for introduction of Cycling infrastructure Standards and Guidelines	
	Implementation of a Holistic Cycling Network	Understanding what were the driving forces that helped form the concept of the Active Mobility Routes proposal
	The involvement of the cycling community during Planning and Design	Determining how much the stakeholders were involved in these particular matters
	Adaptive Measures that cater more towards Active Mobility	Determining the views of the relevant authorities and stakeholders on specific adaptive measures? (ie. Relocation of Parking)
Community Participation, Education and Incentives	Promotion of Active mobility	Understanding what are the main barriers that are holding back an Increase in Active Mobility
	Grants on Pedelects Bicycles	Understanding whether the grant was successful and well received
Infrastructure	Sufficient placement of Bicycle Stations	How much priority is given to cycling infrastructure when designing new residential roads?
	Safe and Interconnected Cycle routes	
Safety & Vulnerability	Adequate zoning for cycle Routes	Further research on the relationship between shared mobility spaces in residential areas and segregated routes for links with heavier traffic

Table 2.1 Summary of Main Findings and Points of Discussion from the Literature Review

Chapter 3 - Methodology

3.1 Introduction

The main scope of this dissertation is to gain a better understanding of the main contributors to Malta's low cycling rates and if the recent construction of cycling infrastructure has in any way inhibited a change to this particular statistic. The Literature Review helped provide a solid basis to understand Malta's transport sector and its effects on active modes of transport. It was evident that a disproportional balance exists between the use of private transport vehicles and the other remaining modes of transport.

While highlighting the deficiencies that contribute towards such a negative bias, this study has also looked at international practices that could also inspire the way forward for Malta. The fact that a positive change was possible within similar scenarios such as Seville, provides a sense of optimism that a potential modal shift is also achievable in the local context. With the guiding design principles and active mobility concepts that were discussed in the Literature Review, Malta could pave the way forward and achieve an equitable modal share within its road network. Changes can already be witnessed with the construction of certain infrastructural projects on a national scale. Therefore, to assess if such changes are truly yielding positive results, further research is required beyond what has been established with the desk studies in this dissertation. Hence, this chapter intends to discuss the structured methodology that was adopted to assess the contributions related to specific projects that feature cycling infrastructure.

3.2 Methodology Structure

To help answer the various research questions that are posed in this study, a structured methodology has been devised to help assure that the following research questions can be adequately answered:

- I. Has there been an increase in cycling activity with the incorporation of new cycling infrastructure over the past few years?
- II. Have these routes been well received by the cycling community?
- III. Are there any instances in which cyclists are still using motor vehicle carriageways despite the presence of cycle lanes in the vicinity of their cycling route and why is this the case?
- IV. What barriers might be preventing a modal shift from happening?

While the Literature Review helped answer some aspects of the research questions, especially in relation to question I, other methods of research are required to fully address the remaining

questions. Since the questions themselves touch upon multiple facets related to cycling and active mobility, it was decided that a combination of research methods was to be used.

All the research methods used will be described in the following sub-sections. The chronology of the described methods was devised to set up a portfolio of data that could be correlated. The findings from each section helped solidify and develop the data-capturing process of the subsequent research tool used. Therefore, this methodology not only assisted in thoroughly answering the research questions but also provided a far greater understanding of the subject matter than if only a single method of research was used.

3.2.1 The Literature Review

The Literature Review was the main starting point of the entire research process since it helped set a clear picture of the current situation related to cycling in Malta and how it could be improved. A multitude of secondary sources were used, ranging from reports, journals, articles and published statistics. Common themes related to certain shortcomings were made evident upon reviewing these sources. The amalgamation of this information brought rise to certain questions that could not be answered solely through the literature review. Hence, further research using primary sources was required. These made it possible to answer specific questions related to this study.

3.2.2 Qualitative and Quantitative Research Techniques

In the case of this dissertation, to thoroughly study the cycling routes in question, it was opted to use both quantitative and qualitative techniques. Data such as traffic counts and surveys helped assess the frequency of use and how fit for purpose these cycling routes are perceived by the cycling community. The data gathered from these techniques was more numerical in nature. Therefore, it did not provide enough descriptive information as to why these cycle routes were or were not so well received. Hence, qualitative data was also required to better understand the reasoning behind this feedback. This was achieved by conducting interviews with both the relevant authorities as well as active members of the cycling community.

3.2.2.1 Primary Assessment of Cycling Routes

3.2.2.1.1 Geographic Mapping

The first step in assessing these cycle routes was to map them on a geographical map. This helped assess how holistic and well-connected our cycle routes are. A map was already published in the NTS back in 2016 (Figure 2.8). Since then, several new routes have been constructed including the ones that will be assessed in this dissertation. Therefore, the map provided by the NTS was updated to include all the cycle routes constructed up till the end of 2022. Once the map was completed, an overlay of the newly proposed cycling network was included to assess any overlaps with the already existing routes. The assessment of this updated map helped provide insight into certain issues with regard to network suitability that also helped formulate other research methods.

Accessing the GIS platform used by TM assisted in identifying and mapping all the recently constructed cycling routes. Three specific newly constructed cycling routes were chosen for this particular study. Apart from being some of the most prominent and recently constructed cycle lanes, these routes also appear to be included in the newly proposed cycle network. This makes this study more relevant in case future studies are required in relation to this proposal.

The chosen cycle routes were:

- i) the Central Link Project
- ii) the Marsa Flyovers project
- iii) Triq Hal Qormi in Luqa

These particular routes were chosen since the width and length for the majority of each of these cycle routes were sufficient to be considered adequate cycling paths according to international standards (Sustrans, 2014). The routes are located in areas that experience large volumes of mobility hence posing the possibility of a greater catchment area of cyclists to be recorded. All three routes also include fully segregated cycle lanes, a prospect that in theory should further boost cycling numbers thanks to the improvements in road safety for VRUs.

Cycle Route	Year of Completion	Route Length	Types of Cycle ways	Single or Bi-Directional
Qormi Road - Luqa	2020	1.6km	1km – Segregated Cycle Lane 0.6km – Share the Road (Service Road – Single Direction)	Mix of Both
Marsa Flyovers Project	2021	0.85km	0.85km - Segregated Cycle Lane	Bi-Directional
Central Link Project	2022	3.6km	2.5km – Segregated Cycle Lane 0.6km – Share the Road 0.5km - Unsegregated Cycle Lane	Bi-Directional

Table 3.1 Table of the chosen Cycle Routes that were assessed

Qormi Road – Luqa



Figure 3.1 Site Plan of Qormi Road with Imagery sourced from IM

Marsa Flyovers Project



Figure 3.2 Site Plan of Marsa Flyover Project Cycle lane with Imagery sourced from IM

Central Link Project



Figure 3.3 Site Plan of the Central Link Project with Imagery sourced from IM

3.2.2.1.2 On-Site Observations

After mapping and understanding the location and site extents of each cycle route, an onsite inspection was carried out for all three routes. This helped in the familiarisation of particular components for each cycle route. This was especially useful during the surveys and interviews. It was hence easier to identify the location and understand the issues that were highlighted from the feedback given. By also experiencing these routes first-hand on an e-scooter, it was also easier to identify any hardships that cyclists might be experiencing when using these routes. A photo library of the photos taken while on site is included in Appendix B.

3.2.2.2 Cyclist Counts

The undertaking of cycling counts helped provide a better picture of how frequented these cycle routes truly are. This was the first step in also understanding if these infrastructural projects are truly contributing towards active mobility. After consulting with both IM and the NGO Rota, it was confirmed that cyclist counts have never been undertaken in Malta, making this study the first of its kind within the local context.

A small battery-powered camera was installed alongside these cycle routes. The identity of the pedestrians and cyclists that were recorded could not be identified since the camera was set to record at a faster recording speed (opposite to slow-motion recording). With the use of a camera, it was also possible to take counts for the entirety of a single day while also distinguishing the counts between cyclists and pedestrians. The counts were specifically carried out mid-week either on a Tuesday, Wednesday or Thursday, since these are the days when traffic demand is usually at its highest.

Cycle Route	Date of Cyclist Counts	Weather Conditions
Qormi Road - Luqa	Wednesday 10 th May 2023	Cloudy with No Rainfall
Marsa Flyovers Project	Thursday 11 th May 2023	Clear and Sunny
Central Link Project	Wednesday 17 th May 2023	Clear and Sunny

Table 3.2 Table of Date and Weather Conditions for each set of Cycle Counts

For each cycle route, a full day's worth of cyclist counts was taken. The counts started at 6:30 a.m. and finished at 8:00 p.m. Given that the most frequented trips are for work and educational institutions (NSO, 2022b), this time frame was deemed to be sufficient to capture as many cycling counts as possible for each of the three routes.

Camera location for Qormi Road – Luqa



Figure 3.4 Location of Cyclist Count Camera at Qormi Road

Camera location for the Marsa Flyovers Project

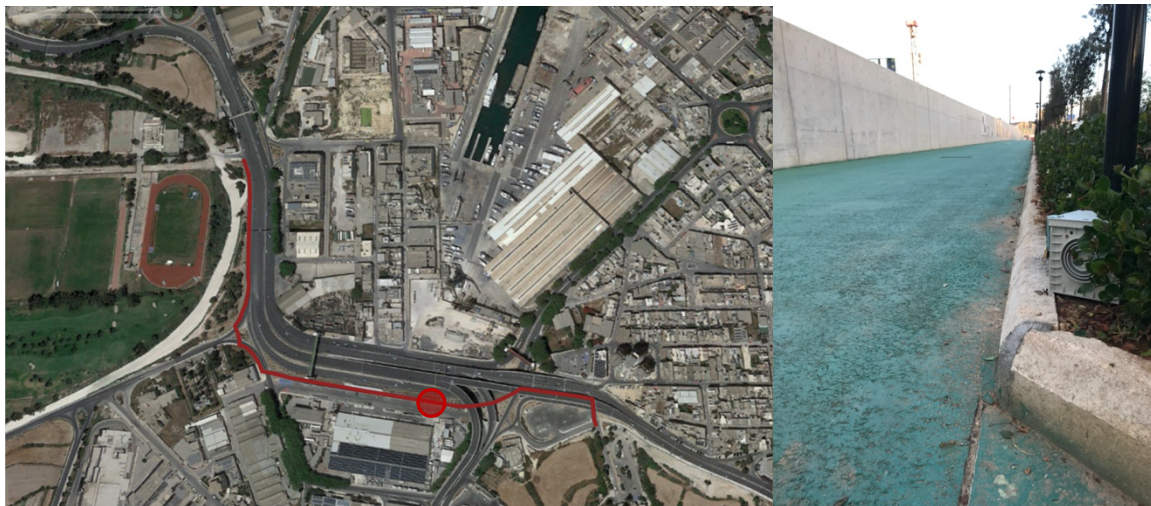


Figure 3.5 Location of Cyclist Count Camera at Marsa Flyovers Project

Camera location for the Central Link Project



Figure 3.6 Location of Cyclist Count Camera at the Central Link Project

Apart from assessing the usability of these cycle lanes, these cyclist counts also intend to serve as a base of reference in case new counts are undertaken in the future. If active modes of transport truly become more popular with the implementation of a cycling network, these counts could act as a comparative measure that helps assess by how much cycling has improved within these routes.

The Annual Average Daily Traffic (AADT) for the three routes was provided by IM to help determine the cycling modal share for each route. Dividing the cyclist counts of each route by its respective projected AADT for 2023 provided the percentage of trips that were made using a bicycle. Scooters were also included in the calculation of the modal share.

Projected AADT Values (1% Per Annum Projection for 2023)		
Qormi Road - Luqa	Marsa Flyovers Project	Central Link Project
15,088 (Year 2014)	67,318 (Year 2014)	15,381 (Year 2017)
16,501 (Year 2023)	73,624 (Year 2023)	16,328 (Year 2023)

Table 3.3 Table of AADT values for each route

These counts are the first of their kind locally. Therefore, to provide a sense of scale for the data gathered, it was compared to a heat map provided by Strava. By registering online, Strava provides access to their heat map which highlights the most frequented routes by cyclists. The heat map is formulated by registered users that allow their cycling trips to be tracked across the island. Therefore, by assessing if the routes studied in this dissertation are highlighted within this map, a better sense of scale was attained for these cyclist counts. If for example a studied route was not highlighted within the map, this showed that the counts gathered for that particular route represent a very small percentage of cycle flows compared to the rest of the island. Hence, the traffic counts for that route can be considered a low representation of cycling users compared to other routes, deeming the route unpopular with cyclists.

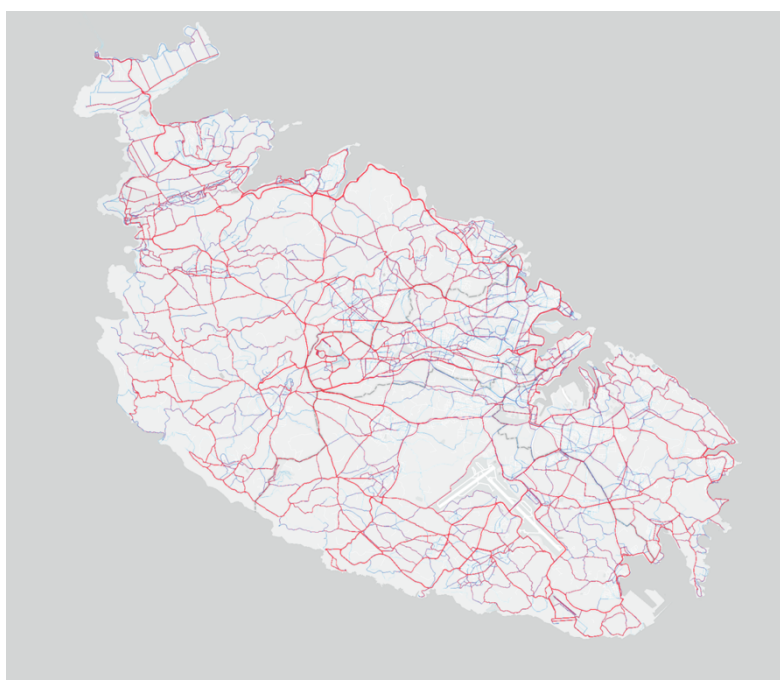


Figure 3.7 Strava Heat Map with Red Overlay

Source: Strava.com

3.2.2.3 Surveys

The main intention of the surveys was to better support the cyclist counts data and understand why figures were so high or so low for these cycling routes. Since the aim was to assess usability and efficiency, the surveys were specifically targeted at cyclists. The survey was formed using Google Forms and was disseminated using online platforms, specifically through cycling-related Facebook groups. Before proceeding with the survey, participants were specifically asked if they have ever cycled around Malta. This was done to ensure that only cyclists participated in the survey.

Given that no figures exist on the size of the cycling community, the survey results acted to support the other research techniques, since there was no way to guarantee that the number of responses provided a statistically representative sample of the cycling community. A total of 148 respondents answered the survey. A survey was previously carried out by the NGO Rota, which was formerly known as the Bicycle Advocacy Group (BAG) in 2016. This survey was acknowledged by the NCS. It highlighted that the survey focused on cyclists' behaviour and included 90 participants (TM, 2018). Given that there has not been a significant increase in cycling numbers, the collection of 148 responses is very positive when compared with the number of participants that had participated in BAG's survey.

The survey was split into three main categories, the first set of questions was mostly related to the participant's travel patterns and provided an idea of the socio-demographic characteristics of the respondents. Questions in this section included what their common type of trip purpose was on a normal day and what was their average travel distance of such a trip. The second section focused on cycling as a mode of transport in Malta. Amongst the questions in this section, participants were asked how safe they feel when cycling around Malta's roads. The questions also explored cyclists' perceptions around alternative ways to further implement cycling-friendly infrastructure and what they were willing to sacrifice for this to commence. The final and most important section included questions directly related to the cycle routes that are being studied. Participants were asked a series of questions about whether they had found the incorporation of these cycling lanes useful and more efficient. At the end of the survey, they were also asked what they believed could have been done better in the design and construction of these cycle paths.

3.2.2.4 Interviews

The findings from the Literature Review highlighted that there are multiple shortcomings mostly related to not following through on cycling policies (specifically the NCS) as well as a lack of design protocols related to cycling. These factors could also have potentially affected the design and hence the functionality of the cycling routes that are being assessed. Therefore, it was necessary to question these shortcomings to the relevant authorities. It was also crucial to question members of the cycling communities to assess both sides of the story.

In total, four participants took part in the interviews, a representative from an entity which opted to remain anonymous, a representative from IM, and two prominent members of the cycling community. The interviews were structured into four sections: general questions on cycling; questions on the National Cycling Strategy and Action Plan; a section on planning and implementation of cycling infrastructure and lastly, a set of questions on cyclist's safety and vulnerability. The same set of questions was asked to each participant, to attain a like-with-like comparison. All the questions were directly or indirectly related to the functionality and performance of the cyclist routes that are being studied.

The first set of questions sought to determine whether there was a common ground between the authorities and cyclists about what role cycling has to play in Malta's transport sector. The questions related to the NCS were devised to see if this document had any form of influence on the design of the cycle routes in question. Hence, it was also crucial to question both the authorities and the stakeholders on how they believe adequate policies and design guidelines would essentially affect the quality of our cycling infrastructure in general. The effects of having a cycling network and the importance of cooperative design were the main emphasis of the third section. In the final section, the participants were asked about particular cycling infrastructure features which are present in the cycle routes that are being studied in this dissertation. This also helped analyse how adequate these cycle routes are perceived in terms of safety. By splitting the questions into four themes, thematic analysis was possible. Hence a better understanding of whether the relevant authorities and the cycling community share the same view with regard to the design and implementation of cycling infrastructure.

Entity/Interviewee	Role	Contributions	Interviewed
Anonymous Entity	/	/	✓
Infrastructure Malta	Implementation	Construction of infrastructural projects	✓
NGO - Rota	Stakeholder	Standing up for the needs of cyclists	✓
Involved Member & Bicycle Event Organiser	Activist	Evoker of cycling and bicycle event organiser	✓

Table 3.4 Table of the chosen Interviewees

3.2.3 Analysis & Correlation of Data

A vast portfolio of data was collected through these multiple research methods. Apart from analysing each data set individually to understand the emerging trends, the different sets of data were then corresponded together, resulting in a wider understanding of the subject being studied.

The findings from all the different research methods provided a diversified insight into the performance of the assessed cycle lanes. The comprehensive picture established from all these data sets helped answer all of the research questions while also guiding the necessary changes for the shift of cycling as a means of commuting in the future.

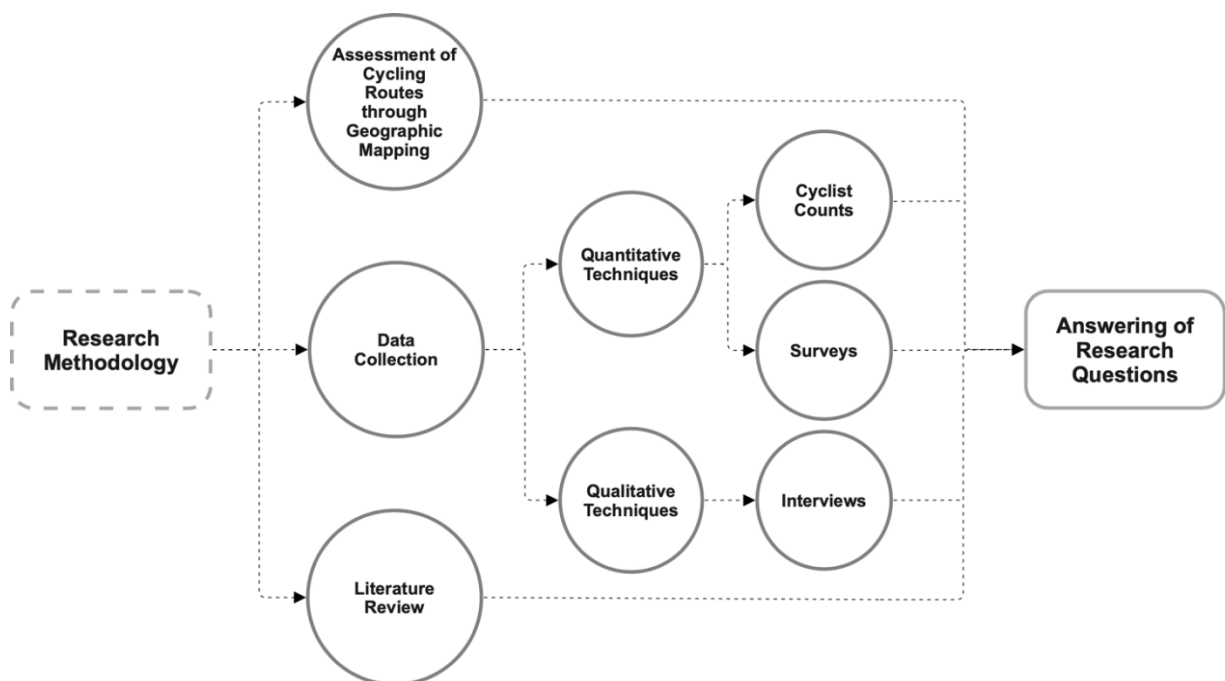


Figure 3.8 Flowchart of Research Methodology and Analysis

3.3 Ethical Considerations

There was no handling of personal data for the mapping of the cycle routes, so there were no ethical issues. The recording speed of the cyclist counts ensured that no one's identity could be traced through facial recognition. As for the participants of the surveys and the interviews, a consent form was provided stating that their identity will not be revealed in any way or form and their participation is entirely voluntary. From the interviewees, permission was also granted for the interview to be recorded and transcribed. All participants accepted except for one. The Appendix includes the template information letter used to contact the participants as well as the template consent form.

3.4 Limitations

Given the number of research techniques used, several limitations were acknowledged and envisioned even before the start of the data-capturing process. The following is a list of limitations for each research tool:

Assessment of Cycling Routes through Geographic Mapping and Site Observations

- Given the scale of the map used to plot the cycling routes, the routes could not be assessed in more detail, making the observations more on a macro-scale than a micro-scale.
- The visit for each cycle route only included a walk or scooter ride through the route itself from start to finish, therefore other issues related to other secondary access points within these cycle routes may have been overseen.

Cyclist Counts

- The positioning of the camera restricted the field of view only onto the cycling lane. Therefore, it was not possible to notice if any cyclists were using the motor carriageway instead.
- Only a single location was used to record each cycle route. Recordings from multiple locations simultaneously would have been more insightful to assess how the cycle route is performing in its entirety.
- Infrastructural Works close to the Qormi road in Luqa may have affected how frequented this route is when compared to normal circumstances.
- The data provided by Strava is only indicative and cannot provide a detailed representation of cycle flow intensity.

Surveys

- The surveys cannot guarantee that the responses truly represent the mass beliefs of the cycling community.
- The platforms used to disseminate the surveys cannot guarantee that the surveys reached all the social classes that cycle in Malta.
- Since no official numbers exist on the number of cyclists in Malta, it was not possible to attain an accurate sample population required for the survey.

Interviews

- It was assumed that the responses from each individual represent the beliefs of the entity or community that the interviewee is speaking on behalf of, but this is not always the case.
- The responses from the participants could have been biased and not provide a fair representation of the situation that is being assessed.

3.5 Conclusion

Data is crucial to help gather further knowledge within the respective fields of study. While secondary data is readily available for us to assess and discuss, primary data requires scrutinising and examination before it can be presented as final findings.

Chapter 4 - Analysis of Results

4.1 Findings from the Geographic Mapping

The updated map below highlights the degree of connectivity from the existing cycling routes which are marked in green. It is quite clear that the existing routes are not properly connected. At the time of writing, there is not a single route that has at least two or more links connected together except for the Mgarr bypass and Buqana Road. The links that are marked in red are the cycling routes that are being assessed in this study. These also face a similar issue of connectivity. The routes marked in orange form part of the main transit route within the cycling network that has just been recently proposed.

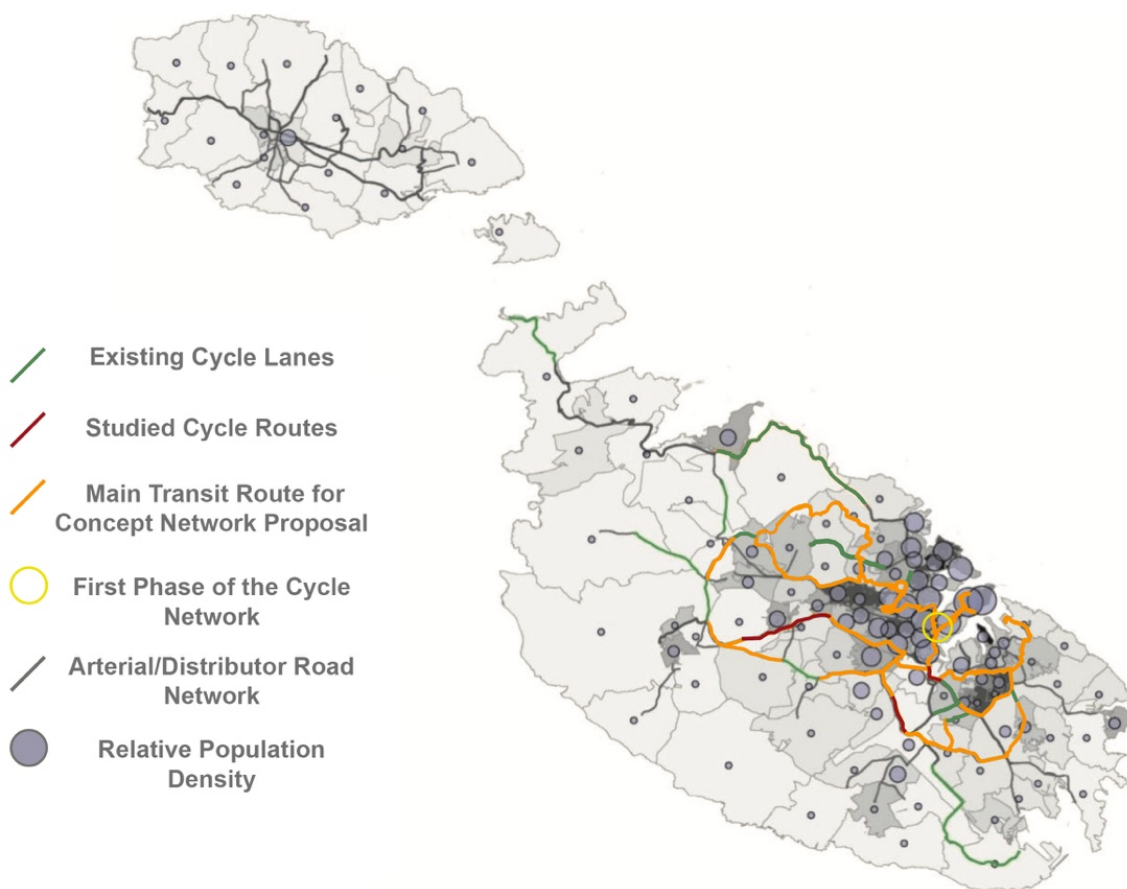


Figure 4.1 Updated Map of Malta's Existing and Proposed Cycle Routes

The lack of connectivity between the existing cycling routes could be a main contributor to low cycling rates in Malta. Such an issue was made more evident from the feedback given in the surveys and interviews. What is encouraging when analysing the overlay of the new cycle network is that a substantial number of the existing cycling routes could now become interconnected with each other. Hence, it would be very interesting to compare the cyclist counts obtained within this study to future cyclist counts that could be taken once the main network has been completed.

Furthermore, while the proposed orange routes appear to differ from the specific routes proposed in the NCS, they still appear to maintain connectivity to specific areas that were highlighted in the NCS. The connection between Fgura to Sliema, and from Sliema to Valletta is still maintained even with this new network. The same applies to the routes from Mosta to University. The map on the previous page only highlights the main transit routes of the new cycle network. Further insight regarding connectivity to and from Sliema can be seen in the Figure below. What is also important to note is that this network is still in its concept stage and could be subject to change. Therefore, we can only properly assess to what extent connectivity may be improved once definitive plans are published.



Figure 4.2 Zoom in on the Grand Harbour and Marsamxett Harbour Area of the Newly Proposed Cycle Network

4.2 Findings from the On-site Visit

Apart from providing an initial idea of how frequented these cycle routes are, walking and driving a scooter through these routes also helped identify certain shortcomings located in each of these routes. The main observations and shortcomings of each route are discussed down below.

Qormi Road - Luqa

The route starts just before the roundabout between “Triq San Tumas” and “Triq il-Kunsill Tal-Ewropa” (Photo A). The first few metres consist of a shared footpath/cycle lane on one side of the road. This leads to a kilometre-long fully segregated bi-directional cycle lane which is adjacent to the carriageway leading to Qormi. This then transitions to sharing the road through the one-way service road that leads to Qormi. Given that it is illegal to cycle contraflow, the service road only facilitates cyclists heading down to Qormi.



Figure 4.3 Map of Qormi Road Showing Photo Locations

Observations/Issues	Images*
The start/end of the route from Luqa consists of a short shared footpath/cycle lane. The entry point at the start of the route is not very clear since construction works were taking place at the roundabout known as “Tad-Dinitrol Roundabout”. The footpath which is meant to be bidirectional becomes very narrow at one point to accommodate the space required for the adjacent roundabout.	 Photo A

To avoid unauthorised vehicles from entering the cycle lanes, bollards have been installed at T-junctions and private access points throughout the segregated cycle lane.	 Photo B
Adequate line markings have been incorporated at T-junctions to improve cyclists' safety while crossing.	 Photo C
For the rest of the route that passes through the service road, the route is only available to cyclists that are heading down towards Qormi, since it is illegal for cyclists to cycle contraflow against the direction of the service road.	 Photo D
Cyclists heading towards Luqa are required to cycle along the motor carriageway (similar to what happens on other roads in Malta, where cycling facilities are not present) and share the road with cars that are driving at a considerable speed. At the end of the service road towards Luqa, cyclists can access the segregated cycle lane through a pelican crossing.	 Photo E
When cycling from Luqa to Qormi, the cycle route abruptly ends after exiting the service road, and hence cyclists must navigate through a very busy roundabout.	 Photo F

Table 4.1 List of Issues and Observations made at Qormi Road in Luqa

*For more photos related to particular components within each cycling route, please refer to Appendix B.

Marsa Flyovers Project

The cycle route within the Marsa flyovers project is fully segregated throughout except for a couple of crossings. The bidirectional route starts corner with the road leading to the Marsa Sports Complex (Photo A) and ends adjacent to the parking area of the Addolorata Cemetery (Photo D). Within the route, there are a few more entry points such as pedestrian bridges with

lifts (Photo B) and a crossing towards Paola. The route is also frequented by pedestrians especially since it also includes a bus stop.

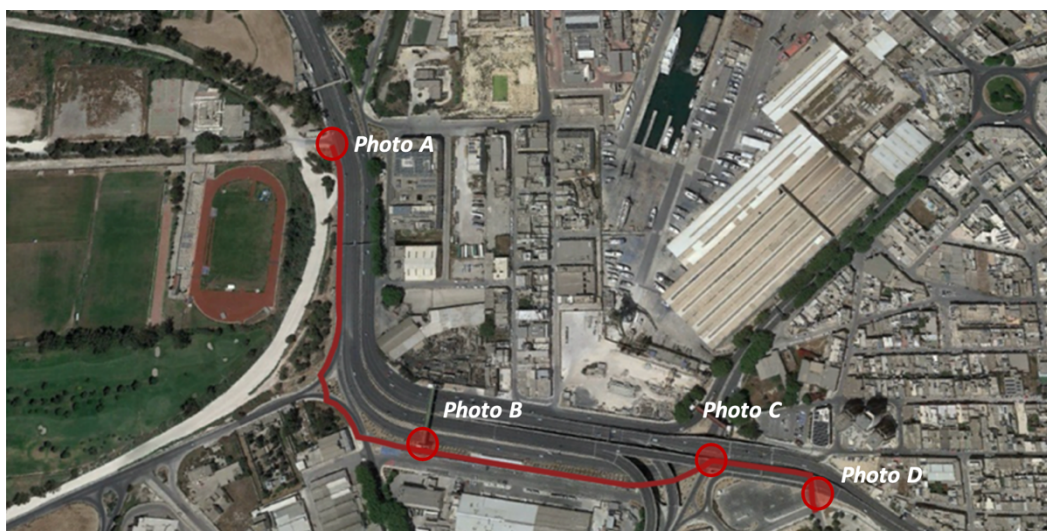


Figure 4.4 Map of Marsa Flyovers Project Showing Photo Locations

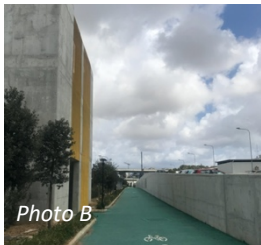
Observations/Issues	Images*
Access to the cycle lane from the Marsa Sports Complex side appears to be very restricted, especially for cyclists coming from the centre of Marsa. The main hardship is that cyclists can only reach the cycle lane by cycling contraflow after crossing the footbridge, which can be seen in the right-hand side photo.	
A couple of entry points consisted of pedestrian bridges with lifts and stairs.	
The route beneath the flyovers is completely segregated from all motor traffic.	
The route connects to the footpath at Vjal Santa Lucia.	

Table 4.2 List of Issues and Observations made at the Marsa Flyovers Project

*For more photos related to particular components within each cycling route, please refer to Appendix B.

The Central Link Project

The cycling route is bi-directional throughout and alternates between segregated cycle lanes, unsegregated cycle lanes at service roads, footpaths as well as sharing the road. From Ta’ Qali to Attard the route is fully segregated and is located to the side of the carriageway that leads to Attard. This is followed by a small stretch where the route is unclear without any signs present. Around a hundred metres after entering Attard, the route continues with a mix of wide footpaths and service roads until a pelican crossing is reached to help access the cycle lane within the newly constructed service road parallel to the new bypass at the periphery of Attard. The cycle lane then transforms into a fully segregated cycle lane towards the second half of the service road. When the service road merges with the rest of the bypass, a crossing shifts the cycle route to the other side of the bypass. Up until Vjal De Paule (the road leading to San Anton Gardens) the cycle route is also a mix of footpaths and service roads. From the Vjal De Paule to the Mriehel roundabout, the service road may be used with multiple crossings present within the arms of the new roundabout to help cyclists navigate through it.



Figure 4.5 Map of Central Link Project Showing Photo Locations

Observations/Issues	Images*
The lack of cycling friendly infrastructure before the start of the cycling lane from the Ta’ Qali side makes it very challenging for cyclists to reach the cycling lane itself. A pedestrian crossing is present for cyclists to cross over to the carriageways that lead to Rabat.	 Photo A

Part of the bidirectional cycle lane heading from Rabat to Attard narrows excessively in a blind corner and is also obstructed by the trunk of a tree.	 Photo B
There is a lack of signage and cycling-friendly infrastructure when entering Attard. To reach the rest of the cycling route, very tight manoeuvres are required due to the presence of a very narrow pedestrian bridge. (See photos in Appendix B for further reference)	 Photo C
A mix of wide footpaths, and cycle lanes along service roads form the next part of the cycle route. The cycle lanes in the service roads are bidirectional with the service road being one-way.	 Photo D
The first part of the cycle lane (Service Road parallel to the new bypass in Attard) is not segregated and private vehicles tend to park on the cycle lane, obstructing the passageway for cyclists.	 Photo E
The service road after Vjal De Paule requires resurfacing since it consists of multiple potholes. This is mostly an issue for vehicles with smaller wheels and no suspension such as scooters.	 Photo F
The navigational path to manoeuvre around the roundabout requires multiple changes in direction at tight 90-degree turns which goes against streamlined flow and pedestrian desire lines.	 Photo G

Table 4.3 List of Issues and Observations made the Central Link Project

*For more photos related to particular components within each cycling route, please refer to Appendix B.

4.3 Findings from the Cyclist Counts

The cyclist counts provided the first indication of cycling levels within these routes. Given that Marsa is one of the busiest links in all of Malta, the highest number of cyclists was recorded along this route. This not only applied to cyclists but to all modes of active mobility. In total, 58 cyclists, 11 scooters and 177 pedestrians were recorded using this dedicated route. Bicycle counts and scooter counts together accounted for a modal share of 0.08%. Similar to motor vehicles, the highest number of counts were recorded during the morning and evening peak hours of travelling. In the case of Marsa, it is also interesting to note, that the evening peak was prolonged by almost twice the duration of the morning peak, meaning that cycling numbers during the evening were double that of the morning hours.

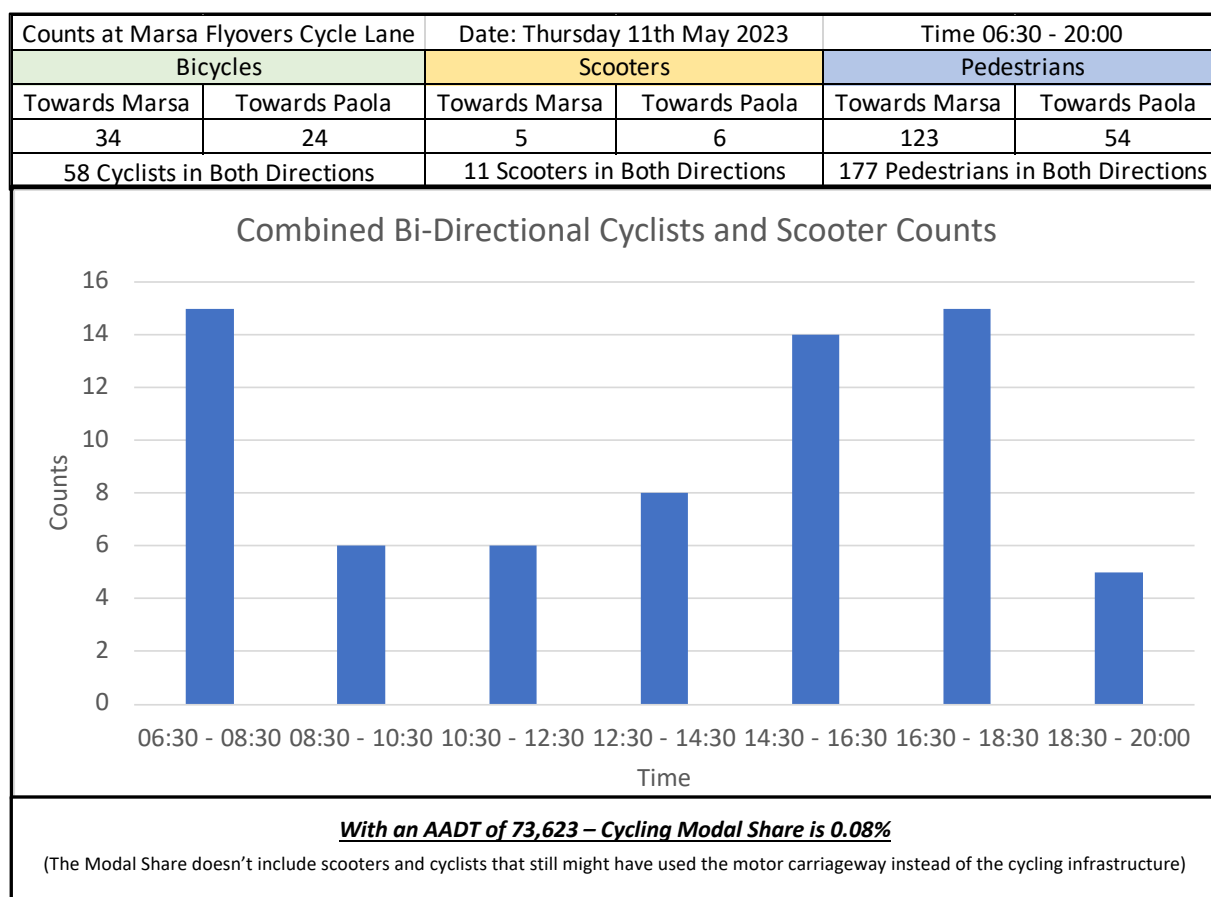


Figure 4.6 Table & Bar Chart of Counts at the Marsa Flyovers Project

From the three routes, cyclist counts were lowest at Qormi Road, with only 3 cyclists and 2 scooters using the cycling lane. This represents a very poor modal share of only 0.03%. It is also important to state however that major road works were taking place in the vicinity of the route. This could have influenced the results that were obtained.

Qormi Road Cyclist Counts		Date: Wednesday 10th May 2023		Time 06:30 - 20:00	
Bicycles		Scooters		Pedestrians	
Towards Luqa	Towards Hal Farrug	Towards Luqa	Towards Hal Farrug	Towards Luqa	Towards Hal Farrug
0	3	1	1	26	25
3 Cyclists in Both Directions		2 Scooters in Both Directions		51 Pedestrians in Both Directions	
<u>With an AADT of 16,501 – Cycling Modal Share is 0.03%</u>					
(The Modal Share doesn't include scooters and cyclists that still might have used the motor carriageway instead of the cycling infrastructure)					

Figure 4.7 Table of Counts at Qormi Road in Luqa

From the Central Link, a total of 21 cyclists, 1 scooter and 61 pedestrians were recorded. Compared to Marsa, fewer scooters used this route when compared to cyclists. Unlike bicycles, electric scooters are mostly used for commuting rather than sporting activities. Therefore, this led to questioning if this route was more frequented for leisurely purposes rather than commuting. The high-speed recordings also showed that the route with the highest percentage of cyclists wearing sporting attire was the Central Link. The modal share in this route was the highest at 0.13%.

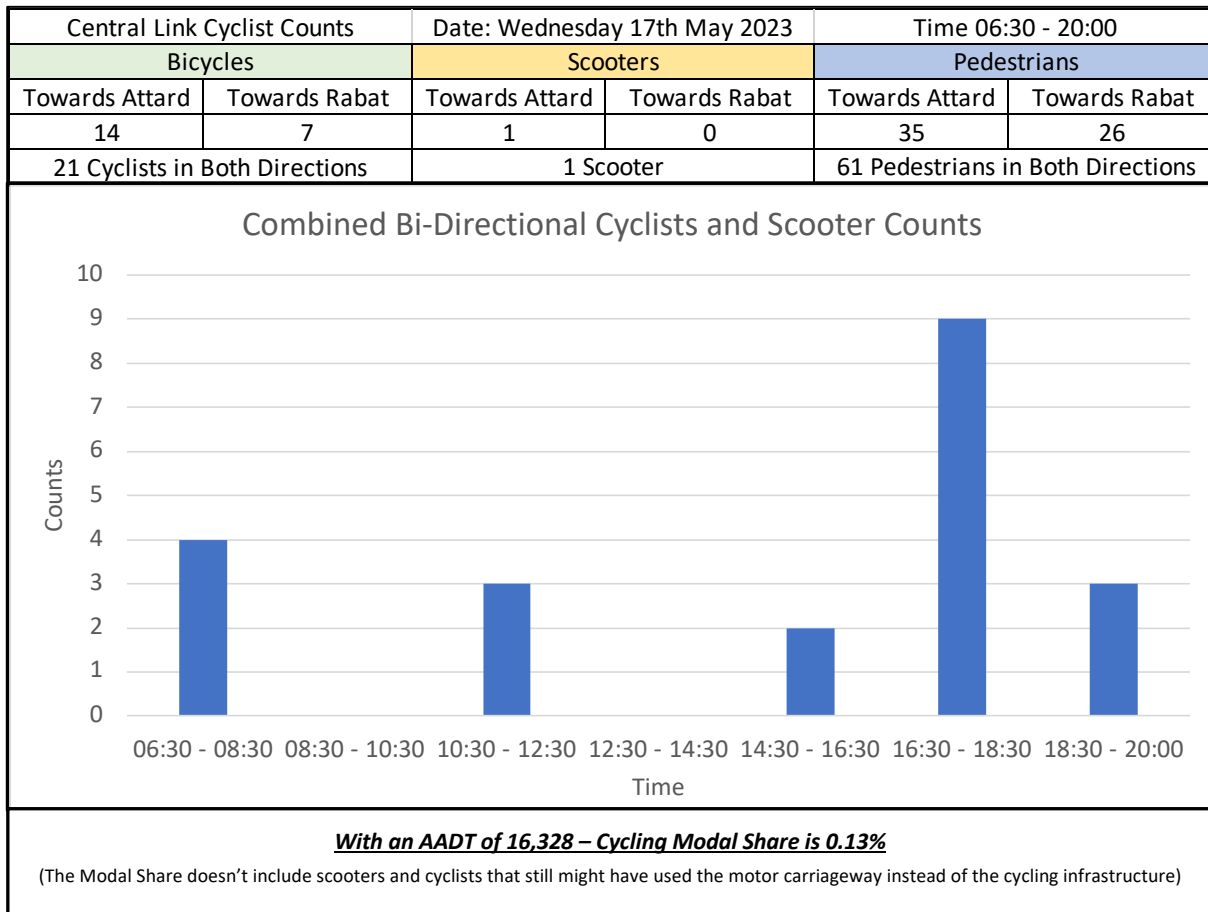


Figure 4.8 Table & Bar Chart of Counts at the Central Link Project

Compared to motor vehicles, these counts still prove that the cycling modal share is still relatively low, with the routes being devoid of users for considerable periods when assessing the camera recordings. All three routes exhibited modal shares that are far below the 2021 NHTS' modal share of 0.7%. This led to question if cyclists are still using alternative routes. The assessment of the heat map from Strava on the following page showed that from all three routes, the highest intensity of flow is also at Marsa. This corresponds with the fact that the highest number of counts was recorded at this link. Compared to the thousands of motor vehicles that pass through Marsa, this route which is marked as high relative intensity still represents a very poor modal share.

The cycle route at Qormi Road is marked at medium intensity which does not correspond to the extremely poor cycling numbers that were recorded. Once again, the construction works located at the roundabout known as "Tad-Dinitrol" could have affected cycling flows in the area.

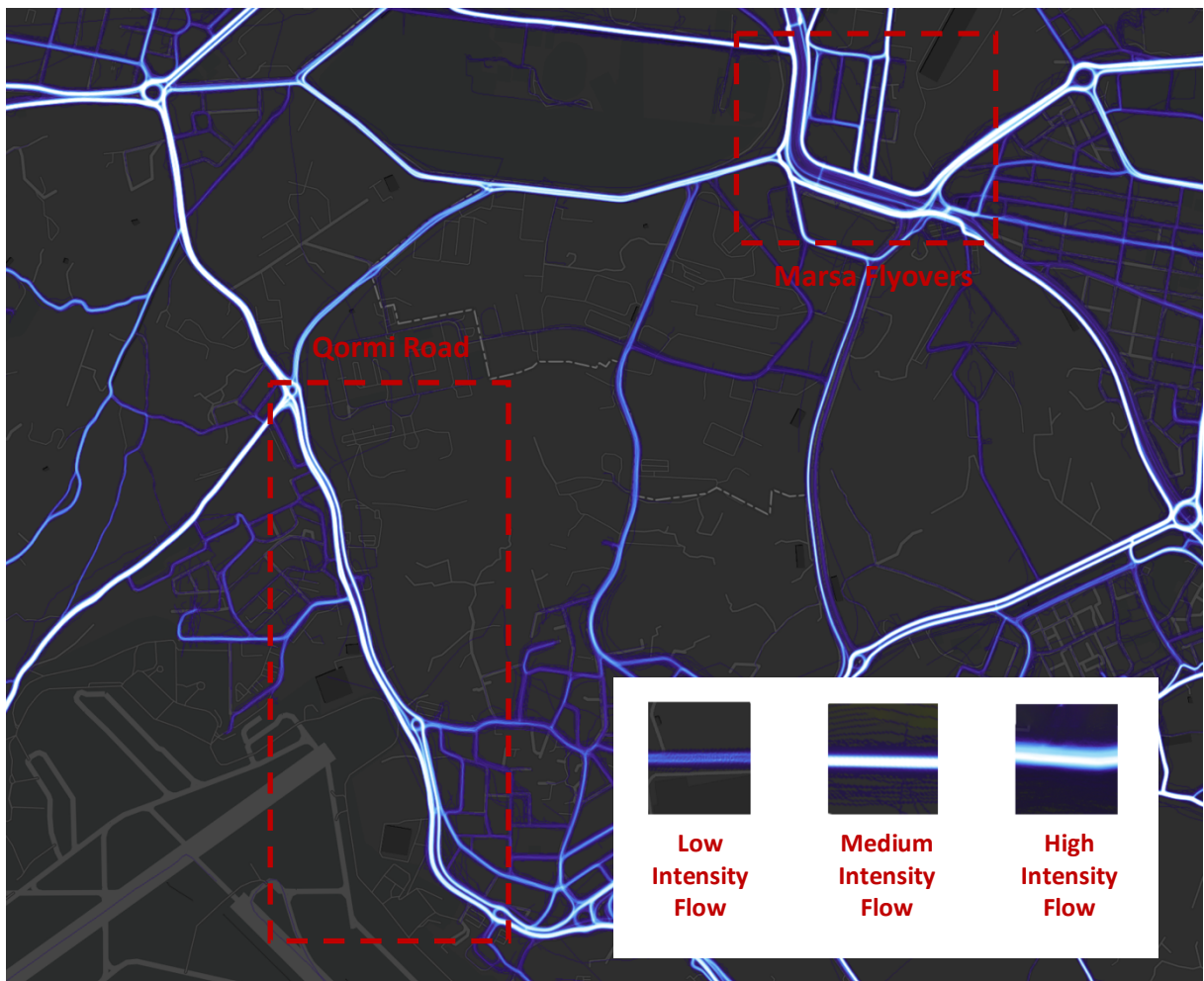


Figure 4.9 Strava Heat Map for Cycling including Qormi Road and Marsa Flyovers

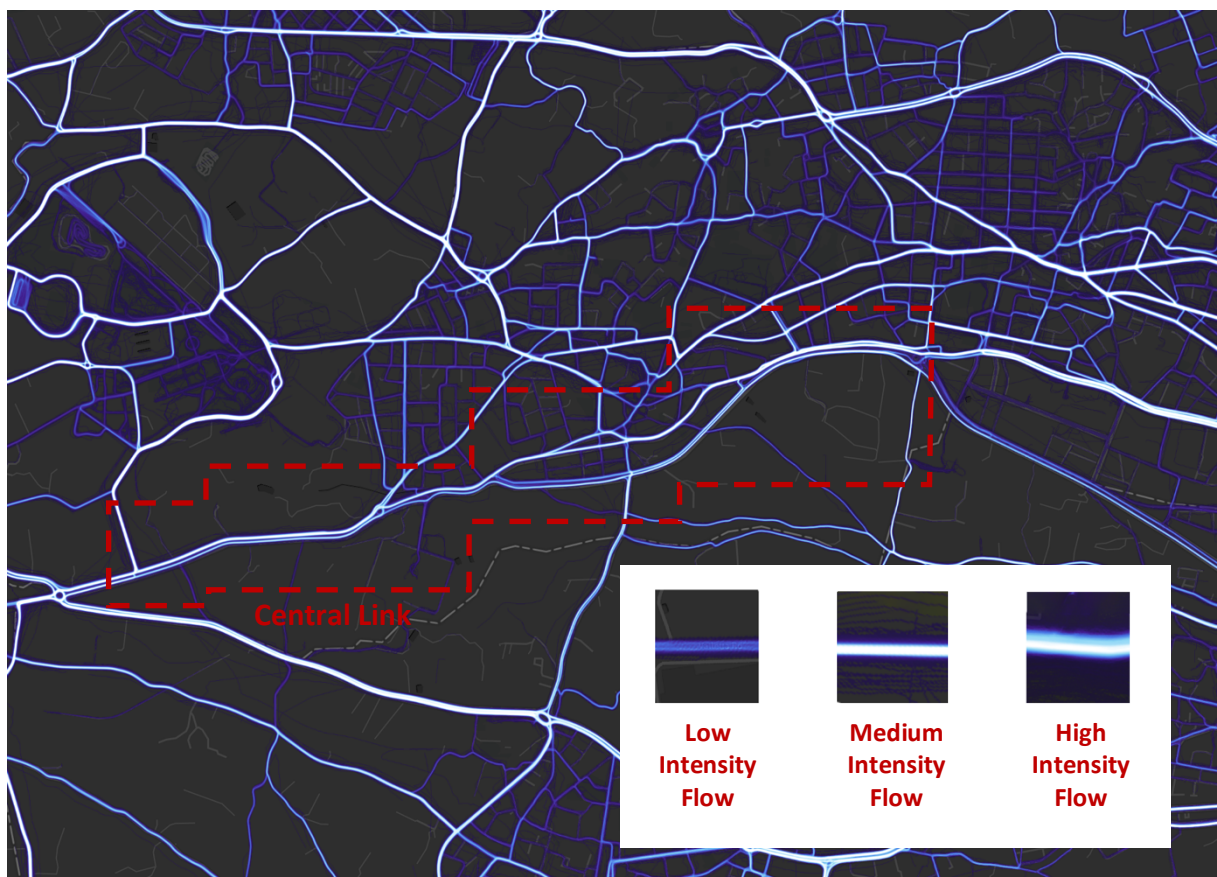


Figure 4.10 Strava Heat Map for Cycling including the Central Link

The cycling route at the Central Link was marked as medium intensity around the area where the traffic counts were taken. A higher intensity of cyclists can be observed along other routes surrounding the Central Link, such as some of the roads within Ta' Qali and Triq L-Imdina. This shows that the cycling counts gathered are still in the minority compared to other surrounding links which are frequented by more cyclists. Parts along the Central link also demonstrate that cyclist counts could have been even lower along certain stretches since they are marked as less intense. The map clearly shows that the route is not being used in its entirety.

4.4 Findings from the Survey Results

The purpose of the surveys was to gather information and feedback from the local cycling population since existing information is very limited. The results from the three sections of the survey are discussed below. In total 148 participants filled in the survey. Any information that is not discussed in this chapter is included in Appendix D.

4.4.1 General Questions

The first section provided insight into the social demographic of the respondents that form part of the cycling community in Malta.

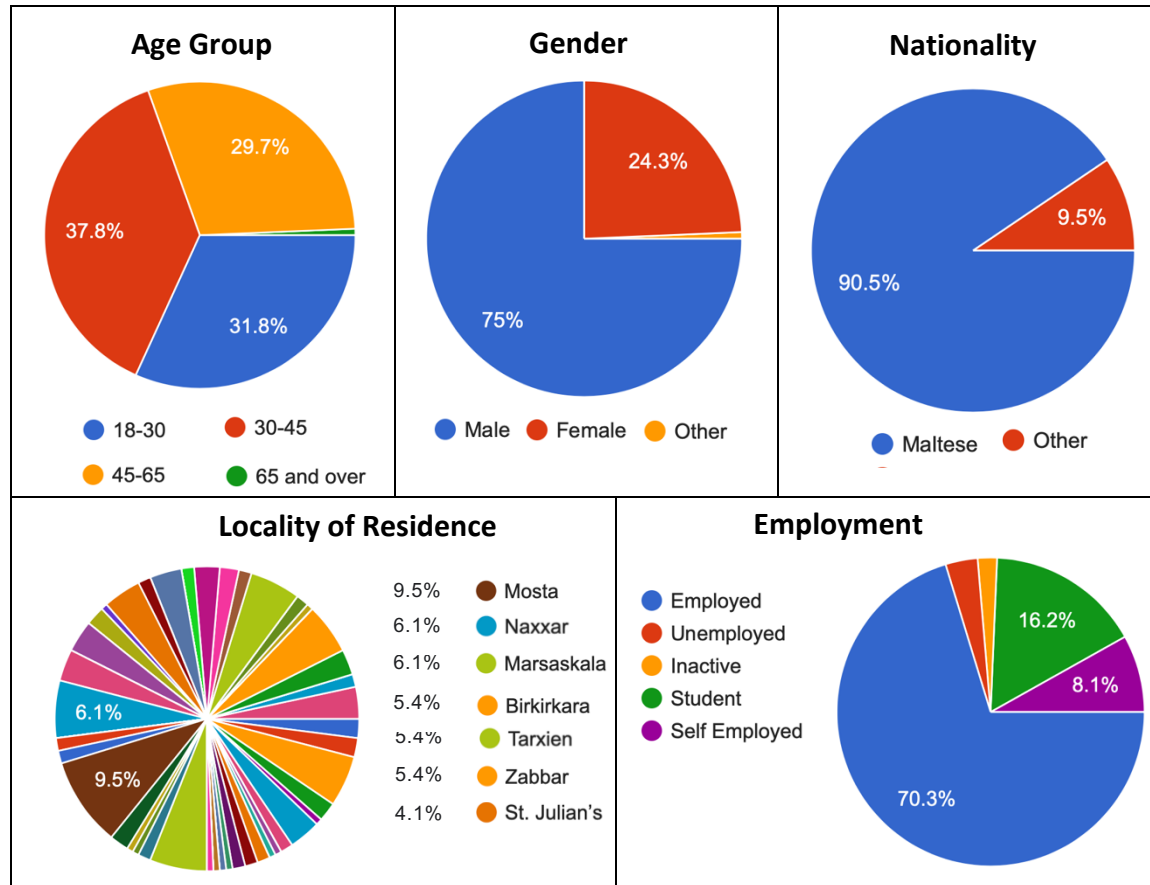


Figure 4.11 General Information on Survey Participants

The age of the respondents was fairly distributed between the three age groups of 18-30, 30-45, and 45-65. Only one respondent was over the age of 65. The survey also showed that the majority of cyclists are male, forming up a 75% stake of the respondents. 90.5% of the participants were also Maltese citizens. The low percentage of foreign participants highlights a limitation with regard to the dissemination of the survey especially since multiple foreigners were observed cycling at the Marsa flyovers project.

Similar to what was presented in NCS and the 2021 NHTS, the highest number of cyclists reside in Mosta, with the most common trip type being commuting. These two parameters helped to further assure that the survey is credible since the data matches other established statistics.

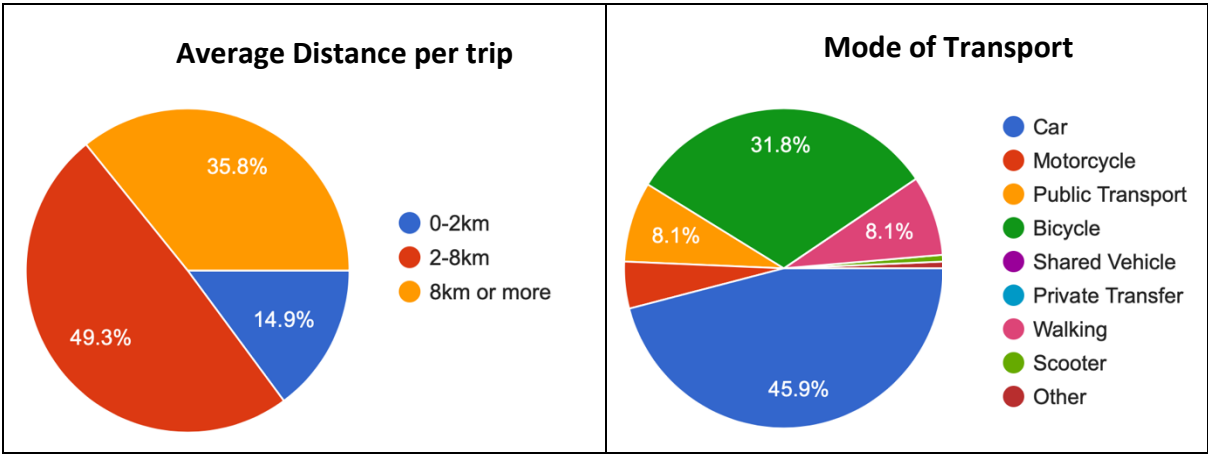


Figure 4.12 Information about the Participant’s Average Trip Distances and Modes of Transport Used

It was also interesting to note that 64.2% of the participant’s main daily trip is under 8km, with the car still being the most popular mode of transport at 45.9% even amongst cyclists. For trips under 2km, the modal share for cars and bicycles were 32% and 28%, while for trips from 2-8km, the modal share was 47% and 36% respectively.

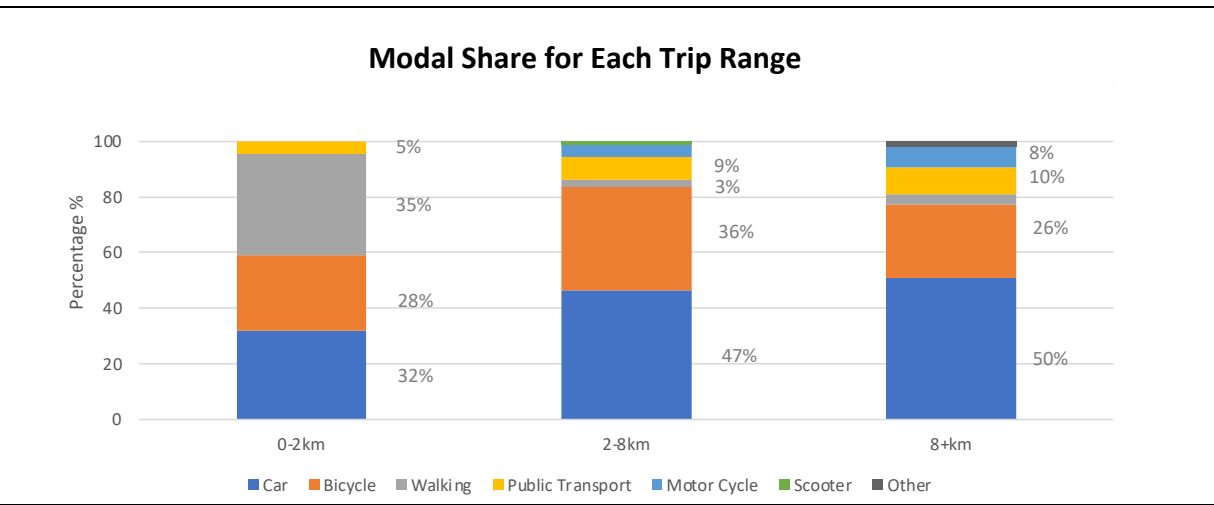


Figure 4.13 Bar Charts of the Modal Shares for Each Trip Range

From 148 participants, 62 participants showed that they were satisfied with their mode of transport, with 32 of the satisfied participants being cyclists. The main reason for dissatisfaction with car trips was traffic at 82%, while the main reason for cycling trip dissatisfaction was issues of safety at 76%.

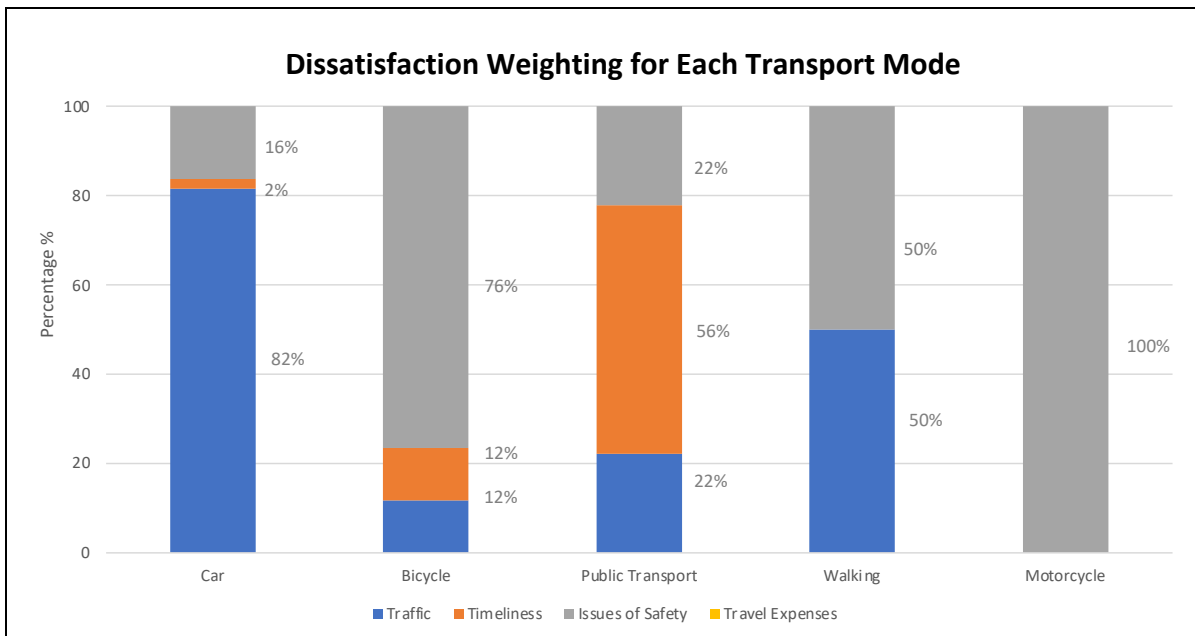


Figure 4.14 Bar Chart with the different Dissatisfaction Ratings for Each Transport Mode

4.4.2 Cycling as a Mode of Transport

From the respondents that have used a bicycle as a mode of transport (109 participants), the majority at 35.8% use the bicycle for under 5% of their commutes. The main two reasons why participants opted to include cycling as part of their daily trips were due to shorter travel times and the acknowledgement of health benefits through cycling.

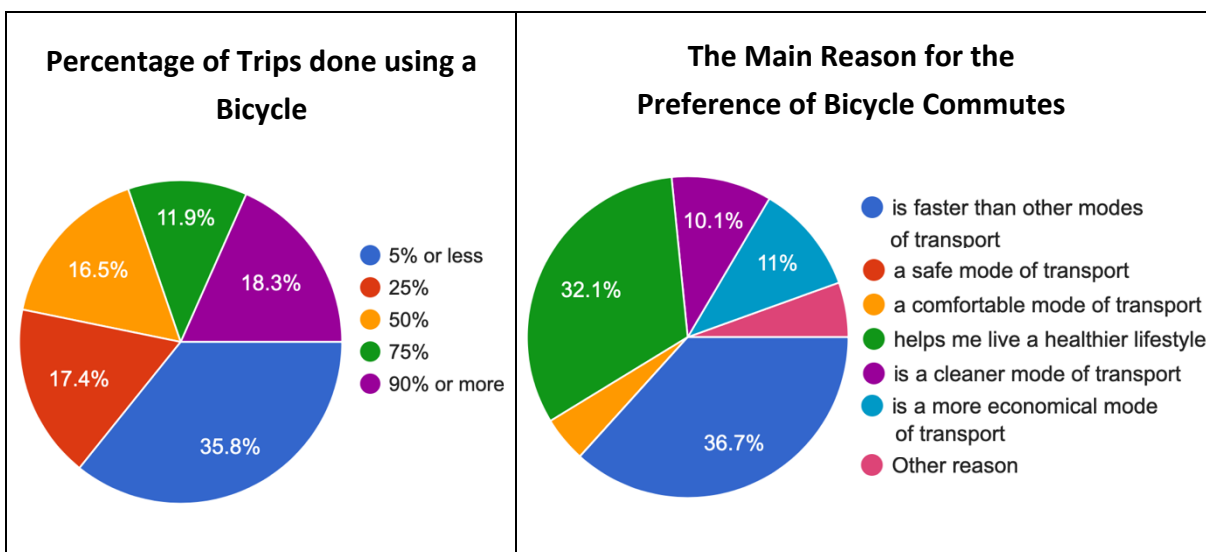


Figure 4.15 Information on Bicycle Commuting

Most respondents expressed that cycling could become more popular in Malta and also help reduce traffic congestion, yet they still felt inferior to motor vehicles even in our village cores. There was also a unanimous response that a safer and more connected cycling network is necessary, with the participants mostly preferring to relocate or redesign motor carriageways and parking spaces over the uptake of agricultural or green land.

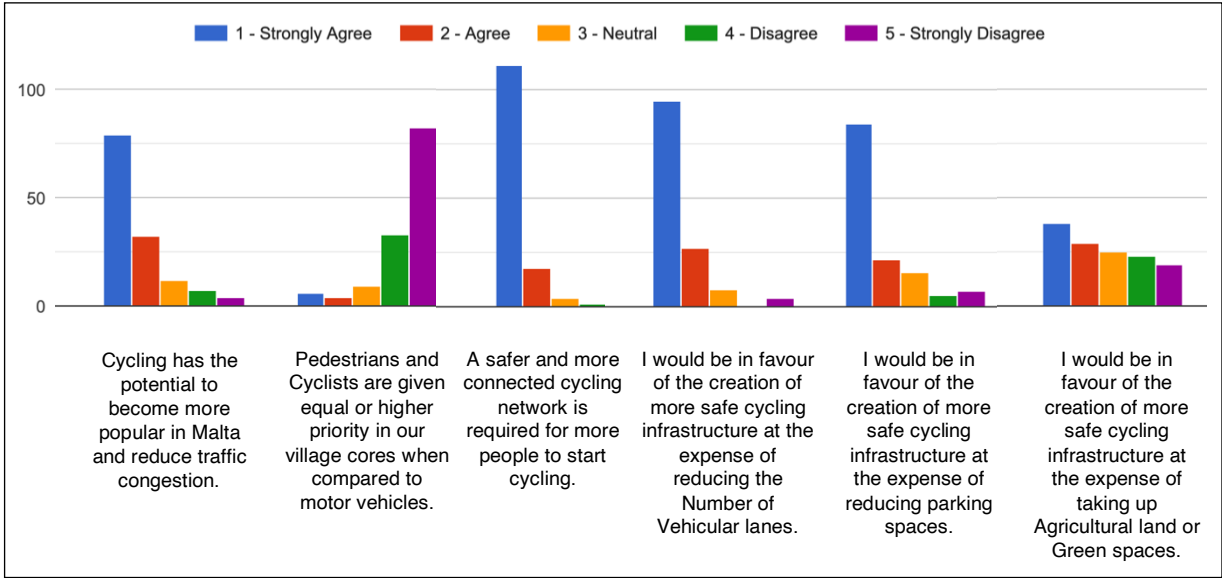


Figure 4.16 Information on Participants' Perspective on Cycling in Malta

4.4.3 Feedback on the Studied Cycling Routes

Most of the participants were familiar with the cycling routes in question, this helped assure that the majority of participants provided experienced and well-informed feedback on these routes. While there was a considerable level of agreement that these cycling routes were beneficial, feedback on the route's contribution to improving safety and efficiency was rather average. There wasn't a common consensus that these routes have improved cyclists' experiences related to safety. Furthermore, when asked if these routes further encouraged them to choose cycling as a mode of transport, the responses slightly shifted towards the disagree spectrum rather than agree. Therefore, evaluating the participant's responses as to what could have been designed better was crucial to understanding why this is the case.

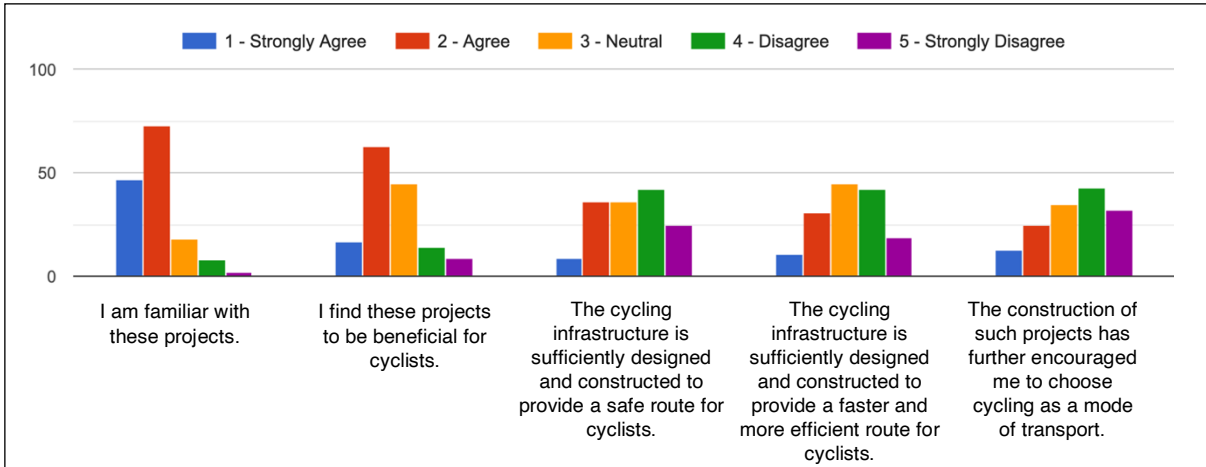


Figure 4.17 Information on Participants' Perspective on the Studied Cycling Routes

There was a unanimous agreement that fully segregated lanes have improved the feeling of safety for cyclists. This contradicts the previous response that these links still do not provide safe and efficient routes. Therefore, other issues must be affecting how these routes are perceived.

While observing the routes on-site, some cyclists still opted to use the motor carriageway. When asked about such a prospect, the majority of respondents still preferred to use the cycle lane instead, but the response was not as unanimous. The reasons why this is the case were investigated further during the interviews.

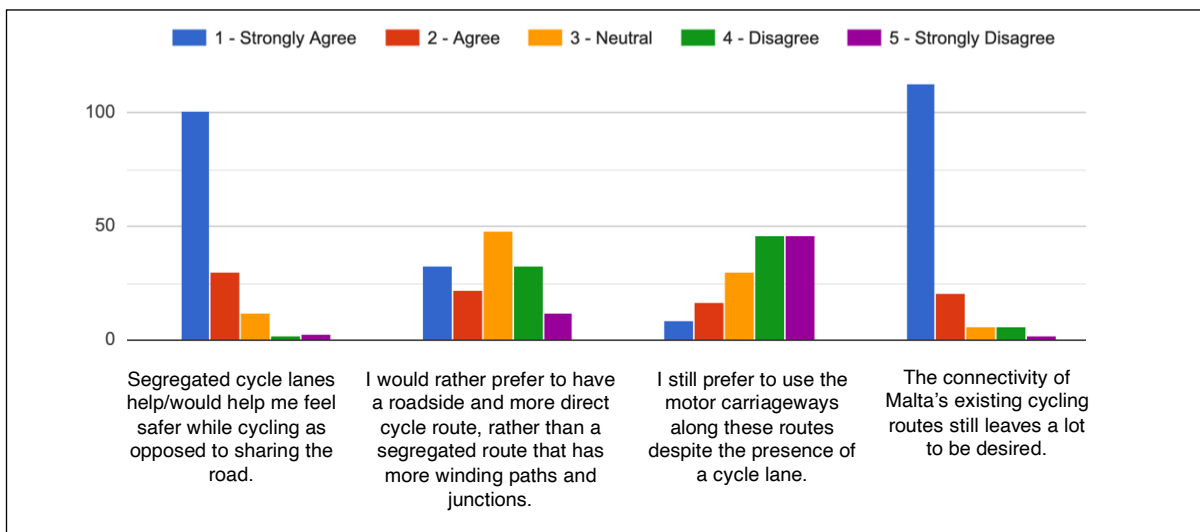


Figure 4.18 Information on Participants' Perspective on Different Aspects Related to These Cycling Routes

From all the questions related to these cycling routes, the most common consensus was that these routes need to be better connected to other routes. The majority of the users also agreed that these cycling routes could have been designed better. Statements included that these routes connect to nowhere, not even to urban roads leading to village cores. Once again given that these cycle routes were constructed as part of road upgrade projects, their design was only able to support cycling infrastructure within the confines of the project itself. Therefore, none of them could be conceived as a strategically designed route for cyclists that starts at an origin and ends at a destination. With the routes also being located in areas of heavy traffic, access to these routes was also perceived to be very dangerous, discouraging cyclists from using them. Hence all three routes require better design elements that facilitate safe entries and exits onto the carriageway.

Specific emphasis was also placed on the Marsa cycle lanes' access points, including the pedestrian bridges that do not include ramps but only stairs and lifts. Several responses also stated that such lifts are often out of order and essentially cause a bottleneck, since they can only carry one bicycle at a time. Other complaints included that there is a lack of cleaning and maintenance for these cycle lanes with debris posing a hazard for users.

4.5 Findings from the Interviews

Further insight and descriptive information were gathered from the interviews. The points of discussion summarised below highlighted attributes that could be affecting the performance of the studied cycling lanes. The perception of each interviewee regarding specific topics that were discussed is colour coded depending on their response. For ease of reference, each interviewee shall be referred to in abbreviated form using the following abbreviations:

Representative from Anonymous Entity - AE

Representative from Infrastructure Malta – IM

Representative from Rota – Rota

Involved Member & Bicycle Event Organiser - BEO

Entity/Interviewee	1.1	1.2	1.3	2.1	2.2	3.1	3.2	3.3	3.4	3.5	3.6	3.7	4.1	4.2
Anonymous Entity											×			
Infrastructure Malta														
NGO - Rota														
Member of the cycling Community														
Themes and Questions: <u>1 – Cycling as a Mode of Transport in Malta</u> 1.1 Cycling can help improve the Transport Sector 1.2 – Car-centric Culture Needs to Change 1.3 – Working against Induced Demand for Cars <u>2 – The National Cycling Strategy and Action Plan</u> 2.1 – Proposed Routes and Infrastructure in NCS were inefficient for cycling 2.2 – The NCS influenced Road Construction over the past few years <u>3 - Planning and Implementation</u> 3.1 – Requirement for cycling standards and policies in Malta 3.2 – Reducing or Relocating car spaces for Cycling Infrastructure 3.3 – Involvement of the Cycling Community at Planning and Design Stage 3.4 – The new Active Mobility Routes are the Way Forward for Active Mobility 3.5 – The Three Studied Cycling Routes Have Increased Cycling Numbers 3.6 – There are still issues in these projects that need to be addressed 3.7– The need of Acquisition of Data on Cycling Flows <u>4 – Cyclist’s Safety & Vulnerability</u> 4.1 – Increase in Road Accidents is Discouraging People from Cycling 4.2 – Segregation is the best form of Infrastructure to Maximise Safety											Response from Participant:  - Agreed  - Neutral  - Disagreed  - Did Not Know			

Table 4.4 Discussed Themes in the Interviews

4.5.1 General Questions on Cycling as a Mode of Transport in Malta

When asked what role cycling has to play in the transport sector, all the participants agreed that it can contribute to becoming a viable mode of transport that helps alleviate our dependence on cars. The interviewees who also cycle highlighted that our average car commute is around 5km, which is a short enough distance that could be travelled using a bicycle. While there was also a common consensus that the existing car-centric mentality needs to be challenged, AE and IM still emphasised that we need to cater for the very high demand for cars that our islands are experiencing. Rota and BEO made it very clear that road construction over the past few years has solely prioritised motor vehicles. Our congestion problem has only increased by catering to an induced demand. So, while it was encouraging to hear that active mobility is being given priority even from the interviewed entities, it still seems to be considered a secondary priority after motor vehicles.

All four interviewees stated that a change in mentality is the biggest challenge for cycling in Malta. Rota and BEO stated that not only public perception needs to change, but also our political will. Up till now, road projects have given utmost priority to motor vehicles, with cycling infrastructure only included as an afterthought that must not hinder motor vehicle flow. Acknowledgement that our cycling infrastructure must improve was also a mutual response, with the newly proposed cycling network being described as the next step forward to attain a competitive uptake of active mobility in Malta.

4.5.2 Questions on the National Cycling Strategy and Action Plan

AE, Rota and BEO all stated that the designed routes in the NCS included certain inefficiencies that made them undesirable to cyclists. While the document's intention was acknowledged by the cycling community, the main feedback highlighted that its proposals were half-baked. Furthermore, BEO believed that these routes would not have attracted existing cyclists, let alone encourage new people to start commuting by bicycle. It was also expressed by Rota and BEO that its time of publication was very opportune to release standards and guidelines on cycling infrastructure just as the government had allocated 700 million euro in investment funds for Malta's roads over seven years. But unfortunately, this was not the case.

With NCS only providing three routes as part of its strategic plan, both cyclists stated that from the influx of road construction over recent years, there were multiple occasions where an adequate cycling lane could have been implemented. This could have been made possible with the implementation of a road diet in their design. It was a matter of priorities and both interviewees shared a level of disappointment with the number of missed opportunities over recent years.

AE confirmed that other proposals in the NCS such as an active mobility platform are currently being developed and have arrived at tender stage. The interviewee also clarified that the NCS that was released in 2018 was only a draft for public consultation and new finalised strategy plans will be published in the future. The newly proposed active mobility routes are to follow these new documents.

4.5.3 Questions on Planning and Implementation

While the two cycling representatives agreed that we require standards and guidelines at a national level, the representative from IM stated that while having local guidelines would somewhat help, international guidelines are sufficient enough to proceed in the local context. The main issue for cyclists was that the lack of legally binding regulations has allowed for inconsistencies and irregularities in our cycling infrastructure. Only until recently, its design has been manipulated as needed in order not to hinder car flows as much as possible. As a result, this has negatively affected the quality of the cycling infrastructure that has been constructed over the past few years.

When it came to planning and design, all participants agreed that consultation with stakeholders and end users is key. Rota and BEO both stated that the current situation, especially in relation to the newly proposed cycle network, is much better when compared to previous years. Both cyclists revealed that previously, consultation was very limited, and they would only be approached when the designs were almost finalised, making it too late for their feedback to be taken on board.

There was also a consensus between IM and BEO that for cycling to gain more public acceptance, such a transition must be gradual. Imposing cycling infrastructure and removing car parking spaces will not be welcomed by the general public, which could lead towards further discrimination against cycling. It is also very difficult to justify major cycling interventions since cycling numbers are very limited. Therefore, adopting measures such as road diets will spark less controversy while also being able to invite an alternative mode of transport. This ought to be the first step in increasing cycling numbers. Once a substantial cycling population starts to solidify, it will also be easier to justify interventions that directly affect car use since a stronger cycling demographic would further support such changes. Hence creating a competitive market for active mobility in Malta.

Another common belief from all the interviewees was that the incorporation of the aforementioned cycling routes has supported the concept of active mobility in Malta, but they still haven't yielded significant results. The main issues highlighted by Rota and BEO were that these routes also created barriers. A major concern with the Central link is that it has blocked safe access for cyclists that are travelling from Qormi towards Attard. The creation of a new

bypass and the introduction of a new staircase with no ramps were the main contributors to such feedback. Parallel to the feedback from the surveys, complaints were voiced about the fact that cyclists must cycle contraflow to access the cycle lane at Marsa from the Sports Complex side. The incorporation of lifts instead of crossings created a bottleneck rather than a solution. Another common complaint was that the service road in Qormi Road in Luqa only catered for cyclists in a single direction since it is illegal to cycle contraflow in a one-way service road. The formation of cycle lanes using footpaths was also criticised since asphalt is always preferred over concrete footpaths due to its better provision of grip and rideability..



Figure 4.19 Photos of barriers at the Central Link discovered during the interviews

Photo A: Cyclist having to navigate between a slip lane and the carriageway at the roundabout before entering the cycle lane since the cycle lane doesn't extend to the roundabout

Photo B and C: Cyclists have to navigate through the bypass before reaching the pelican crossing and climb up a flight of stairs to reach the cycle lane.

These issues once again show how vital it is to take feedback on board at the beginning of the design process. Moving forward, the fact that adequate consultation is now taking place certainly attributes to the positive response from all interviewees that these new active mobility routes will help cater for the needs of cyclists and improve the presence of active mobility in our transport sector.

4.5.4 Questions on Cyclist Safety and Vulnerability

All respondents except for IM agreed that road accidents are negatively impacting how cycling is perceived as a safe mode of transport. The importance of properly designed infrastructure was accredited by all participants. It was also agreed that segregation would be the best solution, but AE and IM stated that the limitation of space makes this hard to achieve on a national scale, while Rota and BOA both advocated that segregation would be easier to incorporate if we stop catering for induced demand.

It was accredited by all participants that the incorporation of these new cycling routes has improved safety and connectivity with the routes themselves. Yet even the respondents who do not cycle acknowledged that this was still not enough to instigate a modal shift.

While both cycling participants admitted that they prefer to use cycle lanes whenever they are available, they were able to provide insight as to why certain cyclists may still prefer to use the carriageway rather than an adjacent cycle lane. The main responses were that some users may find the entry points to these cycle lanes too far-flung as opposed to using the carriageway. How much this is considered an inconvenience is related to one's perception of risk and vulnerability when sharing the road. A more judicious reason was the fact that debris is sometimes present in these cycle lanes rendering them unsafe for cyclists.

4.6 Understanding the Full Picture

The results clearly show that Malta still has a long way to go to achieve a higher modal share for cycling. As it stands the studied cycling infrastructure has not played any contribution to the increase of cycle flows, with the potential of such cycle routes still being untapped due to the presence of several barriers within them. The main issue from almost all modes of research was highlighted to be connectivity.

The fact that there were no regulations or comprehensive strategic plans devised before the start of the government's major investment in road construction has negatively affected the execution of our recently constructed cycling infrastructure. It was admitted that these cycling routes were included as a secondary measure thanks to the construction of road upgrades. This has resulted in a fragmented cycle network. Such an issue is reflected both in Malta's existing cycle map as well as the feedback given by cyclists. Fortunately, the issues of connectivity could be addressed through the provisions of the newly proposed cycling network.

To make matters worse, the interviews revealed that the 2018 NCS was only regarded as a draft document intended for public consultation, meaning that Malta presently still does not possess a finalised and published Active Mobility Strategy Plan. The interviews also revealed that the Sustainable Urban Mobility Plan should be published shortly and should include guidelines on cycling infrastructure. Given the construction of the newly proposed active mobility routes should soon commence, time is of the essence for these documents to be published.

Both cycling interviewees stated that the lack of legally binding regulations also allowed for any irregularities and questionable design features within these cycle routes to be glossed over. Such deficiencies showed that the design of such infrastructure was manipulated not to hinder motor vehicle flow as much as possible. This came at the expense of creating more barriers for cyclists along certain links and nodes. Without regulations, there are no safeguards that could help question the liability of any design related to cycling infrastructure, especially in cases of irregularities. Hence this has negatively affected the quality of our cycling infrastructure so far. Both the interviews and the surveys showed that there are both small-scale flaws as well as larger strategic flaws that require improvements to help make cyclists' experience smoother and safer along these routes.

It was expressed by all participants that consultation with end users has improved significantly, especially for the proposal of the new active mobility routes. Yet such a positive approach also highlights, even more, the necessity for Malta to adopt its own legally binding regulations and strategies. Similar to the case study of Seville, their adoption guarantees that

such good practices are maintained, especially in case of another change of approach from the relevant authorities might occur.

Issues related to barriers and connectivity were the main concern when analysing the results. Yet it was also stipulated that the maintenance of these cycling routes requires further attention. Problems such as dysfunctional lifts or the presence of debris on the cycle lane are leading to unfavourable circumstances for cyclists. Despite the presence of cycling infrastructure, in such cases, cyclists would still be forced to use the motor carriageway, making the cycle lanes unusable. So, while proper design and planning are crucial, they are meaningless if our infrastructure is not properly maintained.

Over the past few months, significant strides have been made in relation to the planning and implementation of cycling infrastructure. The fact that a specially dedicated active mobility network has been proposed with the support and feedback from the cycling community is a significant step in the right direction. Yet the main issue that became evident from the results of this dissertation still hasn't been addressed. This is the publication of national standards and regulations. The discussed issues within these cycle routes show that strategic planning and regularisation are key for Malta to experience a profound change towards active mobility. It is only after establishing such criteria that we can truly challenge the current status quo. Otherwise, our transport sector could be subject to repeating the same mistakes that were made during the execution of these studied routes.

Chapter 5 - Conclusion

5.1 Summary of the Main Findings

The Literature Review provided an initial understanding of Malta's transport sector and how it differs from international practices, especially in relation to active mobility. The different methods of research provided further insightful information for the appraisal of the aforementioned cycle routes. The main findings from each research tool are summarised down below.

Main Findings from Geographic Mapping

Updating the map of Malta's cycle routes showed that the three studied cycle routes all possess an issue with connectivity since they end abruptly with no supporting links at each end.

Main Findings from On-Site Visits

The onsite visits highlighted that apart from connectivity, certain details within these routes are hindering the riders' experience. Most of the issues could be resolved with slight modifications in the design.

Main Findings from Cyclist Counts

Obtaining such low cycling numbers showed that these routes are underperforming and are only contributing towards a very low modal share. Addressing the barriers discussed in the subsequent research tools should be the first step in addressing such a low modal share.

Main Findings from the Surveys

The surveys exhibited to what extent the cycling population acknowledged the construction of such cycling infrastructure. The results demonstrated that due to certain issues, these routes have hardly encouraged participants to further prioritise cycling as a main mode of transport. Multiple issues were identified that helped support the findings from the on-site visits.

Main Findings from the Interviews

Both cyclists and the relevant entities acknowledged that Malta is still a long way off from achieving an increased cycling modal share. The interviews gave further clarity as to what were the pitfalls during the execution of these cycle routes. New approaches and strategies have now been set in place which should help avoid the repetition of certain issues, but there are still certain deficiencies within our transport sector that need to be addressed.

5.2 Answering the Research Questions

I. Has there been an increase in cycling activity with the incorporation of new cycling infrastructure over the past few years?

Establishing a discrete figure proved to be not a straightforward task since quantitative data related to cycling numbers did not exist before this study. The counts represented a very low number of cyclists when compared to the thousands of motor vehicles that use the same routes. The recordings showed that these routes did not experience any users for prolonged periods. With such low figures, the modal share can be considered negligible within these routes (below 0.2%), despite the presence of cycling infrastructure.

The results from both the surveys and the interviews also showed that while these routes do support the cause to increase active mobility, they have not yielded any noticeable results. Therefore, it is safe to conclude that the routes currently have not instigated an increase in cycling activity.

II. Have these routes been well received by the cycling community?

While it was vastly acknowledged that these routes should have been beneficial for cyclists, their execution was highly questioned. Their design caused multiple inconveniences for cyclists which resulted in the creation of several barriers. The main strategic issue was expressed to be a lack of connectivity.

III. Are there any instances in which cyclists are still using motor vehicle carriageways despite the presence of cycle lanes in the vicinity of their cycling route and why is this the case?

It was acknowledged that there are users that would still opt to use the motor carriageways, yet the surveys highlighted that such users are in the vast minority. Issues related to maintenance were advocated as the main reason for such a prospect. In certain situations, the presence of debris posed issues of safety resulting in cyclists using the motor carriageway instead.

IV. What barriers might be preventing a modal shift from happening?

Apart from the main issue of connectivity, multiple physical barriers also exist in terms of infrastructural design for these routes. The barriers also included the ease of safe access when entering and exiting such routes. It was also established that the elimination of such barriers both in current and future projects is necessary to at least encourage existing cyclists to use these routes. Such a prospect can only become attainable with the publication of standards and regulations. Once our cycling infrastructure is up to standard even on a strategic level, it will become more attractive for new users to opt for alternative modes of transport.

5.3 Moving Forward

This dissertation has shown that Malta still possesses a very poor uptake of cycling commuters. The studied routes are underperforming and have not instigated a modal shift towards cycling. These routes have even shown poorer modal shares than what is presented within the 2021 NHTS. It was made evident that all three routes possess multiple barriers and shortcomings which need to be addressed. Hence it was attributed that the publication of standards and regulations is not only necessary to address any existing issues but to also safeguard the quality of infrastructure that is to be constructed in the new active mobility routes.

While we could easily refer to international guidelines, having national regulations would ensure liability that all our cycling infrastructure is indeed adequate and up to standard. This study has shown there are certain inconsistencies and inefficiencies in the design of these three cycling routes, rendering them less desirable for cyclists. Therefore, the publication of legally binding standards would enforce the correction of such shortcomings.

Commuters such as car users that have never cycled are most probably unaffiliated with such barriers. Therefore, resolving them would still most probably not inspire new people to start cycling. Yet this should still be the first step in increasing our modal share. We must first ensure that our infrastructure is being frequented by the already established cycling community. Hence why local regulations and standards are the pivotal first step. We should never expect to have an increase in cycling numbers if even the existing cycling population is not satisfied with the cycling infrastructure that is made available. Once satisfaction is achieved, the transition becomes feasible since the infrastructure can then be sold to the general public as a safe and attractive solution against the issues of congestion that our current transport sector possesses. The incorporation of green infrastructure is also crucial and is another major selling point for the attractiveness of alternative mobility.

Yet such a prospect should be supported by other measures since it cannot guarantee a modal shift solely on its own. The lack of restrictions on car use has resulted in a very strong car-centric mentality that is difficult to defy. Even if we manage to construct a safe, attractive and holistic cycling network with little to no barriers, the public will still resist giving up their car due to its ease of use and access within our road network. Improvements and further incorporation of cycling infrastructure are a must, but strategies are also required that detract from the attractiveness of car use, especially for shorter trips. Measures such as pedestrian priority zones and paid parking are still alien concepts in most of our urban zones. Hence a carrot-and-stick approach is also necessary to disincentivise car dependency and attract more people to seek alternative modes of transport.

Education and awareness are also necessary to raise awareness that alternative modes of mobility could improve transport efficiency for all users, but education on its own provides little change. The issue of traffic congestion is constantly on the rise, and we are currently in a gridlock scenario where the public is not willing to give up car use since there are no as attractive alternatives. Hence space for alternative modes of transport that could help alleviate such issues is being set aside.

The main contributor to achieving a culture change is not the removal of car-related infrastructure for the imposition of cycling lanes. Public acceptance is only viable if interconnected links are implemented in locations that can strike a balance between all modes of transport. This does not necessarily mean a single road must cater for all modes of transport, but it does mean that all transport modes are accessible safely and efficiently. This concept is crucial in order not to cast a dark shadow and discriminate the provision of space for active mobility.

The current minority of cyclists also proves it challenging to justify large-scale projects to investors, yet it is also with the incorporation of such large-scale projects that cycling could be alleviated to a competitive mode of transport. This is only possible once there is enough momentum in the number of cyclists using our road network. Gaining such momentum will be no easy task and will require time for the public to experience a change in mentality through the strategic approach that has just been discussed. Up till now, we have only witnessed stand-alone measures such as education campaigns, government grants and the construction of singled-out cycle routes. Yet for change to truly suffice it is necessary to not only propose but implement a collective strategy plan that strikes a balance between all modes of transport. The proposal and incorporation of a new active mobility network should be the way forward in achieving this change both in our existing infrastructure and future routes, but this needs to be supported with the necessary standards and regulations. Furthermore, it is also necessary that such a network is to be followed by parallel measures that address the underlying issue of excessive car dependency.

5.4 The Potential Value from the Conducted Cycling Counts

The belief by all four interviewees that the studied cycling routes have not yielded positive results towards active mobility, can be confirmed as correct by the results from the cyclist counts. Hence, these counts could also prove to be useful in the future. Since almost no data existed related to cycling counts in Malta, this dissertation could serve as a basis to further monitor and compare cycling rates in the near future with the construction of the new cycling network. The provision of such data could help further justify whether future investments in cycling infrastructure have truly yielded positive results by referring to this dissertation as the initial scenario before the adoption of the new cycle network.

5.5 Suggestions for Future Research

As was previously attributed, once the proposed cycle network is completed, it would be insightful to collect new cyclist counts to assess if the construction of such a network has increased the number of users using these cycle routes.

Given that data on cyclists is very limited, further research may need to be conducted on the cycling community, especially in relation to the percentage of cyclists who are foreigners while also studying how much foreign cultures contribute to alternative modes of transport in Malta. The willingness to transition towards active modes of transport could also be studied between foreigners and locals. Lastly, it would also be beneficial to determine and establish a differentiation between the cyclists that travel for commuting and those who cycle for leisurely purposes to attain a clear picture of how much of the cycling population truly cycles for commuting purposes.

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Appendices

This Section is split into five main parts, presenting the resources and results for each research methodology. Only select resources are included in the appendices to comply with current GDPR regulations.

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1.1 Appendix A – Information Letters for Surveys and Interviews

1.1.1 Information Letter to Survey Participants

My name is **Luke Bartolo** and I am currently reading for a Master of Engineering (Civil Engineering) at the **University of Malta**.

I am currently conducting research that aims to better understand the existing barriers to the promotion of cycling and what is required for them to be overcome. The survey that you have been invited to complete forms part of this study. This will take around 5 minutes to complete. Any data collected from this survey will be used solely for the purposes of this study. There are no direct benefits or anticipated risks in taking part. Participation is entirely voluntary, i.e., you are free to accept or refuse to participate.

At no point will you be asked to provide your name or any other personal data that may lead to you being identified. Furthermore, you may skip over any questions that you do not wish to answer. Any data collected related to this questionnaire will be deleted four years after the completion of this study.

If you wish to participate in this study, please click the button that says “I agree to participate”. If not, please close the browser window (or click “I do not wish to participate”).

Should you have any questions or concerns, you may contact myself or my supervisor on the details provided below.

Yours Sincerely,

Luke Bartolo
luke.bartolo.16@um.edu.mt

Student - Researcher

Dr Odette Lewis
Odette.lewis@um.edu.mt
Faculty for the Built Environment: Room 302
Research Supervisor

DECLARATION BY RESPONDENT: I hereby confirm that I am 18 years of age or older. I am aware that completing and submitting this anonymous questionnaire implies that I am participating voluntarily and with full informed consent on the conditions listed above.

- I agree to participate – begin survey ☐
- I do not wish to participate – exit the survey ☐

1.1.2 Information Letter for Interviewees

Date

Information letter

Dear _____,

My name is Luke Bartolo and I am a student at the University of Malta, presently reading for a Master of Engineering (Civil Engineering) and who is also working part-time in the Implementation Section of Infrastructure Malta. I am presently conducting a research study for my dissertation titled **“An Appraisal on the Increase of Cycling Infrastructure in Malta and its Influence on the Promotion of Cycling”**; this is being supervised by Dr Odette Lewis. This letter is an invitation to participate in this study. Below you will find information about the study and about what your involvement would entail, should you decide to take part.

The aim of my study is to better understand the existing situation in relation to cycling as a mode of transport. It intends to further understand the existing barriers against the promotion of cycling and what is required for them to be overcome. Your participation in this study would help contribute to a better understanding of the existing limitations and the potential improvements that could be introduced in the local scenario. Any data collected from this research will be used solely for the purposes of this study.

Should you choose to participate, you will be asked to participate in a one-on-one interview regarding the state of our existing cycling network and what ought to be the way forward to improve cycling numbers in Malta.

Data collected from the interview will be recorded and then transformed into a transcript. The interviewee shall be referred to in an anonymous manner with only the organisation that he is representing being referred to by an identifiable name basis. The transcript shall not be included in the appendix section of the dissertation. No one except the interviewer shall have access to these recordings unless access is requested by the interviewee him/herself. These recordings will then be deleted four years after the dissertation has been completed.

Participation in this study is entirely voluntary; in other words, you are free to accept or refuse to participate, without needing to give a reason. You are also free to withdraw from the study at any time, without needing to provide any explanation and without any negative repercussions for you. Should you choose to withdraw, any data collected from your interview will be erased as long as this is technically possible (for example, before it is anonymised or published), unless the erasure of data would render it impossible or seriously impair the achievement of the research objectives, in which case it shall be retained in an anonymised form.

If you choose to participate, please note that there are no direct benefits to you. Your participation does not entail any known or anticipated risks.

Please note also that, as a participant, you have the right under the General Data Protection Regulation (GDPR) and national legislation to access, rectify and where applicable ask for the data concerning you to be erased. All data collected that reveals the identity of the interviewee shall be erased four years after the completion of this study.

A copy of this information sheet is being provided for you to keep and for future reference.

Thank you for your time and consideration. Should you have any questions or concerns, please do not hesitate to contact me by e-mail at luke.bartolo.16@um.edu.mt; you can also contact my supervisor via her email: odette.lewis@um.edu.mt

Sincerely,

Luke Bartolo
luke.bartolo.16@um.edu.mt

Dr Odette Lewis (Supervisor)
odette.lewis@um.edu.mt
Faculty for the Built Environment: Room 302

1.2 Appendix B – Mapping and Onsite Photos

Map & Photos of Qormi Road - Luqa

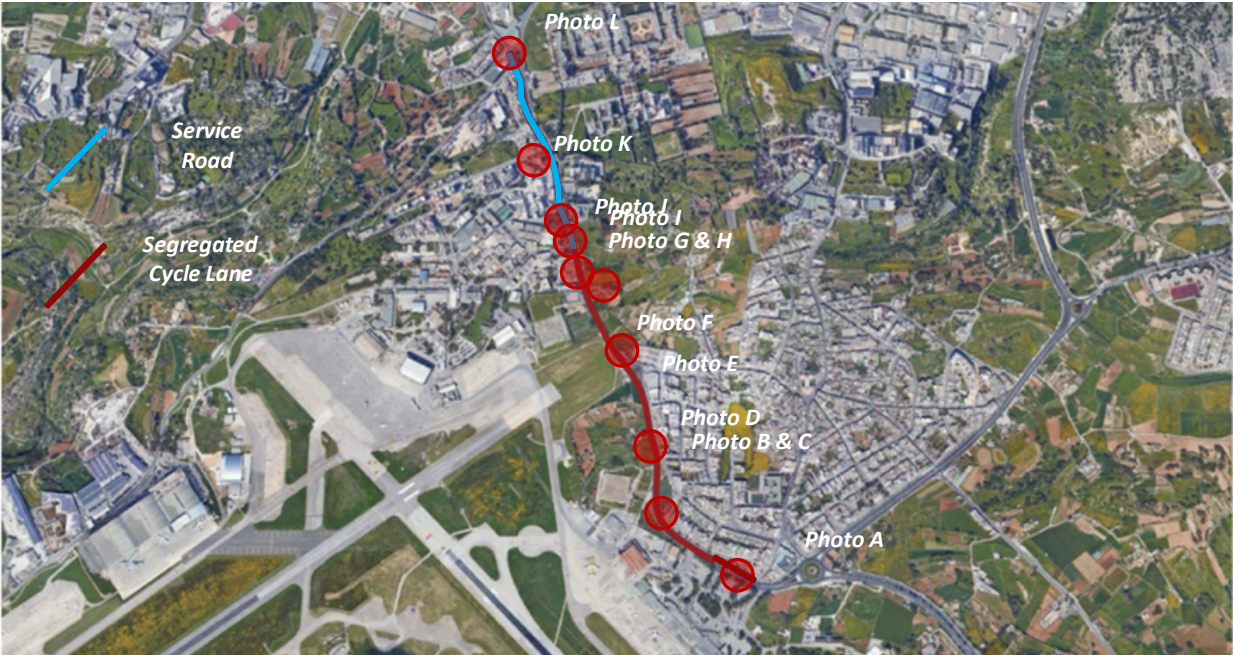


Photo A



Photo B



Photo C



Photo D



Photo E



Photo F



Photo G



Photo H



Photo I



Photo J



Photo K



Photo L

Map & Photos of Marsa Flyovers Project

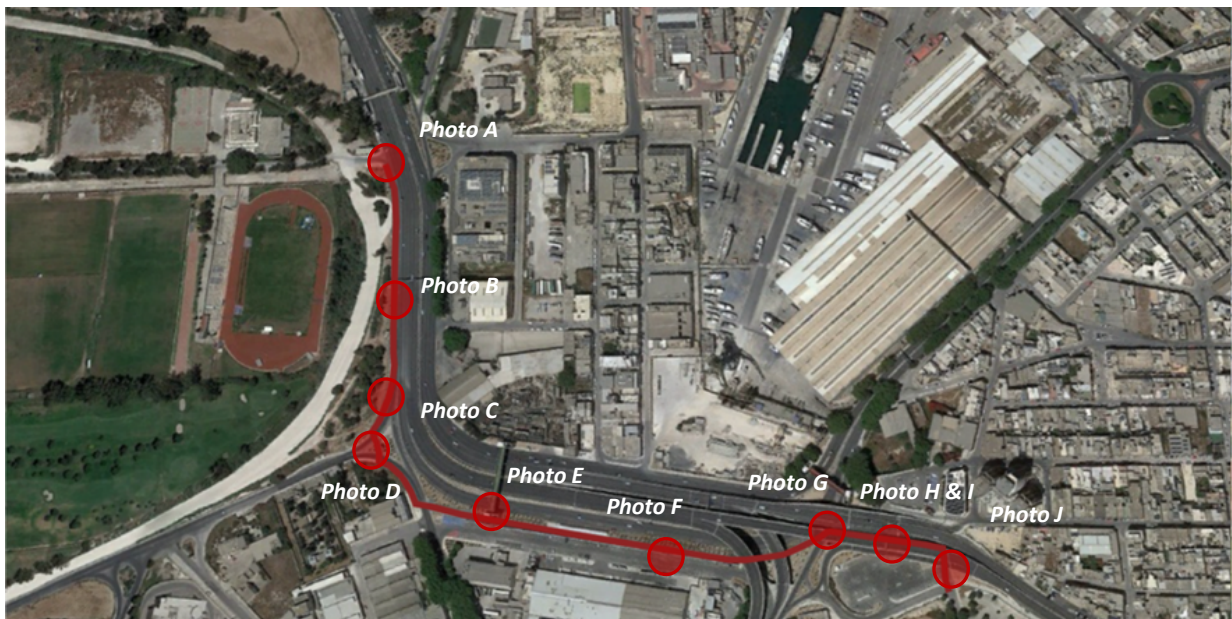




Photo G



Photo H



Photo I



Photo J

Map & Photos of The Central Link Project





Photo G



Photo H



Photo I



Photo J



Photo K



Photo L



Photo M

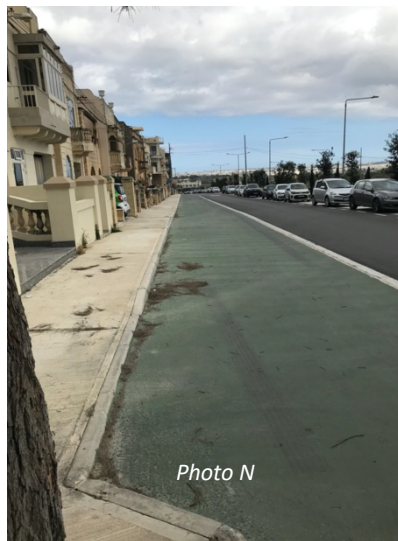


Photo N



Photo O



Photo P



Photo Q



Photo R



Photo S



Photo T

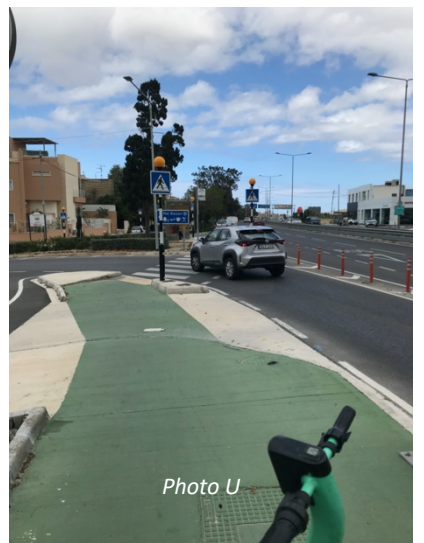


Photo U



Photo V



Photo W

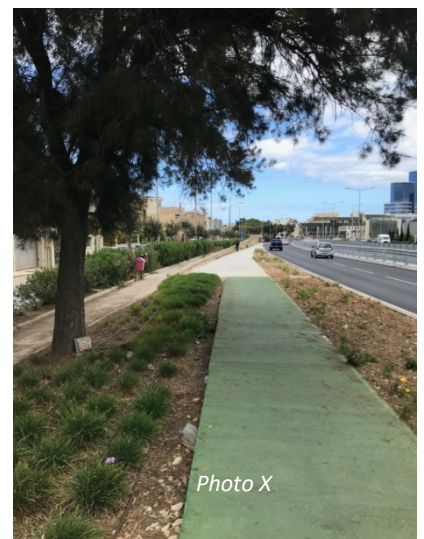


Photo X

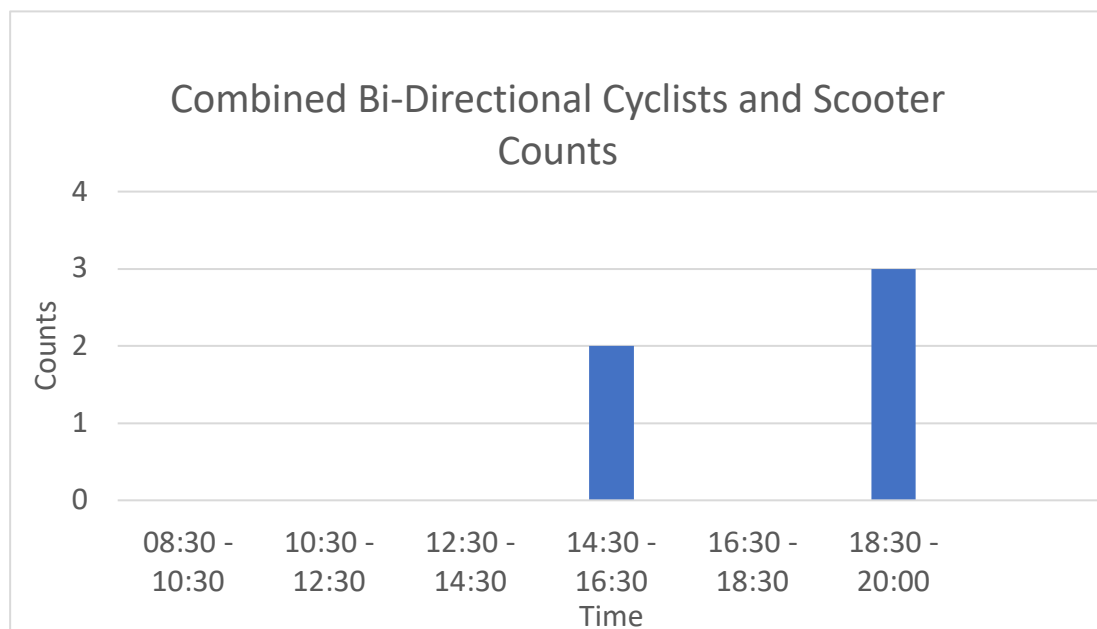


1.3 Appendix C – Cyclist Counts

Counts taken at Qormi Road on Wednesday 10th May 2023

Qormi Road Cyclist Counts					
Bicycles		Scooters		Pedestrians	
Towards Luqa	Towards Hal Farrug	Towards Luqa	Towards Hal Farrug	Towards Luqa	Towards Hal Farrug
	13:47	18:07	16:40	06:59	06:41
	14:07			07:30	07:06
	17:07			07:52	07:11
				07:54	07:13
				07:54	07:41
				07:55	09:07
				09:04	09:51
				10:08	10:14
				10:28	10:22
				11:05	11:13
				11:54	11:38
				12:54	13:15
				12:54	13:33
				13:05	13:57
				13:48	15:22
				14:25	16:27
				16:17	16:27
				16:52	17:51
				16:52	17:51
				17:46	18:14
				18:02	18:49
				18:02	18:52
				18:05	19:40
				18:43	19:50
				19:35	19:56
				19:45	
0 Cyclists	3 Cyclists	1 Scooter	1 Scooter	26 Pedestrians	25 Pedestrians
3 Cyclists in Both Directions		2 Scooters in Both Directions		51 Pedestrians in Both Directions	

Bar Chart for counts at Qormi Road on Wednesday 10th May 2023

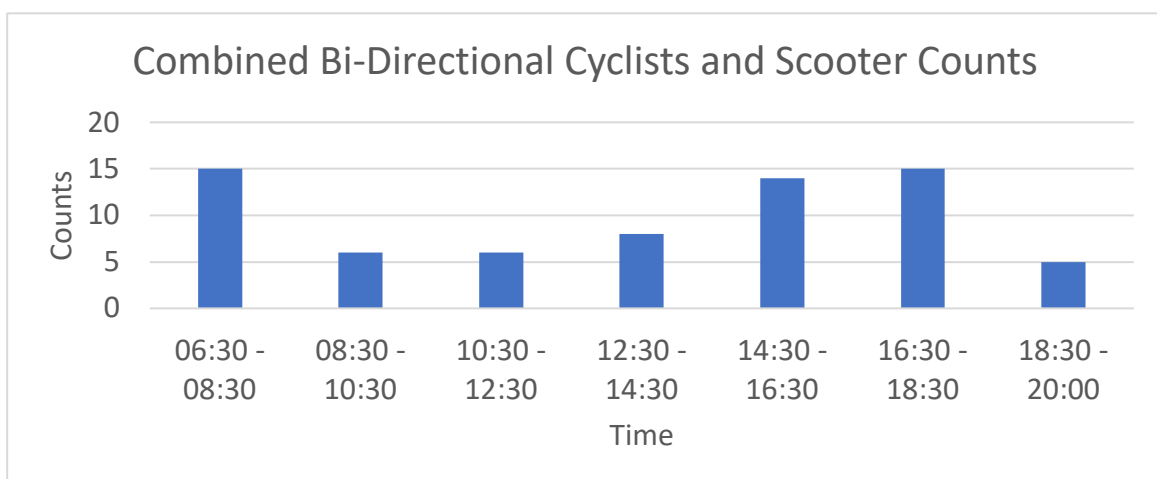


Counts taken at Marsa Flyovers Project on Thursday 11th May 2023

Bicycles		Scooters		Pedestrians	
Towards Marsa	Towards Paola	Towards Marsa	Towards Paola	Towards Marsa	Towards Paola
06:47	06:59	06:39	07:37	06:31	06:39
06:48	07:19	06:39	08:30	06:31	07:01
06:54	07:27	06:52	09:14	06:31	07:08
06:58	08:30	09:55	11:29	06:36	07:09
07:11	12:11	11:15	13:09	06:38	07:20
07:26	12:38		13:17	06:39	07:20
08:08	13:54			06:39	07:36
08:26	14:12			06:41	07:37
08:42	15:45			06:47	08:20
09:52	15:45			06:47	08:33
11:34	15:45			06:50	08:52
11:41	16:03			06:51	09:05
12:19	16:07			06:53	09:10
14:14	16:19			06:56	09:10
14:26	16:28			06:59	09:11
14:29	16:50			07:02	09:11
14:42	17:09			07:03	09:58
14:42	17:19			07:03	09:59
14:51	17:19			07:05	10:09
15:34	17:22			07:06	10:09
15:35	17:35			07:11	11:29
16:20	17:58			07:20	11:48
16:23	19:35			07:21	11:48
16:48	19:43			07:49	12:28
17:52				07:49	13:54
18:01				07:51	14:46
18:16				07:51	14:48
18:16				08:15	15:20
18:22				08:15	15:22
18:22				08:25	15:30
18:28				08:35	15:50
18:42				08:35	15:53
19:21				08:52	16:03
19:51				09:00	16:21
				09:02	16:38
				09:05	17:01
				09:13	17:16
				09:13	17:16
				09:18	17:33
				09:26	17:49
				09:29	17:49
				09:31	17:52
				09:37	17:59
				09:43	18:13
				09:49	18:20
				09:50	18:21
				09:52	18:31
				09:55	19:16
				10:14	19:25
				10:27	19:37
				10:29	19:49
				10:31	20:00
				10:33	20:00
				10:40	
				10:54	
				11:19	
				11:19	
				11:23	
				11:23	
				11:29	
				11:29	
				11:29	
				11:40	
				11:48	
				12:00	
				12:00	
				12:06	
				12:35	
				12:44	

				12:46	
				13:15	
				13:15	
				13:32	
				13:33	
				13:34	
				13:44	
				13:46	
				13:57	
				14:05	
				14:12	
				14:13	
				14:43	
				14:43	
				14:43	
				15:13	
				15:22	
				15:46	
				15:56	
				16:12	
				16:14	
				16:20	
				16:21	
				16:21	
				16:34	
				16:35	
				16:38	
				17:00	
				17:02	
				17:11	
				17:14	
				17:16	
				17:23	
				17:23	
				17:31	
				17:44	
				17:47	
				17:53	
				17:58	
				18:11	
				18:25	
				19:12	
				19:15	
				19:20	
				19:22	
				19:26	
				19:26	
				19:33	
				19:33	
				19:36	
				19:48	
				19:51	
				19:56	
				19:56	
34 Cyclists	24 Cyclists	5 Scooters	6 Scooters	123 Pedestrians	54 Pedestrians
58 Cyclists in Both Directions		11 Scooters in Both Directions		177 Pedestrians in Both Directions	

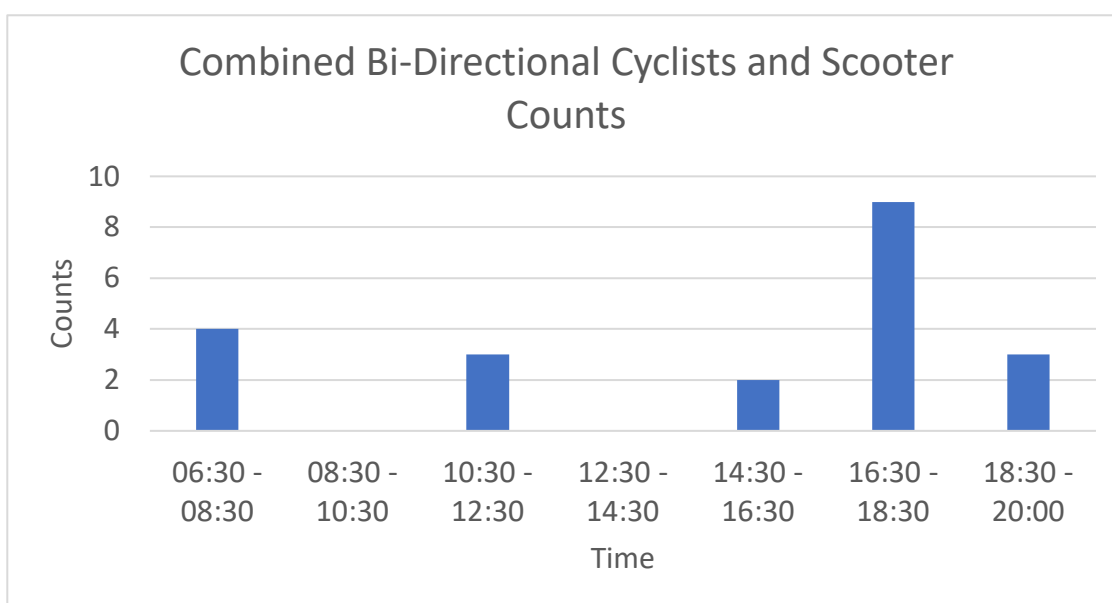
Bar Chart for counts at Marsa Flyovers Project on Thursday 11th May 2023



Counts taken at the Central Link Project on Wednesday 17th May 2023

Central Link Cyclist Counts					
Bicycles		Scooters		Pedestrians	
Towards Attard	Towards Rabat	Towards Attard	Towards Rabat	Towards Attard	Towards Rabat
06:30	08:28	15:08		06:55	06:35
08:11	16:39			06:59	06:55
08:15	17:22			07:06	07:11
11:03	18:04			07:08	07:29
11:03	18:28			07:11	09:50
12:19	18:46			07:20	10:14
15:38	19:22			07:20	10:50
15:52				07:23	11:03
16:37				08:28	11:03
17:46				08:40	12:19
18:12				08:46	12:38
18:24				10:15	12:38
18:26				12:09	12:38
19:37				12:30	00:27
				12:54	02:26
				12:54	03:19
				00:56	04:02
				03:34	04:52
				03:53	04:54
				03:53	04:54
				04:10	05:14
				04:11	05:33
				04:19	06:05
				04:30	06:05
				04:33	06:05
				04:33	06:13
				04:57	
				05:06	
				05:38	
				05:46	
				05:52	
				06:15	
				06:19	
				06:29	
				06:29	
14 Cyclists	7 Cyclists	1 Scooter	0 Scooter	35 Pedestrians	26 Pedestrians
21 Cyclists in Both Directions		1 Scooter		61 Pedestrians in Both Directions	

Bar Chart for counts at the Central Link Project on Wednesday 17th May 2023



1.4 Appendix D – Surveys

1.4.1 Survey Questions

This survey is particularly aimed at cyclists that have previously used or are currently using a bicycle to cycle around Malta and Gozo. Please only answer this survey if you fall under this category.

Are you over 18 years of age and ever cycled in Malta?

- ☐ Yes
☐ No

General Questions

1. Age Group

- ☐ 18-30
☐ 30-45
☐ 45-65
☐ 65 and over

2. Gender:

- ☐ Male
☐ Female
☐ Other

3. Nationality:

- ☐ Maltese
☐ Other

4. Locality of Residence:

☐ Attard	☐ Balzan	☐ Birkirkara	☐ Birżebbuġa	☐ Cospicua	☐ Dingli
☐ Fgura	☐ Floriana	☐ Fontana*	☐ Għajnsielem*	☐ Għarb*	☐ Għargħur
☐ Għasri*	☐ Għaxaq	☐ Gudja	☐ G'Mangia	☐ Gżira	☐ Ħamrun
☐ Iklin	☐ Kalkara	☐ Kercem*	☐ Kirkop	☐ Lija	☐ Luqa
☐ Marsa	☐ Marsaskala	☐ Marsaxlokk	☐ Mdina	☐ Mellieha	☐ Mgarr
☐ Mosta	☐ Mqabba	☐ Msida	☐ Mtarfa	☐ Munxar*	☐ Nadur*
☐ Naxxar	☐ Paola	☐ Pembroke	☐ Pietà	☐ Qala	☐ Qormi
☐ Qrendi	☐ Rabat	☐ Safi	☐ St. Julian's	☐ San Gwann	☐ San Lawrenz*
☐ Senglea	☐ St. Paul's Bay	☐ Sannat*	☐ Santa Lucija	☐ Santa Venera	☐ Siggiewi
☐ Sliema	☐ Swieqi	☐ Tarxien	☐ Ta' Xbiex	☐ Valletta	☐ Victoria
☐ Vittoriosa*	☐ Xaghra*	☐ Xewkija	☐ Xgħajra	☐ Zabbar	☐ Żebbuġ
☐ Żebbuġ*	☐ Zejtun	☐ Zurrieq	*Gozo		

5. Employment
- ☐ Employed
 - ☐ Unemployed
 - ☐ Inactive
 - ☐ Student
 - ☐ Self Employed
6. What is the most common type of trip purpose on a normal day?
- ☐ Commuting to Work
 - ☐ Commuting to School
 - ☐ Shopping
 - ☐ Personal errands
 - ☐ Medical trips
 - ☐ Other
7. The Average Distance per Trip:
- ☐ 0-2km
 - ☐ 2-8km
 - ☐ 8km or more
8. The main mode of transport usually used for this type of trip:
- ☐ Car
 - ☐ Motorcycle
 - ☐ Public Transport
 - ☐ Bicycle
 - ☐ Shared Vehicle
 - ☐ Private Transfer
 - ☐ Walking
 - ☐ Scooter
 - ☐ Other
9. What is the most important aspect for you when travelling:
- ☐ Travel time
 - ☐ Comfort
 - ☐ Directness
 - ☐ Levels of Carbon emission with your commute
 - ☐ Other
10. Are you satisfied with your existing mode of transport?
- ☐ Yes
 - ☐ No
11. If no, what is your main reason for this answer?
- ☐ Traffic, Lack of Comfort
 - ☐ Timeliness
 - ☐ Travel Expenses
 - ☐ Issues of Safety
 - ☐ Other

Section 2: Cycling as a Mode of Transport

This section contains questions on using a bicycle instead of other modes of transport to travel from an origin point to a final destination.

Have you ever used a bicycle to commute from one location to the other? (Not for leisurely purposes):

- ☐ Yes
- ☐ No

Answer the following two questions only if your answer to the previous question was yes.

a) I use a bicycle for around “___”% of my commuting journeys.

- ☐ 5% or less
- ☐ 25%
- ☐ 50%
- ☐ 75%
- ☐ 90% or more

b) The main reason I prefer to ride a bike for my commutes is that it:

- ☐ Is faster than other modes of transport
- ☐ A safe mode of transport
- ☐ A comfortable mode of transport
- ☐ Helps me live a healthier lifestyle
- ☐ Is a cleaner mode of transport
- ☐ Is a more economical mode of transport
- ☐ Other

The maximum distance I feel comfortable commuting with a bicycle is:

- ☐ I do not feel comfortable
- ☐ Not more than 2km
- ☐ Not more than 5km
- ☐ Not more than 10km
- ☐ Not more than 15km
- ☐ Over 15km

Kindly rank on a scale from 1 to 5 the following statements: (1 = Strongly Agree; 5 = Strongly Disagree)

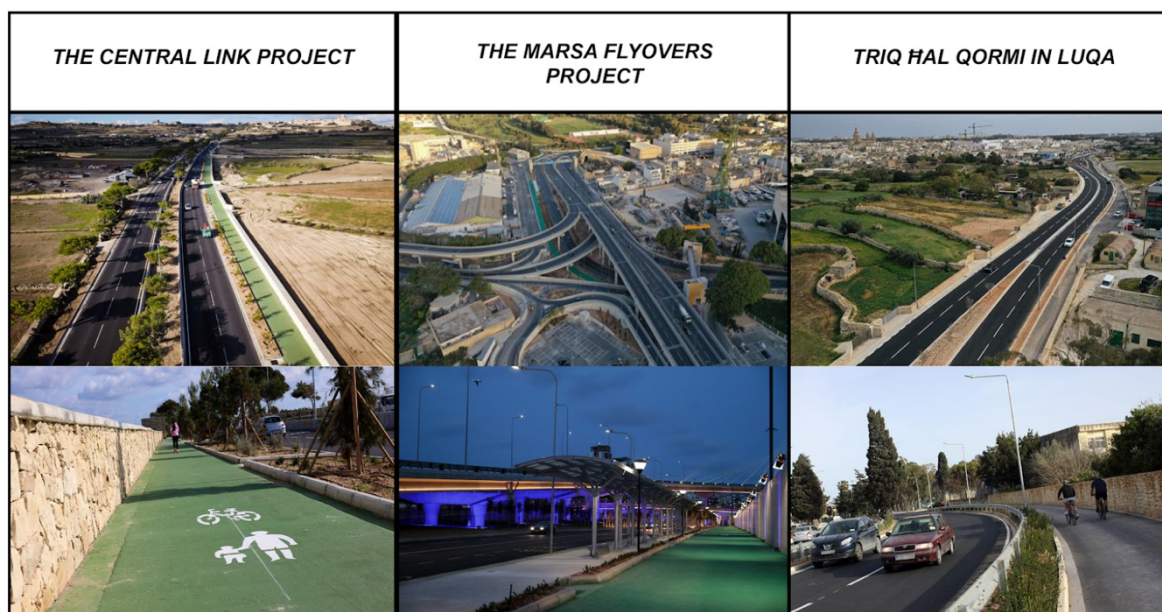
	1	2	3	4	5
Cycling is a safe mode of transport.					
Cycling has the potential to become more popular in Malta and reduce traffic congestion.					
Pedestrians and Cyclists are given equal or higher priority in our village cores when compared to motor vehicles.					
Our Climate and road terrain make cycling too physically demanding to be a viable mode of transport in Malta.					
Paddle-assisted bicycles or electric bicycles are plausible solutions for the issues mentioned in the previous statement.					
A safer and more connected cycling network is required for more people to start cycling.					

I would be in favour of the creation of more safe cycling infrastructure at the expense of taking up Agricultural land or Green spaces.					
I would be in favour of the creation of more safe cycling infrastructure at the expense of reducing the Number of Vehicular lanes where possible					
I would be in favour of the creation of more safe cycling infrastructure at the expense of Reducing Parking spaces.					

Section 3

The final section focuses on some of the recently constructed cycling routes and their effect on the promotion of cycling.

The cycling routes/lanes in question are:



Kindly rank on a scale from 1 to 5 the following statements: (1 = Strongly Agree; 5 = Strongly Disagree)

	1	2	3	4	5
I am familiar with these projects.					
I find these projects to be beneficial for cyclists.					
The cycling infrastructure is sufficiently designed and constructed to provide a safe route for cyclists.					
The cycling infrastructure is sufficiently designed and constructed to provide a faster and more efficient route for cyclists.					
The construction of such projects has further encouraged me to choose cycling as a mode of transport.					
Segregated cycle lanes help/would help me feel safer while cycling as opposed to sharing the road.					
I would rather prefer to have a roadside and more direct cycle route, rather than a segregated route that has more winding paths and junctions.					
I still prefer to use the motor carriageways along these routes despite the presence of a cycle lane.					
The connectivity of Malta's existing cycling routes still leaves a lot to be desired.					

Is there anything which you believe could have been designed better in these projects to ensure a safer and more efficient experience for cyclists?

- ☐ Yes
- ☐ No

If the answer to your previous question was yes, please write a brief description of what could have been done better.

Thank your participation.

1.4.2 Data from Surveys

Total Number of Participants: 148

Section 1: General Questions

Q1. What is your age group?

Age	Responses
18-30	47
30-45	56
45-65	44
65 and over	1

Q2. What is your Gender?

Gender	Responses
Male	111
Female	36
Other	1

Q3. What is your Nationality?

Nationality	Responses
Maltese	134
Other	14

Q4. In which locality do you reside?

3 Attard	3 Balzan	8 Birkirkara	3 Birżebbuġa	1 Cospicua	5 Dingli
2 Fgura	0 Floriana	0 Fontana*	0 Ġhajnsielem*	1 Ġharb*	1 Ġhargħur
0 Ġhasri*	0 Ġhaxaq	2 Gudja	2 G'Mangia	2 Gżira	1 Ħamrun
1 Iklin	0 Kalkara	1 Kercem*	0 Kirkop	0 Lija	1 Luqa
0 Marsa	9 Marsaskala	2 Marsaxlokk	1 Mdina	1 Mellieha	3 Mgarr
14 Mosta	2 Mqabba	2 Msida	0 Mtarfa	0 Munxar*	0 Nadur*
9 Naxxar	5 Paola	0 Pembroke	0 Pietà	0 Qala	5 Qormi
0 Qrendi	3 Rabat	1 Safi	6 St. Julian's	2 San Gwann	0 San Lawrenz*
0 Senglea	5 St. Paul's Bay	0 Sannat*	0 Santa Lucija	2 Santa Venera	4 Siggiewi
3 Sliema	2 Swieqi	8 Tarxien	0 Ta' Xbiex	2 Valletta	1 Victoria
0 Vittoriosa*	0 Xaghra*	0 Xewkija	0 Xghajra	8 Żabbar	4 Żebbuġ
0 Żebbuġ*	2 Żejtun	5 Żurrieq	*Gozo		

Q5. What is your current state of employment?

Employment	Responses
Employed	104
Unemployed	5
Inactive	3
Student	24
Self Employed	12

Q6. What is your most common type of trip purpose on a normal day?

Trip Purpose	Responses
Commuting to Work	72
Commuting to School	22
Shopping	4
Personal Errands	15
Medical trips	0
Other	10

Q7. What is the average distance of this trip?

Distance	Responses
0-2km	22
2-8km	73
8km or more	53

Q8. What is the main mode of transport used for this trip?

Q8. Main Mode of Transport used	
Car	68
Motorcycle	7
Bicycle	47
Public Transport	12
Walking	12
Private Transfer	0
Scooter	1
Shared Vehicle	0
Other	1

Q7. & Q8 Combined	Trip Range		
	0-2km	2-8km	8km or more
Car	7	34	27
Bicycle	6	27	14
Walking	8	2	2
Public Transport	1	6	5
Motorcycle	0	3	4
Scooter	0	1	0
Shared Vehicle	0	0	0
Private Transfer	0	0	0
Other	0	0	1

Q9. What is the most important aspect for you when travelling?

Factor	Responses
Travel Time	85
Comfort	27
Directness	14
CO ₂ Emissions	8
Other	14

Q10. Are you satisfied with your existing mode of transport?

Answer	Responses
Yes	62
No	36
Somewhat	50

Q11. If your answer was No or Somewhat, what is the main reason for your previous answer?

Reason	Responses
Traffic	48
Timeliness	9
Travel Expenses	0
Issues of Safety	29
Other	0
Total Responses 86	

Q8. & Q11. Combined	Transport Mode				
	Car	Bicycle	Public Transport	Walking	Motorcycle
Traffic	4	2	2	3	0
Timeliness	1	2	5	0	0
Issues of Safety	8	13	2	3	3
Other	0	0	0	0	0

Section 2: Cycling as a Mode of Transport

Q1. Have you ever used a bicycle to commute from one location to the other? (Not for leisurely purposes)

Answer	Responses
Yes	109
No	39

Q2. I use a bicycle for around “ _____”% of my commuting journeys. (Answered only by those who answered yes in the previous question)

Percentage	Responses
5% or less	39
25%	19
50%	18
75%	13
90% or more	20
Total Responses 109	

Q3. The main reason I prefer to ride a bike for my commutes is that it: (Answered only by those who answered yes)

Reason	Responses
Faster than other modes of transport	40
Safe mode of Transport	0
Comfortable mode of Transport	5
Helps to live a Healthier Lifestyle	35
It's a cleaner mode of Transport	11
It's a more economic mode of Transport	12
Other	6
Total Responses 109	

Q4. The maximum distance I feel comfortable commuting with a bicycle is:

Distance	Responses
I do not feel comfortable	21
Not more than 2km	7
Not more than 5km	23
Not more than 10km	28
Not more than 15km	22
Over 15km	47

Ranked from a scale to 1 to 5 (1 = Strongly Agree; 5 = Strongly Disagree)

	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>
Cycling is a safe mode of transport.	12	31	33	45	37
Cycling has the potential to become more popular in Malta and reduce traffic congestion.	83	36	16	9	4
Pedestrians and Cyclists are given equal or higher priority in our village cores when compared to motor vehicles.	6	5	10	35	92
Our Climate and road terrain make cycling too physically demanding to be a viable mode of transport in Malta.	14	27	48	28	31
Paddle-assisted bicycles or electric bicycles are plausible solutions for the issues mentioned in the previous statement.	92	35	14	6	1

A safer and more connected cycling network is required for more people to start cycling.	120	23	4	1	0
I would be in favour of the creation of more safe cycling infrastructure at the expense of taking up Agricultural land or Green spaces.	43	33	27	24	21
I would be in favour of the creation of more safe cycling infrastructure at the expense of reducing the Number of Vehicular lanes where possible	100	32	11	0	5
I would be in favour of the creation of more safe cycling infrastructure at the expense of Reducing Parking spaces.	89	25	18	7	9

Section 3: Questions on the Three Specific Cycling Routes

Ranked from a scale to 1 to 5 (1 = Strongly Agree; 5 = Strongly Disagree)

	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>
I am familiar with these projects.	47	73	18	8	2
I find these projects to be beneficial for cyclists	17	63	45	14	9
The cycling infrastructure is sufficiently designed and constructed to provide a safe route for cyclists.	9	36	36	42	25
The cycling infrastructure is sufficiently designed and constructed to provide a faster and more efficient route for cyclists.	11	31	45	42	19
The construction of such projects has further encouraged me to choose cycling as a mode of transport.	13	25	35	43	32
Segregated cycle lanes help/would help me feel safer while cycling as opposed to sharing the road.	101	30	12	2	3
I would rather prefer to have a roadside and more direct cycle route, rather than a segregated route that has more winding paths and junctions.	33	22	48	33	12
I still prefer to use the motor carriageways along these routes despite the presence of a cycle lane.	9	17	30	46	46
The connectivity of Malta's existing cycling routes still leaves a lot to be desired.	113	21	6	6	2

Q. Is there anything which you believe could have been designed better in these projects?

Answer	Responses
Yes	113
No	6
Don't Below	29

Feedback of what could have been done better:

- More connectivity
- The cycle lanes previously mentioned have no standards, do not connect properly to different villages hard to enter and exit and contain unsafe crossings and indirect pathways

- In both the central link and marsa underpass crossings should have been made level with the sidewalk with automatic detection of incoming cyclists and pedestrians that turn on pelican lights and in the marsa underpass specifically, the lifts should never have happened and instead they should be pelican lights.
- Cycle lanes are connected (cycle network) cycle lanes that end and begin in a safer way. + quicker way (ramps are not placed to accommodate the cyclists' time).
- Infrastructure isn't made safely (overall)
- Some locations lack signs that indicate that it's a cycle lane (I often see people walking in them, parked kick scooters or even CARS parked in the cycle lanes).
- Change in people's mentality.
- I would point out that the safest form of cycle lanes are those with trees/shrubs/bushes segregating the cycle lane with the road.
- not all cycle lanes are made wide enough. (and some lack lanes going both ways - like the cycle lane recently made on the Msida promenade/ xatt is a single lane...this is problematic when 2 cyclists coming from opposite directions are using it).
- If there aren't cycle racks, there are usually the wrong type.
- Frequency of maintenance of cycle lanes. Adequate lighting at night. Debris Cleaning from cycle lanes. Maintenance stations in the mentioned projects.
- If there is no connectivity to the new infrastructure, it will still be unusable
- Connectivity. A segregated lane in the middle of a busy intersection seems useless. You would think you would have to get the bike off a car to drive the small protected lanes. Lanes need to get you somewhere if we are able to see cycling as a transport option.
- Junction design could be better
- Cycle lanes that continue, not as you're cycle in a cycle lane after a while you find yourself cycle with cars
- Focus on lanes need to be more on connectedness. Connecting a network of lanes from 1 town to another.
- Lifts and bridges don't cut it. Take time not practical and costly to maintain. It should be underpass ramp and tunnel
- 90 degree turns (Attard), no ramps to access cycle lane(Santa Lucia), need to go wrong way to access CL (Attard santa Lucia-dawwret it-torri)), made from concrete not tarmac(addolorata), CL disappears and puts you in dangerous traffic (buqana, too narrow(mgarr) , disappears in crossroads (Mgarr), lifts- never work (Marsa), not clearly signposted (Marsa CL entry Poala side)
- We are definitely missing connectivity between cycle lanes, as unfortunately these cycle lanes need to be entered and exited through busy roads. Additionally car speed reduction is also required and must be enforced if we want to protect the more vulnerable commuters. Also, lifts should not be included as part of these cycle lanes if we're lacking their maintenance and creating more inefficiencies. Only one cyclist can fit in a lift, what happens if 10 cyclists commute together and need to use the lift?

- 1. Use of 90deg corners (Attard) design guidelines use curved turns.
- 2. Failure to ensure connectedness throughout scheme (All).
- 3. Need to contraflow mainroad traffic to reach/leave infra (Marsa).
- 4. Use of lifts as primary connectors, unreliable, can't cater for logistic bikes like cargo bikes(Marsa).
- 5.They don't really connect to anything.
- 6.Parking on the bike lane (Attard).
- 7. Network mesh density was not established (it was not a criteria for Attard, and clearly was not established in other cases)
- 8. Luqa's one sided design is complicated to reach, only half way up Qormi Hill. Going down it takes you to the left slip lane only.
- 9. Luqa lane from turn off to Gate 1 MIA is one way only.
- When looking at the project by itself, the inclusion of a segregated cycle lane for cyclists was very good (i.e. especially in comparison to their previous scenario). However, when commuting, one will flow through other areas as well. Better connectivity at the start and end of these projects is needed to make cyclists feel safer throughout their entire journey.
- The central link has blocked access to the routes that connected Attar to Qormi The bloody lifts in Marsa are not working almost every week. Forcing pedestrians and cyclists to lengthen their trip by about 1km to cross a road while cars are almost stationary in traffic is ridiculous.
- Better connectivity and signage on and around the routes
- In Marsa street level pedestrian crossings were replaced by bridges with stairs and very unreliable lifts. We need ramps. We also need safe connectivity such as to access Aldo Moro pedestrian bridge from Albert Town
- Safety in junctions for cyclists and better connectivity between these different projects
- Cycle lanes tend to abruptly stop, and you have to go on the road. Cycle lanes should be connected throughout as a network
- Lanes should have been wider and kept clean 24/7.
- Wider cycle lanes with proper segregation from main road .
- Overhead cycling passageways maybe also incorporating a monorail installed on the road paths by using the central strips as foundations for the structure required would have been relatively simple to add whilst road upgrades were. Been carried out. It still I sto a certain point
- In Attard, there are parts when joining the cycle lane has to be done by climbing a low pavement. In one instance this is dangerously at an angle. The Marsa lanes are not clearly marked everywhere.
- NSCAP 2018 lacks consultation and public engagement.
- We need education, respect and taking responsibility for our actions when driving a vehicle. There should be strict rules, Regards road speeding and using of mobile while

driving a vehicle and dangerous vehicles including the vehicles that exhaust too much fumes.... And the police and warden should be every where....

- Priority is still given to cars in these projects such as the marsa lifts arent able to cater if higher volumes of cyclist use it
- Better signage and connected paths (not bike lanes "from nowhere to nowhere")
- The major scope of those road projects were to facilitate the mobility of private cars and were therefore counter-productive to the long-term goals of reduced traffic congestion and increased use of public and active commuting. Moreover, the intensification of these roads negatively affected existing safe cycling options (ex: what were minor roads around the Central Link project) and the segregated cycling paths are not necessarily logical or continuous (ex: Marsa's one-sidedness and reliance on very falliable lifts).
- Many of the lanes were only made to get EU funding for the roads and they took up agricultural land needlessly when a lot of space was given to cars. To top it off then Ian Borg blamed the take up of agricultural land to the cycling lanes when alternatives by volunteers where drawn up but not listened to. The lanes were designed by someone who doesn't know what a bicycle is. Despite consultation with actual cyclists and despite said cyclists spoon-feeding better designs to IM, they were ignored. The lanes are disjointed for no reason. Getting to them is very dangerous in many cases. They are counterintuitive to use so that someone not experiences might end up in the car lane instead. Cyclists and pedestrians are made to take obscene detours so as not to inconvenience cars. Horrible unusable pedestrian bridges on which millions of euros of my money was burned (thank Ian Borg) so that their lifts literally never work. The list goes on.
- Lower vehicle speed limits policies and reduce the size of vehicles and engines to create a safer environment for cuyclicst and pedestrians.
- Proper planning of cycle routes to create a consolidated cycling network that links key destinations not random cycle lanes that take you from nowhere to nowhere. More stakeholder engagement in the design and planning phase, including NGOs, the community and transport experts/ academics.
- Cycle lanes integrated with existing roads, especially ones with faster speeds are not ideal for cyclists, even if segregated. Larger vehicles still make cyclists feel unsafe when travelling at faster speeds. Also, cycling next to ICE vehicles is not desirable because of carbon emissions and brake dust inhaling during the commute. For this reason, either separate cycling lanes or bicycle routes through village cores are preferred.
- Cycle lanes need to be consistent. Many suddenly stop and one has to lift bike off the pavement. They should be in all towns not just in certain areas
- Segregated cyclelanes, dutch roundabouts, no lift connections
- Saftey, maintenance, bike parking, maintenance stations, connectivity,

- Better routes, more segregated lanes, harsher laws for reckless drivers who injure cyclists, more laws protecting non-car commuters
- Connectivity to existing road network needs to be improved. Bicycle infra needs to be more direct and intuitive (from Paola toward Valletta, you have to cross main roads 4 or 5 times to use the cycle path, it doesn't make any sense at all).
- Have onboard bicycle and pedestrian stakeholders throughout the whole process of such projects
- Segregated bike lanes, increased connectivity, safety and awareness campaigns prioritising the use of bicycles and pedelecs.
- The road use by cyclists looks to have been an after thought.
- Alternative route system and not along main motorways
- Metal railings instead of silicone poles (in case of a car crashing toward the cycle lane at high speed, the poles would make minimal difference)
- Cycles lanes must be designed to safeguard cyclists and guarantee a safe journey. At present, authorities are creating them just to tick a box, under pressure to gain votes!
- More protection and lack on prioratisation
- Much more (segregated) cycling lanes
- Bike routes that lead to and from point of interest is needed for them to be useful
- Make them easier for mechanical cleaning as bicycle lanes are many times full of road debris
- Lack of a proper continuation of the cycle routes both within the project area and connecting to it, proper segregation in all areas and not just a handful, better crossings which prioritize cyclists and pedestrians instead of cars
- Passage of cyclists through lifts is a horrible idea. They are faulty most of the time besides being an enormous bottleneck.
- Create segregated bike lanes & bus lanes thus reducing the overall dependency on cars. These projects created over speeding roads for cars users without providing any further benefits for other road users.
- Interconnections for a single uninterrupted trip.
- Priority given to cyclists and pedestrians at junctions; coloured pavement; segregated lanes; raised paving at intersections; incorporating chicanes and bioswales to even segregate bike lanes from vehicular lanes; incorporating bike repair stations; a holistic cycling network that spread to the majority of the urban localities
- The cycling lanes only last for a short distance before leading to a dead end, making it mildly useless and unsafe for bikers, not to mention the fact that too much debris ends up in these lanes furthermore making it unsafe as a cyclist may get a puncture or even worse crash while trying to avoid the debris.
- I would only ask the designers to have the foresight and be users themselves of their creations. we live in an age of simulations and proof of concept visualisations that no other generation had, yet the higher complexity of projects is making the outcome

seem worse! for example the cycle lane is usually filled with debris, then we need to have in place a sweeping routine that cleans up these debris. infrastructure does not stop at project completion phase....

- Vertical access such as lifts are not convenient. Cycle lanes should be asphalted and not concrete finished like pedestrian pavements.
- The designers should have taken account the vulnerability of each road users prioritising the most vulnerable first. Instead they have prioritised motorised transport over walking and cycling
- The cycling infrastructure should be part of the project from the planning phase till implementation. There should be a safety assessment in the planning phase where all road users should be invited to participate and identify any hazards at the planning phase so that the appropriate mitigations are taken . In addition, road regulations and laws should provide a much better protection to the most vulnerable road users.
- I would have done a study of a possible bike lane around the country before investing ,Ç700 million in infrastructure. Cars are increasing by a large amount everyday, therefore road expansions and flyover will not solve this problem.
- Marsa flyover (for example) - I am still clueless how to actually get on the new cycle path. It also doesn't help that Google Maps doesn't have 'bicycle' to choose from as mode of transport.
- It's too fragmented. Joined up infrastructure is needed. No one would drive down a road that ends in a field and starts again some km across
- At points where cyclists have to choose a direction, drivers risk accidents because the cars don't/can't anticipate a cyclist in front of them. Dedicated cycling overpasses are always going to be the safest option for cyclists having to pass from the fast moving traffic eg Marsa.
- Connected to village cores, Make it an actual cycle network- not just for certain busy roads
- Maintain the cycle lanes- because a lot of them have gravel and litter in them
- place the starting and ending points of cycle lanes and pedestrian crossings in safer parts of the roads make the pedestrian crossings (with lights) and cycle lanes more direct and less playing around (in terms of distance) - which ends up being more dangerous for the cyclists and pedestrians. maintain lifts. They are always out of order.
- More shrubs, trees and bushes needed in these roads and in the roads that aren't pictured. Ideally segregating pedestrians and cyclists from the cars.
- Remove a lane from the road, to force drivers off the road.
- Have more traffic police on duty. A lot of wardens don't give out fines and people drive even more recklessly knowing that they won't get fined.
- Proper lighting in the roads where there are cycle lanes and side walks.
- Increase the fines (they increased them ONLY SLIGHTLY recently).

- Make the roads less high-way type and more slow. To decrease the dichotomy of cars vs. Active mobility users. Less talk, more action from the government aswell as citizens.. People easily complain about traffic but don't make the changes themselves, often because safety is the biggest issue with transitioning towards active mobility (me included).
- All cycle lanes are not safe
- The lanes must not share the road with cars and must be connected as one continues route, underground tunnels could be constructed to provide a more direct route for cyclists, while providing protection from the weather.
- Lanes needed to be continuous; junctions need to prioritise cyclists/ pedestrians
- Connection to other cycle lanes
- Junction improvements especially from rabat to hattard (ta qali area)
- More segregation or else use of side roads/country lanes for pedestrian and bike commuters only (even if longer in terms of km)
- A better segregation from cars and bikes
- Isolated cycle lanes are pointless.. it has to be part of an integrated network, or at least cycle lanes have to end up onto residential streets which can take you safely further to other destinations. for example taking the marsa bypass cycle lane from paola to marsa throws you out onto the bus stop and requires mounting the pavement, taking the pedestrian (not properly designed for bicycles) bridge, to be able to 'safely' access marsa/hamrun. Ironically, despite the cycle lanes in these projects being safe, the entrances and exits to these projects are more dangerous than taking eventual residential streets where you can easily keep up with traffic.
- Cycle lanes could be planned better to maximise efficiency. Furthermore, havune the cycle lane be segregated with some form of traffic light when rejoining major junctions (similar to how it is in some EU countries) can also be a possible solution.
- Continuation of the lanes. The lanes cover only a piece of the commute
- Usually these 'cycle lanes' starts from nowhere and end nowhere
- The new road infra is simply dividing towns and making cycling impossible and then covering the whole mess by unfuctionable cycle lanes which makes one to cycle from a to b go never ending senseless winding paths!! the only solution is road sharing and EDUCATION and stop these crazy multi lanes roads which makes it scary even in acar let alone on a bike as in malta one have to switch from one lane to another every 1or 2 kms
- Some crossings do not have ramps only elevators that do not work most of the times
- Connectivity of towns (actual integrated networks without gaps in cycling infrastructure), and ensuring the paths do not dangerously or inconveniently intersect with other traffic

- If village cores could dedicate roads that are more pedestrian friendly, even the new projects would feel more connected. We don't need more "lanes" for cars, we need more pedestrian/cycle lanes
- Connectivity, access, completion of works
- Division of cycle lane similar to foreign countries
- Priority over side roads and better connections off the network
- More cleaning and tidying up
- Further segregated lanes, sometimes even sheltered with solar panels if needed or trees to allow easier commute. Cycle lanes that finish and merge to normal carriage way make it difficult and less desirable to commute via bicycle
- The recently constructed bicycle lane on the Mosta only has barriers to segregate cyclists from motorists for 40% of the road. The project consisted of replacing one vehicle lane with a cycling lane - leaving only one lane for cars. So, during traffic it is not uncommon for motorists to drive through the bicycle lane - no barriers ux who's going to stop them?
- More segregated bicycle lanes that take you somewhere, not dead ends
- Even though the cycling lanes created offer a decent amount of safety, they were designed towards a single direction rather than both directions. Therefore you have to cycle wrong way to manage and use the cycle lane.
- Cycling lanes need to be on either side.
- Enforcement to stop cars from parking in cycling lane
- Wherever these need to cross large roads it is more efficient to build pedestrian/cyclist underpasses. Also it is more economical (hence probably why they are not done!. A bridge is expensive to build and maintain - Steel bridge, periodic repainting, lights, lift expense, lift maintenance, takes much more time to cross the road, when lift is not working makes it very hard to cross. A tunnel costs less to build, no steel to repaint, no lift maintenance, no delay to cross the road, can be built to allow natural light so has lower running costs, has no steps, a pedestrian/cyclist tunnel is not too wide and high so the digging costs and the concrete road bridge required are less costly.
- Sta lucija addolorata hill pavement for cyclists and pedestrians is only accessible from zejtun via either the busy tal-barrani dual carriageway where there are frequent car crashes, or a very long detour to negotiate one way systems in sta lucija itself and dangerous junctions and roads between zejtun and Tarxien. Some thought could yield:
 1. More crossing points to Tarxien near Toly (currently only one set of lights so you have to dismount, walk to lights, then negotiate an immediate one way system on the other side).
 2. Change the one way in sta lucija so access to the pedestrian crossing for the cycle path is direct.
 - Or 3. Close the country lanes between Ghaxaq and sta Lucija to cars and redesign as cycle and footpaths. This would allow non car safer commutes for bikes and walkers between zejtun ghaxaq gudja and sta lucija.

- To cross the roads pedestrians and cyclist have bridges that they have to climb 4 stories high, while a simple 3m down underpass is easier like in Milan or Austria
- Barricades to make it impossible for cars to park in cycle lanes
- Cycle lanes end abruptly and leave cyclists without any options but to cycle on the road very often in dangerous junctions.
- It is bad practice to have a shared cycle lane with pedestrians. I cannot understand why cycle lanes are not segregated and strictly for cycling, else they are either too narrow in certain section (Mgarr Road direction to Mgarr is a prime example). It also does not make sense for the shared cycle lane leading from Ta Qali to Attard to narrow substantially near Attard and discontinues next to Ivory and Co. You need to navigate your way through Attard Back roads to rejoin. Then the section leading down from Mon Lung showroom to Balzan is used for Parking.
- Cycling lanes are only on parts of the commute. Roads are designed on purpose to create confusion like multiple lane at roundabouts. Several research shows that more lanes increase traffic, but in malta, multiple lanes is viewed like a progress
- Wider and safer lanes as currently they are not given as much attention Connectivity. Some crossings are not cycling friendly and require the cyclists to dismount which is inconvenient.
- Barriers because the dust and gravel displaced by cars tends to find its way onto the cycle lanes, making it impossible to brake, accelerate or steer effectively without risking a crash due to a lack of grip.
- I mean there are some lanes...which connect you to a shared road where cars go at 60kmph, whoever approved those plans should be forced to cycle there. They are nearly useless, if you cannot connect to the lanes safely, they are not good enough.
- It is very important that there is a connection between all the bike path lines, to go on the intermodal transport line
- Safer cycling lanes
- Better access and connection to surrounding prominent destinations
- Better creation of an overall connected cycling infrastructure
- Safety in junctions for cyclists and better connectivity between these different projects
- Lanes should have been wider and kept clean 24/7.
- Cycle lane design needs more consistency. Many stop suddenly. They should connect to all town and not just in certain areas

1.5 Appendix E - Interview Questions

1.5.1 Interview with Anonymous Entity

General Questions on Cycling in Malta

1. In your view, what role does cycling have to play in improving the transport sector in Malta? And how significant do you believe this role to be?
2. As an entity, how are you contributing to improving cycling as a mode of transport in Malta? Is there anything in the pipeline with regard to cycling that you would be able to share with us and were you involved in the recent proposal of a cycling network?
3. According to the Eurobarometer, Malta has one of the lowest cycling rates of all the EU member states. What do you believe to be the main contributors to low cycling numbers in Malta? What needs to change the most to address these issues?
4. In late 2022, we witnessed the closure of one of the only two bike-sharing companies in Malta, “Nextbike”. Has this had any effect as an entity on how it views cycling as a viable mode of transport? Is this closure seen as a setback when it comes to improving cycling numbers?

The National Cycling Strategy

5. Several cycling routes were proposed in the NCS, including Mosta to University and St Julians to Valletta. Do you know if there is a particular reason as to why these routes have not been implemented yet?
6. When describing the process of how these cycle routes were designed, the NCS stated cycle lanes were only possible in an intermittent manner and it has therefore opted to propose shared infrastructure instead. Do you share the same view on this matter and do you believe that such reasoning bodes well with cyclists?

7. One of the short-term goals proposed in the NCS is the better provision of space for bicycle use. From your side, has any work been done related to this particular proposal over the past few years?

8. A few other short-term goals in the NCS included the creation of a web-based app for real-time cycling journey planning and a new platform to bring various stakeholders together. No updates or public information is available on these two proposals. Are these proposals still set to take place and what is the reason for their delays?

Planning and Implementation

9. Presently there are no standards related to cycling infrastructure in Malta. Are there any plans for standards to be published and if yes, at what stage are they presently?

10. Has the removal or relocation of on-street parking ever been considered as a solution to better incorporate cycle lanes instead? Do you believe this to be a sensible option?

11. Has zoning or reclassification of certain roads ever been considered within localities in order for them to prioritise active mobility users such as cyclists and pedestrians?

12. During the previous month, the Minister for Transport, Infrastructure and Capital Project announced the first details for the new cycling Network. Are you involved in any way in the scheming and designing of such a network and are you able to share if the routes mentioned in NCS are included within this network?

13. Recently there was training provided by the EIT Urban Mobility Academy for cycling. What have been the most prominent outcomes of this training? Has it played a role in

devising the cycle Network that was announced by the Minister for Transport, Infrastructure and Capital Projects?

14. Is the entity planning any other schemes or strategies related to cycling? And if yes, how actively involved are members of the cycling community in the scheming of such plans? Do you believe it is important to take their feedback on board?

15. Do you believe that the recently constructed cycling routes such as the Central Link project, the Marsa Flyovers project and Triq Hal Qormi in Luqa have encouraged more people to use the bicycle as a mode of transport? Do you monitor cyclist flows in any way or form?

16. Do you use any mobility data sources such as Strava Metro to identify which are the most popular commuted routes by cyclists? Do you believe that such information would better help plan Malta's Cycling Network?

17. A few years ago there was also mention of the SMITH's project which also included the provision of cycling infrastructure. Do you know if this particular project still on?

Cyclist's Safety and Vulnerability

18. With the number of road accidents increasing on a yearly basis, do you believe that vulnerable road users such as cyclists are feeling discouraged or threatened to share the road with motor vehicles? What is the best way to overcome such an issue?

19. Do you believe that incorporating fully segregated cycle lanes would encourage even more people to start cycling since it could be perceived as a safer mode to travel than it currently is? What would be the main challenges to achieving this in our road networks?

20. A common complaint from cyclists is that the existing cycle lanes are currently not interconnected and hence do not provide a continuous safe link. How critical do you believe this issue to be and do you believe that the proposed cycle network will be able to solve this problem?

21. Despite the construction of new segregated cycle lanes in projects such as the Central Link project, the Marsa Flyovers project and Triq Hal Qormi in Luqa, we still sometimes witness cyclists using the motor carriageways instead of the cycling lane. Why do you believe this is the case?

1.5.2 Representative from Infrastructure Malta

General Questions on Cycling in Malta

1. In your view, what role does cycling have to play in improving the transport sector in Malta? And how significant do you believe this role to be?

2. As an agency, how important is it for Infrastructure Malta to incorporate cycling infrastructure within our road network? With regards to the recently proposed cycle network, how were the routes within the network chosen?

3. According to the Eurobarometer, Malta has one of the lowest cycling rates of all the EU member states. What do you believe to be the main contributors to low cycling numbers in Malta? What needs to change the most to address these issues?

4. What do you believe are the main challenges for the incorporation of cycling infrastructure in Malta?

The National Cycling Strategy

5. Several cycling routes were proposed in the National Cycling Strategy (NCS), including Mosta to University and St Julians to Valletta. Has IM ever planned to construct these routes and are they now being considered in the newly proposed cycling network?

6. The NCS stated that for its proposed cycle routes, cycle lanes were only possible in an intermittent manner. When cycle lanes can only be incorporated in an intermittent manner into new design projects, what solutions does IM try to adopt in such instances? In certain cases such as the Haz-Zebbug bypass, it was chosen to incorporate shared infrastructure in a distributor road, do you believe that such reasoning bodes well with cyclists?

7. One of the short-term goals proposed in the NCS is the better provision of space for bicycle use. How much is cycling infrastructure taken into consideration during IM's design process both for the reconstruction of existing roads and the design of new roads?

Planning and Implementation

8. Presently there are no standards related to cycling infrastructure in Malta. Do you believe that the publication of local guidelines and regulations would be of help when designing cycling infrastructure in general?

9. Has the removal or relocation of on-street parking ever been considered as a solution to better incorporate cycle lanes instead? Do you believe this to be a sensible option?

10. During the previous month, the Minister for Transport, Infrastructure and Capital Project announced the first details for the new cycling Network. How is Infrastructure Malta involved in the design and implementation of such a network?

11. IM participated in the training provided by the EIT Urban Mobility Academy for cycling. What have been the most prominent outcomes of this training? Has it played a role in devising the cycle Network that was announced by the Minister recently?

12. Considering the implementation of cycle lanes in some of IM's most prominent projects, such as the Central Link project, the Marsa Flyovers project and Triq Hal Qormi in Luqa, were there any specific guidelines or standards that were referred to when designing these particular cycle lanes?

13. Was the primary inclusion of cycle lanes in these projects primarily to improve cycling accessibility for that particular project or were these cycle lanes always intended to form part of a larger cycling network?

14. Is there anything which you believe could have been done better in these projects in relation to safe and efficient cycling flows? Would IM be willing to modify parts of these projects in order to make these more accessible within the cycling Network?

15. How actively involved are members of the cycling community in the design and implementation of cycling infrastructure? How important is it for IM to take onboard feedback from the cycling community?

16. Have any form of cyclist counts or studies been used to affect the design and construction of such cycling routes? And if not, are there any plans to start doing such studies in the future?

17. Do you believe that the recently constructed cycling routes such as the Central Link project, the Marsa Flyovers project and Triq Hal Qormi in Luqa have encouraged more people to use the bicycle as a mode of transport? Does IM usually try to anticipate how much cycling numbers could increase when proposing a new cycling lane?

18. Does IM use any mobility data sources such as Strava Metro to identify which are the most popular commutes for cyclists? Do you believe that such information would better help plan Malta's Cycling Network?

Cyclist's Safety and Vulnerability

19. With the number of road accidents increasing on a yearly basis, do you believe that vulnerable road users such as cyclists are feeling discouraged or threatened to share the road with motor vehicles?

20. Do you believe that incorporating fully segregated cycle lanes would encourage even more people to start cycling since it could be perceived as a safer mode to travel than it currently is? What would be the main challenges to achieving this in our road networks?

21. A common complaint from cyclists is that the existing cycle lanes are currently not interconnected and hence do not provide a continuous safe link. How critical do you believe this issue to be and do you believe that the proposed cycle network will be able to solve this problem?

22. Despite the construction of new segregated cycle lanes in projects such as the Central Link project, the Marsa Flyovers project and Triq Hal Qormi in Luqa, we still sometimes witness cyclists using the motor carriageways instead of the cycling lane. Why do you believe this is the case?

1.5.3 Bicycle Event Organiser

General Questions on Cycling in Malta

1. In your view, what role does cycling have to play in improving the transport sector in Malta? And how significant do you believe this role to be?

2. As a member of the cycling community who is also known for organising cycling-related events, how do you believe such events help encourage cycling as a mode of transport in Malta? What changes to our road network would you like to see implemented in the future by the relevant authorities?

3. According to the Eurobarometer, Malta has one of the lowest cycling rates of all the EU member states. What do you believe to be the main contributors to low cycling numbers in Malta? What needs to change the most to address these issues?

4. What, in your opinion, are the biggest challenges that cyclists are currently facing when it comes to using a bicycle on our road network?

The National Cycling Strategy

5. Several cycling routes were proposed in the National Cycling Strategy (NCS), including Mosta to University and St Julians to Valletta. How crucial do you believe these routes to be for cyclists? And why do you think TM or IM still have not followed through on these proposals?

6. When describing the process of how these cycle routes were designed, the NCS stated cycle lanes were only possible in an intermittent manner and it was therefore opted to propose shared infrastructure instead. As a cyclist, what are your thoughts on this matter?

7. One of the short-term goals proposed in the NCS is the better provision of space for bicycle use. Do you believe that up till now, such a proposal has been adequately implemented by the relevant authorities?

Planning and Implementation

8. Presently there are no standards related to cycling infrastructure in Malta. Do you believe that the publication of standards and regulations would improve the quality of cycling infrastructure adopted on our islands?

9. Do you believe that the removal or relocation of on-street parking is a plausible solution to better incorporate cycle lanes instead?

10. During the previous month, the Minister for Transport, Infrastructure and Capital Project announced the first details for the new cycling Network. Do you know if members from the cycling communities and Local Councils are being consulted in the design of such a network?

11. Do you believe this network could help boost cycling numbers? How hopeful are you that this new network will provide safer and more efficient links for cyclists?

12. Do you believe that the recently constructed cycling routes such as the Central Link project, the Marsa Flyovers project and Triq Hal Qormi in Luqa were beneficial for the cycling community? And do you think they have encouraged more people to use the bicycle as a mode of transport?

13. Is there anything in such projects that you believe could have been done better or should be done better in the future?

14. Do you feel that members from our Cycling Community are involved enough in the design and implementation of cycling infrastructure on our islands? What are the main drawbacks being encountered when your feedback is not taken on board?

15. Do you believe that if the relevant authorities had access to data such as cyclist counts and cycle flows, the design of Malta's cycling Network would be better planned?

Cyclist's Safety and Vulnerability

16. With the number of road accidents increasing on a yearly basis, do you believe that vulnerable road users such as cyclists are feeling discouraged or threatened to share the road with motor vehicles? What is the best way to overcome such an issue?

17. As a cyclist, how often do you feel vulnerable or at risk of being involved in an accident? Do you believe the main issue is the improper design of infrastructure or inconsiderate behaviour from drivers?

18. Do you believe that incorporating fully segregated cycle lanes would encourage even more people to start cycling since it could be perceived as a safer mode to travel than it currently is? What would be the main challenges to achieving this in our road networks?

19. A common complaint from cyclists is that the existing cycle lanes are currently not interconnected and hence do not provide a continuous safe link. How critical do you believe this issue to be and are you hopeful that this will be solved in the future?

20. Despite the construction of new segregated cycle lanes in projects such as the Central Link project, the Marsa Flyovers project and Triq Hal Qormi in Luqa, we still sometimes witness cyclists using the motor carriageways instead of the cycling lane. Why do you believe this is the case?

1.5.4 Member from the NGO Rota

General Questions on Cycling in Malta

1. In your view, what role does cycling have to play in improving the transport sector in Malta? And how significant do you believe this role to be?
2. As a cycling NGO, how is Rota contributing to improving cycling as a mode of transport in Malta? What changes to our road network would you like to see implemented in the future by the relevant authorities?
3. According to the Eurobarometer, Malta has one of the lowest cycling rates of all the EU member states. What do you believe to be the main contributors to low cycling numbers in Malta? What needs to change the most to address these issues?
4. What, in your opinion, are the biggest challenges that cyclists are currently facing when it comes to using a bicycle on our road network?

The National Cycling Strategy

5. Several cycling routes were proposed in the NCS, including Mosta to University and St Julians to Valletta. How crucial do you believe these routes to be for cyclists? And why do you think TM or IM still have not followed through on these proposals?
6. When describing the process of how these cycle routes were designed, the NCS stated cycle lanes were only possible in an intermittent manner and it was therefore opted to propose shared infrastructure instead. As a cyclist, what are your thoughts on this matter?
7. One of the short-term goals proposed in the NCS is the better provision of space for bicycle use. Do you believe that up till now, such a proposal has been adequately implemented by the relevant authorities?

Planning and Implementation

8. Presently there are no standards related to cycling infrastructure in Malta. Do you believe that the publication of standards and regulations would improve the quality of cycling infrastructure adopted on our islands?

9. Do you believe that the removal or relocation of on-street parking is a plausible solution to better incorporate cycle lanes instead?

10. During the previous month, the Minister for Transport, Infrastructure and Capital Project announced the first details for the new cycling Network. Do you know if members from the cycling communities and Local Councils are being consulted in the design of such a network? Do you believe this network could help boost cycling numbers?

11. How hopeful are you that this new network will provide safer and more efficient links for cyclists?

12. Do you believe that the recently constructed cycling routes such as the Central Link project, the Marsa Flyovers project and Triq Hal Qormi in Luqa were beneficial for the cycling community? And do you think they have encouraged more people to use the bicycle as a mode of transport?

13. Is there anything in such projects that you believe could have been done better or should be done better in the future?

14. Do you feel that members from our Cycling Community are involved enough in the design and implementation of cycling infrastructure on our islands? What are the main drawbacks being encountered when your feedback is not taken on board?

15. Do you believe that if the relevant authorities had access to data such as cyclist counts and cycle flows, the design of Malta's cycling Network would be better planned?

Cyclist's Safety and Vulnerability

16. With the number of road accidents increasing on a yearly basis, do you believe that vulnerable road users such as cyclists are feeling discouraged or threatened to share the road with motor vehicles? What is the best way to overcome such an issue?

17. As a cyclist, how often do you feel vulnerable or at risk of being involved in an accident? Do you believe the main issue is the improper design of infrastructure or inconsiderate behaviour from drivers?

18. Do you believe that incorporating fully segregated cycle lanes would encourage even more people to start cycling since it could be perceived as a safer mode to travel than it currently is? What would be the main challenges to achieving this in our road networks?

19. A common complaint from cyclists is that the existing cycle lanes are currently not interconnected and hence do not provide a continuous safe link. How critical do you believe this issue to be and are you hopeful that this will be solved in the future?

20. Despite the construction of new segregated cycle lanes in projects such as the Central Link project, the Marsa Flyovers project and Triq Hal Qormi in Luqa, we still sometimes witness cyclists using the motor carriageways instead of the cycling lane. Why do you believe this is the case?