Enhancing Infrastructure and Road Safety to Promote Active Mobility for Adolescents' School Trips

A Case Study of a Maltese College

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To my parents, Charlot and Claire, who have always believed in me and provided unwavering support. And to my partner, Justin, for his endless support, patience, and belief in me throughout this journey.

This achievement would not have been possible without you.

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As a Master's student, as per Regulation 77 of the General Regulations for University Postgraduate Awards 2021, I accept that should my dissertation be awarded a Grade A, it will be made publicly available on the University of Malta Institutional Repository.

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Finally, I acknowledge that, like any academic work, this dissertation has its limitations. I take full responsibility for any errors or shortcomings it may contain.

Abstract

This dissertation explores how infrastructure and road safety can be enhanced to promote active mobility, specifically walking and cycling, for adolescents commuting to school. Focusing on a case study of Dr Maria Sciberras Middle School and Pietru Pawl Saydon Secondary School, St Benedict College in Kirkop, Malta, the research investigates the current commuting patterns, infrastructure quality, policy environment, and cultural mindset affecting student travel choices. A mixed-methods approach was used, including surveys with students and guardians, interviews with local councils, school representatives and NGOs, as well as route assessments using GIS mapping and on-site observations.

Findings show that while many students and parents support the idea of active mobility, safety concerns and inadequate infrastructure are major barriers. High traffic volumes, lack of pedestrian and cycling paths, and poor connectivity contribute to low levels of walking and cycling to school. Interviews highlighted a fragmented policy landscape and varying levels of engagement across local councils and institutions. Cultural attitudes remain a significant hurdle, with strong dependence on private vehicles.

The study concludes that creating a safer and more supportive environment for active mobility in Malta requires improvements in infrastructure, policy reform, and a shift in public mindset. Recommendations include prioritising low-stress route design, implementing clearer mobility policies, and promoting community-led initiatives such as walking and cycling buses.

Main Keywords:

Cycling routes, active mobility, middle school students, secondary school students

Table of Contents

List of Figures

List of Tables

Glossary

Abbreviation	**Term**
Active Mobility	Encompasses walking and cycling
NSO	National Statistics Office
EEA	European Environment Agency
WHO	World Health Organization
LTS	Level of Traffic Stress

Chapter 1: Introduction

1.1 Background

Different urban populations have varying infrastructural needs depending on the size of land and the volume of daily commuters. Malta is widely recognized as one of the most densely populated countries in Europe, as illustrated in Figure 1. With so many people living in close proximity, and with a strong dependence on private cars as the main mode of transport, a lot of pressure is placed on local road networks especially during peak hours when the school commute occurs.

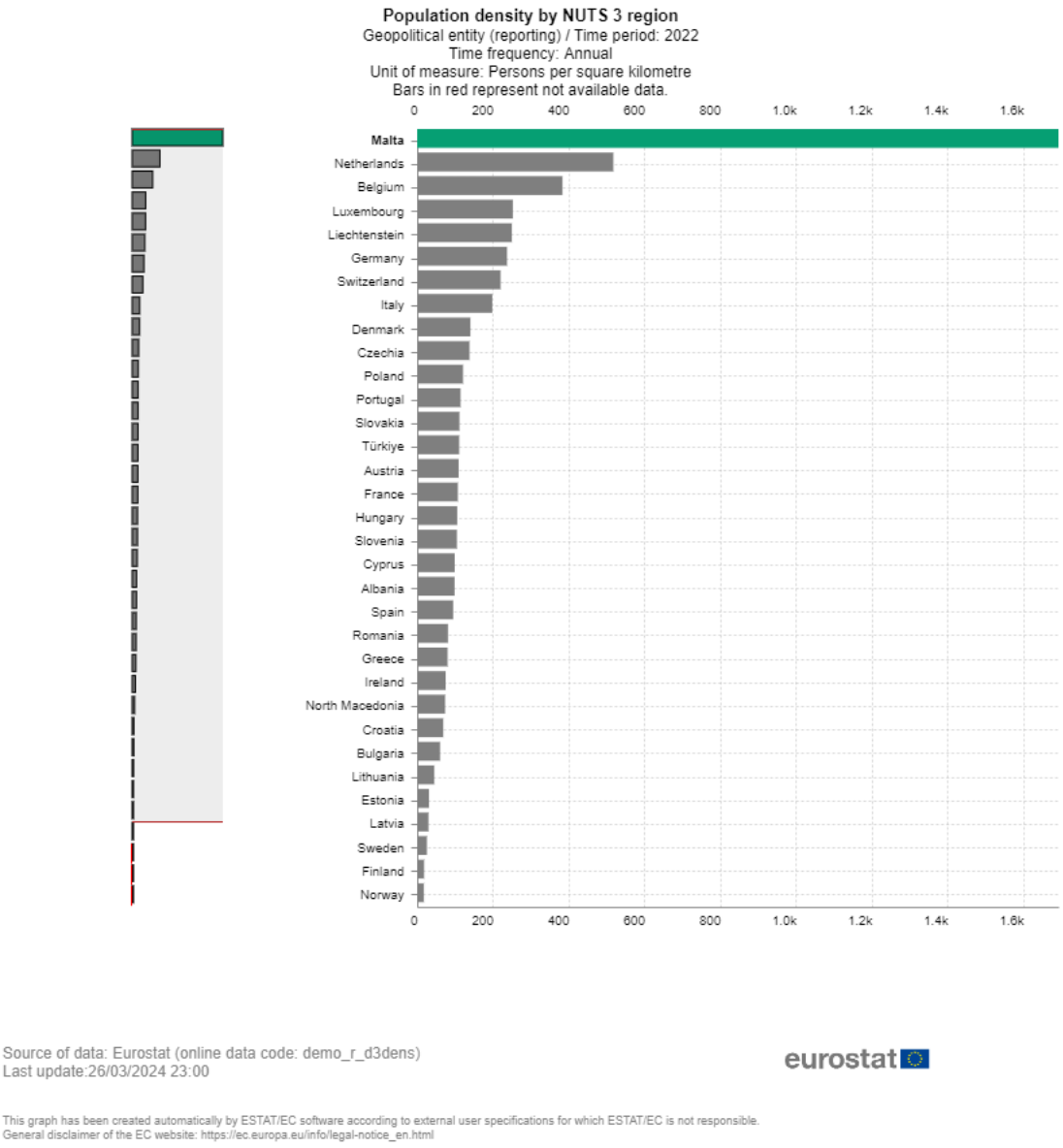


Figure 1 *Population Densities by Country in Europe*
(Source: Eurostat online data, 2024)

According to the NSO (2024), in 2022 there was a high vehicle ownership rate, with 784 motor vehicles per 1,000 residents and 1,536 motor vehicles per 1,000 licensed drivers. Given the high population density, vehicle density is also exceptionally elevated. Figure 2 showcases the distribution of motor vehicle ownership, showing the number of vehicles licensed per 100 residents across different localities in Malta. This density correlates with Figure 3, which records an average of 18,694 motor vehicles per square kilometre of road. The limited space available creates unique challenges in managing the transportation infrastructure.

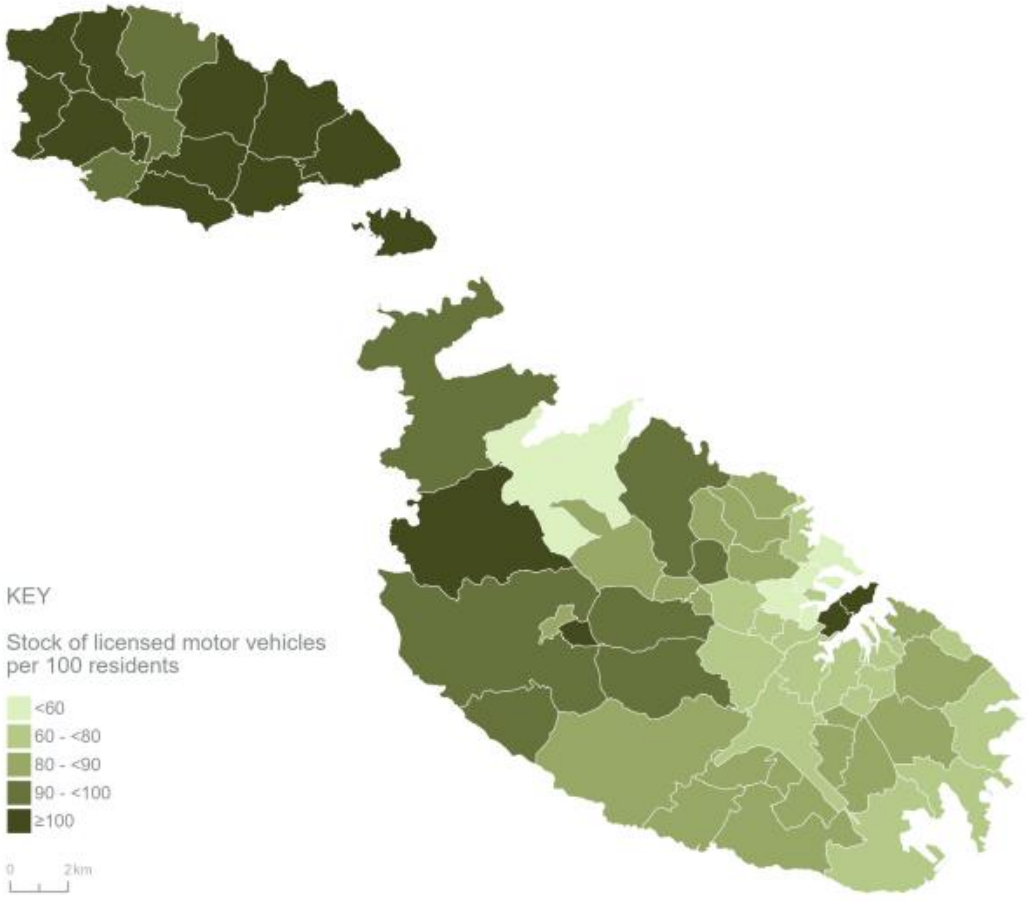


Figure 2 *Licensed motor vehicles per 100 residents by locality of registered owner: 2022*

(Source: NSO, 2024, Transport Statistics)

Ratios	2018	2019	2020	2021	2022
Total motor vehicles per square km	1,219	1,258	1,274	1,307	1,345
Total passenger cars per square km	950	972	976	991	1,004
Total motor vehicles per square km of roads	16,952	17,488	17,705	18,171	18,694
Total passenger cars per square km of roads	13,211	13,512	13,566	13,779	13,957
Total motor vehicles per one km length of roads	136	140	142	145	150
Total passenger cars per one km length of roads	106	108	109	110	112

Notes:

1. Maltese Islands' approximate total surface is area is 316 sq. km.
2. Road area and length are calculated on estimated road length of 2,841 km as at end 2022. The average width of roads is estimated at 0.008 km. Therefore, total estimated area of roads in Malta and Gozo is 22.73 sq. km (rounded by 2 decimal places).
3. Data is subject to revision.

Source: Transport Malta.

Figure 3 *Motor Vehicles per country's dimension: 2018 – 2022*

(Source: NSO, 2024, Transport Statistics)

The dependence on private vehicles in Malta continues to increase exponentially. According to the NSO, the total number of registered vehicles increased to 439,398 between January and April 2024, with an average net increase of nine motor vehicles per day (NSO, Motor Vehicles: Q1/2024). This has led to significant traffic congestion and environmental degradation, and being such a densely populated region, the increasing number of vehicles on the road not only exacerbates air pollution but also contributes to urban density and reduces the quality of life. These issues are particularly concerning when considering the implications for younger generations, who are becoming increasingly disconnected from active modes of transport, such as cycling and walking. In Malta, where traffic congestion is particularly severe during peak hours, which as can be seen in Figure 4 according to the National Household Travel Survey 2021, occur between 7 a.m. to 9 a.m. and 3 p.m. to 6 p.m. (NSO, 2021), there is an urgent need to explore sustainable alternatives for daily commutes.

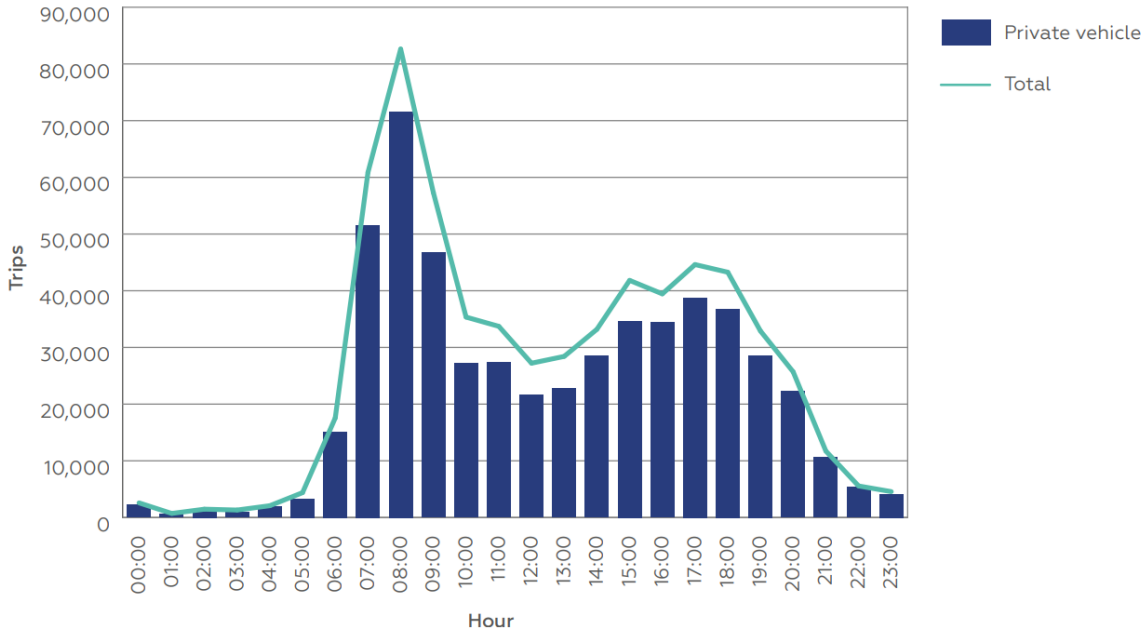


Figure 4 *Distribution of total trips and private vehicle trips during the day*

(Source: NSO, 2021, National Household Travel Survey 2021)

Active mobility is recognised for its numerous benefits, including the reduction of greenhouse gas emissions, the mitigation of traffic congestion, and the promotion of public health through increased physical activity (World Health Organisation, 2021). Despite these advantages, several barriers hinder the widespread adoption of active mobility, especially when it comes to cycling, particularly among young people. These barriers include safety concerns, inadequate infrastructure, and a lack of connectivity in cycling routes (Buehler & Pucher, 2012). The situation is further complicated by Malta's unique geographic and demographic characteristics, where densely populated urban areas and narrow roads limit the possibilities for expanding cycling infrastructure (Transport Malta, 2016). The lack of proper infrastructure can contribute to an increase in road traffic accidents, leading to a higher number of casualties. This trend is evident in Figure 5, although showing a notable decline in casualties in 2020. This reduction coincides with the period when much of Malta was under lockdown due to the COVID-19 pandemic. Health measures, such as lockdowns, social distancing, and the closure of businesses, resulted in significantly less commuting, thereby reducing road traffic and the associated risks.

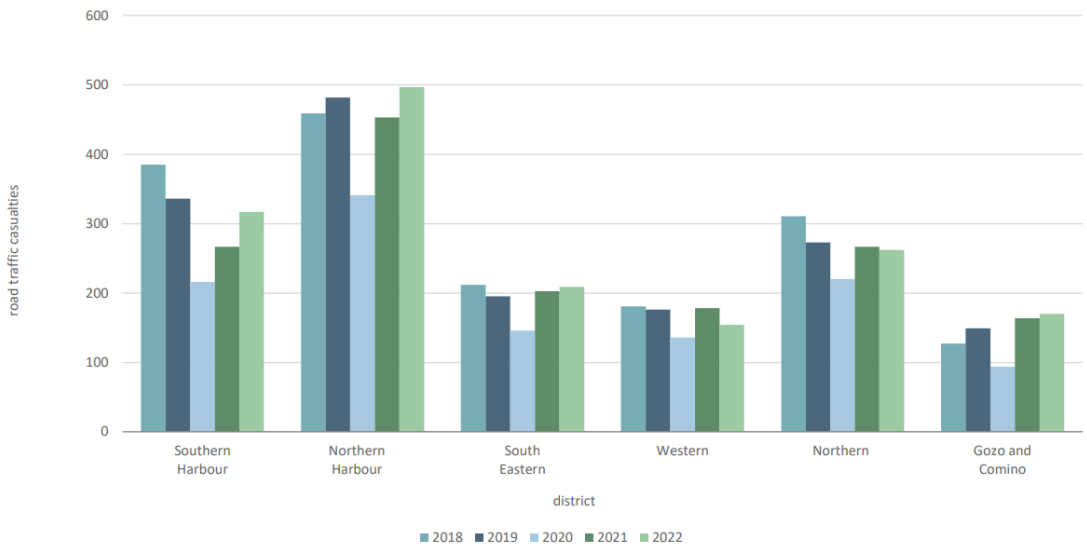


Figure 5 Total Casualties in road traffic accidents by district: 2018 – 2022

(Source: NSO, 2024, Transport Statistics)

Considering also Malta's climate especially during the summer months, cycling can prove to be a physical strain in such high temperatures, enduring profuse sweating, dehydration, increased heart rates, sunburn and heat strokes (Behr, 2023).

Promoting active mobility as a viable mode of transport for middle and secondary school students requires a comprehensive approach that addresses these barriers. This involves improving the safety and connectivity of cycling routes, enhancing infrastructure, and fostering a cultural shift towards active mobility. Such efforts not only contribute to environmental sustainability but also play a crucial role in tackling public health issues, such as the rising obesity rates among Maltese youth. Regular physical activity, including cycling, has been shown to significantly reduce the risk of obesity and associated health problems, underscoring the importance of encouraging active lifestyles from a young age (Janssen & LeBlanc, 2010).

In light of these challenges, this research aims to investigate the current state of active mobility among middle and secondary school students in Malta and to propose practical solutions for increasing active transportation. By examining the safety, infrastructure, and connectivity of existing walking and cycling routes, and by evaluating current policies related to student mobility, this study seeks to identify actionable strategies for creating a safer and more supportive environment for young cyclists. This research is particularly

relevant in the context of Malta's ongoing efforts to reduce road traffic and promote sustainable urban development.

This research presents the St Benedict College, Kirkop, Malta, as a case study. This college consists of Dr Maria Sciberras Middle School hosting 550 students ages 10–13 and 150 staff (Middle school representative, personal communication, June 12, 2025) and Pietru Pawl Say don Secondary School hosting a population of over 750 students (ages 13–16) and a staff of over 150. It acts as a receiving school for boys and girls hailing from the eight Southwest villages of Birżebbuġa, Żurrieq, Għaxaq, Gudja, Mqabba, Qrendi, Safi and Kirkop (Galea, 2021).

1.2 Aims of the Research

The primary aim of this research is to study how active mobility can be promoted among middle and secondary students for their school commute by addressing safety, environmental conditions, infrastructure, traffic, and the connectivity of cycling routes. Additionally, the aim of encouraging cycling, also seeks to reduce road traffic, particularly during peak hours. Furthermore, increasing physical activity among young people and fostering healthier lifestyles can contribute to a reduction in obesity rates among Maltese youth.

To achieve this aim, the following objectives have been established:

1. To assess the current levels of active mobility among the middle and secondary school students at a Maltese College and identify key barriers preventing increased participation.
2. To evaluate the safety, infrastructure, and connectivity of walking and cycling routes in school zones and provide recommendations for improvements.
3. To review current policies on student mobility and recommend actionable policy changes to enhance and support active commuting initiatives.

Thereby answering the following research question:

What improvements can be made to Malta's road infrastructure to create a safer cycling and walking environment for middle and secondary school students commuting to school?

1.3 Overview of Research Methods

To address the research question, a mixed-methods approach was employed, combining both quantitative and qualitative techniques. Surveys were distributed to middle and secondary school students and teachers to gather data on current cycling practices and perceived safety. Semi-structured interviews with school administrators, local councils, and related NGOs provided deeper insights into infrastructure needs and policy considerations.

Observational studies were conducted to assess the current state of cycling routes in school zones. This was supported by Geographic Information Systems (GIS) mapping to visualise the current situation and identify gaps in connectivity.

The data collected through surveys was analysed using descriptive statistics to identify trends and correlations related to cycling habits and safety perceptions. Interview data underwent thematic analysis to identify common themes and insights. Observational data was analysed to assess the current state of infrastructure. GIS mapping was utilised to visualise cycling routes and identify connectivity gaps.

This approach ensures that both quantitative and qualitative data are thoroughly examined, providing a comprehensive understanding of the factors influencing safe cycling for middle and secondary school students in Malta.

1.4 Dissertation Structure

The structure of the dissertation is done in conjunction with the sequence of the research, where each chapter contributes to the development of the study as summarised hereunder:

Chapter 1: Introduction

This chapter provides a comprehensive introduction to the dissertation, outlining the context and motivation for the research. It begins by discussing the growing reliance on individual vehicles in Malta, which has led to significant traffic congestion, environmental degradation, and challenges in promoting active mobility, especially among secondary school students. The chapter highlights the potential benefits of active mobility, such as reducing traffic congestion, lowering carbon emissions, and improving public health, while also acknowledging the barriers that hinder cycling, including safety concerns and inadequate infrastructure.

Chapter 2: Literature Review

The literature review focuses on the impact of school transportation on traffic congestion and pollution in a global and local context, emphasising the challenges this creates for promoting active mobility among the younger generation, particularly on middle and secondary school students. It explores the benefits of active mobility, which includes improved air quality, reduced traffic and better physical health. This section emphasises the need for safe cycling infrastructure and stresses the importance of effective policies and planning to encourage active mobility. Addressing these issues, would ultimately foster healthier lifestyles and reduce traffic in Malta.

Chapter 3: Methodology

This chapter recognizes that relying solely on desk research wasn't enough to gather all the necessary information. As a result, it outlines the research methodology chosen to fill those gaps. A mix of quantitative and qualitative methods was used, carefully selected to ensure that the research question is thoroughly addressed.

Chapter 4: Analysis of Results

The Analysis of Results explores the findings gathered from each research method used in the study. After examining each data set on its own, the results are brought together and analysed collectively. This combined approach offers deeper insight into the barriers impacting the performance of the routes assessed for active mobility use.

Chapter 5: Recapitulation and Conclusion

The final chapter brings together the key findings of this dissertation and explores possible steps to address the limitations uncovered along the way. It also highlights areas where further research could build on this study and deepen understanding of the topic.

Chapter 2: Literature Review

2.1 Global Perspectives

2.1.1 Benefits of Active Mobility

Active mobility is considered to be the most sustainable form of getting from A to B (Brand, Dons, et al., 2021). Research indicates that the range of benefits span across various sectors including environmental, health and economic dimensions, especially when considering urban areas.

Environmental Benefits

Shifting from motorised vehicles to active transportation can substantially improve traffic congestion and reduce air pollution. A study conducted by Brand, Götschi, et al. (2021), found that increasing active travel, such as cycling and walking, leads to significant reductions in lifecycle carbon emissions, even in European cities where walking and cycling are already common.

In a similar study by Brand, Dons, et al. (2021), travel activity data was collected from seven European cities and the lifecycle CO_2 emissions were analysed for different modes of transport. On average, daily mobility-related CO_2 emissions amounted to 3.2 kg per person, with car travel accounting for 70% of emissions and cycling only 1%. Cyclists had 84% lower lifecycle CO_2 emissions compared to non-cyclists. Each additional cycling trip reduced emissions by 14%, while avoiding one car trip decreased emissions by 62%. People who switched from car to bicycle lowered their daily CO_2 emissions by 3.2 kg. The study suggests that promoting active travel, such as cycling, should be a key strategy in achieving net-zero carbon goals, improving public health, and enhancing the quality of life in urban areas.

Health Benefits

Active mobility, such as walking and cycling, plays a vital role in promoting regular physical activity, which is essential for maintaining fitness and preventing chronic conditions like obesity, diabetes, and cardiovascular disease (WHO, 2021). These forms of exercise are easily integrated into daily routines, making them particularly beneficial for populations with increasingly sedentary lifestyles. Research by Bassett et al. (2008) indicates that countries with higher levels of active transport tend to have significantly lower obesity rates compared to those with greater reliance on cars.

Beyond physical health, active mobility supports mental and emotional well-being. Excessive sedentary screen time is corelated with poor mental health (Biddle & Asare, 2011). Physical activity has been shown to improve mood, self-concept, sleep quality, and reducing symptoms of anxiety and depression (Mahindru et al., 2023). Activities conducted in natural environments, such as walking or cycling through green spaces, can further enhance these benefits (Pretty et al., 2005). Among students, these gains extend to improved academic performance through better concentration, memory, and cognitive skills (Hillman et al., 2008).

The WHO recommends that children engage in at least 60 minutes of moderate to vigorous physical activity daily to support healthy development (Bull et al., 2020). However, the rise in sedentary behaviour among youth is contributing to growing obesity rates, which are associated with a range of adverse health outcomes, including type 2 diabetes and poor mental health (Janssen et al., 2004; WHO, 2021; Biddle & Asare, 2011).

Encouraging active travel to school is an effective way to embed physical activity into students' daily routines. Children who cycle or walk to school are more likely to have better cardiovascular fitness, and maintain healthier body weights (Larouche et al., 2014; Laverty et al., 2021). In addition, cycling is linked to improved emotional well-being, reduced anxiety, and enhanced cognitive performance and self-esteem (Lubans et al., 2016). Regular active commuting also helps young people cope with academic and social pressures by fostering psychological resilience (Biddle et al., 2019). For example, Caamaño-Navarrete et al., (2024) found that those who commute actively report lower stress levels and better emotional regulation than those who rely on motorised transport.

Economic Benefits

When considering economic effects, active mobility offers significant benefits. When the general reliance on motor vehicles is reduced, since walking and cycling are less expensive than driving, transportation costs are lower for individuals (Litman, 2021). Active mobility can also be beneficial for healthcare costs as exercise is known to lower rates of chronic diseases and reduces obesity (Sælensminde, 2004). Additionally, cities which prioritize active mobility, often experience increased local economic activity, since pedestrian and cycle friendly areas generally attract more foot traffic, which benefit local businesses and vibrant communities (Sustrans, 2022). This shows that investments in

active transportation infrastructure can also lead to job creation and economic development.

2.1.2 Active Mobility Among School Children Globally

Commuting to School According to Travel Distances

The distance that needs to be travelled between home and school is one of the main factors that influence the mode of transport chosen by students. Certain studies (Mandic et al., 2020; D'Haese et al., 2011) suggest that students living within 2.25 kilometres from their schools are more likely to engage in active travel modes, particularly walking, while those between 2.25 to 4 kilometres may opt for cycling, provided the infrastructure supports it. Beyond 4 kilometres, the likelihood of walking or cycling diminishes as students and their parents often prefer motorised transport due to time and safety concerns. Such data can be observed in Figure 6.

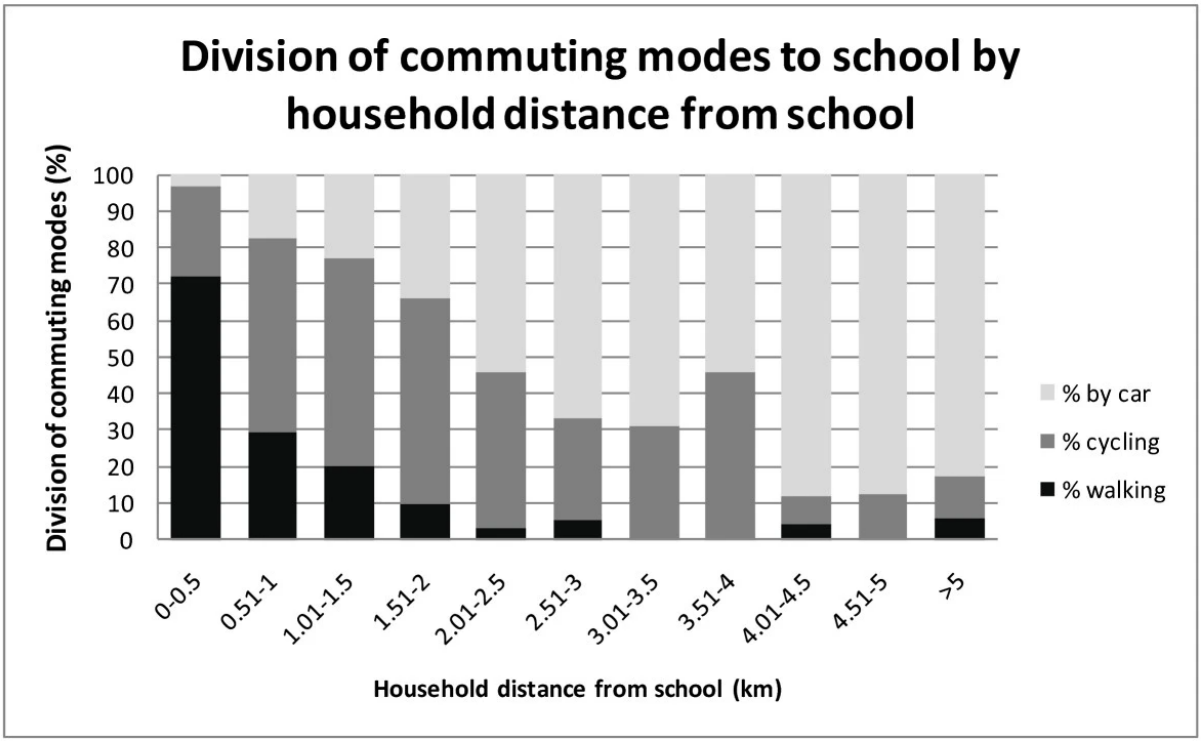


Figure 6 *The division of commuting modes to school by household distance from school (Source: D'Haese et al., 2011)*

2.1.3 Active Mobility Infrastructure and Safety

Challenges in Global Contexts

In many global contexts, walking and cycling face considerable challenges due to inadequate infrastructure and the dominance of motorised vehicles. Urban environments often present high levels of traffic stress, making active mobility an option only for the most experienced and confident users. According to Mekuria et al. (2012), these environments are typically classified under Level of Traffic Stress (LTS) 3 or 4, indicating conditions that discourage the majority of potential cyclists and pedestrians. The levels of stress as classified in this study are classified as can be seen in Figure 7.

LTS 1	Presenting little traffic stress and demanding little attention from cyclists, and attractive enough for a relaxing bike ride. Suitable for almost all cyclists, including children trained to safely cross intersections. On links, cyclists are either physically separated from traffic, or are in an exclusive bicycling zone next to a slow traffic stream with no more than one lane per direction, or are on a shared road where they interact with only occasional motor vehicles (as opposed to a stream of traffic) with a low speed differential. Where cyclists ride alongside a parking lane, they have ample operating space outside the zone into which car doors are opened. Intersections are easy to approach and cross.
LTS 2	Presenting little traffic stress and therefore suitable to most adult cyclists but demanding more attention than might be expected from children. On links, cyclists are either physically separated from traffic, or are in an exclusive bicycling zone next to a well-confined traffic stream with adequate clearance from a parking lane, or are on a shared road where they interact with only occasional motor vehicles (as opposed to a stream of traffic) with a low speed differential. Where a bike lane lies between a through lane and a right-turn lane, it is configured to give cyclists unambiguous priority where cars cross the bike lane and to keep car speed in the right-turn lane comparable to bicycling speeds. Crossings are not difficult for most adults.
LTS 3	More traffic stress than LTS 2, yet markedly less than the stress of integrating with multilane traffic, and therefore welcome to many people currently riding bikes in American cities. Offering cyclists either an exclusive riding zone (lane) next to moderate-speed traffic or shared lanes on streets that are not multilane and have moderately low speed. Crossings may be longer or across higher-speed roads than allowed by LTS 2, but are still considered acceptably safe to most adult pedestrians.
LTS 4	A level of stress beyond LTS3.

Figure 7 *Level of Traffic Stress Categories*
(source: Mekuria et al. 2012)

This study highlights the importance of creating cycling infrastructure that accommodates users of all ages and abilities, including adolescents. Their research shows that perceived safety and comfort are critical determinants of whether individuals choose to cycle. For school-aged students, whose independence and confidence are still developing, cycling networks must avoid high-stress roads and ensure seamless connectivity. This reinforces the need for dedicated, well-maintained, and accessible routes near schools to foster safer and more appealing active mobility.

Importance of Comprehensive Networks

When facilitating active modes of transport, it is important to develop a connected and safe network. Studies show that low-stress networks, designed to minimise pedestrians' and cyclists' exposure to high-speed traffic, significantly increase the use of active transport (Mekuria et al., 2012).

The Netherlands is often seen as a global leader when it comes to cycling infrastructure, and much of that success is guided by the CROW Design Manual for Bicycle Traffic (2016). This manual outlines what makes a cycling route truly effective and user-friendly, built around five key principles: coherence, directness, safety, comfort, and attractiveness. In simple terms, a good cycling route should connect easily to important destinations (coherence), follow the most efficient path without unnecessary detours (directness), keep cyclists safe from traffic (safety), feel smooth and easy to ride on (comfort), and offer an inviting environment that people enjoy using (attractiveness).

These principles have been applied successfully across Dutch cities and are one of the reasons cycling is such a common and safe way to travel there, especially for school children. Applying similar standards in Malta could help bridge gaps in the current infrastructure and encourage more students to walk or cycle to school confidently. If routes are designed to be safer, more comfortable, and better connected, families may be more willing to choose active commuting over driving.

Building comprehensive networks that reduce detours and traffic stress is just as important as creating bicycle-friendly surroundings and fostering a strong cycling culture. It underscores the need for urban planners and cycling advocates to work together to build low-stress, well-connected routes that actually fit into people's daily lives. (Cervero et al., 2019).

Influence of Climate and Infrastructure on Active Mobility

In a study done using Seville as a case study by Marqués et al. (2015), they demonstrated the importance of robust cycling infrastructure that were tailored to climate conditions which led to a successful increase in cycling adoption. This city implemented dedicated cycling lanes, complimented with urban planning strategies to transform it into a cycling friendly city. Excessively high temperatures pose a significant challenge to cyclists as they

increase the risk of heat-related illnesses such as dehydration, heat exhaustion, and heat stroke, which can impair physical performance and concentration (Kenny et al., 2010). These conditions make cycling in the summer not only uncomfortable but potentially unsafe. As highlighted by Stone et al. (2012), many local climate strategies still overlook the importance of managing urban heat directly. To protect public health and support safe, year-round active mobility, cities need to adopt climate-responsive infrastructure that prioritises cooling; like shaded routes, green cover, and heat-mitigating design. This could include tree lined streets which can significantly lower the temperature leading to a more comfortable environment as can be seen in Figure 8. (Barbierato et al., 2019)

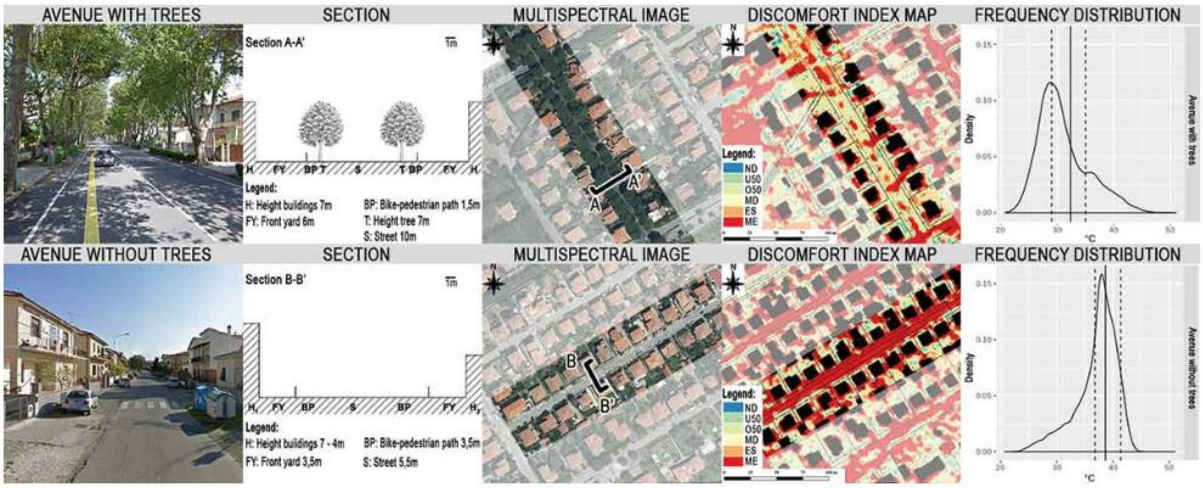


Figure 8 *Urban pattern of an avenue with and an avenue without trees: ground view, section drawing, aerial view, discomfort index map and frequency distribution of temperature.*
(source: Barbierato et al., 2019)

Influence of Distances and Age Groups on Mode Choice

Different age groups can have vastly different perceptions on the active mode of transport that would be appropriate to different distances, which are influenced by the infrastructure and safety measures taken. In a study conducted by Gössling et al., (2024), risk perception varies with age, in conjunction with social, technological and neurological developments. As can be seen in Figure 9, children/adolescents seem to go through various stages, where the relative risk exposure is generalised by traffic situations.

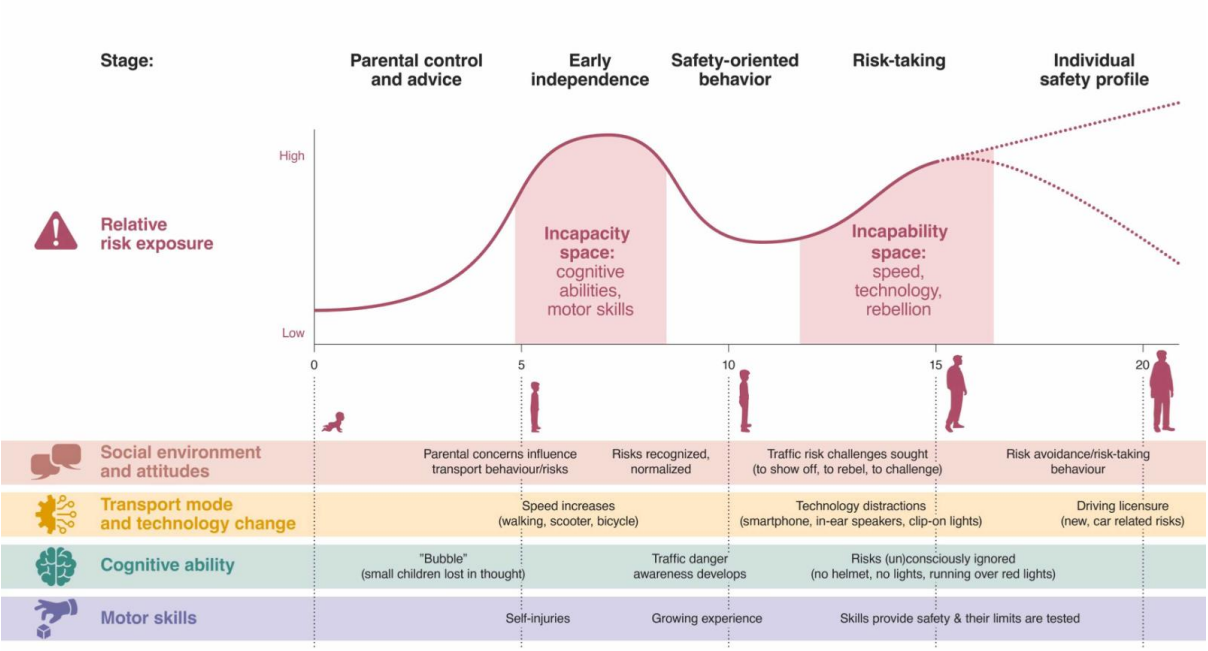


Figure 9 *Risk exposure and the incapability-incapacity space (Source: Gössling et al., 2024)*

Typically, younger children are more reliant on a supervised initiative. On the other hand, adolescents are more likely to travel independently for longer distances. This emphasises the need for a well-lit, continuous and safe path with clear signage (Kelly et al., 2020).

2.1.4 Policy and Planning Considerations

When encouraging active mobility, policy frameworks and effective urban planning play a crucial role. Most countries with high cycling rates, such as the Netherlands and Denmark have long prioritised the development of cycling infrastructure and policies that promote cycling through traffic calming measures and safety education (Pucher et al., 2011).

In the Netherlands, The Dutch Road Traffic Act (WVW) Article 185 (1994) establishes a strict liability regime in collisions involving motor vehicles and pedestrians or cyclists, presuming the motorist liable unless they can prove the incident was due to circumstances beyond their control, an approach designed to protect vulnerable road users and ensure their compensation, reflecting a policy choice to shift financial responsibility onto motorized vehicle insurance and reinforce cyclist and pedestrian safety (Slimmen & Van Boom, 2017).

Educational programs that teach cycling skills and road safety can make a big difference in how confident children feel about cycling and how comfortable their parents are letting them do it. A great example comes from Poland, where children over the age of 10 are required to earn a bicycle licence, known as a *karta rowerowa*, before they're allowed to cycle on public roads. To get it, they need to pass both a theory test and a practical exam at school (Mazowsze, 2025). This kind of structured training not only builds children's cycling skills but also reassures parents that their kids are well prepared and safe on the road. But education on its own isn't enough (Chillón et al., 2011). In a study done by Piatkowski et al., (2017), the authors discuss the effectiveness of various interventions aimed at promoting active transportation. They highlight that combining both "carrots" (incentives) and "sticks" (disincentives) can be more effective in encouraging active transport behaviours. This approach highlights the importance of integrating educational programs with broader infrastructural and policy measures to create environments that support active mobility.

2.2 The Maltese Context

In Malta, the lack of physical activity has a significant role in the rising levels of obesity among youth which is becoming a pressing public health issue (Grech et al., 2017). According to Grech et al. (2017), around 40% of Maltese children aged 5-17 years are overweight or obese, a figure that highlights the urgent need for interventions promoting physical activity. The integration of cycling into daily routines also offers long-term benefits by establishing healthy habits early on, reducing the likelihood of maintaining sedentary behaviours into adulthood.

2.2.1 School Transportation and Local Traffic in Malta

The increasing reliance on individual vehicles has led to significant traffic congestion and environmental pollution, particularly in urban areas. The daily commute to school for children plays a substantial role in exacerbating these traffic issues, especially since many parents opt to drive their children to school. Figure 10 indicates that 16.5% of all trips in Malta are related to education, while Figure 11 reveals that 77.9% of the 48,018 education-related trips are made using personal vehicles. This contributes significantly to the already congested traffic during peak hours (NSO, 2021).

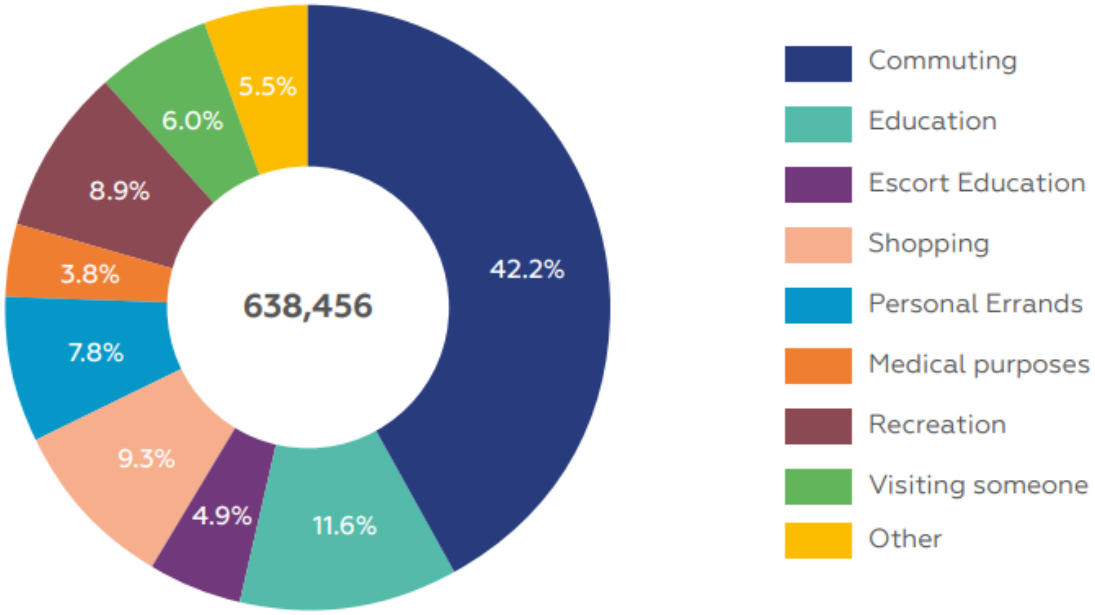


Figure 10 *Trips in Malta by main purpose*
(Source: NSO, 2021, National Household Travel Survey 2021)

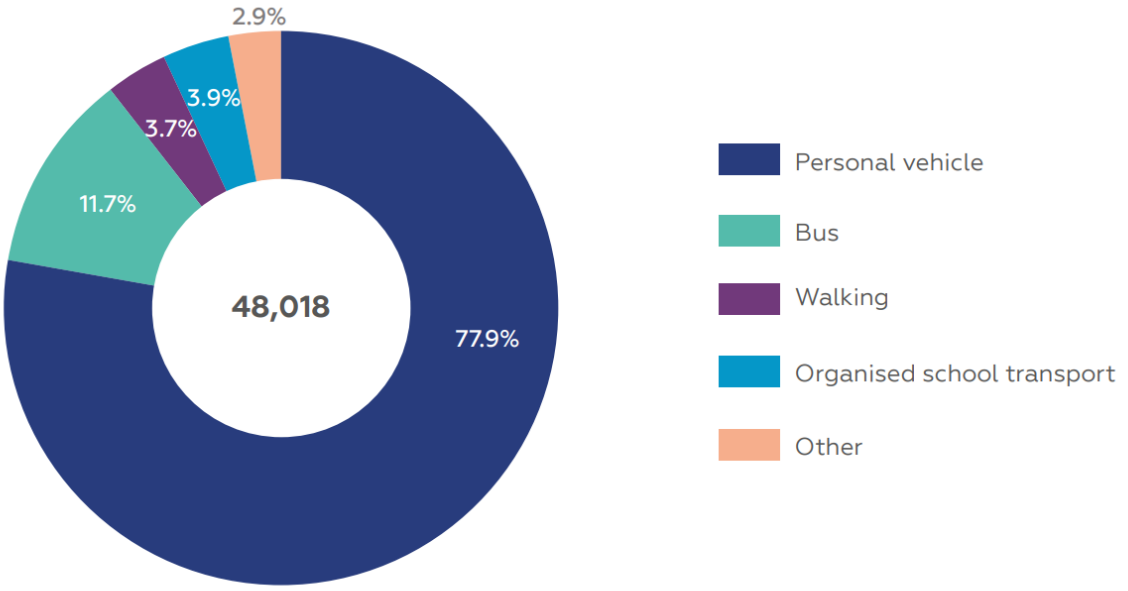


Figure 11 *Education and escort education by main mode of transport*
(Source: NSO, 2021, National Household Travel Survey 2021)

The reliance on private vehicles for school transportation contributes not only to traffic congestion but also to elevated levels of air pollution, which have a broader environmental and public health impacts. (EEA, 2020). The concentration of vehicles

during peak hours, result in longer travel times, increased fuel consumption and higher emissions of pollutants such as nitrogen dioxide and particulate matter (Transport Malta, 2016). These are harmful to human health, contributing to respiratory problems, heart disease, and premature death; even at low exposure levels (EEA, 2024).

The effects of increased vehicles on the road extend beyond air pollution. The noise pollution caused can have detrimental effects on residents, especially in densely populated urban areas (EEA, 2020).

Additionally, when most children are driven to school in private cars, it not only adds to traffic congestion but also discourages active mobility, which is a healthier and more sustainable way to travel. This not only contributes to traffic congestion but also undermines the efforts to promote physical activity among students, which is crucial for their overall health and development. Research shows that the way neighbourhoods and school routes are designed can influence whether children walk or cycle, highlighting the need for safer, more supportive environments to promote active commuting (Panter et al., 2010).

2.2.2 Active Mobility Among School Children in Malta

Pre-Higher Education System in Malta

The compulsory pre-higher education system in Malta is divided into three stages, with compulsory education lasting until the age of 16 (The Education Act, Chapter 605 of the Laws of Malta, Article 2). Children aged 3 to 5 have an optional stage of pre-primary education: kindergarten. The compulsory stages begin with primary education from ages 5 to 11. Following this, students enter middle school education from ages 11 to 13 and secondary school education from age 13 to 15. Afterwards, students have the option to opt for post-secondary education (ages 16 to 18) before pursuing tertiary or vocational education at universities and other institutions (European Commission, 2023). Figure 12 shows a detailed overview of the structure of the national education system in Malta.

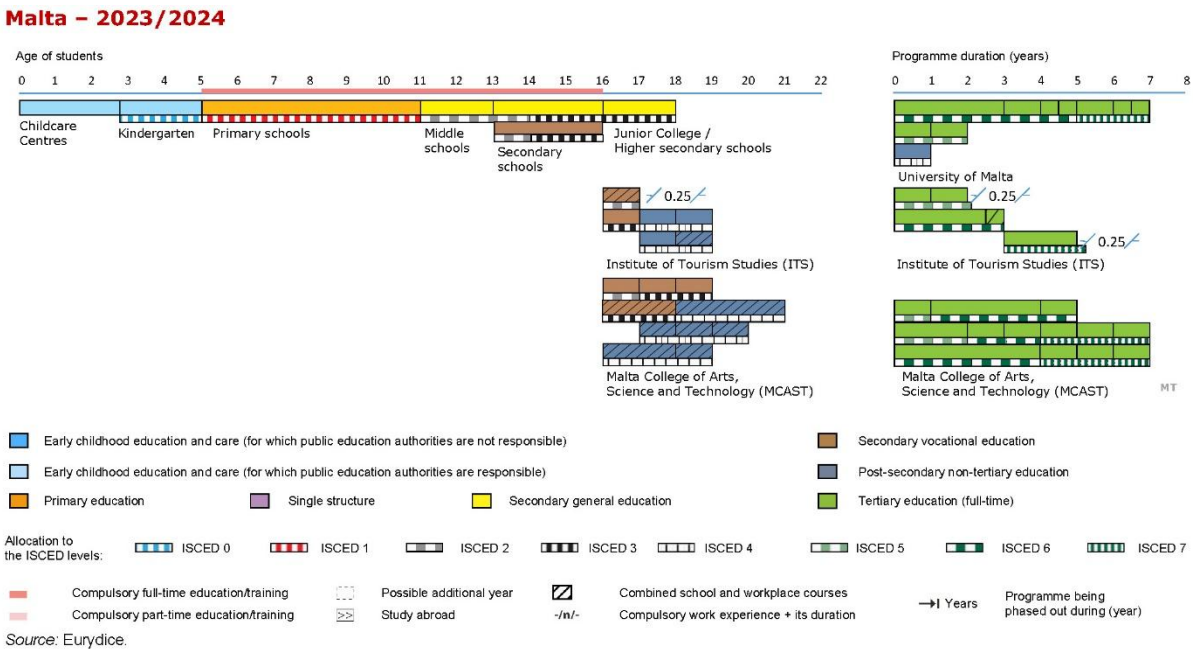


Figure 12 *Structure of the National Education System in Malta (Source: European Commission, 2023)*

School Travel Distances in the Maltese Context

When considering Malta's small size, it should theoretically provide more opportunities to have students live within 'cyclable' distance from their schools. However, students do not usually opt for active modes of transport, this is generally due to the lack of proper infrastructure. The perception of adolescents of their built environment, including the lack of dedicated lanes, high traffic density and the lack of safety measures, greatly influence their decisions to opt for motorised transport (Lutfur Rahman et al., 2022).

Local Case Studies on Active Mobility to School

To encourage middle and secondary school students to opt for an active mode of commute, especially in Malta, can prove to be a challenge as there are several barriers that deter them from doing so. Safety is the most significant concern that would probably cross any parent's mind.

In a study by Carver et al. (2008), many parents expressed that traffic-related risks discouraged them from allowing their children to cycle to school. These concerns are aggravated when the infrastructure in urban areas with high traffic density is not well maintained or lacks good connectivity.

Despite the lack of a well-established cycling culture, there have been various initiatives that aimed to promote active mobility among students, where schools and local governments are beginning to implement targeted strategies to promote active mobility to school. St Benedict's College, Dr Maria Sciberras Middle and Pietru Pawl Saydon Secondary School in Kirkop in collaboration with local councils and environmental organizations, are focusing on improving safety measures around school zones and increasing awareness of the benefits of active mobility. These initiatives include educational campaigns and the provision of bicycle racks to encourage students to cycle. Moreover, national efforts have included offering subsidies for bicycles and e-bikes, raising awareness about the environmental and health benefits of active commuting (Transport Malta, 2025).

There was also the introduction of the Siġġiewi school's walking bus, which provided a significant step forward toward active mobility in Malta. This program, organised by Project Aegle backed by Transport Malta and the Siġġiewi Local Council, encouraging students to walk to school through organized walking groups (Project Aegle Foundation, 2023). This initiative has proven to be effective in reducing traffic congestion near schools while promoting a healthier lifestyle among children (Times of Malta, 2023). Additionally, the educational campaigns aimed at parents and students are helping to alleviate safety concerns, which remain one of the key barriers to a more widespread adoption of cycling as a mode of transport (Pisoni et al., 2021).

A complementary pilot in Naxxar, led by Project Aegle Foundation with the Naxxar Local Council and Naxxar Primary School, focused on improving pedestrian guidance and safety through colourful footpath markings and signage. Crossing guards were also stationed at key junctions during peak school-arrival times to calm traffic and ensure children could cross safely. Preliminary feedback indicates increased walking rates and greater parental confidence in their children's safety when walking to school (Cilia, 2021).

Continuing on this, the government's Vjal Kulħadd programme is investing €10 million across 14 localities to retrofit streets for pedestrians, including widened footpaths, raised crossings, and upgraded lighting in school zones (Azzopardi, 2025).

The government is recognising the societal benefits of active mobility, such as reduced air pollution and traffic congestion, which aligns with the European Union sustainability goals. As noted by Pisoni et al. (2021), the transition from motorised to active transport

offers extensive environmental and social benefits. For Malta, this shift would require an extensive investment towards infrastructure, which would include dedicated cycling lanes and improved pedestrian crossings.

To envision a future where cycling and walking to school become the norm rather than the exception, Malta needs to create safer and more connected routes, while also educating both students and parents.

Transportation Methods to St Benedict College Pietru Pawl Saydon Secondary School Kirkop

The Ekoskola Committee's Green School Travel Plan (2024) presents recent findings on student commuting patterns with a focus on active mobility. Traffic counts conducted in January 2023–24 by Year 11 students revealed that, during a ten-minute morning peak, between 57 and 100 private cars and 16 to 43 large vehicles passed in front of the school, with only a handful of bicycles observed (all ridden by students) as can be seen in Figure 13. Comparing these figures to the previous year shows a decrease in morning car traffic alongside an increase in large vehicles, while afternoon traffic (cars and large vehicles) rose slightly as shown in Figure 14 (EkoSkola, 2024).

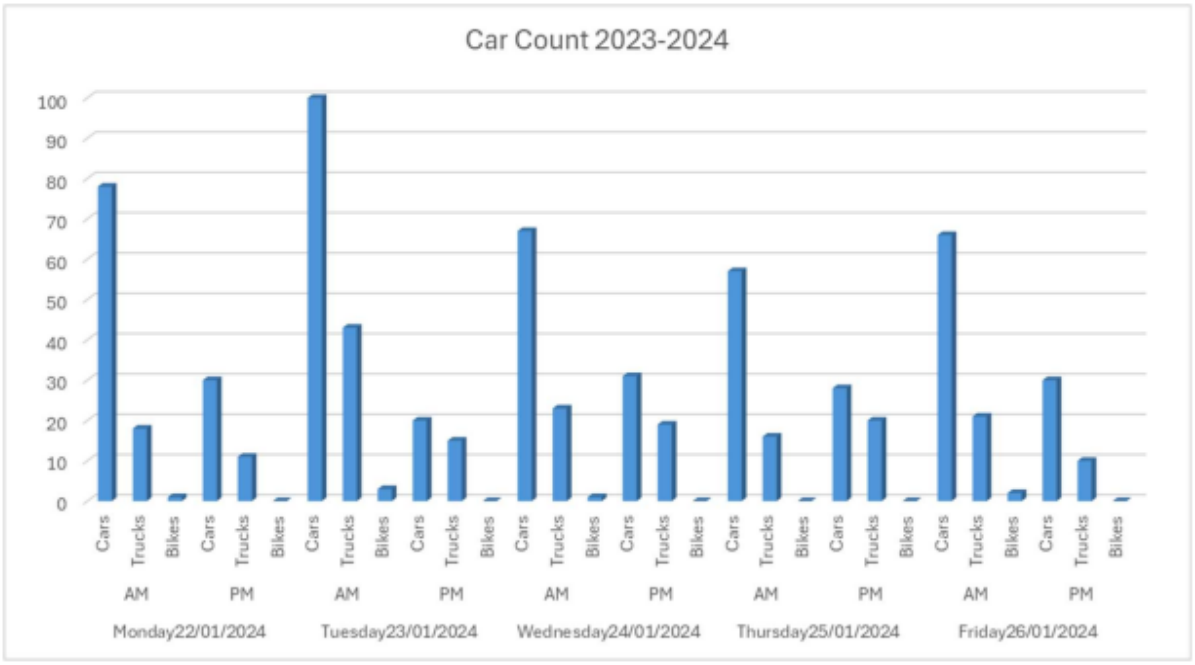


Figure 13 *Traffic Count 2023 – 2024*
(Source: EkoSkola, 2024)

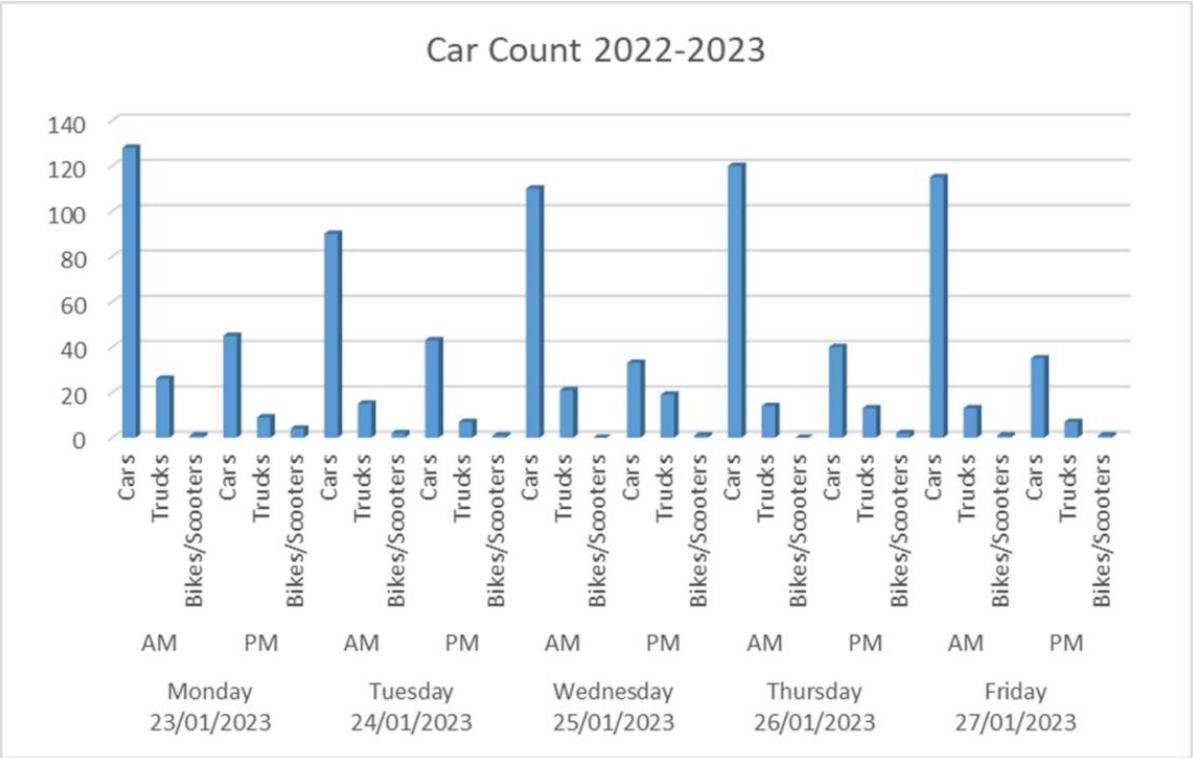


Figure 14 *Traffic Count 2022 – 2023*
(Source: EkoSkola, 2024)

Concurrently, student travel patterns shifted toward active modes, in 2022–23, 219 students walked and 24 cycled as shown in Figure 15, whereas in 2023–24, 302 held on-foot passes or dual passes, 30 held bicycle passes, and the combined share of walking and cycling reached nearly 40 % of the school population as can be seen in Figure 16.

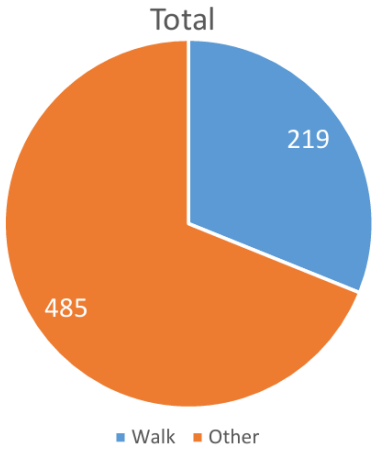


Figure 15 *Student who walk vs other means 2022-2023*
(Source: EkoSkola, 2024)

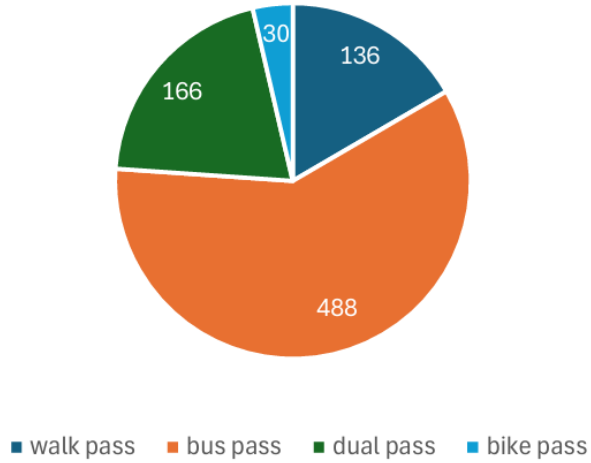


Figure 16 *Transport passes issued during year 2023-24 (Source: EkoSkola, 2024)*

In the 2023–24 scholastic year, most students who applied for bicycle passes were from Żurrieq, as illustrated in Figure 17. A few students also applied from Birżebbuġa, which is the furthest locality from the school.

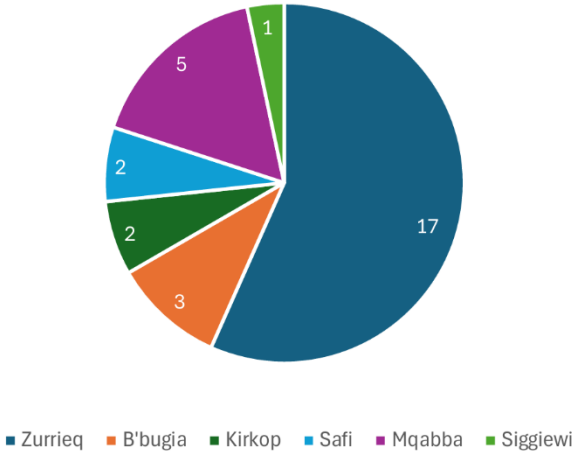


Figure 17 *Students commuting from different localities by bicycle in 2023-24 (Source: EkoSkola, 2024)*

Incentives driving this change included the installation of a 15-bicycle rack in 2022, later expanded to 25 spaces with a shelter via an Active Mobility Grant, plus an updated Bicycle Policy requiring parental consent, helmet use, and safety guidelines. As a result, 30 students registered for bicycle permits in 2023–24, and additional signage was installed near the school efforts credited with reducing morning car trips and encouraging more students to walk or cycle.

2.2.3 Active Mobility Infrastructure and Safety in Malta

When walking and cycling are promoted as an active mode of transport, several challenges need to be addressed related to infrastructure, safety, environmental factors and community engagement.

Challenges of Active Mobility in Malta

The country's narrow streets and dense urban layout already make walking and cycling difficult. This is further exacerbated by rapidly increasing vehicular traffic, which not only heightens the risk for non-motorised road users but also contributes to a high Level of Traffic Stress (LTS 3 or 4), as defined by Mekuria et al. (2012) in the previous section. Such conditions create an environment where only the most confident cyclists or pedestrians feel safe navigating the streets.

Malta's harsh summer climate adds another layer of difficulty. With average high temperatures exceeding 35°C, walking or cycling becomes extremely taxing, particularly in the absence of cooling provisions such as shaded pathways or rest areas. These environmental and infrastructural limitations are coupled with societal attitudes that favour car use overactive mobility. The lack of a 'mature cycling culture', as identified by Pisoni et al. (2021), leads to limited political and financial commitment toward building cyclist- and pedestrian-friendly infrastructure. This reinforces the status quo and hinders the transition to more sustainable modes of transport.

Importance of Comprehensive Networks in the Maltese Setting

To truly encourage cycling among Malta's youth, fragmented lanes must give way to a connected system. Bartolo's (2023) review of recent cycle infrastructure upgrades highlights the critical need for comprehensive, contiguous networks rather than isolated lane segments. Bartolo's analysis revealed that new cycle lanes frequently terminate without safe connections to existing routes or key destinations, forcing cyclists, particularly adolescents with limited traffic experience, back onto congested, high-speed roads where perceived stress levels deter regular use.

Bartolo further emphasizes the importance of integrating cycle lanes with broader urban development projects and adopting legally mandated design standards to guarantee uniform surface quality, clear signage, and protected intersections across all local council jurisdictions (Bartolo, 2023). Without such cohesive planning and statutory

oversight, investments risk perpetuating fragmented infrastructure that cannot support a genuine modal shift away from private vehicle use.

Bartolo's findings suggest that comprehensive networks must prioritise low-stress connectivity, routing cyclists along quieter streets and incorporating dedicated crossings at arterial roads, to build user confidence and encourage higher uptake. By aligning infrastructure development with a clear policy framework and centralized governance, Malta can transform disjointed cycle paths into an integrated, low-stress network that promotes active mobility, enhances safety, and contributes to healthier, more sustainable school commutes.

While Bartolo (2023) focuses primarily on cycling infrastructure, the principles he outlines (connectivity, consistency, and safety) can be applied equally to walking. Many Maltese students, particularly those living within one or two kilometres of school, could rely on walking as their main form of transport. However, the walking experience is often compromised by broken footpaths, poor lighting, lack of safe crossings, and an overall car-centric road environment.

Malta's current pedestrian infrastructure suffers from similar fragmentation to its cycle routes. Disconnected footpaths and the absence of pedestrian priority zones in high-traffic areas discourage walking to school, even for those who live nearby. The Local Councils' Association (2021) has highlighted the importance of "Slow Streets" and traffic calming initiatives that give back space to pedestrians, particularly around school zones. Such efforts not only reduce vehicle speeds but also improve safety and comfort for young walkers.

By ensuring safe, direct walking paths that connect homes with schools, bus stops, and community facilities, Malta can foster a culture of active travel from an early age, reduce road congestion, and support healthier lifestyles for its young population (Litman, 2024).

Malta's Climate and Infrastructure

Many opportunities and obstacles can be observed for walking and cycling when considering Malta's Mediterranean climate. The mild winters support year-round active modes of transport, however significant challenges are surfaced in the extreme high temperatures of summer, often exceeding 30 ˚C (Met Office, 2019) and the high humidity.

Adapting similar approaches to the ones mentioned in section 2.1.3 in Malta, focusing on weather resiliency could provide a sufficient base to encourage active mobility, leading also to a more attractive route.

2.2.4 Policy and Planning Considerations in Malta

Despite growing concerns for the safety of pedestrians and cyclists, Malta remains one of the few EU countries that has not adopted a presumed liability law to protect vulnerable road users. This absence places the burden of proof on the injured party, making it harder for them to access justice and compensation following collisions with motor vehicles (Times of Malta, 2015). Recent research highlights that this legal gap contributes to the persistent risk faced by vulnerable road users, particularly adolescents, and reinforces the need for policy reform that shifts responsibility onto motorised road users to encourage safer driving behaviour (Abela Caruana, 2023).

In Malta, an integrated approach that combines infrastructure development with policy interventions is crucial. Cycling strategies must address current gaps in infrastructure, including the lack of continuous cycling routes and the fragmented nature of urban design, which is currently favouring motorised transport (Curmi, 2020). The Measures of the National Cycling Strategy public consultation document outlines targeted actions to tackle these deficiencies, including the creation of a National Cycling Route Network (NCRN) designed to link isolated cycle lanes and provide safe, direct connections between schools, residential areas, and key urban destinations (Ministry for Transport, Infrastructure & Capital Projects, 2023). The strategy also proposes adopting internationally recognised cycle lane design standards adapted to Malta's unique street environments and integrating cycling infrastructure into ongoing capital projects, such as "Connections for Alternative Mobility," and local council "Slow Streets" initiatives (Ministry for Transport, Infrastructure & Capital Projects, 2023). Together, these measures aim to facilitate a modal shift away from private vehicle use, improve air quality, reduce greenhouse gas emissions, and promote healthier, more liveable communities across Malta.

Evidence from research indicates that policies promoting active transport are most effective when combined with traffic calming measures such as lower speed limits, the

introduction of car-free zones and enhanced crosswalks (Buehler & Dill, 2015). Such measures ensure that streets are safe for cyclists, which is particularly important in encouraging younger populations, such as school students, to cycle regularly.

Recent efforts by local authorities in Malta have begun addressing these issues, although there is much more that remains to be done. Bartolo (2023) discusses the increased investment in cycling infrastructure in Malta, but also highlights the need for consistent, long-term urban planning strategies that prioritise active transport, particularly for school children. Developing policies that address these planning considerations holistically will be essential in creating a safe and appealing environment for school students to engage in cycling as a mode of daily transport.

2.3 Conceptual Models Informing Mobility Behaviour

This literature review combines the findings on the sustainable and infrastructural factors influencing active mobility among school children. It focuses on the complexities that are involved when promoting active mobility as a form of transport to adolescents. One of the main takeaways is the significant influence on environmental factors such as route connectivity, traffic density and speed. Figure 18 illustrates how the environmental factors, that include infrastructure and urbanisation, influence the suitability of active transport in both parental and youth perceptions. Therefore, affecting adolescents' travel behaviour.

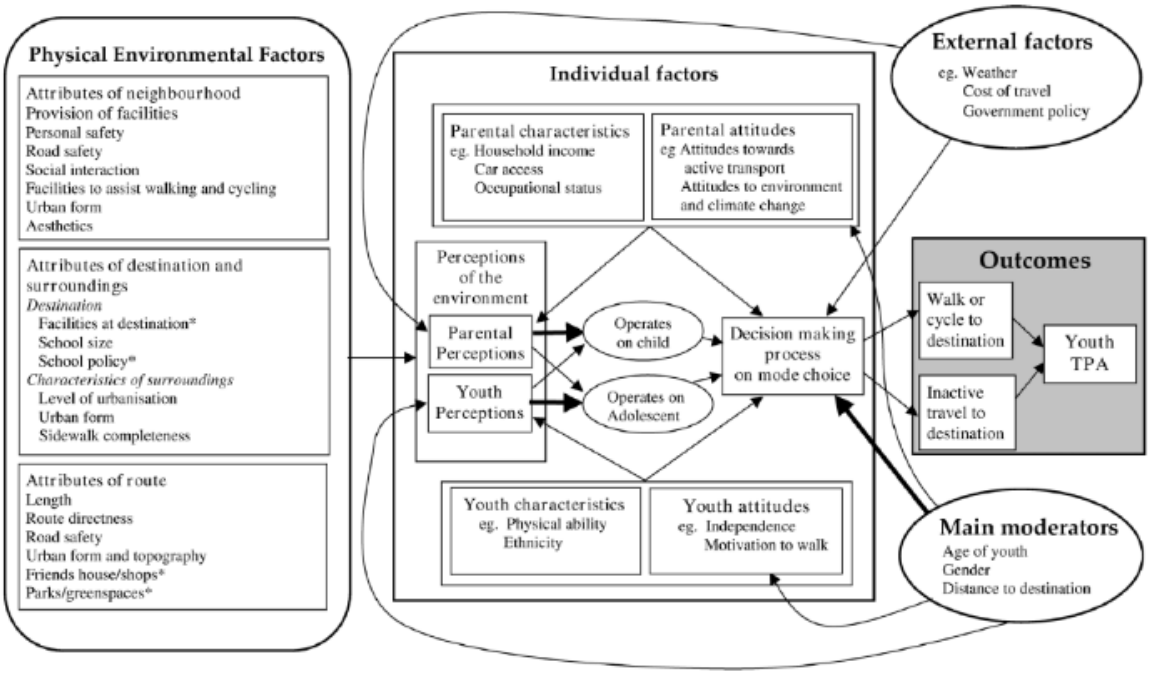


Figure 18 *A conceptual framework for the environmental determinants of active travel in children (Source: Panter et al., 2008)*

In another study by Orellana et al. (2024), a Socio-Ecological Model (SEM) which can be observed in Figure 19, was used to illustrate the decision-making process around school mobility. This model recognises the relationship between individual, social, and environmental factors. It highlights how parental influence plays a significant role with decisions regarding preferred routes, schedules, and perceptions of the surrounding environment impacting mobility choices. It is crucial to consider the effects of socio-economic factors when designing effective infrastructure and safety planning.

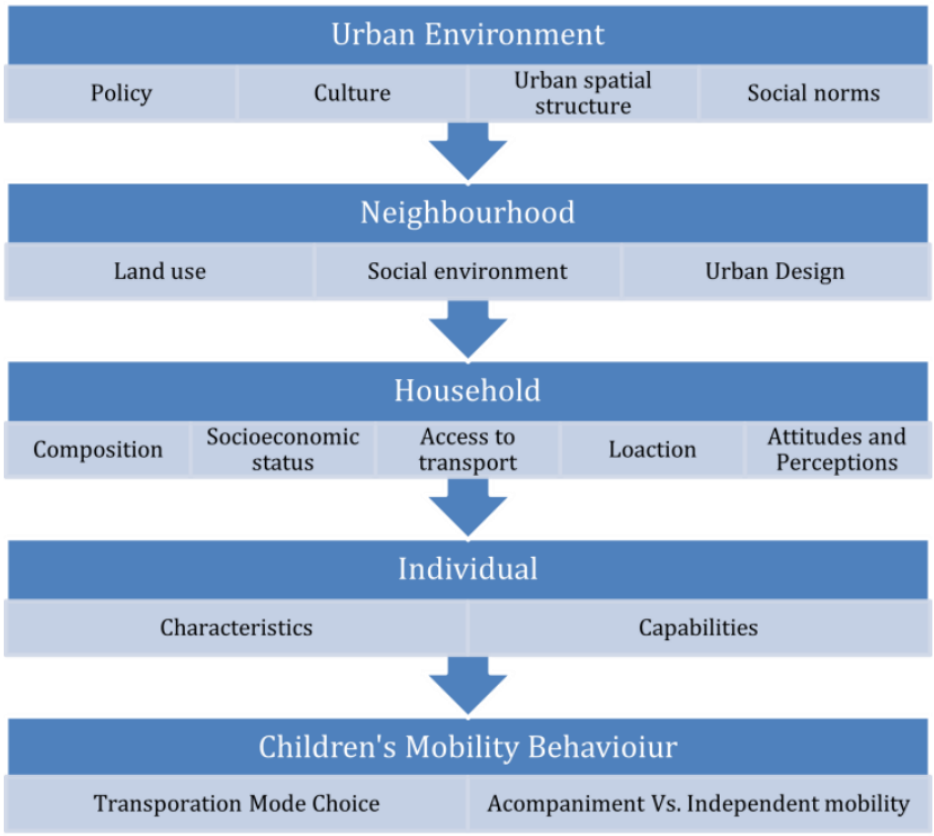


Figure 19 *Socio-Ecological Model for children's mobility with relevant dimensions (Source: Orellana et al., 2024)*

2.4 Conclusion

Promoting active mobility in Malta requires a focused effort to address the country's inadequate infrastructure and high traffic density by developing a safe, continuous, and accessible network for walking and cycling. These efforts must also account for local environmental challenges, such as extreme summer temperatures and dense urban development, which can discourage the use of active transport. In addition to physical improvements, policies promoting active mobility should be supported by educational campaigns aimed at shifting public perceptions and building confidence, particularly among vulnerable groups such as school children, to use walking and cycling as viable, everyday modes of transport. The table hereunder provides a summary of the main findings.

Table 1 Summary of Literature Review Findings

Aspect	Key Findings	Design Implications
Benefits of Active Mobility	• *Environmental*: Reduces CO_2 emissions; cycling emits 84% less CO_2 than car trips. • *Health*: Promotes physical and mental well-being, reduces obesity and chronic diseases. • *Economic*: Reduces transport costs and boosts local economies.	Prioritise cycling and walking infrastructure to leverage environmental and health benefits.
Active Mobility Among School Children	• Younger children prefer walking; adolescents favour cycling if safe infrastructure is available. • Travel mode varies with distance: Walking (<2.25 km), Cycling (2.25-4 km), Cars (>4 km). • Parental safety concerns are a barrier.	Create safe, accessible routes within 4 km of schools; focus on connected cycling paths and traffic calming.
Infrastructure and Safety	• Malta faces challenges with narrow roads, high traffic, and extreme summer heat. • Low-stress networks increase active transport adoption. • Climate-responsive features (e.g., tree-lined streets) improve comfort.	Develop continuous, shaded, low stress cycling and walking networks integrated into urban planning.
Policy and Planning	• Countries like the Netherlands succeed with cycling prioritization and traffic calming. • Malta lacks continuous cycling routes and integrated urban planning. • Multi-stakeholder collaboration is critical. • Malta is anchored in negligence-based civil liability; calls for reform are evident	Implement policies promoting traffic calming measures. Ensure multi-level coordination in planning.

Chapter 3: Methodology

3.1 Introduction

This chapter outlines the methodological approach that was employed to investigate how infrastructure and road safety can be enhanced to promote active mobility for adolescents commuting to school in Malta. The study focuses on a case study of a Maltese College and aims to identify infrastructural barriers, assess existing active travel conditions, and explore stakeholder perspectives that influence student mobility choices.

Given the multifaceted nature of this research, a mixed-methods approach was adopted. This combines both qualitative and quantitative methods to enable a comprehensive understanding of the built environment, user experiences, and institutional frameworks. While observational fieldwork and GIS-based mapping allow for a spatial assessment of infrastructure, stakeholder interviews provide valuable insights into local governance, planning constraints, and strategic priorities. Quantitative data collected through surveys provide further depth to the lived experiences and commuting habits of students and their guardians, that can provide measurable indicators of safety perceptions and modal choices.

The following sections detail the research design, participant recruitment, data collection techniques, and analysis methods used in this study.

3.2 Methodology Structure

A structured methodology was developed to effectively address the objectives provided in Chapter 1, to ultimately answer the research question:

What improvements can be made to Malta's road infrastructure to create a safer cycling and walking environment for middle and secondary school students commuting to school?

While the Literature Review helped answer parts of the research question, it became clear that additional methods were needed to fully explore the most ideal improvements. Therefore, a mixed-methods approach was chosen. The surveys captured quantifiable data, highlighting commuting behaviour patterns in students and parents, while interviews provided richer, qualitative insights into stakeholder perspectives. Mixed-methods research integrates both quantitative and qualitative techniques, providing a more comprehensive view and allows triangulation between the findings from different types of data. This combination has been seen to provide a more holistic understanding rather than relying on a single method even in transport and mobility studies (Creswell & Plano Clark, 2018; Piatkowski et al., 2017). In addition to this, the spatial analysis using ArcGIS and on-site observations grounded these findings into real-world infrastructural conditions, aligning perceptions with physical context.

Integrating these methods is useful in addressing complex social and infrastructural issues such as active mobility, particularly when involving younger participants, where quantitative data alone could overlook cultural attitudes, and qualitative data alone might miss certain trends (Buehler & Pucher, 2012). By using this multi-method approach, the research not only answered the question more thoroughly but also offered a deeper, more nuanced understanding of the topic, something that would have been difficult to achieve with a single method alone.

3.3 Literature Review

The literature review served as a crucial foundation for this study, providing both global and local insights into active mobility. By examining the state of active mobility across

various contexts, the review enabled a more informed and strategic approach to evaluating and enhancing infrastructure surrounding the selected Maltese college.

The review drew upon a range of secondary sources, including academic journals, research reports, government publications, policy standards, articles, and statistical data. While recurring themes and consistent findings emerged across sources, it became evident that the research question could not be fully addressed through secondary data alone.

Consequently, the need for primary research was identified. The development of surveys and interviews was guided by key themes and knowledge extracted from the literature review. This approach ensured that the primary research instruments were comprehensive and targeted, enabling the collection of rich, relevant data directly aligned with the aims of this study.

3.4 Qualitative and Quantitative Research Techniques

3.4.1 Surveys

To gain a comprehensive understanding of the factors influencing active mobility among adolescents, surveys were designed as a key component of the research methodology. The intention behind conducting the surveys was to collect both quantitative and qualitative data directly from middle and secondary school students and their parents or guardians, thereby capturing diverse perspectives and providing a more holistic picture of the current situation. The surveys were structured into four distinct sections:

1. Statistics related to Study
2. Socio-Demographic Section
3. Perception Towards Active Mobility
4. A more in-depth view: an open-ended section allowing participants to elaborate on their responses and offer additional insights, thereby introducing a qualitative dimension.

The survey was directed at both parents/guardians and students, allowing the researcher to identify both shared and contrasting views within households. This dual approach aimed to better understand the social dynamics behind travel decisions and how parent-child opinions correlate when it comes to choosing transport modes. In the statistics

section, participants were asked to indicate their home-to-school distance within detailed categories ranging up to 5 km. This range was informed by a case study in the literature review in section 2.1.2 suggesting that 2.5 to 4 km represents a practical upper limit for active school transport for this age group, while anything beyond that was generalised. This design enabled a more precise analysis of how distance impacts commuting behaviour and the feasibility of promoting active mobility.

Continuing this structured approach, the representativeness of the data collected was also noted. The participation varied significantly between the Middle and Secondary school cohorts. The Middle school provided a sample of 142 responses (N=550), yielded a response rate of approximately 25.8% and a margin of error of ±7% (95% confidence level) providing a good indication of student perspectives.

In contrast, the Secondary school contributed only a sample of 19 responses (N=750), yielded a response rate of approximately 2.5% and is therefore not considered as representative.

These differences were carefully considered when interpreting results, with the Middle School findings treated as indicative of the views of the cohort. Meanwhile, the Secondary School findings were treated as exploratory. To strengthen the reliability of the conclusions resulted from the survey data, the findings were considered with interview outcomes and the spatial analysis.

3.4.2 Interviews

To complement the quantitative data and provide a deeper understanding of infrastructural and policy challenges, semi-structured interviews were conducted with six key stakeholders: representatives from the Middle School and Secondary School in Kirkop, the local councils of Kirkop (on-site) and Qrendi (a surrounding local council), and representatives from two NGOs actively engaged in promoting active mobility in Malta: Rota and the Project Aegle Foundation. Interview questions were designed based on findings from the literature review and tailored to each stakeholder's role and expertise, ensuring the discussions would address both general and context-specific challenges and opportunities related to active school travel.

The interviews were designed using open-ended questions structured around four key themes: current infrastructural conditions, policy or planning barriers, perceived safety concerns, and opportunities for future improvement. These questions were developed to align with the core objectives of the study and to encourage participants to reflect on both systemic issues and context-specific realities. This format allowed for flexibility in responses while ensuring consistency across interviews, making it possible to identify recurring patterns and contrasts across stakeholder perspectives.

For Local Councils, the interview themes focused on: existing infrastructure and safety measures; current policies and initiatives; community partnerships; identified challenges and areas for improvement; and future plans for mobility enhancements. School representatives were asked about current practices and school policies on active commuting, the condition and safety of routes around the school, parental involvement, observed barriers faced by students, and the kind of support they envision for improving sustainable transport. The Project Aegle representative shared insights into program design, safety logistics of walking buses, community involvement, impact outcomes, and plans for expansion. Rota's interview explored the organisation's overarching vision, ongoing challenges in cycling infrastructure, policy advocacy efforts, collaboration with local institutions, and long-term strategies for promoting cycling in Malta.

These interviews helped triangulate findings from the surveys and route assessments, enriching the research with perspectives grounded in policy, community engagement, and on-the-ground implementation.

3.4.3 Spatial Analysis

The assessment of active mobility routes was carried out using a combination of ArcGIS mapping and on-site observations. As the exact home addresses of students were not collected in line with ethical considerations, a strategic method was adopted to select key routes. This involved a simple desk-based review to identify the most likely paths connecting the village cores of the main localities to the Middle and Secondary Schools of St. Benedict's College in Kirkop.

Routes were selected based on the assumption that students would travel in the safest and fastest manner from the central areas of their respective localities, representing the general population density. These routes were assumed to be the most direct and commonly used paths to the school. For each of these selected routes, several key infrastructure and safety features were examined to then identify the LTS discussed in section 2.1.3 of the routes. These included:

- The condition and width of footpaths
- The condition and width of the road

The following classification is used to assess the condition of the footpaths and road:

Table 2 *Condition Classification*

Category	Code	Description
Good	G	Surface is smooth and well-maintained with minimal wear. No visible cracks, potholes, or obstructions. Safe and fully usable for walking and cycling.
Moderate	M	Surface shows signs of wear such as small cracks, unevenness, or partial degradation. Usable but may cause minor discomfort or pose mild safety concerns.
Poor	P	Surface is significantly damaged: large cracks, potholes, broken edges, or obstructions. Unsafe or uncomfortable for pedestrians and cyclists. Infrastructure may be partially or entirely unusable.

- The presence or absence of cycle lanes
- Pedestrian crossing points
- Speed Limits

In this assessment, areas without posted speed limits in rural zones are assumed to permit Malta's national maximum of 80 km/h, while built-up areas are considered to have a default limit of 50 km/h.

On-site observations were done using a mountain bike provided valuable insights into the real-world conditions of these routes, offering a first-hand perspective on the challenges students may face during their school commute. This approach ensured a practical evaluation of the infrastructure supporting active mobility. The following routes were planned with the aid of Bikemap website (OpenStreet Contributors, 2025).

Birżebbuġa (6.4km)

Given that a small number of students reported cycling from Birżebbuġa to Kirkop, this route was selected for assessment despite being one of the longest observed, exceeding the ideal active mobility range of 5 km noted in the literature. As can be seen in Figure 20, the selected route follows natural and quieter paths rather than direct arterial roads, deliberately avoiding areas with heavy traffic to enhance safety and comfort.

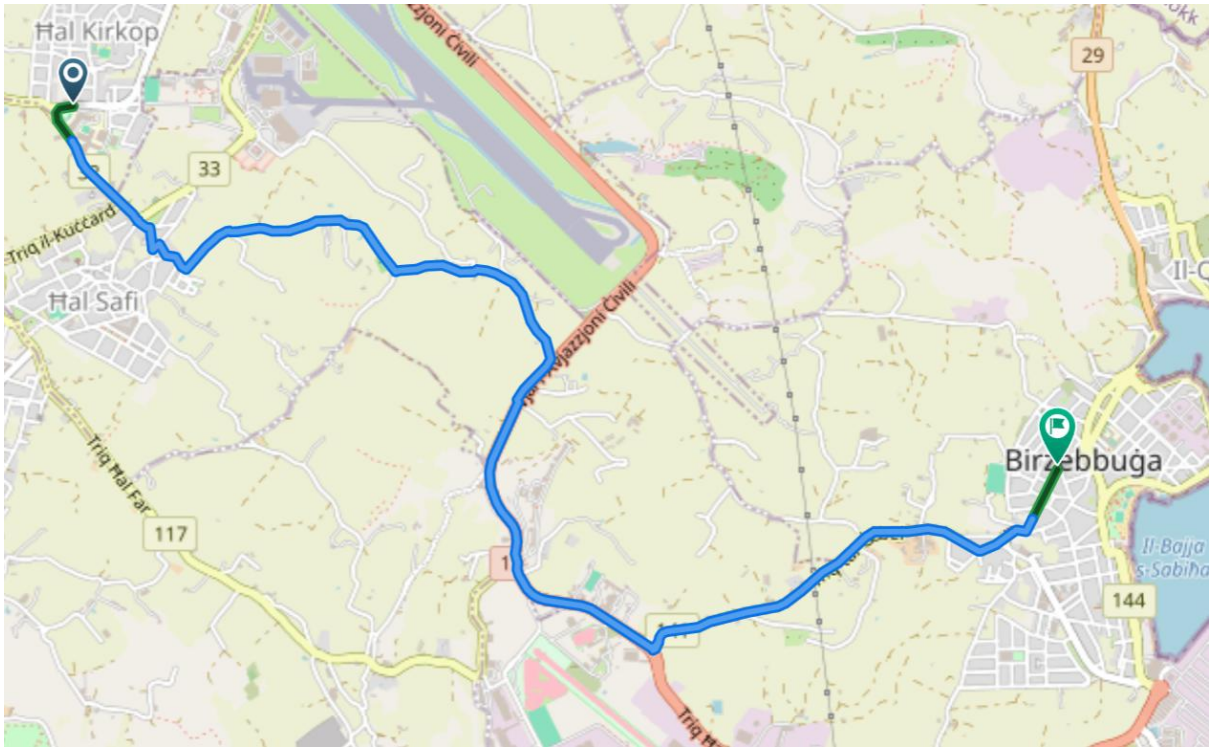


Figure 20 *Route from Birżebbuġa to Kirkop*
(Source: OpenStreet Contributors, 2025)

Għaxaq (5km) and Gudja (3.5km - 4.5km)

Għaxaq is situated at what is considered the upper limit for the cycling travelling distance. for school-aged children, as supported by literature reviewed in earlier sections. Given this distance, Għaxaq presents a valuable case for evaluating the practical challenges and potential of active mobility for longer commutes.

The route from Gudja closely aligns with that of Għaxaq, offering a practical opportunity to implement a shared cycling bus. This could enhance safety and promote active commuting for students from both villages.

Figure 21 illustrates the most direct route from Gudja to the school, passing through a mix of quiet residential streets and busier arterial roads. A key challenge along this route is the tunnel section, where, according to the Low-Powered Vehicles and Pedal Cycles Regulations (S.L. 65.26) (2004), “No person shall ride or permit to be ridden any pedal cycle or a power assisted pedal cycle, including a pedelec, unless clearly marked otherwise [...] in road tunnels;” with the exception that “pedal cycles, including pedelecs with a motor output of 250W or less, may be ridden, with prudence, on footpaths along bypasses and on footpaths along tunnels, with a speed limit of not more than 6 kilometres per hour and giving way to pedestrians.”

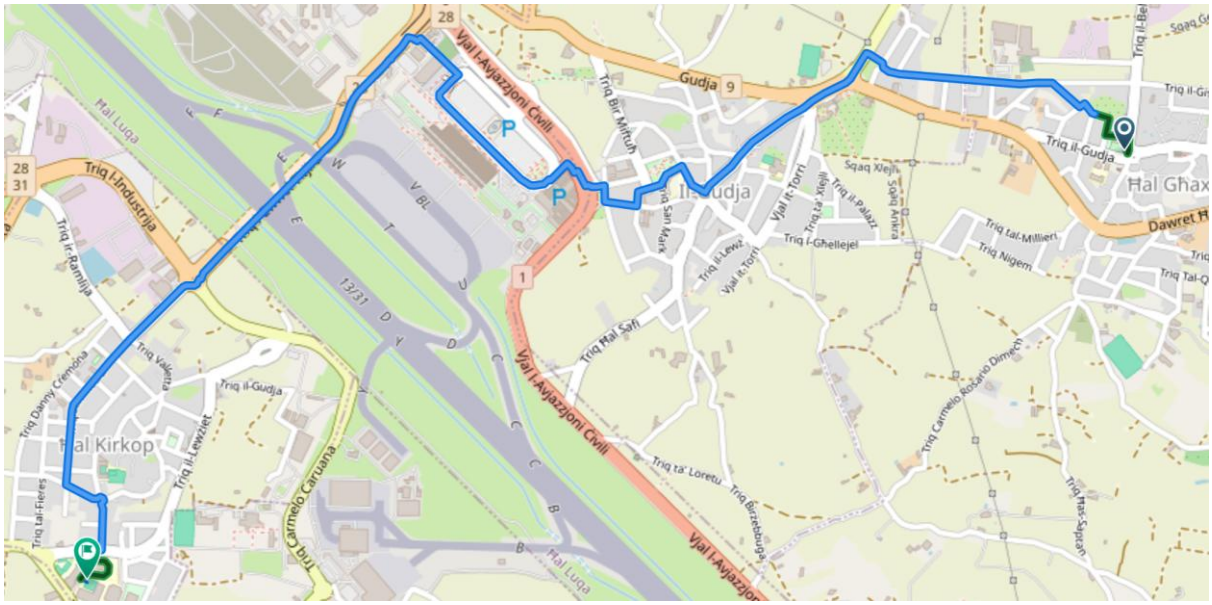


Figure 21 *Route from Għaxaq and Gudja to Kirkop*
(Source: OpenStreet Contributors, 2025)

Given these restrictions, an alternative route was explored, as shown in Figure 22, to determine whether Gudja and Għaxaq could be connected to the school without using the tunnel. However, the alternative path extends to approximately 10km, making it unsuitable for the purpose of this study, which focuses on feasible school commutes. As such, the original route shown in Figure 21 remains the subject of analysis.

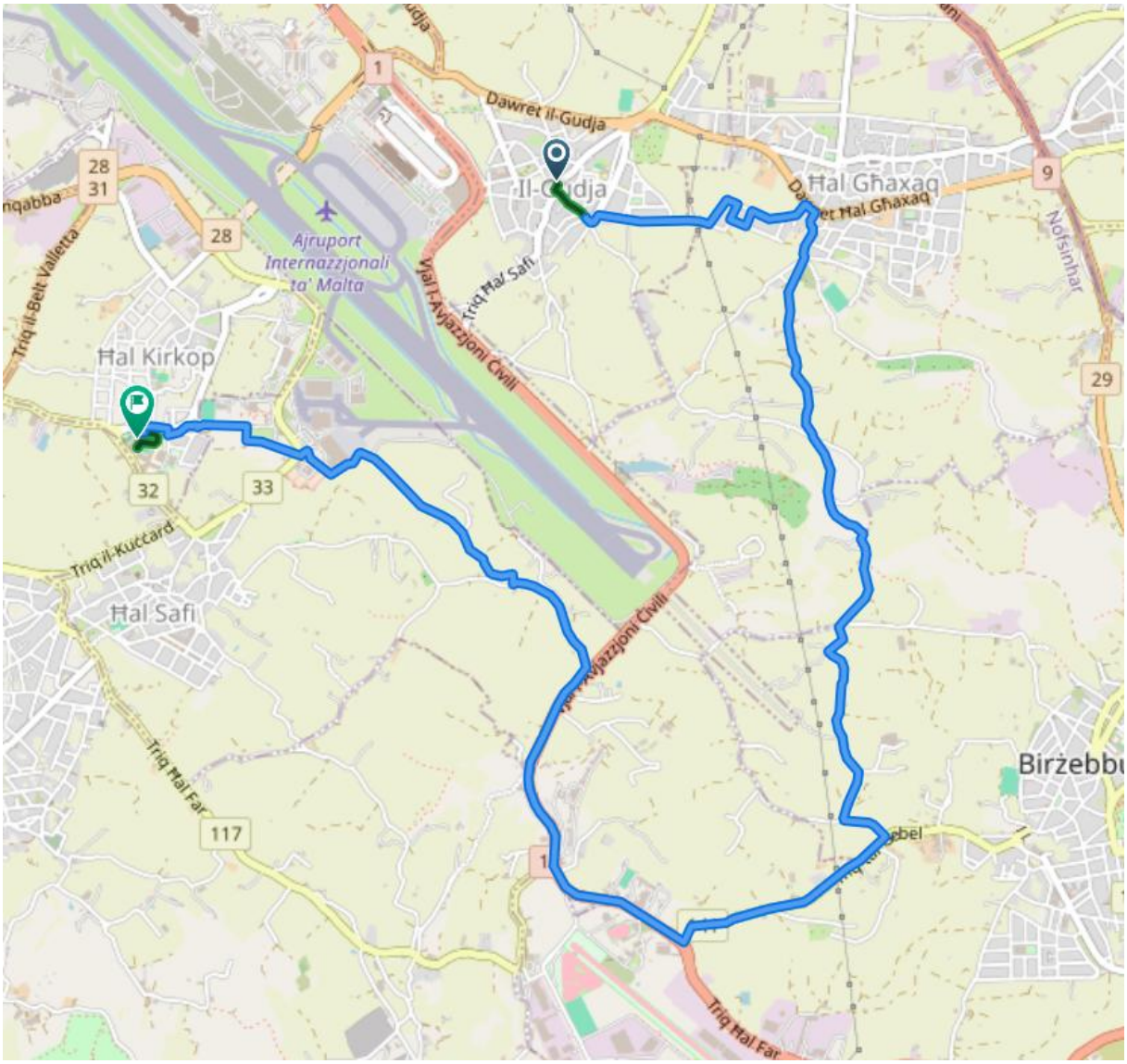


Figure 22 *Gudja and Għaxaq to Kirkop (no tunnel)*
(Source: OpenStreet Contributors, 2025)

Qrendi (2.5km – 3.5km)

Qrendi falls within the ideal cycling range for school-aged students. The assessed route as seen in Figure 23 begins from the village core and follows the most direct connection to the school, as identified through desk research.

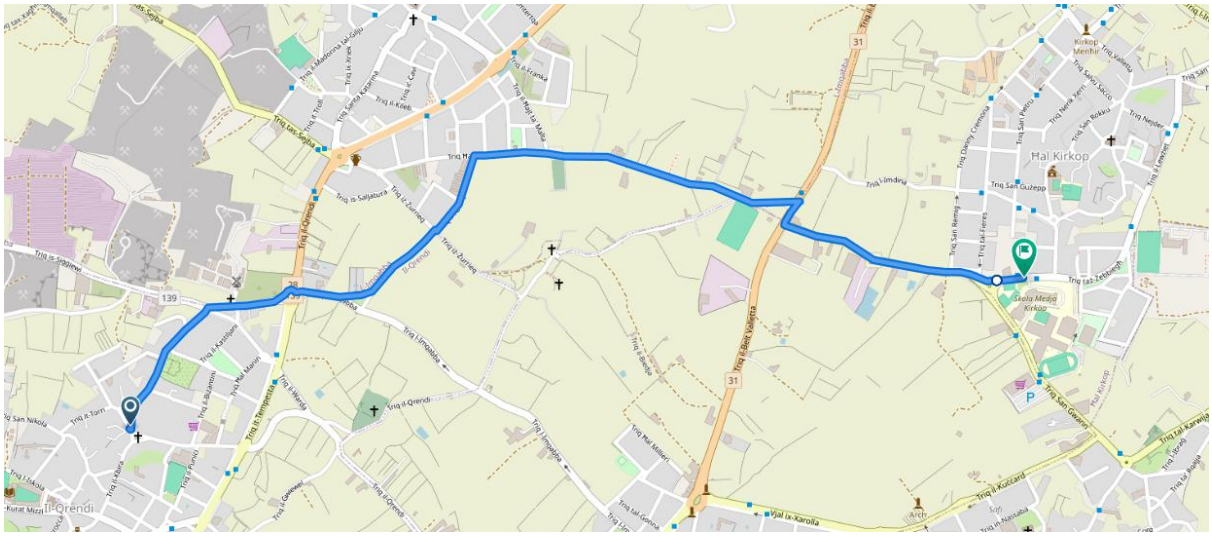


Figure 23 *Route from Qrendi to Kirkop*
(Source: OpenStreet Contributors, 2025)

Mqabba (1.5km – 2.5km)

Mqabba is located well within the optimal distance for active travel by school-aged children. Figure 24 shows the route analysed following the most direct path to the school, as identified through preliminary desk research, overlapping with the route from Qrendi.

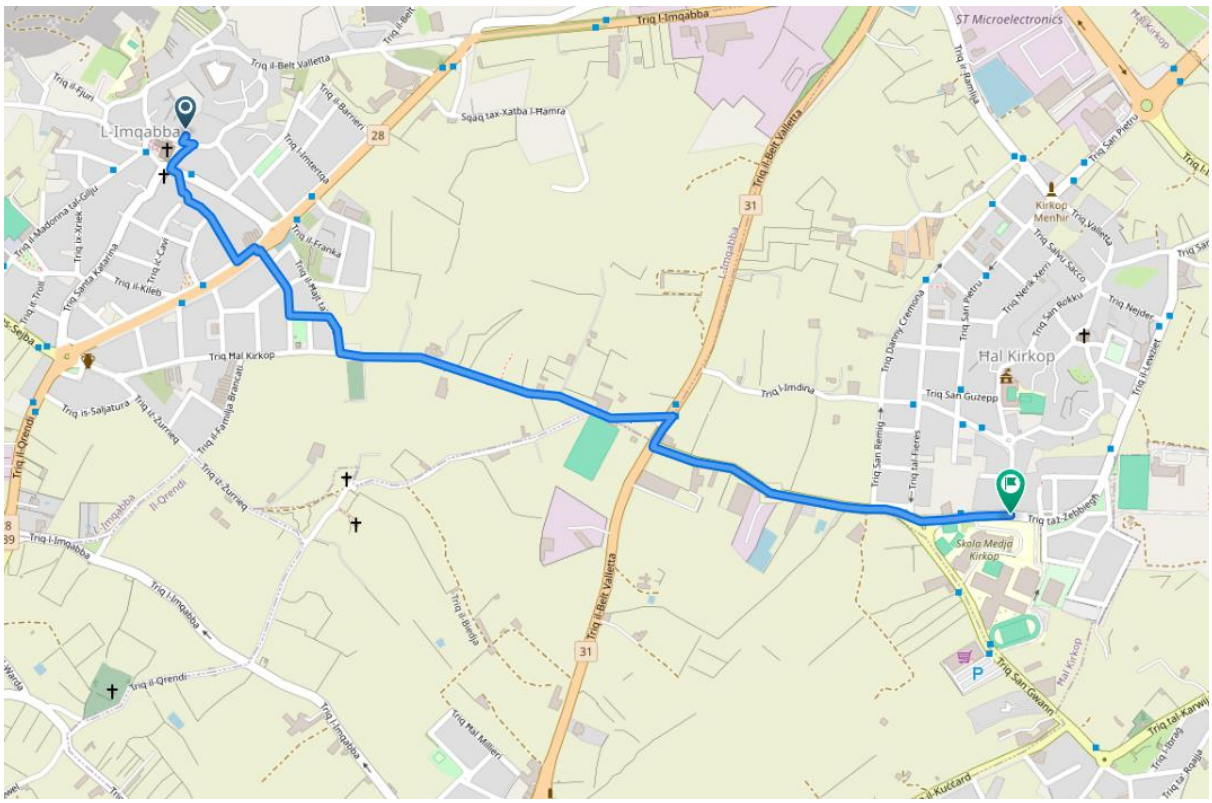


Figure 24 *Route Mqabba to Kirkop*
(Source: OpenStreet Contributors, 2025)

Żurrieq (1.0km – 2.5km)

Due to the village's size and topographical variation, two main routes were assessed. The first, shown in Figure 25, begins from the upper part of Żurrieq and offers a more direct path to the school. However, students residing in the lower part of the village may avoid this route due to a steep incline, instead opting for an alternative route with gentler terrain, illustrated in Figure 26.

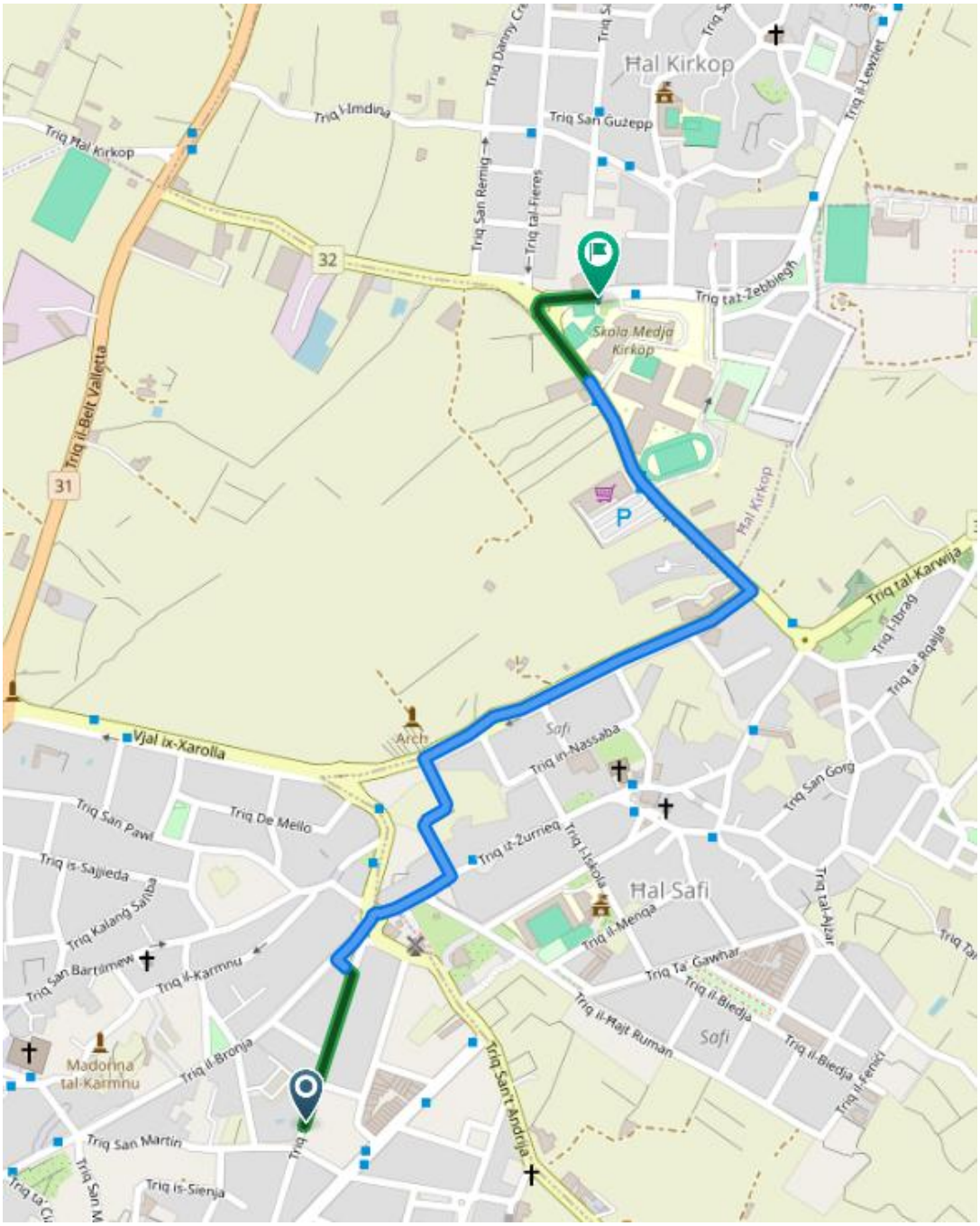


Figure 25 *Route 1 Żurrieq to Kirkop*
(Source: OpenStreet Contributors, 2025)

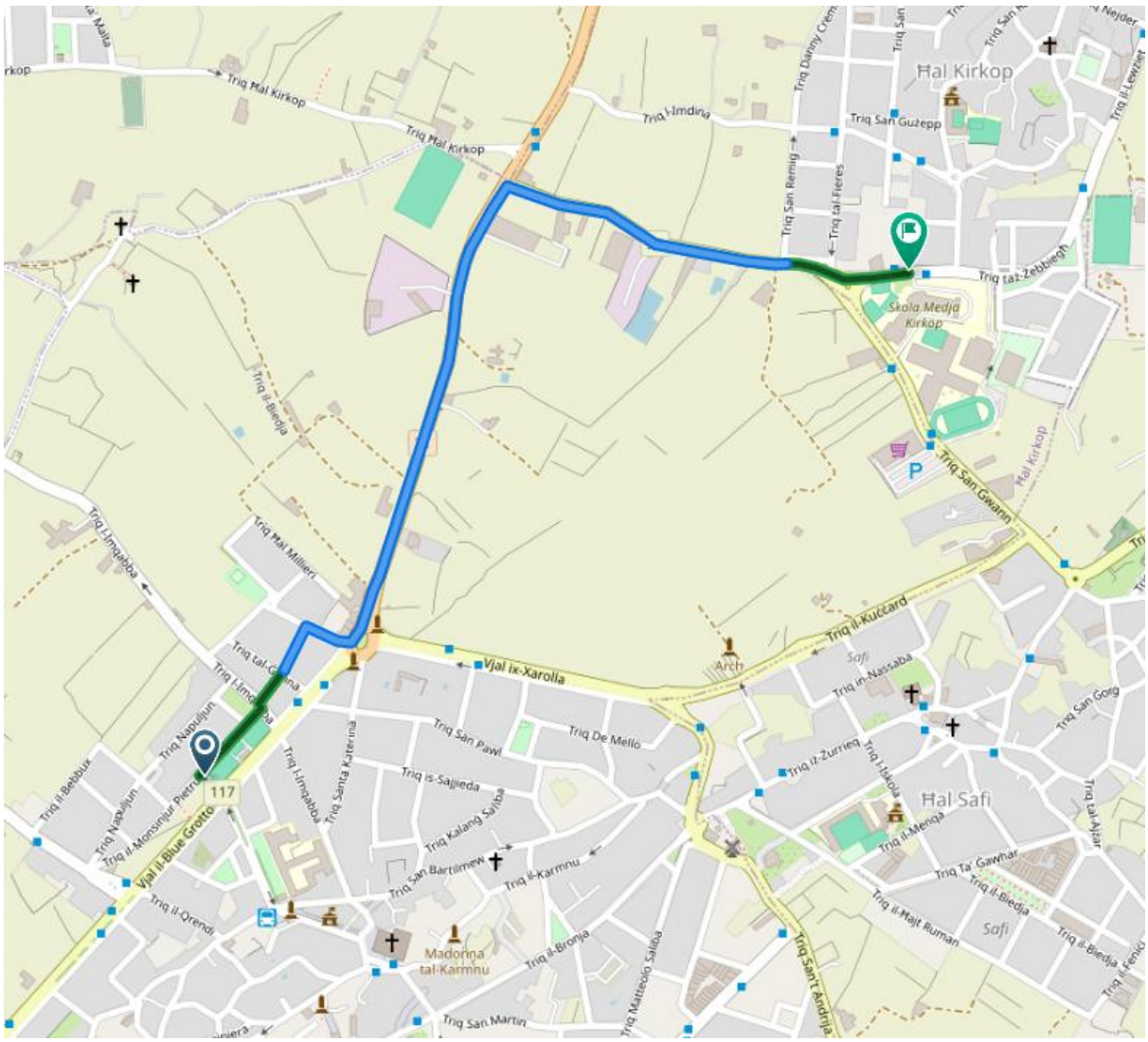


Figure 26 *Route 2 Żurrieq to Kirkop*
(Source: OpenStreet Contributors, 2025)

Safi (0.5km – 1km)

Ħal Safi is one of the closest localities to the Kirkop Middle and Secondary Schools. The route from Safi in Figure 27 overlaps significantly with the first Żurrieq route, as shown in Figure 25.

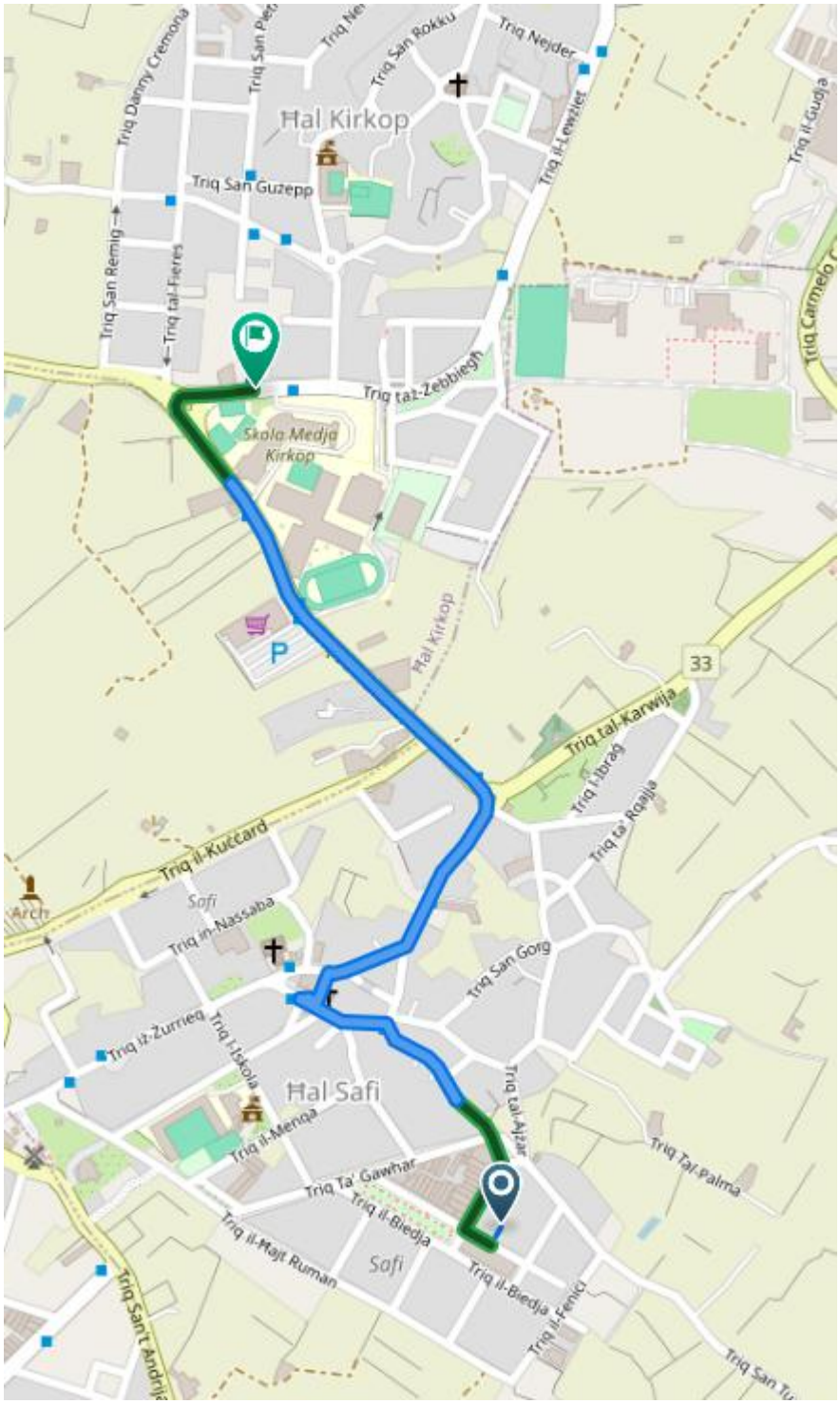


Figure 27 *Route Safi to Kirkop*
(Source: OpenStreet Contributors, 2025)

Kirkop (on-site)

As the location of the Middle and Secondary Schools, Kirkop required a focused assessment of its internal road network. Observations concentrated on the main access routes within the village that students would likely use to reach the school. The aim was to evaluate the quality, safety, and connectivity of these internal roads.

An on-site observation was also conducted at the peripheral area at both schools, particularly in the areas that are used in the aforementioned routes. The surrounding infrastructure was observed to see if it was aiding students that choose active modes of transport.

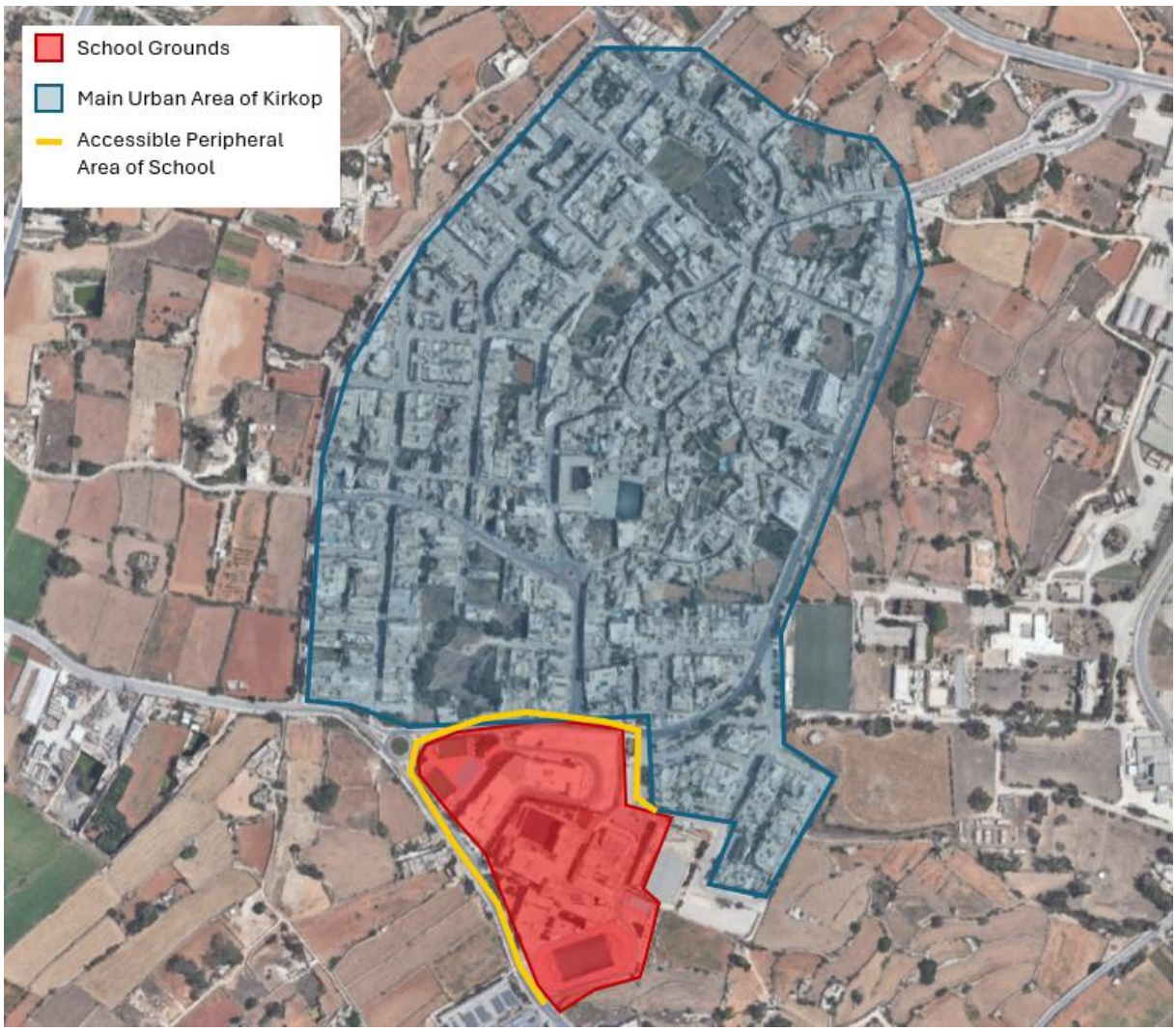


Figure 28 *Location of School and Surrounding Area*
(Source: Basemap - Google Maps)

3.4.4 Analysis and Correlation of Data

A broad range of data was gathered through the application of various research methods. Each dataset was first examined independently to identify key patterns, then cross-referenced with other sources to create a more holistic view of the topic. In the context of this study, integrating survey results, interview responses, mapping analysis, and on-site observations provided a multi-dimensional understanding of the current challenges and opportunities related to active mobility for school commutes.

This combined analysis not only addressed the core research objectives but also informed practical recommendations to enhance infrastructure and road safety for promoting walking and cycling among adolescents in Malta.

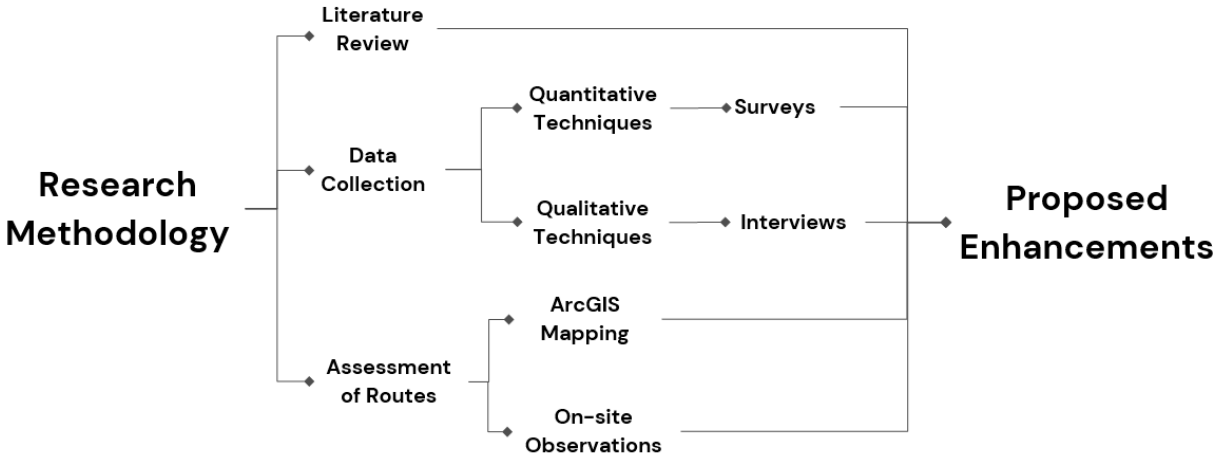


Figure 29 *Research Methodology and Analysis Flowchart*

3.5 Strengths and Limitations

This study adopted a mixed-methods approach that offered both breadth and depth, but like any research, each method came with its own strengths and limitations.

Surveys were effective in capturing quantifiable data from both students and parents/guardians, offering valuable insights into commuting behaviours and perceptions. The dual-perspective approach allowed for meaningful comparisons, especially regarding attitudes toward safety and infrastructure. However, the number of responses (317) was lower than expected, with a clear bias toward middle school respondents. This limited the representativeness across the full student population,

particularly older students in secondary school. Additionally, the results may not fully reflect the broader community's views.

Interviews provided rich, qualitative insights from key stakeholders such as school administrators, local councils, and NGOs. These conversations offered context that would be difficult to extract from secondary research alone, shedding light on local policy, safety concerns, and active mobility initiatives. Still, the data is based on individual opinions, which may not always align with the official positions of the organisations they represent. Interpretations can also vary depending on the stakeholder's personal perspective and experience.

Route assessments using ArcGIS mapping made it possible to visualise and evaluate connectivity and infrastructure quality across key school routes. This was complemented by on-site observations that gave a first-hand understanding of what students experience when walking or cycling. These methods were highly effective in identifying safety concerns, gaps in infrastructure, and real-world commuting challenges. However, the GIS mapping relied partly on outdated orthophotos, and some informal routes or shortcuts used by students may have been missed. On-site observations were conducted in good weather and focused only on primary access routes, meaning certain environmental factors or alternative paths might not have been accounted for. Moreover, classifying Level of Traffic Stress (LTS) involved a degree of subjectivity, as the system was not originally designed for Malta's unique road context.

3.6 Ethical Considerations

Ethical considerations have been a fundamental component of this research, particularly due to the involvement of minors aged 11–16. All primary data collection, including surveys and interviews, was conducted in full compliance with ethical standards outlined by the University of Malta and the General Data Protection Regulation (GDPR). Participation in the study was entirely voluntary, and both students and their legal guardians were provided with detailed information sheets and consent forms outlining the purpose of the study, the nature of participation, and their rights, including the right to withdraw at any time without consequence.

To protect anonymity, survey responses were designed to be non-identifiable and collected anonymously. For the interviews conducted with stakeholders such as school administrators, local council representatives, and NGOs, participants were informed that their identities would remain confidential. The interviews were recorded with prior consent and transcribed in a clean/edited verbatim.

ChatGPT (OpenAI, 2024–2025) was used to aid with comprehension, language, spelling, and grammar; as a research tool similar to an Internet search engine to find information; and to facilitate brainstorming. Multiple versions of the tool were engaged during the development of this dissertation, ensuring that all content was independently verified and aligned with academic standards. No personal information of any of the participants were used on this platform.

3.7 Conclusion

This study gathered diverse perspectives and data on infrastructure, safety, and travel behaviour. This comprehensive methodology enabled a deeper understanding of the current limitations and potential improvements needed to encourage safe and sustainable school commutes.

Chapter 4: Results

This chapter presents the findings of the results that were generated through the aforementioned data collection methods as described in Chapter 3. It is structured so that each method is explored, by first providing an overview of the procedure and tools used in the data collection phase. It then presents the results with supporting visuals to illustrate the main points, and the strengths and limitations of the research processes are explored. Finally, the chapter concludes with a brief discussion on a cross-comparison of the findings.

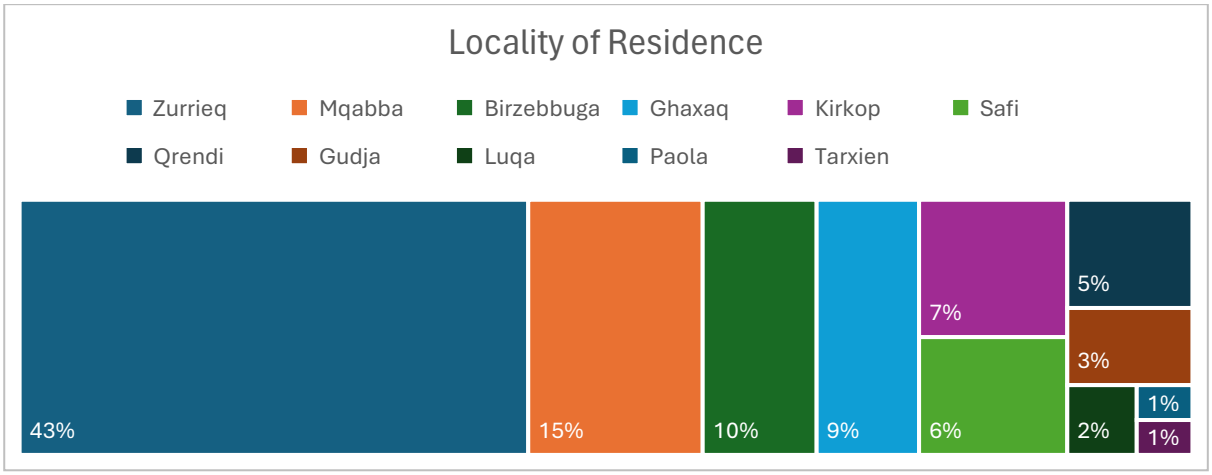
4.1 Findings from Literature Review

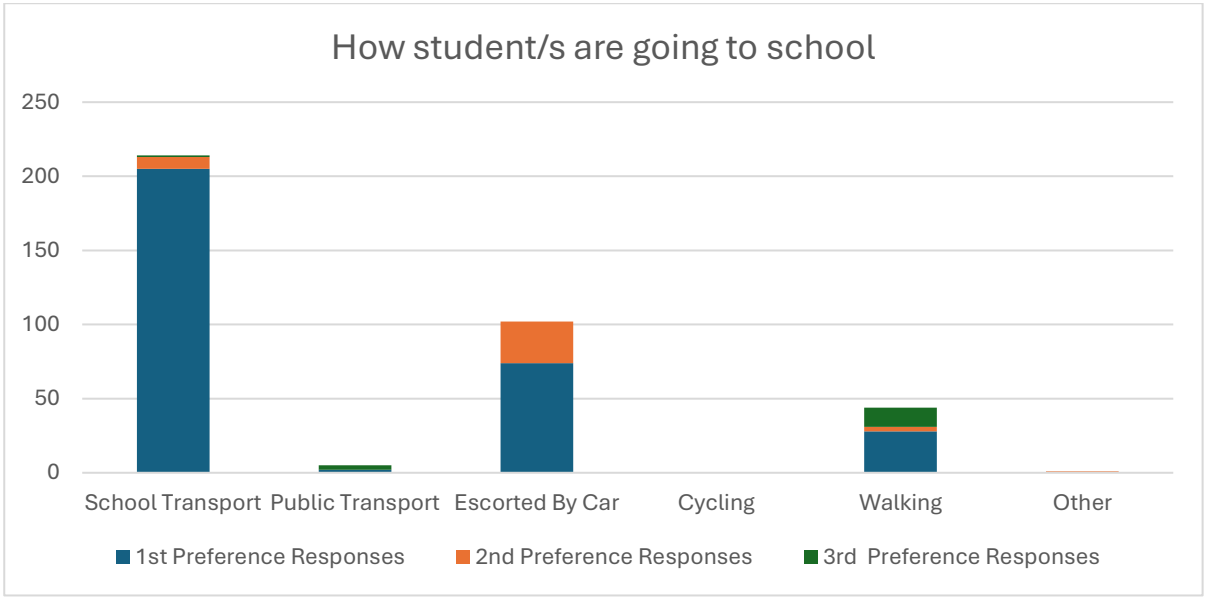
The data collected from the literature review built the foundation on which the infrastructural enhancements should be based on. It established that Malta faces significant challenges to accommodating active modes of transport. These findings and interpreted insights are summarised in Section 2.4 Table 1, translating the findings into specific design implications that inform the proposed improvements to infrastructure, aligning them with the practical needs of adolescent commuters.

4.2 Findings from Survey Results

The main purpose of conducting and distributing these surveys was to understand the commuting habits and perceptions of students and their guardians. The following presented data is from a total of 317 participants that filled in the survey. Any information that is not discussed within this chapter is included in Appendix B.

4.2.1 Statistics Related to Study





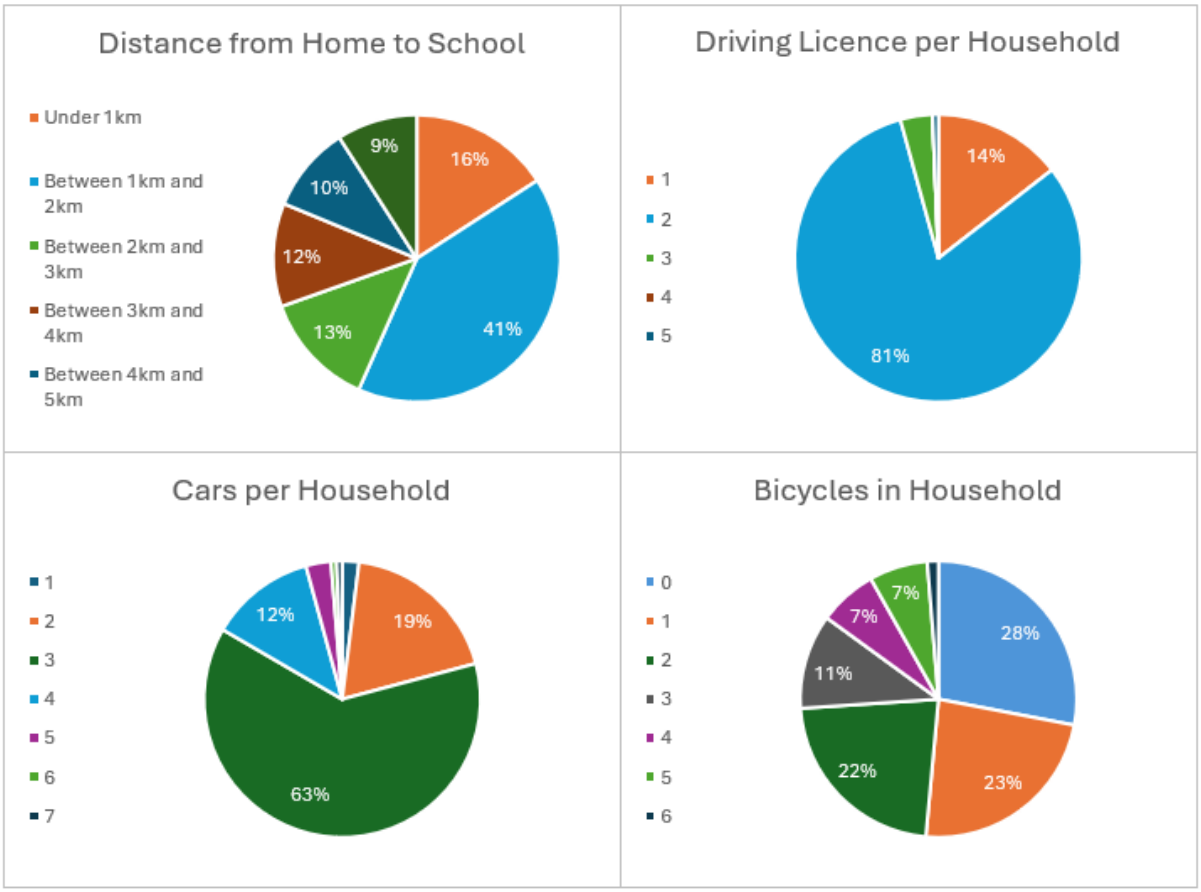


Figure 30 *General Geographic Information of Participants*

The survey data shows that most students live within 2–4 km of the school, with Żurrieq being the most represented locality (43%), followed by Mqabba, Birżebbuġa, and Għaxaq. Despite the short distances, the majority of students rely on school transport, with very few walking or cycling. Most households own two cars (63%) and have at least one bicycle (72%), yet bicycle use remains low. This highlights a clear gap between active mobility potential and actual use.

4.2.2 Socio-Demographic Section

This section provides an overview of participant characteristics to contextualise the survey results. Demographic data such as age, gender, and locality help identify patterns in commuting behaviour and support a more informed analysis.

Parent/Guardian Demographic

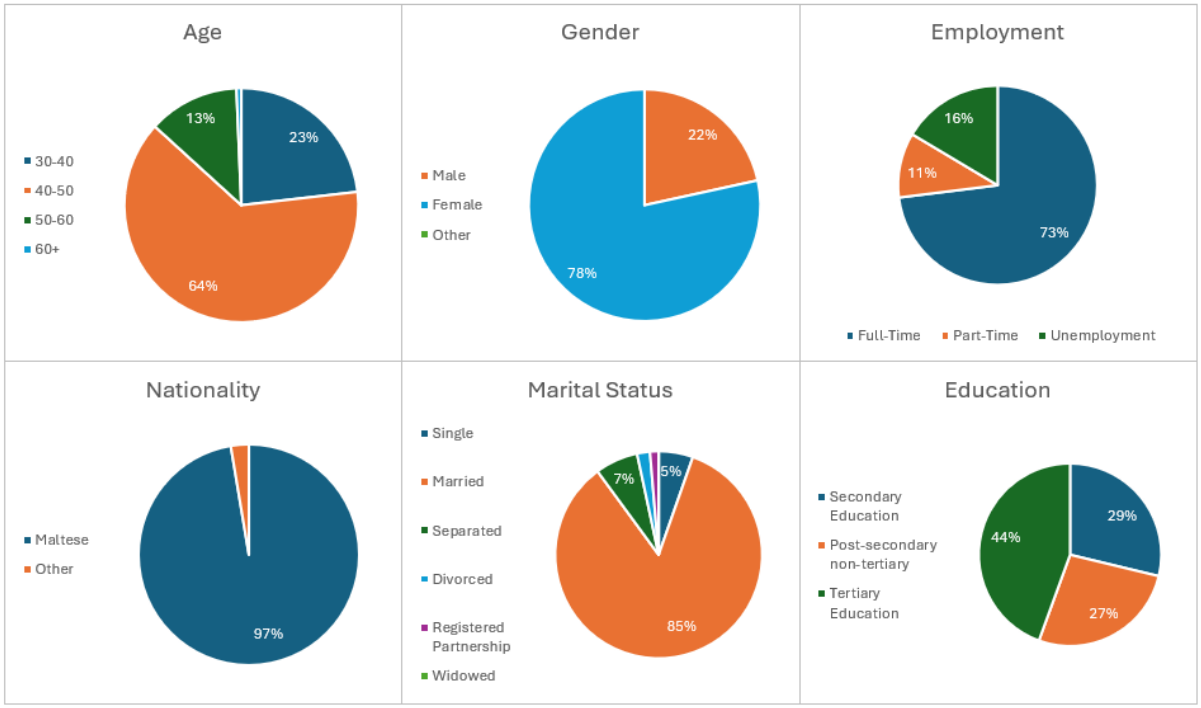


Figure 31 *Parent/Guardian Demographic*

The parent/guardian survey sample was predominantly female (78%), aged 40–50 (64%), and Maltese (97%). Most were married (85%) and employed full-time (73%). Education levels were high, with 44% holding tertiary qualifications.

Student Demographic

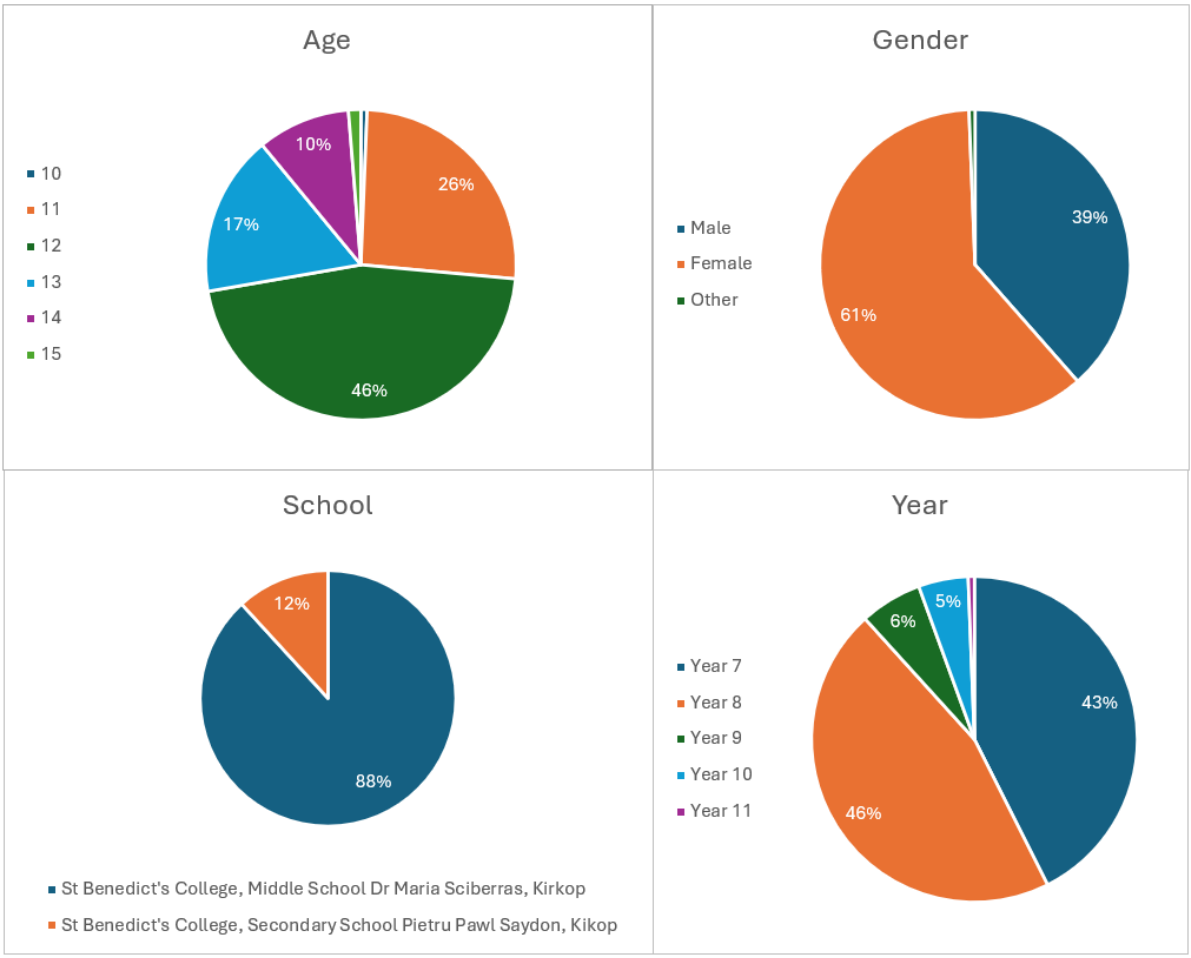


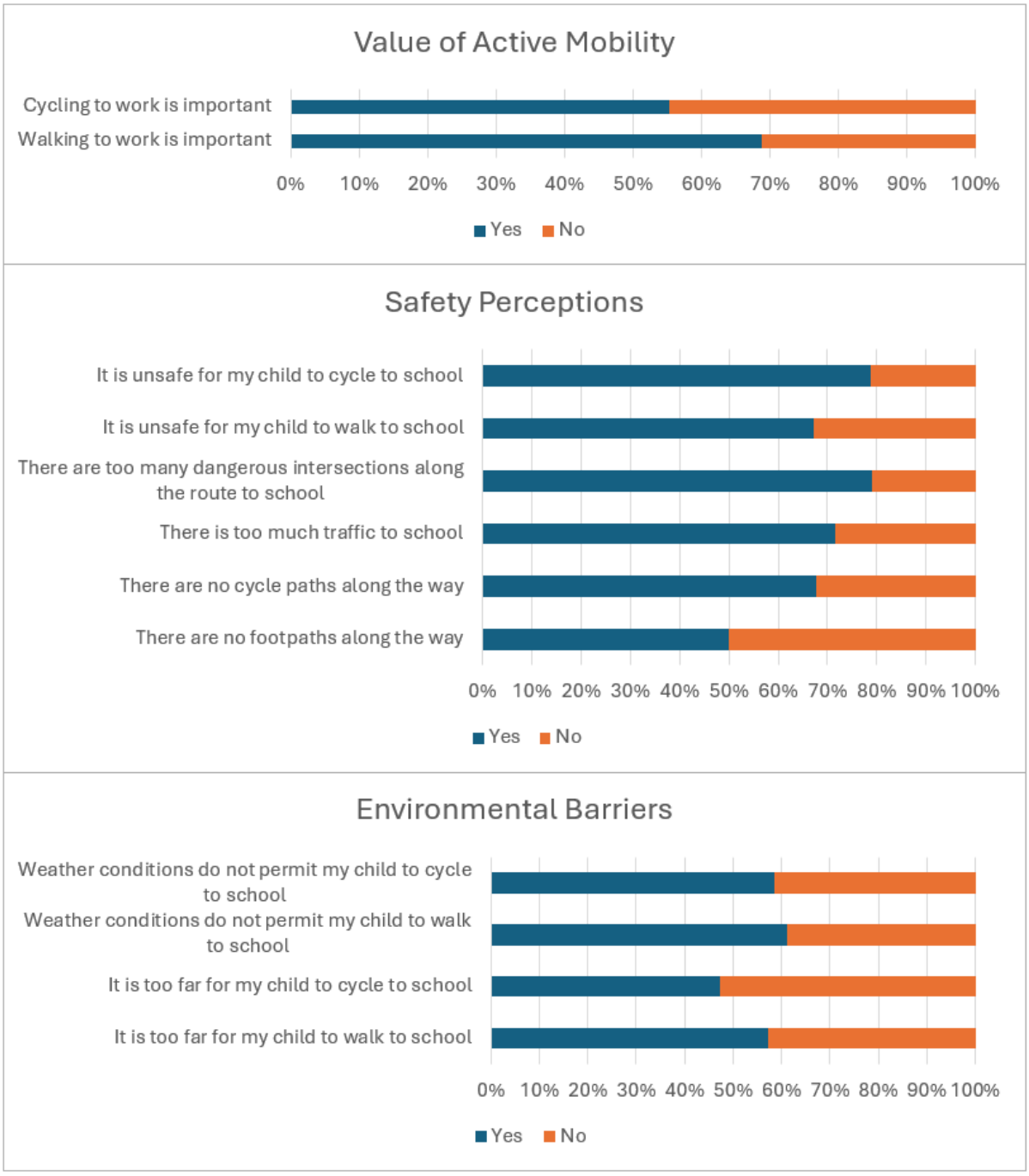
Figure 32 *Student Demographic*

The student survey sample was mostly female (61%), with male students making up 39%. Respondents were primarily from Year 7 (43%) and Year 8 (46%), attending St Benedict's College Middle School. Smaller numbers came from Years 9–11 (12%) who were from the Secondary School. Ages ranged mainly between 10 and 13, with nearly half (46%) being 12 years old.

4.2.3 Perceptions of Active Mobility

This section was vital to understand the perception of parents and students towards active mobility. These insights help to inform recommendations for more effective enhancements to the infrastructure.

Parents/Guardians Responses



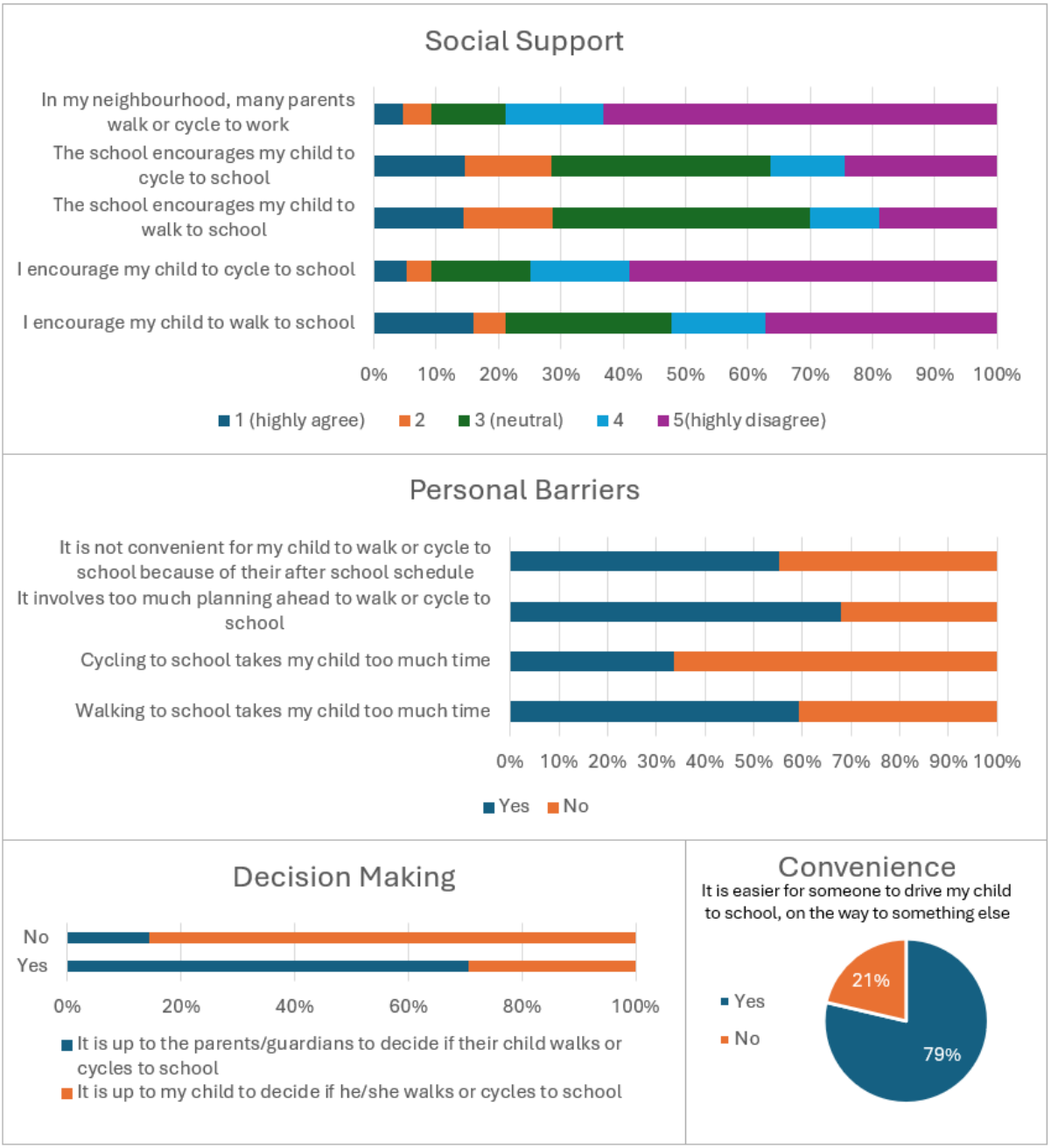


Figure 33 *Perceptions of Active Mobility of Parents/Guardians*

This shows that while most parents/guardians value active mobility, this does not translate into strong support for their children walking or cycling to school. Key barriers include time constraints, weather, distance, and significant safety concerns such as traffic and lack of infrastructure. Convenience also plays a major role, with 79% preferring to drive their child while running other errands. Decisions about travel mode are mostly made by parents, with limited input from children. Social and school support for active travel is generally low.

Students Responses

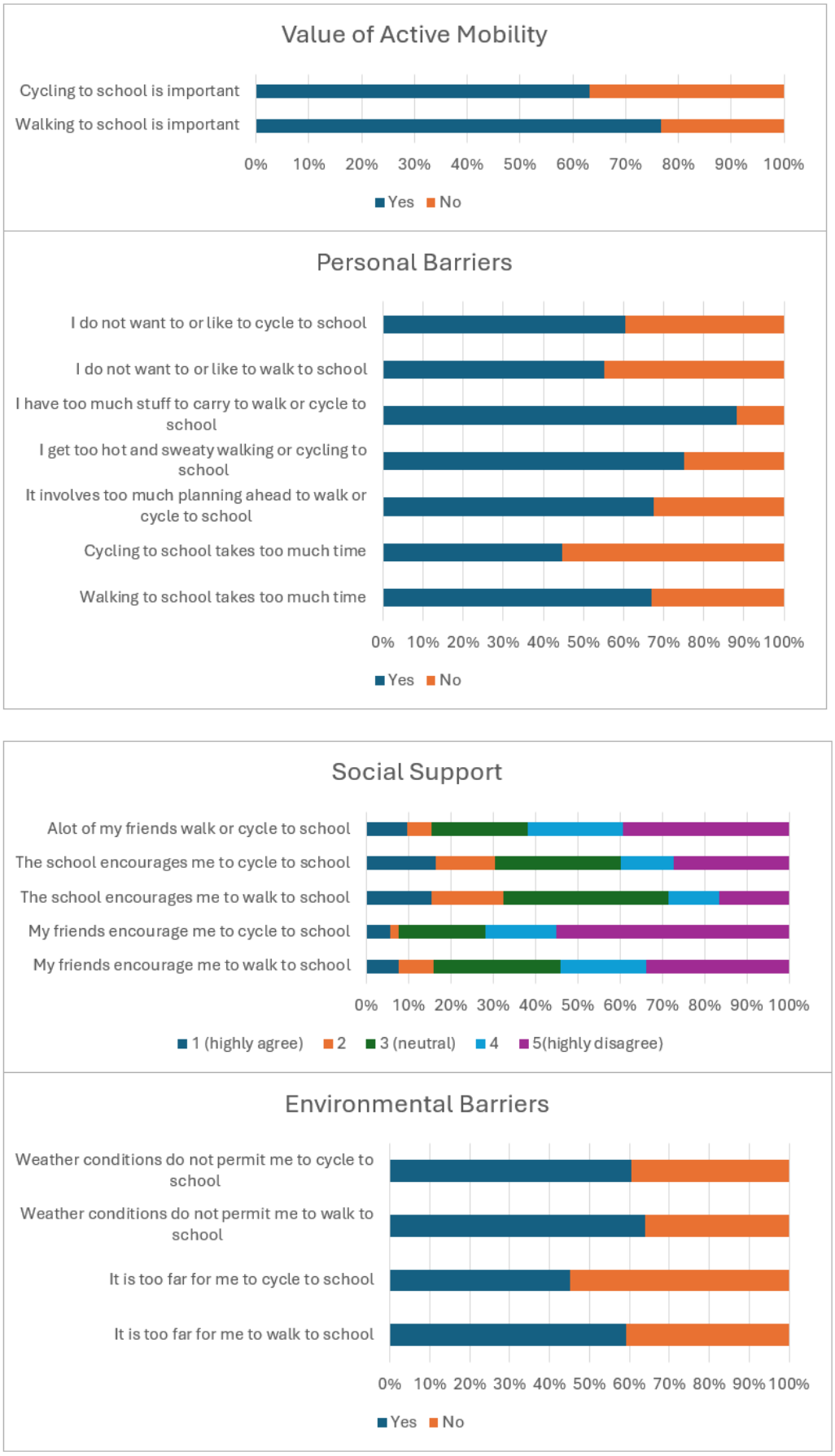


Figure 34 *Perceptions of Active Mobility of Students*

The student survey results show that a majority consider walking and cycling to school important, slightly more so than parents. However, various barriers limit their engagement in active travel. Social support is low, with many students disagreeing that their friends or schools encourage active travel. Personal barriers are significant, the most prominent being that they need to carry too much stuff. Environmental barriers such as poor weather and distance also play a role. Despite valuing active mobility, students face several practical and social obstacles.

4.2.4 A more-in depth view

This section aimed to gather deeper insights into students' and parents' personal experiences, challenges, and suggestions related to active mobility, offering context and perspectives that may not have been captured through fixed-response questions.

Parents/Guardians Feedback

Most parents were reluctant to let children walk or cycle (cycling was more prominent) to school due to safety issues. Many pointed out reckless driving behaviour, lack of enforcement and the chaos generated through traffic near the school. Practical obstacles such as the weight of school bags and long distances to school were also frequently mentioned. Suggested improvements included continuous cycle lanes, wider footpaths, road closures and increased supervision from police or Transport Malta officers. While some parents were aware of initiatives like bike week, most felt these efforts were insufficient or not well-communicated. Overall, parents highlighted the need for broader infrastructural and cultural changes beyond the school's control.

Students Feedback

Students echoed many of their parents' concerns, particularly around unsafe roads and the need for better infrastructure. They frequently called for more cycle lanes, safer and wider footpaths, zebra crossings, and traffic supervision during school hours. A recurring theme was the high volume of traffic and the careless behaviour of drivers, which made walking or cycling feel risky. Students also raised issues about carrying heavy bags and the lack of secure places to store bicycles at school. While some students appreciated activities like bike week or cycling lessons, many stated that such initiatives did not address the main problem which was unsafe commuting conditions. Several students

expressed a desire to walk or cycle to school for health or environmental reasons but felt current conditions were too dangerous to do so regularly.

The following graph shows the main themes obtained from all the feedback and how many times the theme was mentioned.

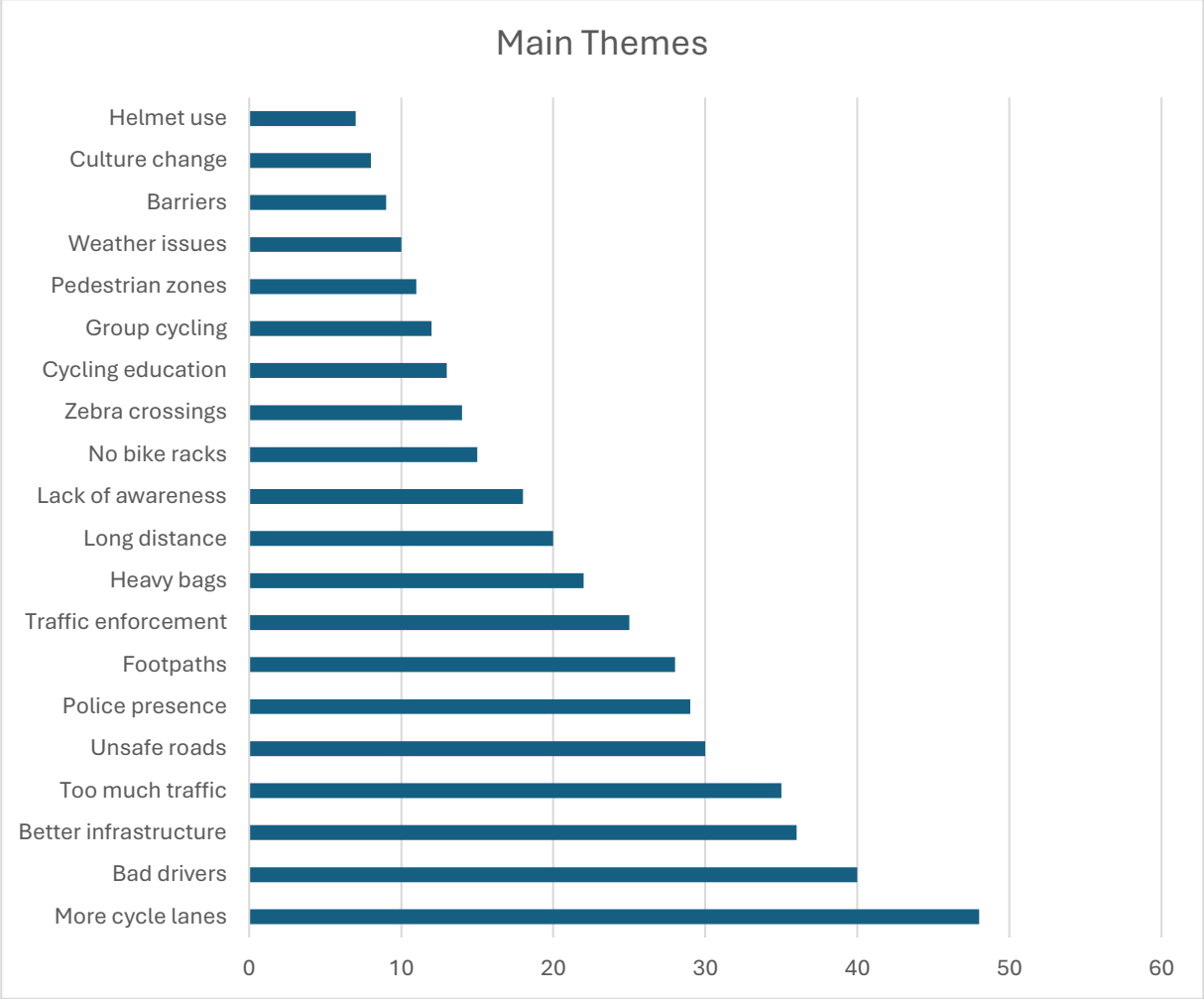


Figure 35 *Main themes from feedback*

Cycle lanes were the most frequently mentioned need, with many highlighting the lack of safe, continuous routes. One parent remarked, “A white line with paint on the road is a pitiful attempt at a cycling lane.” The second most common concern was reckless driving, with drivers described as careless and undisciplined. Other recurring issues included traffic congestion, poor enforcement, and inadequate pedestrian infrastructure. Overall, the feedback underscores the need for safer, well-designed cycling and walking routes, supported by stricter traffic control.

4.3 Findings from Interviews

The semi-structured interviews were conducted to gain deeper insights from key stakeholders, including representatives from local councils, the representatives of the middle and secondary schools at St Benedict College, and NGOs involved in mobility and sustainability advocacy. These interviews aimed to complement the survey and observational data by offering expert perspectives from individuals with direct experience in promoting or managing active mobility for adolescent students in Malta. Their input was particularly valuable in understanding the current challenges, ongoing initiatives, and future opportunities for improving infrastructure and safety in the context of school travel.

There were six interviews conducted, an interview code is provided for ease of reference.

Table 3 *Chosen Interviewees*

Stakeholder Type	Affiliation	Interview Code	Interview Date
Local Government	Kirkop Local Council	LC1	06/05/2025
Local Government	Qrendi Local Council	LC2	13/05/2025
Education – Middle	St Benedict College	S1	05/05/2025
Education - Secondary	St Benedict College	S2	22/05/2025
NGO	Project Aegle	N1	13/05/2025
NGO	Rota	N2	02/05/2025

4.3.1 Interview Summaries

A summary table has been provided to outline the main themes and responses from each stakeholder, structured in alignment with the interview questions provided in Appendix C.

The interview with LC1 was carried out due to their direct responsibility for the locality where the case study school is based. As key decision-makers on local infrastructure and mobility, their input was vital in understanding the current conditions and potential improvements around the school. Questions were designed to explore existing infrastructure, safety concerns, and any initiatives supporting active mobility. The goal was to assess the council's role in promoting safer, more sustainable school commutes. The main points raised during the interview are summarised in the table below.

Table 4 *Main Points of LC1*

Theme	Question Topic	Related Questions	Key Points
Existing Infrastructure and Safety	Existing Infrastructure	1.1.a	Current infrastructure is minimal. Narrow, cluttered footpaths are impossible to use safely. Cyclists are not catered for at all.
	Safety Improvements	1.1.b	To create pedestrian gardens and bicycle parking near the school. Footpaths should not be less than 1m. In favour of cycle lanes but described as "sikkina taqta' minn ġiex naħat" (double edged sword) – loss of parking if implemented
Policies and Initiatives	Policies/ Incentives	1.2.c	Engaging students via a Children's Council for feedback. Supported a fun-run event with road closures and police assistance. No direct financial incentives but actively promoting active mobility through events and educational engagement.
	Road Safety	1.2.d	Prefers police presence over new traffic engineering. Regular police presence, awareness campaigns, and community events are seen as more effective than traffic calming measures.
Partnerships and Community Engagement	Partnerships	1.3.e	Emphasizes communication especially with other Local Councils.
	Community Engagement	1.3.f	Organized community 5km marathon – to encourage children into a fun run.
Challenges and Improvements	Challenges	1.4.g	Cultural: "nidħlu fl-imħuħ tal-parents" (changing parents' mindsets) is noted as the biggest hurdle. Traffic congestion at drop-off/pick-up areas causes chaos
	Improvements needed	1.4.h	Designated drop-off bays (to keep cars off main road) and earlier gate openings for buses. Infrastructure must consider parking, traffic flow, safety holistically
Future Plans	Future goals/ Initiatives	1.5.i	Deeper school collaboration (fun runs, bike rides) for all ages. Innovative ideas like underground parking under plazas to free surface space and reduce on-street parking.

The interview with LC2 was conducted to capture the perspective of a neighbouring locality from which several students commute to the case study school. Using the same set of questions as posed to LC1, this interview allows for a direct comparison between the two councils' approaches to prioritising active mobility for students attending the school of the case study.

Table 5 *Main Points of LC2*

Theme	Question Topic	Related Questions	Key Points
Existing Infrastructure and Safety	Existing Infrastructure	1.1.a	No specific infrastructure for students; only basic mandatory provisions. Mentioned general road safety for all users. Village includes illuminated walking trails and QR-coded pedestrian signage for safer routes.
	Safety Improvements	1.1.b	Barriers placed during school (Qrendi primary) opening/closing hours (when police are available). No dedicated safety upgrades for students. Recounts tragic road accidents; emphasizes local trauma and need for improved culture of road safety.
Policies and Initiatives	Policies/ Incentives	1.2.c	No formal policies or incentives for children. However, organizes annual "Bicycle Day," countryside walks, and supports educational campaigns in collaboration with LESA, Transport Malta, and the primary school.
	Road Safety	1.2.d	Strong focus on enforcement and education, "We need to create an educational campaign" for both drivers and pedestrians. Advocates discipline like Germany/Netherlands.
Partnerships and Community Engagement	Partnerships	1.3.e	Willing to collaborate when invited. Participated in initiatives with Kirkop Middle School and public transport education programs. Past NGO work recognized by EU after 2008 fatal traffic incident.
	Community Engagement	1.3.f	Participates actively in primary school community events; supports scout groups and safe walking. Desires more public engagement but notes frustration due to lack of support and resistance from public when initiatives are launched.
Challenges and Improvements	Challenges	1.4.g	Cultural resistance, lack of enforcement, and undisciplined behaviour from drivers and pedestrians. Limited support from authorities leads to disillusionment. Infrastructure limitations make cycling risky (e.g. narrow roads).
	Improvements needed	1.4.h	Main need is education and enforcement. Infrastructure exists (walking routes, signage), but poor behaviour nullifies benefits. Suggests more visible enforcement and legal reform.
Future Plans	Future goals/ Initiatives	1.5.i	Ambition: make Qrendi *"heaven on earth"* for pedestrians. Encouraging safe, illuminated walking trails, bins, and signage. No immediate plans for cyclists due to infrastructure limitations but sees walking programs as a start.

The interview with S1 was conducted to understand how younger adolescents, typically aged 11–13, are supported in adopting active mobility practices. This stage of schooling is critical, as students begin to develop greater independence in their daily commute. The questions addressed current commuting trends among students, internal school policies related to walking and cycling, and collaboration with parents and local authorities. The summary below outlines the key themes and insights that emerged from the interview.

Table 6 *Main Points of S1*

Theme	Question Topic	Related Questions	Key Points
Current Practices and Policies	Current Initiatives	2.1.a	Participates in annual bike ride to Dar il-Providenza for charity - which is part of college-wide Bike Week initiative. Students are taught basic road rules and traffic signs as part of in-class sessions and invited NGO talks. No formal active mobility programs exist. Cycling to school is not allowed due to safety concerns and students' age.
	Alternative Transport	2.1.b	No formal encouragement of alternatives. Students walk if local or use government-provided school transport. Many are still driven by parents, which creates traffic congestion at drop-off zones.
Infrastructure and Safety	Infrastructure	2.2.c	School has bicycle racks (including shared racks with secondary school), but they are rarely used by students. Staff members occasionally bring bicycle but prefer to store them indoors for security. Nearby cycle lanes exist.
	Road Safety	2.2.d	School zone has standard signage (school sign and reduced speed limit). A community police officer now directs traffic at dismissal, helping reduce illegal parking and congestion. Road safety education provided in-class and by guests.
Parental and Community Involvement	Parental Involvement	2.3.e	No formal structures for parental involvement in school mobility decisions. Awareness is raised through Bike Week and school-wide events. Parents are not actively engaged in mobility policy planning.
	Community Partnerships	2.3.f	School cooperates with the local council on community events like fun runs. Also invites Transport Malta, police, and NGOs for student talks. Participation in external activities is mainly event-based, not ongoing.

Observed Challenges	Challenges	2.4.g	Lack of safe infrastructure around the school discourages cycling and active commuting. Age and safety concerns prevent cycling to school. Pedestrian behaviour also poses issues; students often ignore crossings.
	Concerns	2.4.h	Primary concern is safety – narrow roads, poor driver behaviour, and lack of bicycle-friendly design. Students need supervision when walking. No systemic plan to address these issues beyond occasional interventions.
Future Plans and Support	Expand Programs	2.5.i	No plans to formally expand active mobility programs. Ideas like walking trains or cycling groups exist but are not implemented due to legal and safety concerns.
	Support	2.5.j	Would consider organizing group walking or cycling initiatives if legal clarity and adult support were available. Suggests supervision and safety structures are needed for any program to succeed.

The interview with S2 focused on the older student cohort, aged 13–16, who are generally more independent in their travelling behaviour. Given their increased capacity for independent commuting, the discussion explored how the school supports and regulates active mobility among this age group. Topics included observed trends in student transport, the presence of cycling infrastructure, parental engagement, and future planning. The table that follows highlights the main points discussed during the interview.

Table 7 *Main Points of S2*

Theme	**Question Topic**	**Related Questions**	**Key Points**
Current Practices and Policies	Current Initiatives	2.1.a	Strong commitment to sustainable mobility. Hosts an annual cycling charity event to Dar il-Providenza, involving students and staff for the entire college. Maintains a cycling policy requiring helmet use, ID tagging, and parental consent. Encourages cycling as a school-wide practice.
	Alternative Transport	2.1.b	Students commute on foot, by bicycle, or school transport. Promotes walking and cycling, especially for students living nearby.

Infrastructure and Safety	Infrastructure	2.2.c	Installed a 30-space Sheffield bicycle rack with shelter, funded by Transport Malta. Adequate facilities are in place to support current cycling levels (10–15 daily). Previously underused bicycle rack was upgraded based on student demand.
	Road Safety	2.2.d	Conducts road safety education and monitors student behaviour. Some students were noted to take unsafe risks (e.g. not indicating direction prior to turning). School lacks a dedicated police presence and requests more signage and enforcement.
Parental and Community Involvement	Parental Involvement	2.3.e	Parents are supportive and provide written consent for their children to cycle. Parental trust has increased over time as infrastructure and policy improved.
	Community Partnerships	2.3.f	Excellent cooperation with LC1 — supported fun runs, bicycle charity rides, and travel initiatives. Part of Green Travel Plan program, with recognition for best practices in sustainable commuting.
Observed Challenges	Challenges	2.4.g	Road safety outside school is a persistent concern. Heavy traffic near Lidl and inconsistent enforcement hinder safety. Not all students adhere to cycling rules; risk-taking behaviour poses reputational and safety risks.
	Concerns	2.4.h	School staff worry about lack of enforcement and infrastructure outside campus - traffic volume, speeding vehicles, and absence of speed-calming measures. Top concern students travelling alone.
Future Plans and Support	Expand Programs	2.5.i	Open to expanding cycling and sustainability initiatives but believes school is already highly engaged through Eco-Schools and Green Travel Plan. Seeks projects that align with student interests.
	Support	2.5.j	Requests more infrastructure support: additional signage, speed limit markings, and bicycle-friendly paths. Aims to improve safety and visibility of school zones to increase parent and student confidence in active commuting.

The interview with N1 was conducted to explore the role of non-governmental organisations in promoting safe and sustainable school travel. N1 has been directly involved in community-based mobility initiatives, including the implementation of “walking bus” systems and education campaigns. The purpose of this interview was to gain insight into the design, challenges, and impact of such initiatives, and how they align with national strategies for active mobility. The summary below outlines the key points discussed during the interview.

Table 8 *Main Points of N1*

Theme	Question Topic	Related Questions	Key Points
Program Design and Purpose	Main Goals	3.1.a	Aimed to promote walking to school by addressing Malta's car-centric culture. Identified that many students lived within walking distance but were still driven. Emphasized building independence and confidence in children.
	Routes	3.1.b	Routes were based on where committed parents lived. Parents were consulted through school meetings. In Żebbuġ, the mayor personally helped identify safe walking paths for the route.
Community Engagement	Parental Engagement	3.2.c	Parents involved in planning routes, leading walks, and fostering community participation. While initial commitment was strong, sustaining involvement proved challenging.
	Feedback	3.2.d	Positive feedback from parents and students. Children reported enjoying walks; shy students became more sociable. Parents described the walks as quality bonding time. Assemblies and media reinforced engagement.
Safety and Logistics	Safety Protocols	3.3.e	Always walked in groups; children wore high-visibility vests, which boosted both safety and visibility. Maintained daily communication with parents to handle absences and attendance. Gradually transitioned leadership to families themselves.
	Emergencies	3.3.f	No emergencies were reported. Program maintained preparedness by staying in constant contact with families and walking coordinators.
Outcomes and Impact	Benefits	3.4.g	Noted social and behavioural improvements in children (e.g., less shyness, stronger peer connection). Some families began walking more regularly or cycling as a result of their participation.
	Influence	3.4.h	Students who walked influenced peers to show interest. Project created a visible school-wide culture shift. ITV featured the program. Families began adjusting routines to support more active mobility.
Expansion and Collaboration	Challenges	3.5.i	Main limitation: lack of dedicated coordinators. Parent burnout and logistical difficulties hindered consistency. Passive approaches (e.g. flyers) were ineffective; active outreach was needed.
	Collaboration	3.5.j	Worked with local councils, schools, community police, and parent champions. Advocated for a paid "walking officer". Plans to roll out walking buses in more localities via mayor partnerships.

The interview with N2 was carried out to understand the organisation's perspective on cycling infrastructure, policy advocacy and youth engagement. N2 plays a key role in shaping public discourse around active mobility and collaborates closely with communities and government entities to push for safer cycling conditions. The purpose of this interview was to explore the challenges faced by cyclists, particularly school- aged children, and to understand Rota's vision for improving infrastructure and promoting cycling as a viable mode of transport for students. The summary below presents the key points derived from the interview.

Table 9 *Main Points of N2*

Theme	Question Topic	Related Questions	Key Points
Organizational Goals and Vision	Objectives	4.1.a	Rota advocates for cycling at all ages, focusing on education, infrastructure, and legal reform. Campaigns for "presumed liability" to protect cyclists and promote cultural change away from car-dependency.
	School Commute	4.1.b	Defines a good school cycling route using Dutch CROW standards: safe, direct, comfortable, and attractive. Promotes cycling as transport, not just recreation. Urges schools to allow and support student cycling.
Current Infrastructure and Challenges	Barriers	4.2.c	Major barriers: lack of cycling skills among children, parental fear, and societal attitudes. Parents view cycling with scepticism; cyclists are often blamed or criticized, even by other drivers.
	Infrastructure	4.2.d	School cycling infrastructure is almost non-existent. Some schools actively forbid students from cycling. Routes lack protection, and most traffic systems prioritize cars over bicycles.
Safety and Policy Advocacy	Safety Measures	4.3.e	Recommends 30 km/h school zones, school-street closures, narrower lanes, and tactile crossings. Also supports bicycle parking facilities, traffic-calming, and visible school-zone signage.
	Campaigns/Initiatives	4.3.f	Organizes bicycle buses, bicycle safety workshops, and social media outreach. Promotes cycling licenses for students, public education, and traffic awareness.

Community and Institutional Collaboration	Engagement	4.4.g	Engages with schools, councils, and the public. Runs outreach activities and public events. Shares safe cycling routes and behaviour guidelines to counter misinformation and improve rider confidence.
	Collaborations	4.4.h	Collaborates with local councils, schools, and international groups. Promotes best-practice models from the Netherlands and other cycling-friendly countries. Supports bicycle buses as a scalable school solution.
Future Vision and Expansion	Improvements	4.5.i	Envisions legal protections like presumed liability, improved infrastructure based on international best practices, school-based cycling education, and cultural shifts away from car dependency. Calls for investment in cycling infrastructure integrated into urban planning.
	Support	4.5.j	Requests government support for policy reform (e.g., presumed liability), enforcement of school-zone limits, and proper infrastructure. Advocates for both cultural and systemic change to normalize school cycling.

4.3.2 Analysis

Comparison between LC1 and LC2

A comparison between LC1 and LC2 reveals varying levels of commitment to active mobility for students. LC1, as the host locality, demonstrates stronger engagement through direct collaboration with the school and targeted efforts to improve infrastructure and safety. In contrast, LC2 recognises the issue but shows limited initiative, with no school-specific strategies in place.

This disparity reflects a wider national gap: without a coordinated framework, support for active travel depends heavily on local council priorities. As a result, students commuting from different localities may experience unequal access to safe, active transport options.

Comparison between S1 and S2

Active mobility at St. Benedict College varies by age group and school-level strategies. Interviews with representatives from S1 (ages 11–13) and S2 (ages 13–16) show that younger students rely more on parental transport, while older students are more independent, with higher rates of walking and cycling.

S1 highlighted safety concerns and limited walking initiatives due to age and parental hesitation. In contrast, S2 reported greater success with structured policies like bicycle permits and cyclist IDs. Parental support is crucial at both levels, with S2 noting growing cooperation. Engagement with councils and NGOs is present in both, but S2 has experienced more direct benefits.

Comparison between N1 and N2

NGOs N1 and N2 both promote active mobility in Malta but differ in focus. N1 emphasises behavioural change through school-based initiatives like the “Walking Bus,” working closely with schools and councils to encourage daily physical activity. N2, on the other hand, advocates for systemic change, focusing on policy reform and infrastructure development to support safer, inclusive cycling for all.

While both highlight safety and poor infrastructure as barriers, N1 works within existing conditions to shift habits, whereas N2 argues that behaviour will only change once safe policies and infrastructure is in place.

4.4 Findings from Spatial Analysis

This section presents the findings from the assessment of walking and cycling routes leading to St. Benedict College, Kirkop. Routes from key localities were mapped and observed to evaluate conditions such as road safety, infrastructure, and accessibility. During on-site observations, some routes were slightly adjusted from the initial desk study to prioritise safer and more practical travel conditions for students (reference photos at Appendix D). Key elements assessed included footpaths, cycle lanes, crossings, signage, road conditions and traffic volume. LTS was then determined for each route as per Figure 7 in section 2.1.3. The LTS are determined based on traffic conditions during peak hours, specifically during the school's opening and closing times.

The following image presents all the routes that were assessed throughout this study.

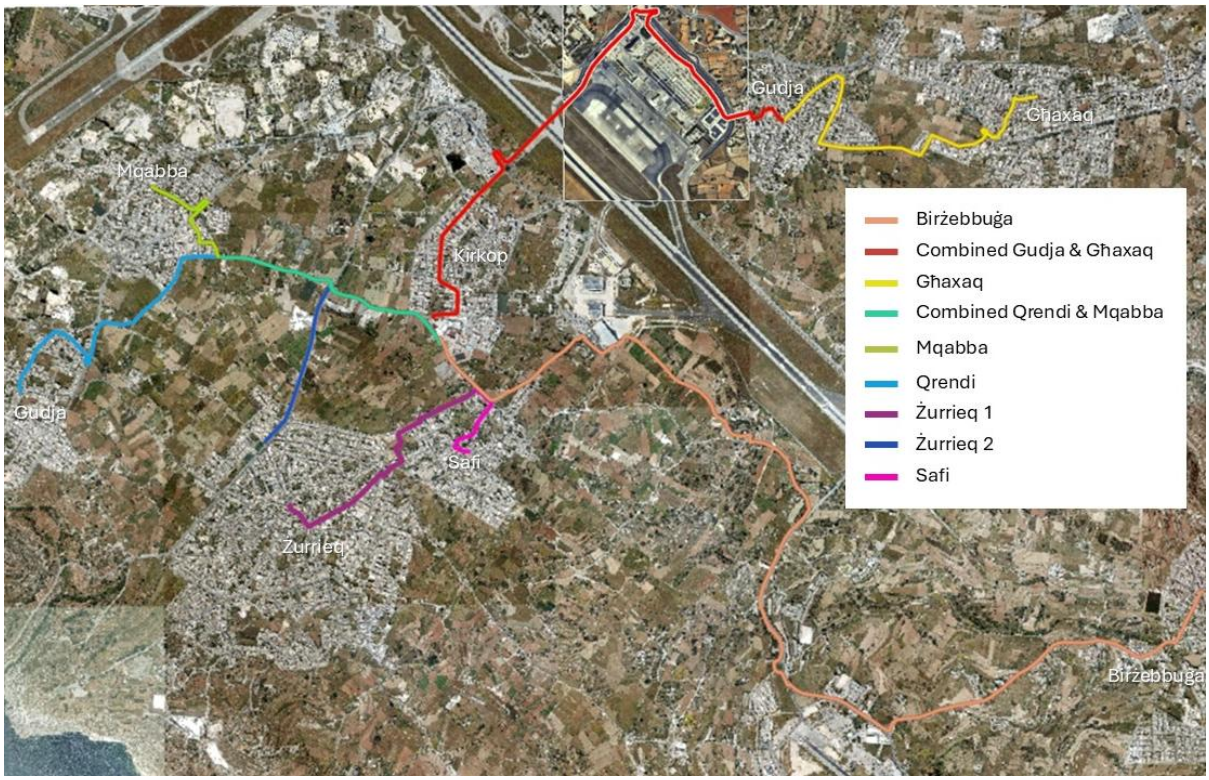


Figure 36 *Assessed Routes*
(Source: Base map: SIntegraM orthophotos (2018), Planning Authority. Map created by author in ArcGIS Pro.)

4.4.1 Birżebbuġa Route

The route from Birżebbuġa to Kirkop incorporated a mix of urban and rural environments. It began in the urban area of Birżebbuġa and transitioned into rural paths, including a main road segment that featured a dedicated cycling lane. Overall, the on-site observation revealed that the rural sections offered a pleasant and comfortable cycling experience. However, several issues were noted along the route.

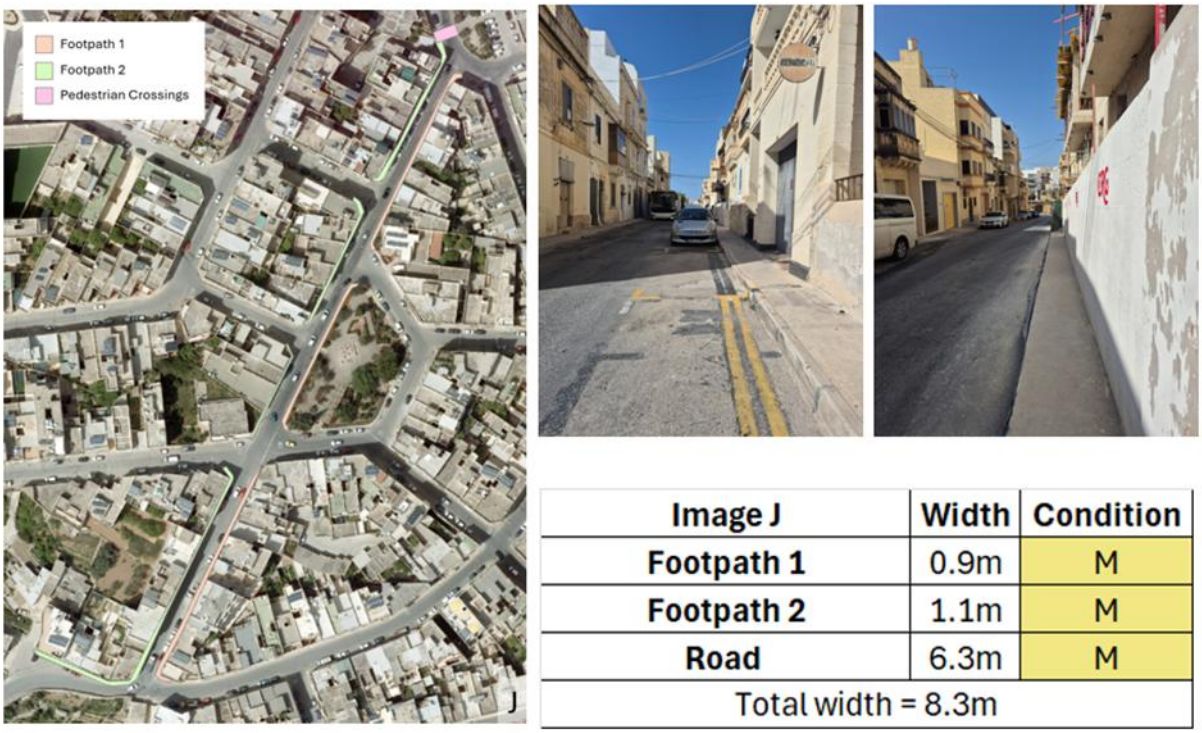


Image J	Width	Condition
Footpath 1	0.9m	M
Footpath 2	1.1m	M
Road	6.3m	M
Total width = 8.3m		

Figure 37 *Birżebbuġa Route Reference 1*
(Source: Base map: SIntegraM orthophotos (2018), Planning Authority. Map created by author in ArcGIS Pro & Photos taken by author during site observations, June 2025)

As shown in Figure 37, the urban areas lacked adequate cycling and pedestrian infrastructure, making the initial part of the journey less safe and accessible.

Image H	Width	Condition
Footpath 1	0.9m	G
Footpath & Cycle Lane	2.9m	G
Road	8.2m	G
Total width = 12m		

Figure 38 *Birżebbuġa Route Reference 2*
(Source: Base map: SIntegraM orthophotos (2018), Planning Authority. Map created by author in ArcGIS Pro & Photos taken by author during site observations, June 2025)

Cycle lanes were only available in one direction on one side of the road, meaning cyclists traveling in the opposite direction have to share the lane with traffic. This setup is far from ideal, especially on a road with a 50 km/h speed limit (Figure 38). Furthermore, ongoing construction works created temporary obstructions, adding to the challenge.

Image G	Width	Condition
Footpath 1	1.5m	G
Footpath & Cycle Lane	3.2m	G
Road	8.5m	G
Total width = 13.2m		

Figure 39 *Birżebbuġa Route Reference 3*
(Source: Base map: SIntegraM orthophotos (2018), Planning Authority. Map created by author in ArcGIS Pro & Photos taken by author during site observations, June 2025)

A significant connectivity issue was identified at a point along the route (Figure 39), where the designated cycle lane suddenly ends without any clear or safe way to cross the road. This kind of break not only poses a safety risk but also makes the cycling route less practical for students commuting to school. While a cycle lane continues in the opposite direction on the other side, the lack of a safe link between the two sides creates a critical gap in the network.

The LTS and Speed Limits of this route were determined as follows:

Figure 40 *LTS and Speed Limits of Birżebbuġa Route*
(Source: Base map: SIntegraM orthophotos (2018), Planning Authority. Map created by author in ArcGIS Pro)

The first segment of the route leaving the school was assigned an LTS 3 due to the absence of dedicated cycle lanes and various missing footpath links in a 50 km/h zone. In the rural areas, although no official speed limits were posted, a low LTS rating was given as traffic volume was minimal, and the narrow road layout naturally discourages high speeds. In areas rated as LTS 1, even though speed limits remain at 50 km/h, both cycle lanes and footpaths are present and safely segregated from vehicular traffic, offering a much more comfortable experience for cyclists and pedestrians.

4.4.2 Għaxaq and Gudja Routes

These routes featured a mix of urban paths and a section along a main arterial road.

Figure 41 *Għaxaq and Gudja Routes Reference 1*
(Source: Base map: SIntegraM orthophotos (2018), Planning Authority. Map created by author in ArcGIS Pro & Photos taken by author during site observations, June 2025)

Overall, there was a clear lack of dedicated cycling infrastructure, often forcing cyclists to use pedestrian footpaths, as illustrated in the images in Figure 41. However, there was a sufficient number of pedestrian crossings, allowing for safer navigation on foot, even if cycling conditions remained suboptimal.

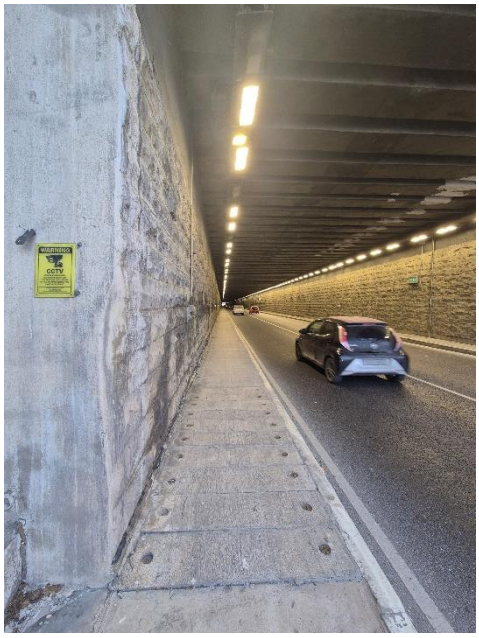


Figure 42 *Għaxaq and Gudja Routes Reference 2*
(Source: Base map: SIntegraM orthophotos (2018), Planning Authority. Map created by author in ArcGIS Pro & Photos taken by author during site observations, June 2025)

The tunnel section posed a particularly unpleasant and unsafe experience due to elevated levels of exhaust fumes, noise pollution, and the absence of physical segregation from vehicles, especially considering that the pedestrian is in a confined space with fast-moving traffic (Figure 42). Additionally, due to the restrictions outlined in S.L. 65.26 (2004), which prohibits cycling in road tunnel, and the absence of any signage on-site indicating exceptions, the researcher had to walk alongside their bicycle for this part of the route. This was done to ensure the researcher stayed within the 6 km/h limit and prioritized the safety of other pedestrians, significantly increasing the overall duration of the journey.

Figure 43 *Għaxaq and Gudja Routes Reference 3*
(Source: Base map: SIntegraM orthophotos (2018), Planning Authority. Map created by author in ArcGIS Pro & Photos taken by author during site observations, June 2025)

Although some cycling infrastructure was present near the airport and the Luqa flyover, it was not conveniently accessible from all directions. For instance, accessing a cycle lane required navigating the entire roundabout (Figure 43).

The LTS and Speed Limits of these routes were determined as follows:

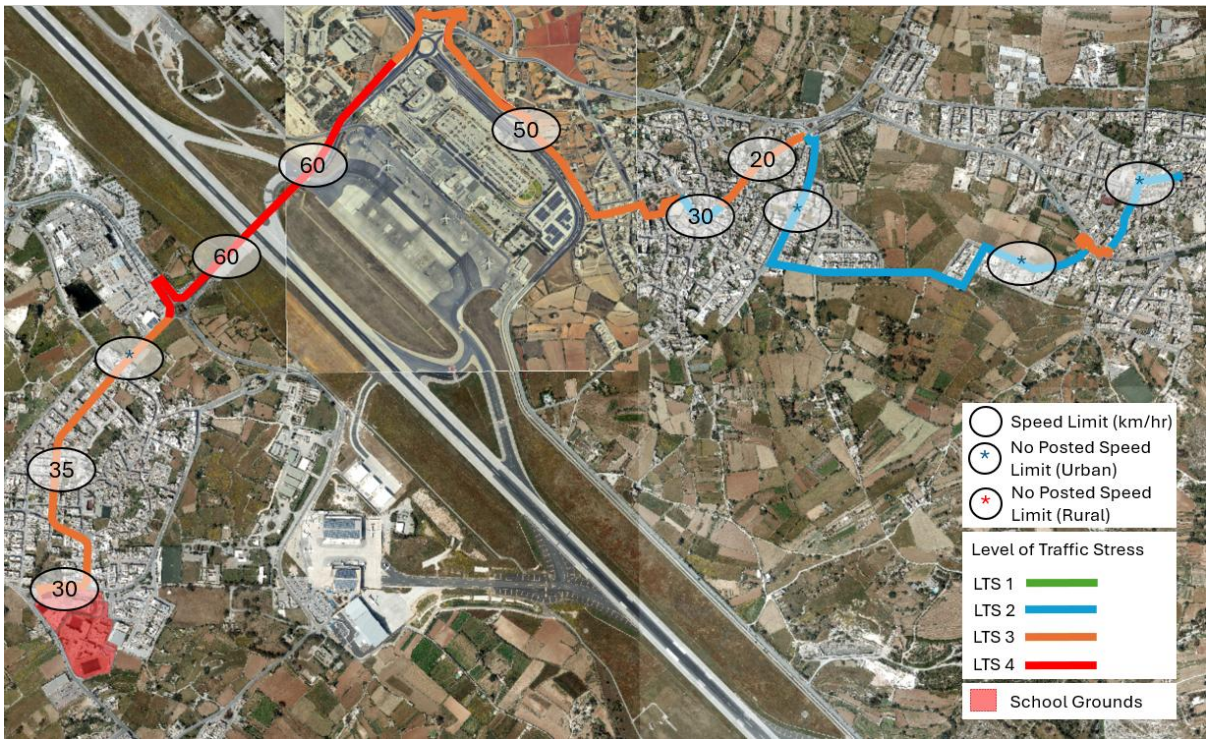


Figure 44 *LTS of Għaxaq and Gudja Routes*
(Source: Base map: SIntegraM orthophotos (2018), Planning Authority. Map created by author in ArcGIS Pro)

Due to the safety risks identified, this route is not recommended for school commutes. In fact, students living in these areas should ideally rely on school transport rather than being encouraged to cycle. The tunnel in particular poses a significant hazard, which may help explain why, as shown in Section 2.2.2 Figure 17, no secondary school students currently cycle to school from Gudja and Għaxaq.

4.4.3 Qrendi and Mqabba Routes

The route from Qrendi offered a generally pleasant and enjoyable cycling experience, particularly due to its passage through scenic rural areas.

Figure 45 *Qrendi and Mqabba Routes Reference 1*
(Source: Base map: SIntegraM orthophotos (2018), Planning Authority. Map created by author in ArcGIS Pro & Photos taken by author during site observations, June 2025)

Several pelican crossings along the way facilitated safe and convenient road crossings (Figure 45).

Image D	Width	Condition
Footpath 1	0.9m	P
Footpath 2	2.1m	G
Road	15.7m*	G
Total width =20.9m**		

Image F	Width	Condition
Footpath 1	1.0m	G
Footpath 2	1.1m	M
Road	16.5m*	G
Total width =19.9m**		

Figure 46 *Qrendi and Mqabba Routes Reference 2*
(Source: Base map: SIntegraM orthophotos (2018), Planning Authority. Map created by author in ArcGIS Pro & Photos taken by author during site observations, June 2025)

Although there were no dedicated cycle lanes along the route, most roads were either wide or had very little traffic. While speed limits weren't posted, cars generally drove slowly due to the natural constraints of the road, allowing cyclists to feel reasonably safe (Figure 46). The only road in Qrendi that didn't share these characteristics is marked as LTS 3 in Figure 48.

Figure 47 *Qrendi and Mqabba Routes Reference 3*
(Source: Base map: SIntegraM orthophotos (2018), Planning Authority. Map created by author in ArcGIS Pro & Photos taken by author during site observations, June 2025)

As the route approached the core of Qrendi, the transition into quieter urban streets further enhanced the experience, with minimal vehicular traffic contributing to a relaxed and pleasant experience (Figure 47).

The LTS and Speed Limits of these routes were determined as follows:

Figure 48 *LTS of Mqabba and Qrendi Routes*
(Source: Base map: SIntegraM orthophotos (2018), Planning Authority. Map created by author in ArcGIS Pro)

4.4.4 Safi Route and Żurrieq Route 1

These routes offer the shortest distance from external localities to get to the school. However, certain safety concerns were identified during the observation.

Figure 49 *Safi Route and Żurrieq Route 1 Reference 1*
(Source: Base map: SIntegraM orthophotos (2018), Planning Authority. Map created by author in ArcGIS Pro & Photos taken by author during site observations, June 2025)

There was no dedicated cycling infrastructure in the urban area connecting Żurrieq to Kirkop, and traffic was heavy, especially during peak hours, however, various zebra crossing points were available (Figure 49).

Figure 50 *Safi Route and Żurrieq Route 1 Reference 2*
(Source: Base map: SIntegraM orthophotos (2018), Planning Authority. Map created by author in ArcGIS Pro & Photos taken by author during site observations, June 2025)

However, after passing through the main urban zone, a cycle lane and zebra crossings were available, allowing for a safer approach to the school, where the cycle lane stops at a crossing and cyclists can cross the road or join the traffic flow. (Figure 50).

Figure 51 *Safi Route and Żurrieq Route 1 Reference 3*
(Source: Base map: SIntegraM orthophotos (2018), Planning Authority. Map created by author in ArcGIS Pro & Photos taken by author during site observations, June 2025)

Safi lacked cycling infrastructure as well, but the narrow roads had very little traffic, making the ride relatively safe despite the absence of designated lanes (Figure 51).

The LTS and Speed Limits of these routes were determined as follows:

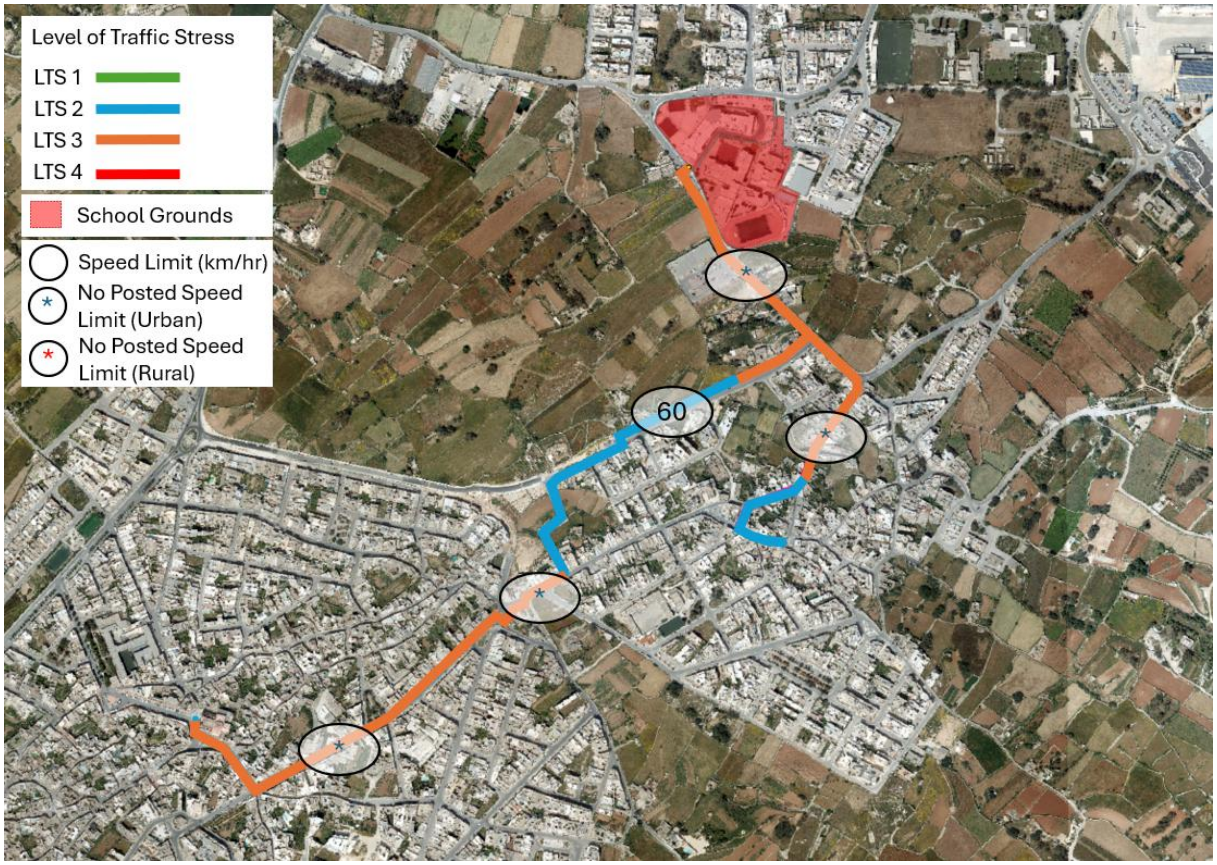


Figure 52 *LTS of Safi Route and Żurrieq Route 1*
(Source: Base map: SIntegraM orthophotos (2018), Planning Authority. Map created by author in ArcGIS Pro)

4.4.5 Żurrieq Route 2

This was also among the shorter routes and was identified as a likely option for students residing in the lower part of Żurrieq.

Figure 53 *Żurrieq Route 2 Reference 1*
(Source: Base map: SIntegraM orthophotos (2018), Planning Authority. Map created by author in ArcGIS Pro & Photos taken by author during site observations, June 2025)

This route followed a main road with no dedicated cycling lanes and heavy traffic, resulting in an overall sense of insecurity (Figure 53).

Figure 54 *Żurrieq Route 2 Reference 2*
(Source: Base map: SIntegraM orthophotos (2018), Planning Authority. Map created by author in ArcGIS Pro & Photos taken by author during site observations, June 2025)

Overgrown prickly pear plants along the roadside also posed a potential hazard to cyclists, underscoring the need for improved vegetation maintenance (Figure 54).

The LTS and Speed Limits of this route were determined as follows:

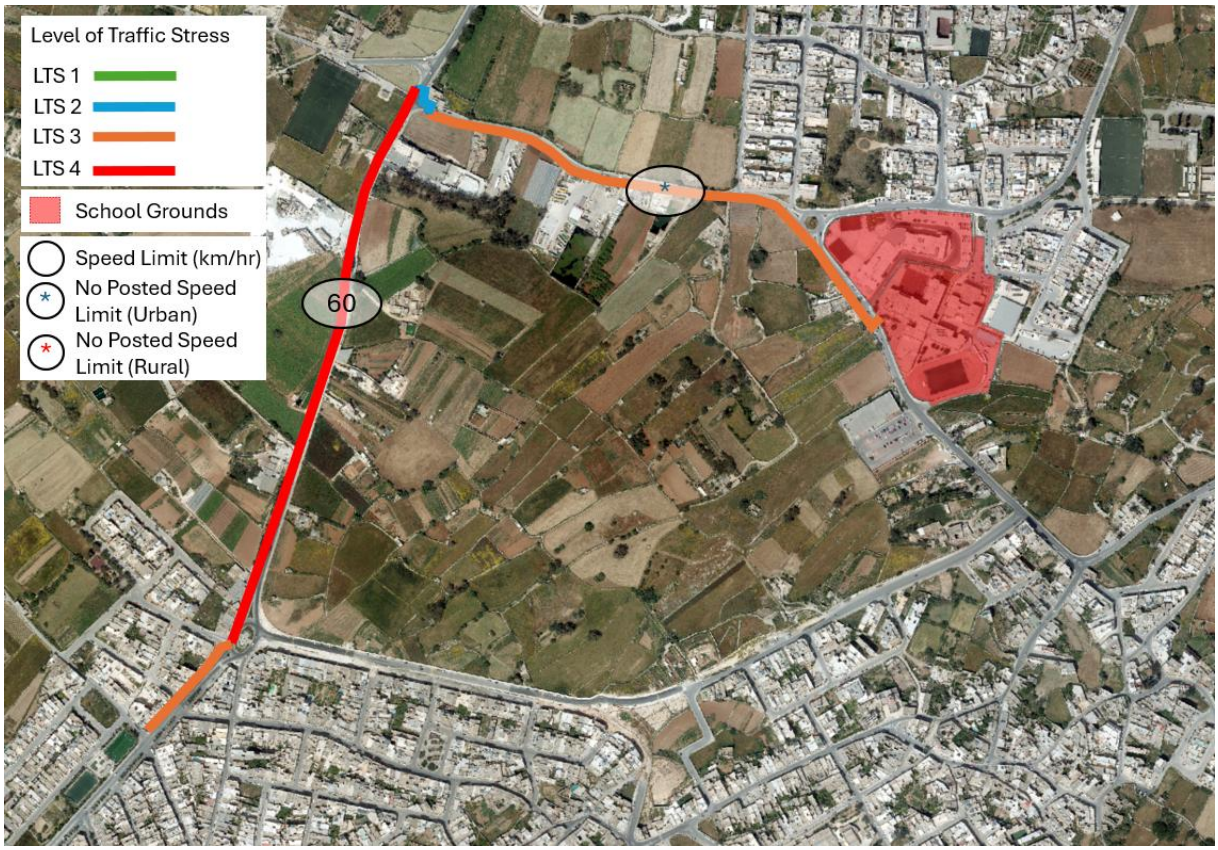


Figure 55 *LTS of Żurrieq Route 2*
(Source: Base map: SIntegraM orthophotos (2018), Planning Authority. Map created by author in ArcGIS Pro)

4.4.6 Kirkop

Overall, Kirkop is a quite town with not a lot of general traffic passing through due to the more direct surrounding main roads.

Image A	Width	Condition
Footpath 1	1.8m	M
Footpath 2	2.1m	M
Road	8.1m	G
Total width =11.3m		

Image B	Width	Condition
Footpath 1	1.5m	G
Footpath 2	1.2m	G
Road	7.6m	G
Total width =10.43m		

Image N	Width	Condition
Footpath 1	0.5m	M
Road	3.7m	G
Total width =3.9m		

Figure 56 *Kirkop Reference 1*
(Source: Base map: SIntegraM orthophotos (2018), Planning Authority. Map created by author in ArcGIS Pro & Photos taken by author during site observations, June 2025)

The footpaths in the area are generally in good condition, but at certain points they become too narrow to walk comfortably. Several missing links were observed, even around the perimeter of the school. While there are no dedicated cycling lanes, and most streets have light traffic, cyclists may still feel uneasy when vehicles pass closely (Figure 56).

Figure 57 *Kirkop Reference 2*
(Source: Base map: SIntegraM orthophotos (2018), Planning Authority. Map created by author in ArcGIS Pro & Photos taken by author during site observations, June 2025)

Around the peripheral of the school there are various signs in place to alert the drivers to the presence of a school zone and to reduce speed to 30km/h. However, beyond these signs, there are no additional traffic-calming measures to reinforce safe driving behaviour (Figure 57).

Figure 58 *Kirkop Reference 3*
(Source: Base map: SIntegraM orthophotos (2018), Planning Authority. Map created by author in ArcGIS Pro & Photos taken by author during site observations, June 2025)

Various crossing points are located for safe access from all directions to the school (Figure 58).

The LTS and Speed Limits of Kirkop were determined as follows:

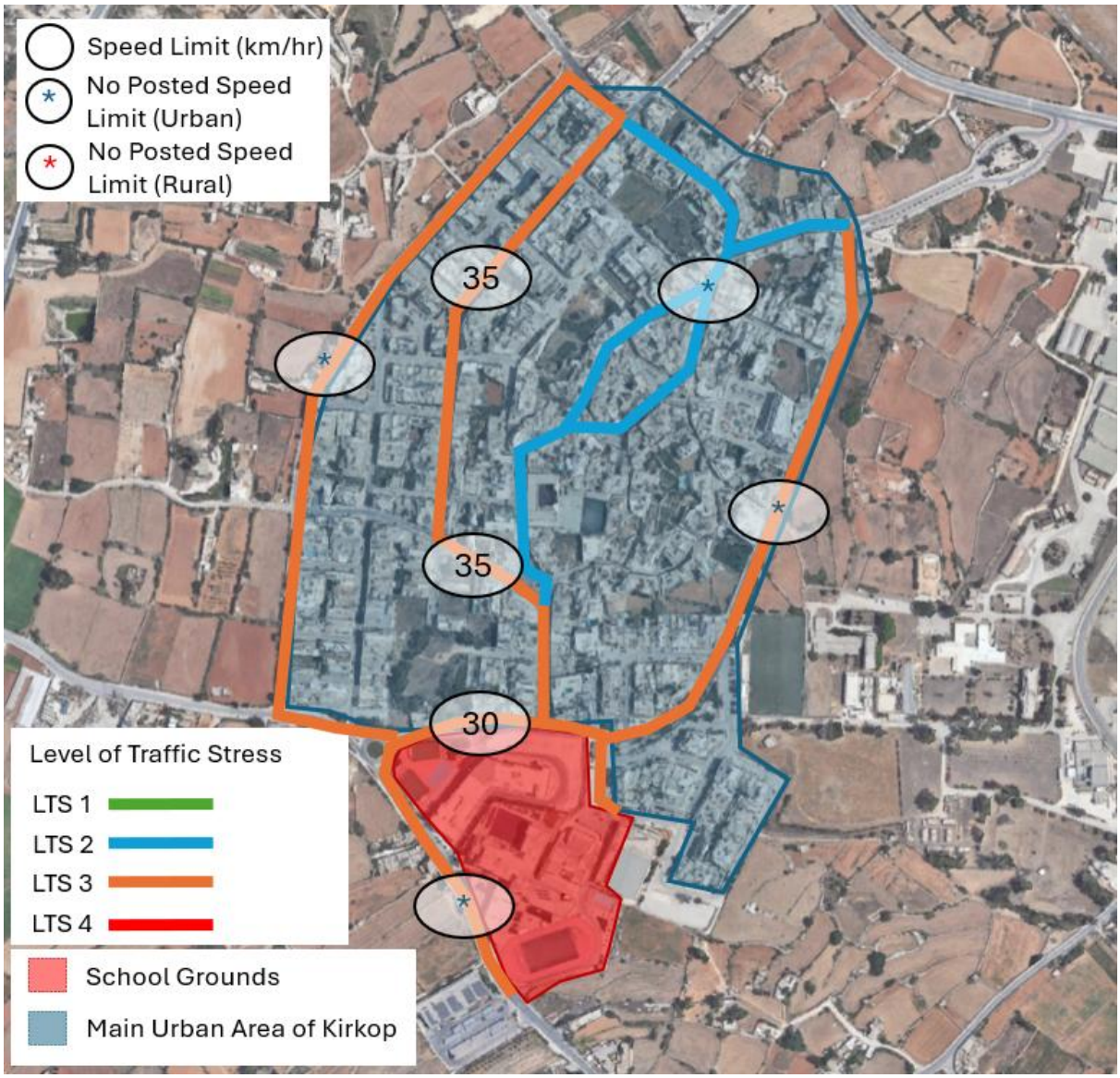


Figure 59 *LTS of Kirkop*
(Source: Base map: SIntegraM orthophotos (2018), Planning Authority. Map created by author in ArcGIS Pro)

Although the area surrounding the school offers a relatively safe environment for pedestrians, it presents a high LTS for cyclists, particularly during school opening and closing times, as illustrated in Figure 59. Despite the 35 km/h speed limit, the segment was classified as LTS 3 due to the high volume of traffic observed on-site and the limited space available for cyclists to safely navigate alongside passing vehicles.

4.5 Cross-Comparison and Interpretation

The combined analysis of data provides a full picture of the opportunities and barriers to active mobility for students attending the case study school.

Across all data sources, safety concerns consistently emerged as the most significant barrier to walking and cycling. Survey feedback from both students and parents highlighted the lack of safe infrastructure, such as continuous, cycling lanes, narrow footpaths and protected crossings, as major deterrents. These concerns were echoed in interviews with local councils, school representatives, and NGOs, who acknowledged that although awareness of active mobility is growing, current infrastructure remains inadequate and inconsistent across localities.

Interview responses from local councils demonstrated varying levels of prioritisation. While Kirkop Local Council, being the host locality, showed greater involvement through events and safety initiatives, neighbouring councils like Qrendi displayed less direct engagement. This imbalance suggests that school catchment areas that span multiple jurisdictions require stronger inter-locality coordination to deliver equitable access to safe commuting options.

Meanwhile, school administrators and NGOs offered contrasting yet complementary perspectives: schools highlighted age-related safety concerns and limited independence among younger students, while NGOs stressed the need for improvements to national policies and planning and cultural shifts to normalise active travel.

Observations and GIS mapping of the main routes confirmed the fragmented nature of Malta's active mobility infrastructure. Many routes lacked dedicated lanes, safe crossings, or maintained footpaths, especially in areas further from the school. Even where infrastructure existed, discontinuities and traffic hazards diminished its effectiveness.

Taken together, the findings suggest that while awareness and interest in active mobility are increasing, tangible improvements to infrastructure, policy coordination, and cultural perception are needed to support a real shift.

Chapter 5: Recapitulation and Conclusion

5.1 Research Objectives

This dissertation was guided by the research objectives outlined in Chapter 1, with each stage of the methodology carefully designed to address them in a structured and coherent manner. This section evaluates how each objective was approached, the methods employed to address it, and the extent to which the objective was achieved. For each research objective, the relevant data collection tool is identified, along with the rationale behind its use, its implementation process, and a concise summary of the key findings. This structured analysis allows for a clear assessment of the study's overall effectiveness in meeting its intended goals.

Objective 1

To assess the current levels of active mobility among the middle and secondary school students at a Maltese College and identify key barriers preventing increased participation.

In order to achieve this objective, the *surveys* were conducted and distributed among the students and parents/guardians. This dual target approach ensured that the commuting behaviours of students could be assessed alongside the perceptions and concerns of their caregivers, offering a more comprehensive understanding of the situation.

This method was selected as the most effective means of collecting large-scale quantitative and qualitative data on commuting habits, preferences, and perceived barriers. Including both students and guardians allowed the research to explore decision-making dynamics within households and gather insight into factors such as safety concerns, distance, convenience, and infrastructure adequacy.

The survey consisted of four sections: general commuting patterns, socio-demographic data, perceptions of active mobility, and a deeper qualitative view allowing for open-ended responses.

A total of 317 participants responded to the survey. Notably, 88% of the student responses came from the Middle School cohort, resulting in limited representation from the Secondary School students. This imbalance affected the overall representativeness of the data for the entire college population. While the survey provided valuable insights,

the researcher acknowledges dissatisfaction with the overall response rate, particularly among older students.

This shortfall may be attributed to several factors: younger students are often more closely monitored by their parents/guardians, who are more likely to engage in school-related initiatives; the timing of the data collection may have coincided with a period of academic pressure or disinterest; and finally, the topic itself may not have resonated strongly with older students, particularly given the common perception that Malta is not equipped with adequate infrastructure to support safe active mobility. Interestingly, while many respondents expressed support for the concept of active mobility, there was widespread reluctance to embrace it locally, citing safety concerns. This sentiment could also explain the limited enthusiasm to participate in the survey among those who perceive the issue as impractical within the current Maltese context.

Therefore, the surveys partially met the research objective as it did provide valuable insight into current travel behaviours and perceptions among Middle School students and their guardians. However, the underrepresentation of Secondary School students limits the generalisability of the findings across the full adolescent age range.

Summary of Surveys Main Findings

The current levels of active mobility among students at St. Benedict College are relatively low, with most students relying on private vehicles for their daily school commute. While a small number of students walk or cycle, particularly those living closer to the school, this behaviour remains the exception rather than the norm.

The key barriers preventing increased participation in active mobility include safety concerns due to inadequate infrastructure, such as the lack of dedicated cycle lanes, unsafe pedestrian crossings, and traffic chaos near school zones. Additionally, negative parental perceptions, limited independence among younger students, and Malta's hot climate further discourage walking and cycling as viable commuting options.

Objective 2

To evaluate the safety, infrastructure, and connectivity of walking and cycling routes in school zones and provide recommendations for improvements.

To address this objective, a combination of GIS mapping and on-site route observations were employed. This method was chosen to allow for both a visual and physical assessment of the existing infrastructure used by students commuting to the case study school. Routes from several key localities, identified through literature review and online mapping platforms, were mapped and walked or cycled by the researcher (reference photos at Appendix D). The assessment focused on footpath and road conditions, availability of cycling infrastructure, crossing points, signage, speed limits and general safety. Observations were made in accordance with legal constraints, including those outlined in S.L. 65.26 (2004), which regulates where and how bicycles may be used, particularly in pedestrian areas and tunnels. This hands-on method provided valuable insight into the quality and accessibility of the routes.

Summary of Route Assessments Main Findings

Findings revealed that most routes lacked dedicated cycling infrastructure and presented safety concerns such as narrow or absent footpaths, lack of cycling infrastructure, and high-speed traffic without calming measures or segregation for pedestrians. The evaluation successfully met the objective of identifying existing issues, the second part of the objective - providing recommendations for improvements - will be explored in the subsequent section.

Objective 3

To review current policies on student mobility and recommend actionable policy changes to enhance and support active commuting initiatives.

This objective was approached through a combination of the literature review and semi-structured interviews with key stakeholders, including local council representatives, school administrators, and NGOs.

The literature review provided a foundational understanding of international and national frameworks, highlighting best practices and common shortcomings in active mobility policy. This was then supported by interview data, which was used to gain context-specific insights on how these policies are implemented (or lacking) within the Maltese context. The qualitative nature of this approach allowed for the identification of several key issues, including fragmented responsibilities between stakeholders, limited national guidance, and a lack of student-focused strategies. The objective was largely achieved through the triangulation of policy analysis and stakeholder perspectives. However, the actionable policy changes derived from these findings are presented in more detail in Section 5.2.

Summary of Interviews Main Findings

A summary of the main findings gathered from the interviews is provided in table 11 hereunder.

Table 10 *Interview Findings Summary*

Stakeholder Group	Key Themes	Main Findings
Local Councils (Kirkop & Qrendi)	Policy, Infrastructure, Community Engagement	Kirkop Local Council demonstrated active involvement in student mobility, with collaboration efforts and a stronger commitment to infrastructure improvement. Qrendi Local Council acknowledged student travel issues but lacked targeted initiatives and school-specific engagement.
Schools (Middle & Secondary)	Safety Concerns, Parental Involvement, Policies	Middle School highlighted younger students' reliance on guardians, concerns over traffic and unsafe crossings. Secondary School reported more independence among older students and noted the effectiveness of internal cycling permit policies.
NGOs (Rota & Project Aegle)	Advocacy, Program Implementation, Collaboration	Rota focused on infrastructure shortcomings and advocated for policy reform and stakeholder coordination. Project Aegle provided insights into practical safety training and educational campaigns but highlighted logistical challenges and limitations in outreach.

Cross-objective insights

Although each method was originally designed to address a specific objective, the results presented in Chapter 4 offered broader insights that contributed to multiple aspects of the study.

The analysis of this cross-comparison was explored in section 4.6.

5.2 Discussion and Recommendations

The main aim for this dissertation has been to answer the core research question:

What improvements can be made to Malta's road infrastructure to create a safer cycling and walking environment for middle and secondary school students commuting to school?

Throughout the study, it became evident that while upgrading road infrastructure is essential, it is not enough on its own. For real and lasting change, improvements must go hand in hand with stronger policy support and a shift in cultural attitudes towards active mobility. These three pillars, infrastructure, policy, and mindset as illustrated in Figure 60 below, are interconnected and equally vital. One cannot be effective without the others.

This section explores each of these pillars, how they interact, and offers practical, evidence-based recommendations within the context of student mobility. Together, they form a roadmap for making school commutes in Malta safer, more sustainable, and more accessible for young people.

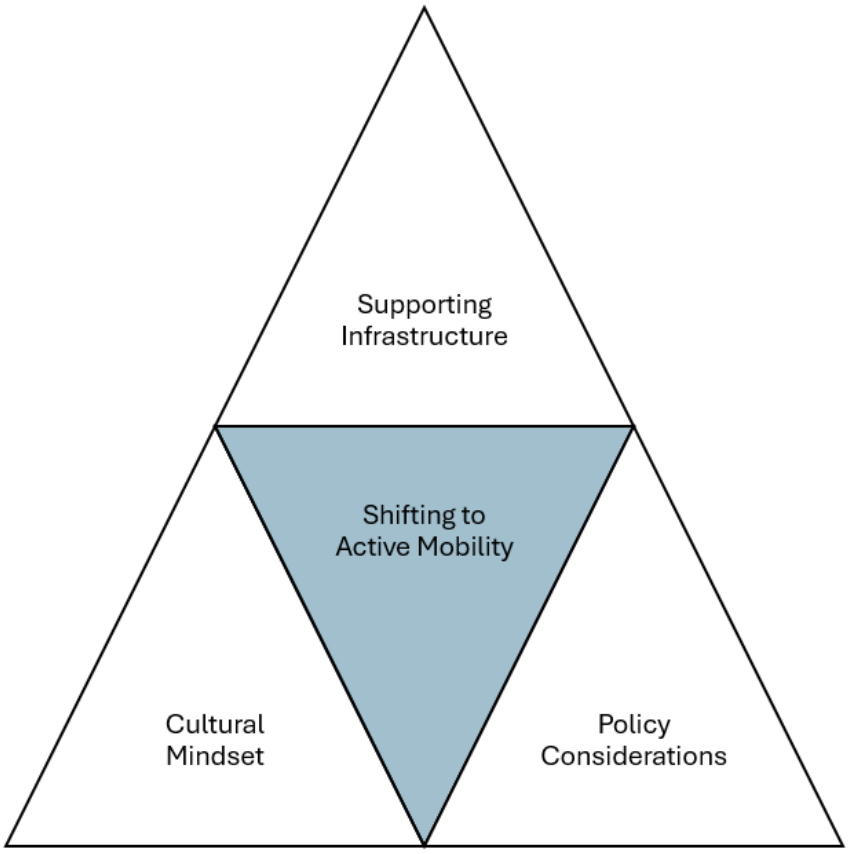


Figure 60 *Three Pillars for Shifting to Active Mobility in Malta (Source: Author, 2025)*

5.2.1 Supporting Infrastructure

Infrastructure remains the most tangible and essential pillar in advancing active mobility. Without safe, connected, and student-friendly walking and cycling routes, it is difficult to encourage behavioural shifts or implement effective policies. Targeted infrastructural improvements that reduce the LTS increase confidence (Mekuria et al., 2012) in active mobility, which in turn supports public willingness and policy success.

While international frameworks such as the Dutch CROW Design Manual (2016) (discussed in Section 2.1.3) offer valuable guidance, their full application in Malta is limited by differences in urban scale, road widths, and land use. However, the core principles of coherence, directness, safety, attractiveness, and comfort remain highly relevant and should be adapted to fit Malta's unique context.

A context-sensitive approach that blends these principles with practical, locally appropriate interventions is necessary. This means focusing on achievable upgrades that respect Malta's physical constraints and travel culture.

The ongoing development of the National Cycling Route Network (see Section 2.2.4) is a promising step forward. This initiative promotes coherent, longer-distance cycling routes and can improve school travel by connecting residential areas to schools with safer, clearly marked paths (Ministry for Transport, Infrastructure & Capital Projects, 2023).

This aligns with findings by Buehler & Pucher, (2012), who point out that when cycling networks are fragmented or discontinuous, people are consistently discouraged to take up cycling, even in countries with supportive policies. In Malta, the lack of connected infrastructure appears to have a similar discouraging effect, which is further exacerbated due to the dense urbanisation.

The infrastructural shortcomings identified in this study, such as fragmented cycle lanes, missing footpaths, and unsafe crossings, mirror international evidence that disjointed networks strongly discourage cycling uptake (Buehler & Pucher, 2012). However, Malta's dense urban form and narrow roads make these gaps more critical compared to larger European contexts. For example, routes classified as LTS 2 in this study were still perceived as unsafe by parents in the surveys and stakeholders during the interviews, highlighting that in Malta, the threshold for what is considered "safe enough" may be higher due to spatial and cultural constraints. This nuance suggests that while Dutch

CROW principles provide valuable direction, they must be adapted to Malta's scale and travel culture to be effective.

At the local level, innovative ideas like the underground public car park proposed by Kirkop Local Council (see Table 4, Section 4.3.1) show how rethinking space use can bring multiple benefits. Moving cars underground frees up street space for wider footpaths, protected cycle lanes, green areas, and safer routes to school, improving mobility and quality of life.

By improving infrastructure, we don't just make roads safer, we can build streets that prioritise student safety, health, and independence, while acknowledging Malta's unique challenges. We also make it easier to implement supportive policies and help shift public attitudes. In this way, infrastructure acts as the foundation that supports and strengthens the other two pillars.

5.2.2 Policy Considerations

The second pillar plays a vital role in shaping a system that actively supports walking and cycling to school. While infrastructure provides the physical foundation, policy enables, regulates, and protects its use. Strong policies not only legitimize active mobility through official support, but also ensure accountability, coordination across stakeholders, and long-term sustainability. When thoughtfully designed and enforced, policy frameworks can directly influence community behaviour, reduce risks, and encourage cultural acceptance.

To strengthen this in the Maltese context, several key policy recommendations are proposed. First, the introduction of child-specific cycling licences could be explored (similar to the *karta rowerowa* in Poland (Mazowsze, 2025). as discussed in section 2.1.4), not as a restrictive measure, but as a means to educate students on road rules and cycling safety, while simultaneously boosting parental confidence. This would help formalise cycling as a legitimate commuting method for students.

Secondly, liability laws should be reviewed and updated to better protect vulnerable road users, including children. Current legal frameworks often place an unfair burden of responsibility on cyclists and pedestrians (Times of Malta, 2015). To shift this balance

following examples from countries like the Netherlands where stronger motorist liability is enforced can create safer road-sharing environments.

Slimmen & Van Boom's (2017) findings show that the Dutch liability regime, where motorists are presumed liable, improved both actual and perceived cyclist safety. Similarly, Piatkowski et al. (2017) concluded that education and policies are most effective when integrated with infrastructural improvements.

Another important recommendation is to expand the use of timed road closures or vehicle access restrictions around schools during peak drop-off and pick-up times. This has been effective in several international and local contexts in reducing traffic volume, lowering accident risk, and promoting a safer environment for walking and cycling.

The policy gaps highlighted in this research, especially the absence of presumed liability laws, directly reinforce earlier concerns raised in the Maltese context (Abela Caruana, 2023). International findings, such as those by Slimmen & Van Boom (2017), show that presumed motorist liability not only improves actual cyclist safety but also strengthens public confidence in cycling as a legitimate mode of transport. This aligns with the parental concerns identified in my survey data, where liability and safety anxieties were frequently cited as barriers. Similarly, the proposal for a child cycling licence reflects successful practices abroad, such as Poland's karta rowerowa (Mazowsze, 2025) but also responds to Malta-specific issues of parental mistrust and limited road safety education. In this way, my findings reinforce the importance of policy as both a regulatory tool and a cultural signal of legitimacy for active mobility.

Ultimately, supportive policies not only make the road safer, but they also reinforce infrastructure improvements and encourage mindset shifts. When parents see that laws are designed to protect their children and enable active travel, their willingness to embrace change grows. Just as important, children begin to see cycling and walking as normal, accepted, and respected forms of transport. Together, the policy pillar strengthens and amplifies the other two, creating a more balanced and supportive system for student mobility.

5.2.3 Cultural Mindset

The third and perhaps most challenging pillar in the shift toward active mobility in Malta is cultural mindset. While infrastructure and policy lay the physical and legislative groundwork, it is people's attitudes, habits, and perceptions that ultimately determine whether walking and cycling will succeed as everyday modes of school transport. In Malta, this presents a particularly tough barrier. As indicated in the surveys, a deeply ingrained vehicle-centric culture continues to dominate, with many seeing private vehicles as the default mode of transport. This mindset not only discourages behavioural change but also makes it harder to implement infrastructure and policy improvements due to public resistance.

The effects of this cultural resistance are especially visible in the allocation of road space. With narrow streets in many localities and a strong emphasis on on-street car parking, active mobility infrastructure like cycle lanes is often deprioritised or seen as an inconvenience. As a result, proposed improvements are frequently met with backlash, further delaying or watering down efforts that could benefit students and the broader community.

In both student and parental surveys, it is reflected that the car-centric mindset is very dominant in Malta. Chillón et al. (2011) argues that parental perceptions often outweigh distance or infrastructure in shaping school travel choices. This study's findings confirm this, where despite some routes being objectively low-stress (LTS 2), uptake remained minimal because parents perceived them as unsafe. This aligns with Piatkowski et al.'s research (2017), which emphasises that behavioural change requires both infrastructural and cultural support. However, Malta provides a unique challenge due to the narrow roads and strong car-parking priorities, intensifying backlash against reallocating space for walking or cycling. The success of walking and cycling buses in Section 2.2.2 shows that community-led initiatives can help shift attitudes, but without cultural encouragement, infrastructural and policy efforts risk falling short.

Changing this mindset requires both time and targeted intervention. One promising recommendation is the expansion of walking buses and bicycle buses. These are programmes where groups of students travel together to school under adult supervision. These initiatives not only promote active travel in a safe and social setting but also help shift community perceptions by demonstrating that active commuting is both feasible

and beneficial (Times of Malta, 2023). Their proven success, as noted in Section 2.2.2, shows that when the right structures and support are in place, parents and students are willing to embrace new habits.

Public education campaigns, student-led awareness initiatives, and local community events can further normalise walking and cycling (Pisoni et al., 2021). Schools can play a major role by celebrating “walk or cycle to school” days and rewarding participation, gradually embedding these values into everyday school culture. Parents must also be engaged, not just through information, but by offering real, visible improvements that build trust and confidence.

Ultimately, culture shapes behaviour. If Malta is to move toward a future where active mobility is truly accessible and embraced by students, we must look beyond asphalt and legislation and focus on shifting hearts and minds. This pillar is the glue that holds the others together; because without cultural acceptance, even the best infrastructure and policies risk going unused.

5.2.4 Concluding Remarks

Promoting active mobility among middle and secondary and middle school students requires a holistic approach beyond isolated efforts.

Safe walking and cycling depend on infrastructure design, yet infrastructure alone is not enough; supportive policies protecting vulnerable users and promoting education are essential. Ultimately, lasting change hinges on shifting cultural attitudes to make active travel both safe and desirable.

No single stakeholder can achieve this alone. A collaborative effort among local councils, schools, transport authorities, NGOs, and families are vital. By addressing all three pillars together, Malta can create a safer, more sustainable, and student-friendly school travel environment benefiting the whole community.

5.3 Contributions to knowledge and future research

Despite the limitations discussed in section 5.3, key trends and concerns relating to school mobility were successfully identified for a significant portion of the target population. The data was sufficient to inform infrastructure recommendations, though further studies with improved targeting of older student groups would strengthen future research outcomes.

This study can also serve as a supporting document for stakeholders such as local councils, Transport Malta and head of schools to enhance their respective projects related to active mobility and/or as a base line for further related research.

Additionally, the implementation of dedicated routes for middle and secondary school in the area under study students can be considered, however, further research to identify the safest and most reliable routes would be ideal.

Finally, this dissertation also brings a new approach to local research by using the LTS framework to assess how safe and accessible school commuting routes are. Since LTS categories were originally developed for larger countries with different road conditions and cycling cultures, applying them directly to Malta has shown that they don't always fit perfectly. This highlights a clear opportunity for future research: developing an LTS model that's tailored specifically to Malta. Such a model would better reflect the way people drive here, the types of roads we have, and how safe people actually feel when walking or cycling. By pointing out where the current framework falls short, this study helps pave the way toward creating tools that are more suited to our local context.

5.4 Self-reflection

Throughout this study, it has become clear that there is no one-size-fits-all solution. Approaches that succeed abroad do not always translate seamlessly to Malta, where the urban, cultural, and environmental context presents unique challenges. Reflecting on the three pillars, I realized that an imbalance between them creates major challenges. They must be considered together because focusing on just one pillar can be undermined by issues in the others.

Throughout this research, I learned the importance of patience and pragmatism. Ambitious goals are vital, but without realistic, incremental steps, progress stalls. By concentrating on student mobility and advocating for small, targeted interventions along school routes, this work embraces a practical approach that can build momentum over time. This strategy not only aims to improve connectivity but also nurtures a cultural shift among younger generation, encouraging them to imagine a less car-dependent Malta.

On a personal level, this process deepened my understanding of the complexities involved in transport planning and behavioural change. It challenged me to balance idealism with realism and to appreciate the value of collaboration across sectors. I've grown more aware that meaningful change is as much about people and culture as it is about infrastructure and policy. This insight has inspired me to continue advocating for holistic, context-sensitive solutions in my future work.

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Appendices

This section presents the resources and results for each research method as follows:

Only select resources are included in the appendices to comply with current GDPR regulations.

Appendix A - Information Letters and Consent Forms for Surveys and Interviews

Information Letter sent to Middle and Secondary Schools at St Benedict's College, Kirkop to request permission to conduct research

My name is Nicole Casha and I am a student at the University of Malta, presently reading for a Master of Engineering (Civil Engineering). I am presently conducting a research study for my dissertation titled Enhancing Infrastructure and Road Safety to Promote Active Mobility for Teenagers' School Trips: A Case Study of a Maltese College. This study aims to promote active mobility among secondary students for their school commute by addressing safety, environmental conditions, infrastructure, traffic, accident rates, and the connectivity of cycling routes. Additionally, seeking to reduce road traffic, particularly during peak hours, by encouraging walking and cycling. This initiative aims to increase physical activity among young people, fostering healthier lifestyles and contributing to a reduction in obesity rates among Maltese youth. The survey that you have been invited to complete forms part of this study. This project is being conducted under the supervision of Dr Odette Lewis.

I am hereby seeking your permission to conduct a brief 5-10-minute questionnaire survey to be completed by students and their parents/guardians. The survey will be distributed either on paper during class or via a link on iLearn and will primarily consist of questions to support my data collection.

Participation will be entirely voluntary, and participants may withdraw at any time without consequence. All responses will remain anonymous, as no personal data will be collected. Only my supervisors, examiners and I will have access to this data.

Should you require further information, please do not hesitate to contact me or my supervisor; both our contact details are provided below.

Thank you for your kind consideration of this request.

Sincerely,

_____ _____

Nicole Casha Dr Odette Lewis

Information Letter for interview participants

Dear Participant,

My name is Nicole Casha and I am a student at the University of Malta, presently reading for a Master in Engineering (Civil Engineering). I am conducting a research study for my dissertation titled Enhancing Infrastructure and Road Safety to Promote Active Mobility for Teenagers' School Trips: A Case Study of a Maltese College; 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 examine the current state of walking and cycling infrastructure in Malta and its impact on encouraging active mobility among teenagers commuting to school. Your participation in this study would help contribute to a better understanding of the barriers and facilitators influencing active transportation among adolescents, which can inform future policy and infrastructure developments. 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 take part in an interview where you will share your experiences and perceptions regarding active mobility and school trips. This will take you approximately 30-45 minutes to complete.

Data collected will be treated confidentially and anonymised. The findings which emerge from this research may be published (e.g., in a dissertation, academic journals) and/or presented (e.g., during conferences, meetings). Your name (or any other identifying information) will not appear when the findings are reported. Raw identifiable data will be encrypted and stored offline on an external hard drive or flash drive. Any material in hard copy form will be placed in a locked cupboard. Only my supervisor and myself (and in exceptional cases, examiners) will have access to this data.

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 erasure of data would render impossible or seriously impair 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; however, if any risks arise, I will take measures to ensure your comfort and safety throughout the process.

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 will be stored in an anonymised form following the completion of the study and the publication of results.

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, you may contact myself or my supervisor on the details provided below.

Yours Sincerely,

_____ _____

Nicole Casha *Dr Odette Lewis*

I, the undersigned, give my consent to take part in the study conducted by Nicole Casha. This consent form specifies the terms of my participation in this research study.

1. I have been given written and/or verbal information about the purpose of the study; I have had the opportunity to ask questions and any questions that I had were answered fully and to my satisfaction.
2. I also understand that I am free to accept to participate, or to refuse or stop participation at any time without giving any reason and without any penalty. Should I choose to participate, I may choose to decline to answer any questions asked. In the event that I choose to withdraw from the study, any data collected from me will be erased as long as this is technically possible (for example, before it is anonymised or published), unless erasure of data would render impossible or seriously impair achievement of the research objectives, in which case it shall be retained in an anonymised form.
3. I understand that I have been invited to participate in an interview in which the researcher will ask questions regarding my insights and experiences related to active mobility for school trips to explore the impact of infrastructure and safety on promoting cycling among adolescents. I am aware that the interview will take approximately 30-45 minutes. I understand that the interview is to be conducted in a place and at a time that is convenient for me.
4. I understand that my participation does not entail any known or anticipated risks.
5. I understand that there are no direct benefits to me from participating in this study; however, I understand that this research may benefit others by informing infrastructure development and policy decisions that promote active mobility.
6. I understand that, under the General Data Protection Regulation (GDPR) and national legislation, I have the right to access, rectify, and where applicable, ask for the data concerning me to be erased.
7. I understand that all data collected will be stored in an anonymised form upon completion of the study and following the publication of results within 10 years of the study completion.
8. I am aware that my identity and personal information will not be revealed in any publications, reports or presentations arising from this research.

9. I have been provided with a copy of the information letter and understand that I will also be given a copy of this consent form.
10. I am aware that, by marking the first tick box below, I am giving my consent for this interview to be audio recorded and transcribed.

    ☐ I agree to this interview being audio recorded.
    ☐ I do not agree to this interview being audio recorded.

11. I am aware that extracts from my interview may be published (e.g., in a dissertation, academic journals) and/or presented (e.g., during conferences, meetings), either in anonymous form, or using a pseudonym (a made-up name or code, e.g., respondent A).
12. I am aware that, by marking the first tick-box below, I am giving my consent for the identity of the organisation I represent to be revealed in publications (e.g., in a dissertation, academic journals), reports or presentations (e.g., during conferences, meetings), arising from this research, and responses I provide may be quoted directly or indirectly.

    ☐ I agree that the identity of the organisation I represent may be disclosed in publications/presentations.
    ☐ I do not agree that the identity of the organisation I represent may be disclosed in publications/presentations.

I have read and understood the above statements and agree to participate in this study.

Name of participant: _____ Date: _____

Signature: _____

_____ _____

Nicole Casha *Dr Odette Lewis*

Consent Form for survey participants

My name is Nicole Casha, and I am currently completing a Master of Engineering (Civil Engineering) at the **University of Malta**. I am conducting research aimed at promoting active travel, like cycling and walking, for students commuting to school. This study will look at ways to improve road safety, environmental conditions, traffic flow, and the quality of infrastructure, with a goal of encouraging more physical activity among students and contributing to a healthier lifestyle.

This questionnaire is designed for middle and secondary school students and their parents or guardians to gather input on commuting experiences. Participation is entirely voluntary and will take approximately 5 - 10 minutes to complete. You are free to accept or refuse to participate.

Important Information:

- **Privacy**: This survey is anonymous. We do not ask for names or any other identifying information.
- **Anonymity**: We will not collect IP addresses for online responses, and physical questionnaires will not be marked with any identifying details.
- **Voluntary Participation**: Participation is optional, and you can choose not to participate by closing the survey without submitting it.
- **Data Use**: The responses collected will be used solely for this research study and will contribute to understanding how to make commuting safer and healthier for young people in Malta.

If you and your child/child under your supervision agree to participate, please complete the questionnaire together. Your responses will help us understand what can make commuting safer and more enjoyable.

Should you have any questions or concerns, please feel free to contact me or my supervisor at the details provided below.
Yours Sincerely,

Nicole Casha	**Dr Odette Lewis**

CONSENT DECLARATION

For Parents/Guardians:
I hereby confirm that I am 18 years of age or older. By agreeing to participate, I confirm that I am the parent or guardian of a participating child. I understand that this questionnaire is anonymous and that completing it implies voluntary participation with full informed consent under the conditions listed above.

For Students:
I understand that my responses will remain anonymous and that I can skip any questions if I do not want to answer them.

Yes, we agree to participate – Begin survey
No, we do not wish to participate – Exit survey

Appendix B – Surveys

Survey Questions

Statistics related to Study

This section is to be filled by Parent/Guardian.

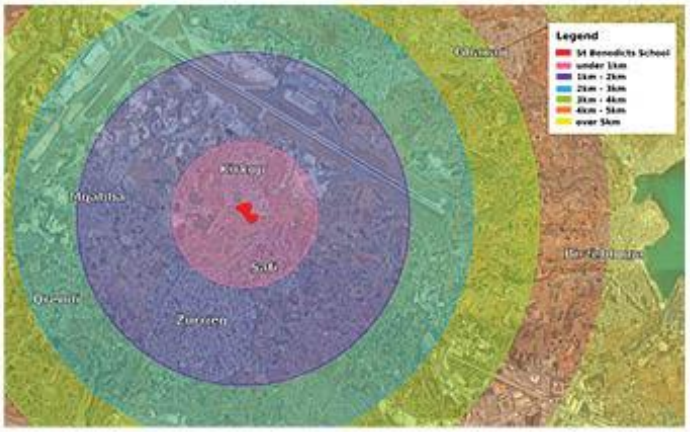
1.1 Locality of Residence

- ☐ Birzebbuga
- ☐ Ghaxaq
- ☐ Gudja
- ☐ Kirkop
- ☐ Mqabba
- ☐ Qrendi
- ☐ Safi
- ☐ Zurrieq
- ☐ Other

please specify: _____

1.2 Distance from Home to School

- ☐ Under 1km
- ☐ Between 1km to 2km
- ☐ Between 2km to 3km
- ☐ Between 3km to 4km
- ☐ Between 4km to 5km
- ☐ Over 5km



1.3 Amount of driving licence holders in household _____

1.4 Number of cars in household _____

1.5 Number of bicycles in household _____

1.6/1.7 How are student/s going to school

Number from most used [1] to least used [6]

- ☐ School Transport
- ☐ Public Transport
- ☐ Escorted by car
- ☐ Cycling
- ☐ Walking
- ☐ Other

please specify: _____

Socio-demographic Section

Each person has a seperate column to fill.

Parent/Guardian	Student 1	Student 2
2.1.1 Age ☐	2.2.1 Age ☐	2.3.1 Age ☐
2.1.2 Gender ☐ Male ☐ Female ☐ Other	2.2.2Gender ☐ Male ☐ Female ☐ Other	2.3.2 Gender ☐ Male ☐ Female ☐ Other
2.1.3 Nationality ☐	2.2.3 School ☐ Middle School ☐ Secondary School	2.3.3 School ☐ Middle School ☐ Secondary School
2.1.4 Marital Status ☐ Single ☐ Married ☐ Separated ☐ Divorced ☐ Registered Partnership ☐ Widowed	2.2.4 School Year ☐ Year 7 ☐ Year 8 ☐ Year 9 ☐ Year 10 ☐ Year 11	2.3.4 School Year ☐ Year 7 ☐ Year 8 ☐ Year 9 ☐ Year 10 ☐ Year 11
2.1.5 Employment outside of home ☐ Full-Time ☐ Part-Time ☐ Unemployed		
2.1.6 Highest level of Education ☐ Secondary Education ☐ Post-secondary non-tertiary ☐ Tertiary Education		

Perception towards Active Mobility

Each person has a seperate column to fill.

Parent/Guardian	Student 1	Student 2
Value of Active Mobility		
Section 3.1.1	Section 3.2.1	Section 3.3.1
Walking to work is important ☐ Yes ☐ No	Walking to school is important ☐ Yes ☐ No	Walking to school is important ☐ Yes ☐ No
Cycling to work is important ☐ Yes ☐ No	Cycling to school is important ☐ Yes ☐ No	Cycling to school is important ☐ Yes ☐ No
Personal Barriers		
Section 3.1.2	Section 3.2.2	Section 3.3.2
Walking to school takes my child too much time ☐ Yes ☐ No	Walking to school takes too much time ☐ Yes ☐ No	Walking to school takes too much time ☐ Yes ☐ No
Cycling to school takes my child too much time ☐ Yes ☐ No	Cycling to school takes too much time ☐ Yes ☐ No	Cycling to school takes too much time ☐ Yes ☐ No
It involves too much planning ahead to walk or cycle to school ☐ Yes ☐ No	It involves too much planning ahead to walk or cycle to school ☐ Yes ☐ No	It involves too much planning ahead to walk or cycle to school ☐ Yes ☐ No
It is not convenient for my child to walk or cycle to school because of their after-school schedule ☐ Yes ☐ No	I get too hot and sweaty walking or cycling to school ☐ Yes ☐ No	I get too hot and sweaty walking or cycling to school ☐ Yes ☐ No

Perception towards Active Mobility

Each person has a seperate column to fill.

Parent/Guardian	Student 1	Student 2
Personal Barriers		
	I have too much stuff to carry to walk or cycle to school ☐ Yes ☐ No	I have too much stuff to carry to walk or cycle to school ☐ Yes ☐ No
	I do not want to or like to walk to school ☐ Yes ☐ No	I do not want to or like to walk to school ☐ Yes ☐ No
	I do not want to or like to cycle to school ☐ Yes ☐ No	I do not want to or like to cycle to school ☐ Yes ☐ No
Convenience		
Section 3.1.3.1	**Section 3.1.3.2**	**Section 3.1.3.3**
It is easier for someone to drive my child to school, on the way to something else ☐ Yes ☐ No	Do you agree with the answer? ☐ Yes ☐ No If no, why?	Do you agree with the answer? ☐ Yes ☐ No If no, why?

Perception towards Active Mobility

Each person has a seperate column to fill.

Parent/Guardian	Student 1	Student 2
Social Support Tick which option you relate best from [1] to [5]		
3.1.4a I encourage my child to walk to school ☐ 1 (highly agree) ☐ 2 ☐ 3 (neutral) ☐ 4 ☐ 5 (highly disagree)	3.2.3a My friends encourage me to walk to school ☐ 1 (highly agree) ☐ 2 ☐ 3 (neutral) ☐ 4 ☐ 5 (highly disagree)	3.3.3a My friends encourage me to walk to school ☐ 1 (highly agree) ☐ 2 ☐ 3 (neutral) ☐ 4 ☐ 5 (highly disagree)
3.1.4b I encourage my child to cycle to school ☐ 1 (highly agree) ☐ 2 ☐ 3 (neutral) ☐ 4 ☐ 5 (highly disagree)	3.2.3b My friends encourage me to cycle to school ☐ 1 (highly agree) ☐ 2 ☐ 3 (neutral) ☐ 4 ☐ 5 (highly disagree)	3.3.3b My friends encourage me to cycle to school ☐ 1 (highly agree) ☐ 2 ☐ 3 (neutral) ☐ 4 ☐ 5 (highly disagree)
3.1.4c The school encourages my child to walk to school ☐ 1 (highly agree) ☐ 2 ☐ 3 (neutral) ☐ 4 ☐ 5 (highly disagree)	3.2.3c The school encourages me to walk to school ☐ 1 (highly agree) ☐ 2 ☐ 3 (neutral) ☐ 4 ☐ 5 (highly disagree)	3.3.3c The school encourages me to walk to school ☐ 1 (highly agree) ☐ 2 ☐ 3 (neutral) ☐ 4 ☐ 5 (highly disagree)
3.1.4dThe school encourages my child to cycle to school ☐ 1 (highly agree) ☐ 2 ☐ 3 (neutral) ☐ 4 ☐ 5 (highly disagree)	3.2.3d The school encourages me to cycle to school ☐ 1 (highly agree) ☐ 2 ☐ 3 (neutral) ☐ 4 ☐ 5 (highly disagree)	3.3.3d The school encourages me to cycle to school ☐ 1 (highly agree) ☐ 2 ☐ 3 (neutral) ☐ 4 ☐ 5 (highly disagree)

Perception towards Active Mobility

Each person has a seperate column to fill.

Parent/Guardian	Student 1	Student 2
Social Support Tick which option you relate best from [1] to [5]		
3.1.4e In my neighbourhood, many parents walk or cycle to work ☐ 1 (highly agree) ☐ 2 ☐ 3 (neutral) ☐ 4 ☐ 5 (highly disagree)	3.2.3e Alot of my friends walk or cycle to school ☐ 1 (highly agree) ☐ 2 ☐ 3 (neutral) ☐ 4 ☐ 5 (highly disagree)	3.3.3e Alot of my friends walk or cycle to school ☐ 1 (highly agree) ☐ 2 ☐ 3 (neutral) ☐ 4 ☐ 5 (highly disagree)
Environmental Barriers		
Section 3.1.5	**Section 3.2.4**	**Section 3.3.4**
It is too far for my child to walk to school ☐ Yes ☐ No	It is too far for me to walk to school ☐ Yes ☐ No	It is too far for me to walk to school ☐ Yes ☐ No
It is too far for my child to cycle to school ☐ Yes ☐ No	It is too far for me to cycle to school ☐ Yes ☐ No	It is too far for me to cycle to school ☐ Yes ☐ No
Weather conditions do not permit my child to walk to school ☐ Yes ☐ No	Weather conditions do not permit me to walk to school ☐ Yes ☐ No	Weather conditions do not permit me to walk to school ☐ Yes ☐ No
Weather conditions do not permit my child to cycle to school ☐ Yes ☐ No	Weather conditions do not permit me to cycle to school ☐ Yes ☐ No	Weather conditions do not permit me to cycle to school ☐ Yes ☐ No

Perception towards Active Mobility

Each person has a seperate column to fill.

Parent/Guardian	Student 1	Student 2
Safety Perceptions		
Section 3.1.6.1	Section 3.1.6.2	Section 3.1.6.3
There are no footpaths along the way ☐ Yes ☐ No		
There are no cycle paths along the way ☐ Yes ☐ No		
There is too much traffic to school ☐ Yes ☐ No		
There are too many dangerous intersections along the route to school ☐ Yes ☐ No		
It is unsafe for my child to walk to school ☐ Yes ☐ No	Do you agree with the answer? ☐ Yes ☐ No	Do you agree with the answer? ☐ Yes ☐ No
It is unsafe for my child to cycle to school ☐ Yes ☐ No	Do you agree with the answer? ☐ Yes ☐ No	Do you agree with the answer? ☐ Yes ☐ No
	If you answered no to the above, why?	If you answered no to the above, why?

Perception towards Active Mobility

Each person has a seperate column to fill.

Parent/Guardian	Student 1	Student 2
Decision Making		
Section 3.1.7.1	Section 3.1.7.2	Section 3.1.7.3
It is up to the parents/ guardians to decide if their child walks or cycles to school ☐ Yes ☐ No	Do you agree with the answer? ☐ Yes ☐ No	Do you agree with the answer? ☐ Yes ☐ No
It is up to my child to decide if he/she walks or cycles to school ☐ Yes ☐ No	Do you agree with the answer? ☐ Yes ☐ No	Do you agree with the answer? ☐ Yes ☐ No
	If you answered no to the above, why?	If you answered no to the above, why?

A more in-depth view

Each person has a seperate column to fill.

Parent/Guardian	Student 1	Student 2
What do you think needs to be done to ensure safety for when someone is walking/ cycling to school?		
4.1.1	4.2.1	4.2.1
What do you think of the current initiatives that are being done by the school to encourage cycling?		
4.1.2	4.2.2	4.2.3
Any additional comments?		
4.1.3	4.2.3	4.3.3

Data from Surveys

Total number of participants: 317 (153 parents/guardians + 164 students)

Section 1: Statistics related to Study

1.1 Locality of Residence

Locality	Responses
Birżebbuġa	30
Għaxaq	27
Gudja	10
Kirkop	21
Mqabba	46
Qrendi	14
Safi	18
Żurrieq	134
Luqa	5
Paola	2
Tarxien	2

1.2 Distance from Home to School

Distance	Responses
Under 1km	49
Between 1km and 2km	126
Between 2km and 3km	40
Between 3km and 4km	36
Between 4km and 5km	30
Over 5km	28

1.3 Amount of driving licence holders in household

Amount	Responses
1	44
2	247
3	11
4	0
5	2

1.4 Number of cars in household

Amount	Responses
0	6
1	58
2	192
3	38
4	9
5	2
6	2

1.5 Number of bicycles in household

Amount	Responses
0	86
1	72
2	69
3	34
4	21
5	21
6	4

1.6 /1.7 How are student/s going to school

Transport	1st Preference Responses	2nd Preference Responses	3rd Preference Responses
School Transport	205	8	1
Public Transport	2	0	3
Escorted By Car	74	28	0
Cycling	0	0	0
Walking	28	3	13
Other	0	1	0

Section 2: Socio-demographic section

Parent/Guardian

2.1.1 Age

Age	Responses
30-40	35
40-50	96
50-60	19
60+	1

2.1.2 Gender

Gender	Responses
Male	33
Female	120
Other	0

2.1.3 Nationality

Nationality	Responses
Maltese	148
Other	4

2.1.4 Marital Status

Status	Responses
Single	8
Married	126
Separated	10
Divorced	3
Registered Partnership	2
Widowed	0

2.1.5 Employment outside of home

Employment	Responses
Full-Time	111
Part-Time	16
Unemployment	25

2.1.6 Highest level of Education

Education	Responses
Secondary Education	44
Post-secondary non-tertiary	41
Tertiary Education	68

Students

2.2.1 (and 2.3.1) Age

Age	Responses
10	1
11	40
12	71
13	26
14	15
15	2

2.2.2 (and 2.3.2) Gender

Gender	Responses
Male	62
Female	98
Other	1

2.2.3 (and 2.3.2) School

School	Responses
St Benedict's College, Middle School Dr Maria Sciberras, Kirkop	142
St Benedict's College, Secondary School Pietru Pawl Saydon, Kikop	19

2.2.4 (and 2.3.2) School Year

Year	Responses
Year 7	69
Year 8	74
Year 9	10
Year 10	8
Year 11	1

Section 3: Perception towards Active Mobility

Parent/Guardian

3.1.1 Value of active mobility

	Yes	No
Walking to work is important	104	47
Cycling to work is important	83	67

3.1.2 Personal Barriers

	Yes	No
Walking to school takes my child too much time	89	61
Cycling to school takes my child too much time	50	99
It involves too much planning ahead to walk or cycle to school	102	48
It is not convenient for my child to walk or cycle to school because of their after-school schedule	83	67

3.1.3 Convenience

3.1.3.1 It is easier for someone to drive my child to school on the way to something else

Yes	118
No	32

3.1.3.2 (and 3.1.3.3) Do you agree with the answer? And if no, why? (this question was for the students)

Yes	160
No	1

- (Previous answer: No) No it would be easier

3.1.4 Social Support

3.1.4a I encourage my child to walk to school

Agreeability	Responses
1 (highly agree)	24
2	8
3 (neutral)	40
4	23
5(highly disagree)	56

3.1.4b I encourage my child to cycle to school

Agreeability	Responses
1 (highly agree)	8
2	6
3 (neutral)	24
4	24
5(highly disagree)	89

3.1.4c The school encourages my child to walk to school

Agreeability	Responses
1 (highly agree)	22
2	22
3 (neutral)	63
4	17
5(highly disagree)	29

3.1.4d The school encourages my child to cycle to school

Agreeability	Responses
1 (highly agree)	22
2	21
3 (neutral)	53
4	18
5(highly disagree)	37

3.1.4e In my neighbourhood, many parents walk or cycle to work

Agreeability	Responses
1 (highly agree)	7
2	7
3 (neutral)	18
4	24
5(highly disagree)	96

3.1.5 Environmental Barriers

	Yes	No
It is too far for my child to walk to school	87	65
It is too far for my child to cycle to school	72	80
Weather conditions do not permit my child to walk to school	93	59
Weather conditions do not permit my child to cycle to school	89	63

3.1.6 Safety Perceptions

3.1.6.1

	Yes	No
There are no footpaths along the way	76	76
There are no cycle paths along the way	103	49
There is too much traffic to school	108	43
There are too many dangerous intersections along the route to school	120	32
It is unsafe for my child to walk to school	102	50
It is unsafe for my child to cycle to school	119	32

3.1.6.2 (and 3.1.2.3) Do you agree with the answers? If no, why? (this question was for the students)

Yes	163
No	5

- No, there is one dangerous tunnel.
- No, I don't think it's unsafe to walk.
- If one is careful there are no dangers.
- No, because mum worries for nothing.
- No - I think it's safe to walk from Luqa to Kirkop.

3.1.7 Decision Making

3.1.7.1

	Yes	No
It is up to the parents/guardians to decide if their child walks or cycles to school	136	16
It is up to my child to decide if he/she walks or cycles to school	57	95

3.1.7.2 (and 3.1.7.3) Do you agree with the answers? If no, why? (this question was for the students)

Yes	157
No	10

- No as I would like to decide myself, but my parents are very strict on health and risk issues.
- No, I want to be able to make that decision.
- No, because parent should not control method of transport.
- No because I am fully capable of making my own decisions.
- No because we are responsible.
- Children are old enough to decide for themselves

Students

3.2.1 (and 3.3.1) Value of active mobility

	Yes	No
Walking to school is important	122	37
Cycling to school is important	98	57

3.2.2 (and 3.3.2) Personal Barriers

	Yes	No
Walking to school takes too much time	104	51
Cycling to school takes too much time	68	84
It involves too much planning ahead to walk or cycle to school	104	50
I get too hot and sweaty walking or cycling to school	115	38
I have too much stuff to carry to walk or cycle to school	135	18
I do not want to or like to walk to school	84	68
I do not want to or like to cycle to school	90	59

3.2.3 (and 3.3.3) Social Support

3.2.3a My friends encourage me to walk to school

Agreeability	Responses
1 (highly agree)	12
2	13
3 (neutral)	47
4	32
5(highly disagree)	53

3.2.3b My friends encourage me to cycle to school

Agreeability	Responses
1 (highly agree)	9
2	3
3 (neutral)	32
4	26
5(highly disagree)	86

3.2.3c The school encourages to walk to school

Agreeability	Responses
1 (highly agree)	24
2	27
3 (neutral)	61
4	19
5(highly disagree)	26

3.2.3d The school encourages to cycle to school

Agreeability	Responses
1 (highly agree)	26
2	22
3 (neutral)	47
4	20
5(highly disagree)	43

3.2.3e A lot of my friends walk or cycle to school

Agreeability	Responses
1 (highly agree)	15
2	9
3 (neutral)	35
4	35
5(highly disagree)	61

3.2.4 (and 3.3.4) Environmental Barriers

	Yes	No
It is too far for me to walk to school	91	63
It is too far for me to cycle to school	69	84
Weather conditions do not permit me to walk to school	99	56
Weather conditions do not permit me to cycle to school	92	60

Section 4: A more in-depth view

Parent/Guardian

4.1.1 What do you think needs to be done to ensure safety for when someone is walking/cycling to school?

- More safety on the roads
- Cycling and pedestrian lanes and heaps of traffic safety
- More cycle lanes
- Better infrastructure and maybe lessons on how to cycle according to rules.
- A route has to be planned and proper bibs and supervision are preset including the carrying of the heavy backpack.
- Drivers need to use indicators and be stop at zebra crossings. Maltese drivers are very bad and selfish and lazy.
- If School is not in the same town, it's impossible for the children to walk or cycle alone, when he was primary school in the same location he used to go by walk but now it's impossible.
- Should be dedicated path and lanes, traffic control and enforcement (which is barely working - look at parents driving crazy at pick up time around the school)
- More supervision by authorities
- It needs to be in the same area, and you need to live in the same town or area.
- Walking and cycling paths
- Roads need to be cleared or the cycling supervised.
- The drivers need to keep an open eye on the steering wheel and the road.
- Transport Malta officers in the vicinity.
- Don't think much can be done to make roads safer for secondary school kids to ride or walk to school.
- Speed limit
- More paths and no stalkers!
- Lanes
- A continuous, uninterrupted cycle lane or footpath is needed.
- Educate drivers to respect cyclists, as some believe that roads are only for cars! Place marshals in busy roads during a particular time frame to ensure road safety and encourage walking cycling to school.
- None
- Barriers
- Cycle lanes
- More cycle lanes
- More traffic wardens and safety in roads
- I think an organised group is necessary
- Traffic lights or zebras
- Cycle lanes
- More police control in the roads
- Introducing more walking/cycling paths along with more awareness regarding safety towards pedestrians/cyclists

- More road safety
- Proper infrastructure with regards to walking and cycling lanes. A white line with paint on the road is a pitiful attempt at a cycling lane. We find joy in riding bicycles when abroad but find it unsafe in Malta.
- To ensure safety, there are many things to be done. I don't feel safe to let my daughter walk to school because to do so, she needs to cross a number of roads during the time people drive their way to work.
- More enforcement in roads to lessen dangers
- less traffic and more secure footpaths
- A correct bicycle policy to ensure safety precautions are taken
- Use of safety helmets
- Use of mobile phone for commute to school
- police patrol along main school route"
- safe paths and zebra crossings
- less cars
- 1. organise cycle groups to make it safer for the kids
  2. create barriered paths along the way put more security staff along the way to warn car drivers to slow down and give children precedent
- Adding footpaths and increase presence of Police and Transport Malta
- more cycle lanes
- Educate drivers and put wardens/police along the way to ensure safety.
- less cars, manage traffic better, cycle lanes, wider and safer footpaths
- wider cycle lanes
- create proper ways to cycle or walking
- various traffic lights, proper footpaths
- Proper walking and cycling lanes
- More cycle lanes
- Drivers should be more cautious and safer cycle paths to be implemented
- 1. Less cars and more footpaths for walking and cycling
  2. A route needs to be done from home to school that everyone would know about for me to send my child on foot/by bicycle.
- More pedestrian zones and more policeman on route.
- They need to observe their surroundings and pay attention on what's in front of them.
- Drivers need to be more educated in driving
- more footpaths and cycle paths and places appropriate to place the bicycles when at school
- There should be cycle lanes for cycling and footpaths all the way through.
- More police force present along the way to help ensure the safety of students.
- There is a lot of traffic.
- Car drivers to be more aware of pedestrians/cyclists. Ped + cyclists to be aware of cars.
- Supervision done by police or TM along the way where it is dangerous for children (such as main roads).
- To be aware of the cars

- Nothing can be done since there are various toads that you need to be careful to crosses + lights as some cars do not stop in time. I am referring to Kirkop to Mqabba route.
- too many factors to consider: too many roads to cross, too many cars, cars driving unsafely and too far to walk with school bag especially in rain and June.
- more crossroads and cycle lanes/walking lanes
- There needs to be a clear path, even in intersection of roundabouts.
- In my opinion we can add more walking and cycling paths because our children may get hurt since traffic is caused.
- Adequate cycle lanes which are separated from the road. Children are taught to ride a bicycle during P.E. They are taught highway security and the highway code. They should have their mobile with them in case of an accident.
- Create cycling lanes and safe footpaths
- Better footpaths, better traffic management
- Cycling road paths and zebra crossings
- More cycling tracks for young children also walking paths
- Staff/designated people can assist/stop traffic in front in front of school entrance speed limit around school areas max 30
- More bicycle lanes, traffic lights in strategic places so they can cross in a more secure manner
- There should be a traffic enforcement person near the school to assist with the traffic
- "Walking: footpaths, decreasing bag load and also appropriate attire be given as part of uniform for walking and cycling.
- Cycling: adult + Maltese culture awareness, policing, road safety by cleaning, schools provide bicycle bays!"
- security in roads, adequate passages and discipline in traffic
- more safe footpaths, something needs to be done on flyovers
- 1. the whole mentality has to be changed - not that easy
  2. reduce the amount of cars from roads (which is practically not possible)
- less cars in the area until children go into school, and there should be more motorbike lane.
- less traffic and cycle lanes
- I don’t agree with cycling. Too much traffic and confusion in the morning.
- Good footpaths and cycle lanes
- More footpaths and safety on the roads
- There should be a group cycle to school campaign with at least two adults. With the addition of cycle lane. Maybe by closing a road for the cycle to school route.
- footpaths, footpaths, cycle lanes, adequate lighting
- Adequate passages so there aren’t dangers when using bicycle for those students that live close to the school.
- Doesn't really have to do with safety but there are potholes everywhere and/or water flows to make puddles when it rains, so one wouldn't risk sending kids on foot to school and risk them being wet all day.
- walking paths, safety personnel always along the route, someone escorting group of kids.

- There should be a road closed where cars don’t pass through (during school hours)
- Nothing because I don’t agree
- Less cars and discipline in driving
- road closure around the school
- Cycle lanes don’t exist where we live to the school
- more secure roads for bicycles
- more maturity in driving
- Trackers can be attached to students backpacks to keep their mind at rest
- I think that there should be cameras to see if any accidents are happening or for supervision along the way. Also, some more footpaths and bicycle paths.
- Wider footpaths where part of them is for bicycle use (including crash barriers), as well as more traffic lights. It is important that there is a public official that ensure cars are driving responsibly in the school area (ex police, LESA, TM)
- Problem of traffic
- More safety because of cars / less traffic / walking in groups
- more secure road
- less cars on roads, which is impossible
- A more secure pathway and more initiatives to encourage students to cycle / walk to school
- less traffic and more pedestrian spaces
- More traffic lights and footpaths
- Our streets/roads are not safe for anyone walking or cycling. I do believe it to be beneficial health wise if my kids has to walk or cycle to school but I wouldn't think about it to let them walk or cycle in such busy roads and with all the crazy drivers!
- There needs to be a pedestrian zone. Most parents that use private transport park incorrectly and that’s why the area is not secure for children that walk/cycle.
- Less traffic / footpaths / zebra crosses
- less cars in roads and footpaths in every road
- cycle lanes, more traffic signals like traffic lights and zebra crossings
- cycle lane
- More discipline in roads
- Fix the road infrastructure to facilitate walking to school
- More and better footpaths made for children, with adequate signage and lighting, more cycle lanes separate from traffic.
- Less cars / bicycle lanes
- to walk to school there must be clear footpaths, zebra crossings with push on lights, no main roads or routes of heavy vehicles.
- make sure the person knows road safety rules and sticks to them
- There needs to be more paths that are sage
- More cycle lanes
- First of all, it is not a matter of safety. In my family's case it is too far
- More cycle lanes and police officers present in route at the travelling time for students.
- More human resources to guide traffic and ensure safety in our roads

- Enforcement from government entities during peak hours mainly the main roads that lead to school
- More pedestrian crosswalks for safety and cycle lanes
- More cycle lanes available
- More segregated cycle paths
- Footpaths, ensure more safety in roads, more traffic wardens present
- More footpaths for children to walk and traffic lights for where they can cross the roads

4.1.2 What do you think of the current initiatives that are being done by the school to encourage cycling?

- They are quite few
- Not interested
- Not much. This week is bike week, and we haven't used the bicycle yet and today is already Wednesday.
- The roads leading to the school do not fall within the remit of the school there are other entities who are responsible for the safety and maintenance of the roads leading to the school.
- I do not know of any
- Good
- I don't think it's efficient, we have much bigger problems in Malta then could be sorted by school program
- I totally agree
- Our roads are not always good to make bicycle lanes as a lot of them they start and finish without giving choice but to end up cycling in the middle with cars.
- I don't know of any such
- It's pretty good
- Not encouraged enough
- School has no big influence in such decision
- It good but my son doesn't know how to ride a bicycle
- Not encouraging
- Not know of any initiatives
- They're too feeble an attempt. If the uptake is to increase, the school must incentivise students and their families to walk/cycle. Collaboration with local councils will be required.
- The initiatives are good in principal, but the roads are not safe not to mention the heavy bag the students have to carry, which makes it impossible to walk to school. My kids complain that they don't have enough locker time between lessons to leave much of the stuff at school.
- fair enough
- I do not know about them
- Good but not enough
- It is not safe for all students
- I'm not aware

- Good
- The school is doing its best with the resources it has.
- I am not familiar with the initiatives, and the main reason is that my daughter does not have a bicycle.
- It’s a good initiative but for me as a parent I'm scared to trust my daughter to walk or cycle when there's traffic in the road.
- I am not aware about them
- No initiatives I know of
- many Facebook blog posts
- My child can explain further on this one.
- I do not agree that my child cycles to school due to the tremendous amount of traffic. I think it is very dangerous for him to cycle to school carrying his school bag.
- If there are any, I don't know about them
- they are very encouraging but it's still unsafe for my child to go to school by bicycle
- Nothing. Malta in general is not safe for walking and cycling
- Activities need to be done frequently. They are not enough.
- Do not know much about this.
- very little
- There was a bike week where students were asked to take the bicycle to school for a week and practice during some lessons.
- Bike week is a nice idea but to implement it from home to school is immensely difficult!
- Don't like it
- I am not aware of any
- Haven't heard about them.
- I am not aware of any incentives. The one day they had to take the bicycle, the parents had to pick it up.
- bicycle parking bays
- My child was interested in attending but couldn't as talks took place while she had a practical to carry out. I understand that timetables are tight but something like this should be aimed to happen during breaks or for the whole school so that children who attend the talks don't miss important lessons.
- They are good, I agree, but today there are a lot of dangers unlike when I was still a child. I used to ride from Zabbar to Kalkara, but there was half or a quarter of the cars that are today.
- no matter how much school encourages the students to cycle to school Everyone knows that the Maltese roads are not safe for young cyclists.
- not informed about it
- bike week
- Cycling is fun and healthy. However, we live too far to cycle.
- The school uses so much resources to encourage our children to school.
- The school doesn't encourage walking and cycling that much because of the dangers (middle school). They have a lot of things to carry, especially for graphical design.

- Bike weeks are a good idea to encourage cycling
- School encourages the use of bicycles for transport purposes.
- More naturitive areas for the younger generation
- Not aware of these initiatives
- I don’t know about these initiatives; there needs to be a place for them to leave their bicycles.
- The school encourages us to take our children to school with the bicycle, but we never do this because of road safety.
- As far as I know this is not promoted, as above Maltese mentality and culture is way behind. Government to give incentives for children opting to cycle. Schools should introduce amend scheme for children cycling.
- it is good that one takes interest and raise awareness regarding these initiatives, it can encourage those who can actually walk/cycle to school/work.
- I do not agree - I don’t have a big car where I can put the bicycles in to take them to school, cycling to school is very dangerous, the students will be already tired after cycling from home to school and wont concentrate.
- good initiative
- to try riding a bicycle
- To my knowledge they don't encourage cycling.
- I strictly disagree
- Haven't heard of them
- They are good but cycling in the safety of the school grounds is not enough…it's a start but again nothing prepares you for the real road than practice.
- nothing is being done…no one has ever taught them how to follow rules and road signage
- I don't know of these initiatives
- there are no incentives encouraging kids to engage in walking/cycling
- Very good idea
- I don't agree
- Something good
- I don't know
- very good
- I don’t agree
- I think they are doing good as they are encouraging students to learn and have one at home
- we’re on the right track but it's not enough. the school has its limits
- its good but you need to consider traffic
- good
- good
- I am not aware of any initiatives
- they do well for the environment and better physical health for children
- for school I don’t agree, there are too many roads without cycling lanes to school, not enough footpaths and too much traffic
- Students who live close to the school such as Kirkop, Safi and Żurrieq could easily or cycle to school. The school encourages sports activities, walking and

has done cycling initiatives. But walking and cycling don't really apply to students living further away from school.
- not aware of any initiatives, but my child has shown interest to go by bicycle, however apart from not seeing it as safe, I have no way to know that my child arrived in school safely.
- I don’t agree because he has a long way from home to school.
- good that they encourage but I don’t trust him walking or cycling alone when the roads are full of traffic and dangerous driving.
- so far there is no place where students can leave their bicycles at school.
- I believe there needs to be more awareness on the importance of less cars
- Unless the trips to schools are flat land, I don’t agree that bicycles are used unless electric ones are used.
- Very good
- Not aware of any in my opinion. My child is not interested in cycling.
- Very good
- If there are any, I do not know about them
- In middle school there is no encouragement
- They do not apply to all students, depends on where they live
- Good initiatives, but they need to make sure that there aren’t any dangers in the road especially for the children that do not live in the same town as the school

4.1.3 Any additional comments?

- Weather conditions in Malta do not permit that much to walk or cycle to school
- Yes, unfortunately Malta is too overpopulated and burdened with the high flow of vehicles, so it is very difficult to entrust one's child to commute unsupervised to school.
- The asphalt in the road outside the school must be fixed and cars should not be allowed to park outside school. They triple park and the police do nothing. It is very unsafe, students of that age can walk a few meters and meet their parents parked properly a few meters away, but everyone is so lazy and the parents baby the children thus causing unnecessary chaos and danger.
- No l but even driving with a car with all these cars you need to be careful image bicycles!
- I am in favour of a healthy lifestyle, walking, cycling etc but I think there is much to be done before road are safe enough to encourage my kids to use these alternatives to get to school. I want to leave to work with peace of mind and not thinking of what they might encounter on the way there, so for now school transport is the only way to get to school.
- Cycling and walking are to be done in a safety environment. Today, traffic is everywhere, and it is best for students to go by school transport. That is my opinion after all.
- It's too far for my daughter to walk to school
- Please make it safe for the people in this country to walk and cycle!

- I agree with walking and cycling initiatives but due to the amount of traffic in our streets it is unsafe for our children to use them.
- Malta is dedicated for drivers only. It is a shame.
- My child's safety comes before walking and cycling.
- The students that I see riding a bicycle on the way to school, not all of them are following the rules of the road.
- Their bag pack is too heavy for them to walk to school!
- Our roads and drivers are too dangerous and need to respect more driving rules before encouraging children to walk or cycle. During summer days, uniform can be smelly, which creates need for extra uniform to change, likewise locker space at school!
- Leave cycling to be a mode of leisure/ enter tournament for the students in free time and not obliging students to come to school with a bicycle/walking.
  Even though students have school transport they arrive 45 mins later when school time finishes, let alone if they have to cycle/walk from school-home (~5km) then they have to start HW/do after school activities and will be already tired.
- 1. Children need to be taught from when they are young how to ride a bicycle, and bicycles should be ridden in narrow carless roads to avoid dangers from principle roads due to the quantity of roads that are in the country.
  2. They need to be taught to use their mobile until they arrive to school and then they give it to the school.
- Kids need to be taught the basic highway + safety code for cycling. This way maybe we can save the earth as well as get healthy kids. Weight of bags would have to be regulated also.
- I personally use the bicycle not just for exercise and I don't recommend my daughter to ride a bicycle alone...let alone from Birżebbuġa to Kirkop!
- Despite lockers, bags are still too heavy to walk with. Almost a year into Year 7 and my child is still scared to leave things in the locker.
- we need to trust our children more. we need to educate our children and parents on how to ride bicycles in the roads
- routes for bicycles can be organised. Denmark everyone rides a bicycle and drivers respect cyclists. Small children of 6 years old go out alone on a bicycle because it is safe for them.
- If points are identified where students can meet up with their bicycles with an adult so together, they can go to school, I would be more encouraged to let my child go to school by bicycle.
- Unattended students can be an easy target for bad intentioned adults
- My opinion, even a motorcycle is dangerous no matter what a bicycle on the road with that huge traffic going on.
- As a parent we are concerned that our children are not very inclined to walk or cycle to school as the environment around us is too urbanised.
- Students should not cycle to school – it is not safe
- I agree with walking and cycling initiatives but due to the amount of traffic in our streets it unsafe for my children to use them

- When it’s raining my children will get wet and when it's hot they will get sweaty and tired easily

Students

4.2.1 (and 4.3.1) What do you think needs to be done to ensure safety for when someone is walking/cycling to school?

- policeman, traffic wardens or MT enforcement officers along the main roads to ensure discipline from drivers
- Safe roads
- better walking paths, shade/trees, good placed zebra crossings.
- Ideally the student walks through pedestrianised areas which feel safe and are risk free.
- Cycling is very unsafe in Malta. Children and drivers need to be well educated on the rules of the road but unfortunately you cannot teach an old dog new tricks. The drivers don't know the rules and some secondary school students cross the road as if they own it without using the traffic lights or looking for oncoming traffic.
- Too far
- Walking paths, cycling paths and people driving carefully
- Too far for me
- Walking and cycling path
- Make sure the drivers respect the pedestrians
- Police officers controlling the traffic
- Stop all cars at school time
- Less cars
- More road supervision
- Walking/cycling lanes
- Make sure that the parent/guardian agrees to take the responsibility of letting their child attend to school on foot or cycling
- Encourage groups of students from same zones to cycle together, thus be more visible to passing cars. Always wear a helmet.
- Use pedestrian lane when crossing
- Cycle lanes
- Less traffic
- traffic wardens, more cycle paths
- One has to be alert of the traffic.
- Traffic lights or zebra's
- Wider payments
- Footpaths done better and less speeding
- Road safety
- Good infrastructure like wide footpaths and cycle lanes. A physical barrier between the road and footpath/cycle lane. Catey lights for when it gets dark. non-slip footpaths.

- lighter bags and more safety on roads
- to pay attention to road signs and prioritize road safety
- a small distance from home to school and zebra crossings
- less cars and more cycle lanes and zebra crossings
- 1. put more security cameras
- 2. create more countryside roads for kids to walk/ride along which cars can't enter
- more footpaths
- more bicycle stands
- more cycle lanes and I think it's possible because there are too many cars
- more footpaths
- make precedence to pedestrians
- 1. All traffic should be removed
  2. People use more the public transport
- Cycle lanes + more traffic lights"
- safer roads
- A lot of stuff.
- Drivers need to be more careful when someone is walking by or cycling
- Add footpaths and cycle paths. Places to place bicycles whilst at school.
- - cycle lanes
  -wear helmet
- cycle lanes on main roads
- Cameras and more footpaths and police
- to be more careful around their surroundings
- footpaths, dedicated cycle lanes, paths free from obstacles (parked cars, poles etc), lower speed limits near school/ speed cameras/speed bumps, clear signs (school zones, children crossing, cycle route, walking buses/cycle groups
- stay on the footpath, drive slow and safely.
- Cycle lanes, wear a helmet, not talking to strangers
- If the student will walk, make sure to look both ways before crossing and in the student is cycling when wear a helmet and when available use cycle pathways.
- I agree with my parent. Even weather conditions affect us.
- Paths, footpath
- I think for us kids to have more areas to cycle and walk
- I think a camera should be installed at every zebra cross
- walking: less cars on the road, footpaths, change school hours so that when we are going to school there is no traffic, more footpaths
  cycling: cycling lanes, protective equipment provided from school
- Put policemen at the start and end of school so children can't get runover.
- kids are often kidnapped, the traffic = lots of accidents
- at that time there needs to be a good amount of security like police.
- less traffic and teach us how to ride a bicycle
- More cycle lanes and traffic lights
- good footpaths and cycling lanes
- You would need a footpath and a zebra cross to stay safe when you cross

- This would be fun for small groups + with the time road closure would ensure safety. But our bags are too heavy!
- cycle lanes and more footpaths
- To pay attention to the cars
- more discipline in driving
- Police and road closure around the school
- Cycle lanes
- routes specifically for cyclists
- Police guiding traffic in school hours
- Less cars on the road
- Traffic lights be functional cause sometimes they're not
- Exactly what my guardian said
- Footpaths and closure of the narrow roads/country roads that we pass through in school times
- A lot of cars present and driving randomly
- anyone riding a bicycle or walking should wear a reflective jacket and helmet (for bicycle)
- More footpath / secure pathway / safer roads
- less traffic
- more places where cars can't pass through
- More zebra crosses, more lights, more bicycle lanes
- I wish they would close the roads at least for an hour before school starts.
- Less traffic / footpaths built better / zebra crosses
- There has to be a cycling lane
- drivers should drive responsibly
- better footpaths
- slower driving
- Reduce traffic and cars
- Be fit enough / eat breakfast / do not talk to strangers on your way to the school
- more zebra crossings so children can cross the road safely
- To cycle to school a proper place has to be available for me to leave my bicycle.
- Leave home early to have enough time to get to school calmly, know road safety rules and follow them
- Shorer paths
- Wider footpaths and cycle lanes
- Have good footpaths on which we can cycle too and adequate crossings
- more footpaths and less cars
- Bicycle lessons about how children should stay safe while cycling to school
- more footpaths with barriers and supervision of roads - cars drive too fast you don't feel safe.
- More zebra crosses, more lights, more bicycle lanes
- Needs to be more lanes for walking and cycling
- Bicycle lessons about how children should stay safe while cycling to school
- Everyone; walkers + cyclists, must stay on the side of the road
- More safety signs for cars and pedestrians
- Reduce the amount of cars on our roads and increase pedestrian roads

- More bicycle stands

4.2.2 (and 4.3.2) What do you think of the current initiatives that are being done by the school to encourage cycling?

- very few
- Good
- nothing in particular
- It is not an easy task apart from the fact that we are not used to cycle our way to school.
- Good but I don't know how to ride a bicycle
- I like them, but I don't think I'll start bicycle to school, walking yes
- I don’t have a bicycle
- It's great
- We are encouraged frequently
- No useful initiatives
- Good but I don't know how to ride a bicycle
- Not good no initiatives
- Not so many
- I think they are a very good idea and opportunity for the students to be responsible
- They're good but also grownups need to be informed that at certain hours students might also be using the roads.
- Nothing
- not sure
- fair enough
- I think they are good
- The instalment of bicycle racks
- Good initiative
- Good
- I think that they are fun but it doesn’t change the fact that it could be dangerous.
- I do not own a bicycle so it’s of little interest to me.
- I think it's interesting however I do not have a bicycle to participate in the activities.
- bicycle days and healthy environment posters
- not the best
- At schools, sometimes we have bicycle activities which I love. It gives me a good chance at learning road safety signs better
- bicycle lanes
- there are none
- we are not being encouraged to cycle to school
- very good initiatives
- not enough

- They taught us how to ride a bicycle safely and it is important but not everyone can do it
- I would get hit by a bus if I tried
- I don't remember
- Bike days
- bicycle week
- the only thing they did was a bike week and acknowledge safety about cycling.
- They organize 'bike week' and teach us how to ride a bicycle.
- not much - it's only one week in a scholastic year
- not informed about it.
- bike week
- Many people enjoy cycling but some students carry a lot of things or live far away and they can't walk/cycle to school.
- I agree with my parent - the school also shows us videos.
- During assembly they sometimes give us advise on how to use a bicycle
- there are no initiatives however there should be to reduce pollution and for us students to live a healthier lifestyle by cycling and walking which is good exercise.
- Bike day is a pretty good idea, to learn cycling.
- I think it is good, but for me it's too much dangerous.
- it is a good step for a cleaner life.
- They don't encourage cycling.
- I don't like it
- I like them. It helps us to be more careful when cycling/walking
- I couldn't take my bag as after that day I had to take it home and mum works.
- nothing
- Not many initiatives lately at school because of exams next June.
- good
- I don’t know
- Good
- I think they do a good job with activities that encourage cycling to school
- I think they are doing good as they are teaching us safely and what equipment do you need to ride a bicycle
- good
- Talks and environment awareness
- for the environment
- to school I don’t agree there’s too much chaos
- They are good
- I see posters to encourage us to use the bicycle frequently, but I have a long way from school, and I don’t know the streets very well.
- NONE
- The school encourages us, but I am scared to cycle with all that traffic.
- bike week
- school encourages us to use bicycle
- I think they encourage more students to cycle to school
- I think they are doing good since the use of the bicycle is better than that of a car and it is better for the environment.

- They are very good
- Having space to park the bicycle
- They are helpful for the environment
- They are educational but not enough to feel safe enough on the road.
- they are good
- there are none
- not bad
- They are good
- There are no initiatives that do so
- None initiatives
- In middle school we cannot come by bicycle
- Depends where they live

4.2.3 (and 4.3.3) Any additional comments?

- Enforce proper traffic management outside school and do not allow parking illegally
- Cycling and walking are fun and healthy activities that I wish were more accessible.
- I really want that every school puts bicycle racks with custom pad locks for student who arrive with said bicycle.
- I don't have a bicycle, and I am not sure I remember how to ride it.
- Pls don’t try to make me cycle. It is too hot, and my bag is heavy.
- If they will encourage us to walk/ cycle, there needs to be safer roads for this to happen.
- A good way for kids to get fit + healthy
- I wish to go by bicycle but there's no place to put it and after school I don’t feel like going by bicycle after a hot and long day.
- It is good for children to go to school alone but they need to be careful of the cars

Appendix C – Interviews

Interview Questions

1. Local Councils

1.1 Existing Infrastructure and Safety

a. What infrastructure is currently in place to support safe cycling and walking to the Middle and Secondary School of St. Benedict College, Kirkop?
b. Are there any ongoing or planned safety improvements specifically around the Middle and Secondary School of St Benedict College, Kirkop?

1.2 Policy and Initiatives

c. What policies or incentives does the council have to promote active commuting for middle and secondary school students?
d. How does the council enforce road safety near the Middle and Secondary School of St Benedict College, Kirkop?

1.3 Partnerships and Community Engagement

e. Are there partnerships with the Middle and Secondary School of St Benedict College, Kirkop or local groups to improve active mobility for students?
f. What efforts are made to engage the community on cycling and walking benefits?

1.4 Challenges and Improvements

g. What challenges exist in creating safer commuting routes for middle and secondary school students?
h. What improvements are most needed in school zone infrastructure?

1.5 Future Plans

i. What are the council's goals for supporting middle and secondary school student active mobility over the coming years?

2. Representatives at the Middle and Secondary School of St. Benedict College - Kirkop

2.1 Current Practices and Policies

a. What policies or initiatives does the school currently have in place to encourage active commuting, such as walking or cycling?
b. Are students encouraged to use alternative transportation, and if so, how is this communicated?

2.2 Infrastructure and Safety

c. What infrastructure is available on or near the school grounds to support students who walk or cycle?
d. Are there specific safety measures in place around the school, such as reduced speed zones?

2.3 Parental and Community Involvement

e. How does the school involve parents in discussions about active commuting and road safety?
f. Are there partnerships with local organizations or the community to support student cycling and walking?

2.4 Observed Challenges

g. What are the main challenges or barriers faced by students who want to commute actively?
h. How does the school handle concerns related to student safety on their way to school?

2.5 Future Plans and Support

i. Does the school have plans to implement or expand programs for active commuting?
j. What support or resources would be most helpful from the local council or community to encourage more students to walk or cycle?

3 NGO: Representative at Project Aegle

3.1 Program Design and Purpose

a. What were the main goals behind implementing the walking bus initiative?
b. What factors were considered in selecting walking bus routes?

3.2 Community Engagement

c. How did Project Aegle engage parents and build interest in the walking bus program?
d. What feedback have you received from parents and children, and how has it influenced the initiative?

3.3 Safety and Logistics

e. What specific safety protocols are in place for children participating in the walking bus?
f. How does Project Aegle handle unexpected events or emergencies on the route?

3.4 Outcomes and Impact

g. Have you observed any physical, social, or environmental benefits from the program?
h. Do you feel the walking bus has influenced attitudes toward walking and biking to school?

3.5 Expansion and Collaboration

i. What challenges do you foresee in expanding the walking bus initiative across Malta?
j. How has Project Aegle worked with schools, local councils, or other NGOs to support this initiative?

4 NGO: Representative at Rota

4.1 Organizational Goals and Vision

a. What are the main objectives of Rota in promoting active mobility, especially cycling, among young people?
b. How does Rota define a “cycle-friendly” school commute, and what key features are needed to create this in Malta?

4.2 Current Infrastructure and Challenges

c. What do you see as the biggest barriers to safe cycling for middle and secondary school students in Malta?
d. How would you assess the current state of cycling infrastructure near schools, specifically in terms of safety and accessibility?

4.3 Safety and Policy Advocacy

e. What safety measures does Rota advocate for in school zones to make cycling more viable?
f. Has Rota worked on any specific campaigns or initiatives to raise awareness about safe cycling among students and parents?

4.4 Community and Institutional Collaboration

g. How does Rota engage with schools, local councils, and other stakeholders to support cycling initiatives?
h. Are there any successful collaborations or programs that you think could serve as models for future school-based cycling initiatives?

4.5 Future Vision and Expansion

i. What initiatives or improvements does Rota envision in the near future for promoting cycling to school?
j. How can schools and students best support Rota’s work in advocating for better cycling conditions in Malta?

Appendix D – Spatial Analysis

Birżebbuġa

On-site Observations


PHOTO A

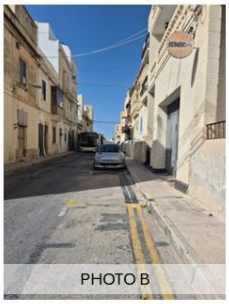

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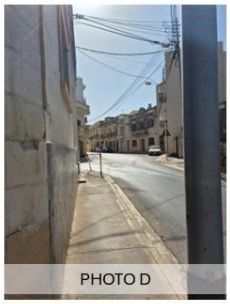
PHOTO C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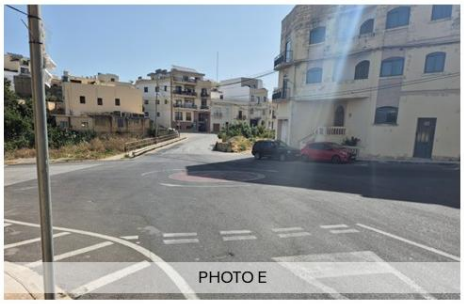
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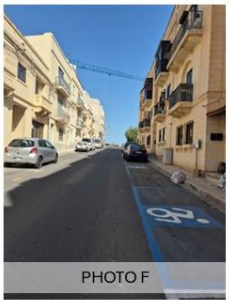
PHOTO F


PHOTO G


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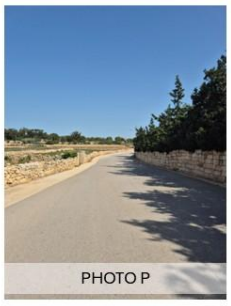

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PHOTO Q

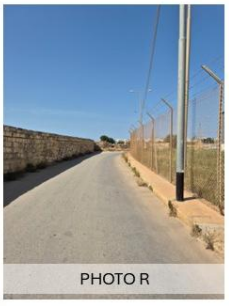

PHOTO R

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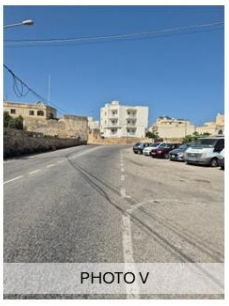

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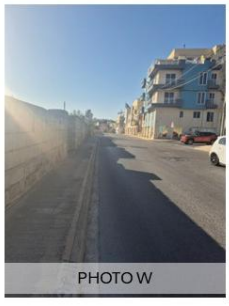

PHOTO W

PHOTO X

PHOTO Y

ArcGIS Mapping

Image A	Width	Condition
Footpath 1	1.3m	G
Footpath 2	1.6m	G
Road	10m	G
Total width = 12.9m		

Image B	Width	Condition
Footpath 1	1.1m	G
Footpath 2	1.1m	M
Road	7.5m	M
Total width = 9.7m		

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* Road width refers to the total span between footpaths, including central strips, multiple carriageways, and any features located between the footpaths - excluding parking spaces.

** Total width includes the full cross-sectional width from edge to edge, encompassing road width as well as adjacent parking areas, green infrastructure, and any segregation or buffer zones present on the footpaths.

Image C	Width	Condition
Footpath 2	1.2m	M
Road	6.8m	G
Total width = 8m		

Image D	Width	Condition
Footpath 2	1.4m	M
Road	7.3m	M
Total width = 8.7m		

Image E	Width	Condition
Footpath & Cycle Lane	3.1m	G
Road	9m	G
Total width = 12.1m		

Image F	Width	Condition
Footpath 1	1.3m	M
Footpath & Cycle Lane	2.9m	G
Road	8.1m	G
Total width = 12.3m		

* Road width refers to the total span between footpaths, including central strips, multiple carriageways, and any features located between the footpaths - excluding parking spaces.

** Total width includes the full cross-sectional width from edge to edge, encompassing road width as well as adjacent parking areas, green infrastructure, and any segregation or buffer zones present on the footpaths.

Image G	Width	Condition
Footpath 1	1.5m	G
Footpath & Cycle Lane	3.2m	G
Road	8.5m	G
Total width = 13.2m		

Image H	Width	Condition
Footpath 1	0.9m	G
Footpath & Cycle Lane	2.9m	G
Road	8.2m	G
Total width = 12m		

Image I	Width	Condition
Footpath 1	0.8m	M
Footpath 2	0.9m	M
Road	8.9m	G
Total width = 10.6m		

Image J	Width	Condition
Footpath 1	0.9m	M
Footpath 2	1.1m	M
Road	6.3m	M
Total width = 8.3m		

Għaxaq and Gudja Routes

On-site Observation

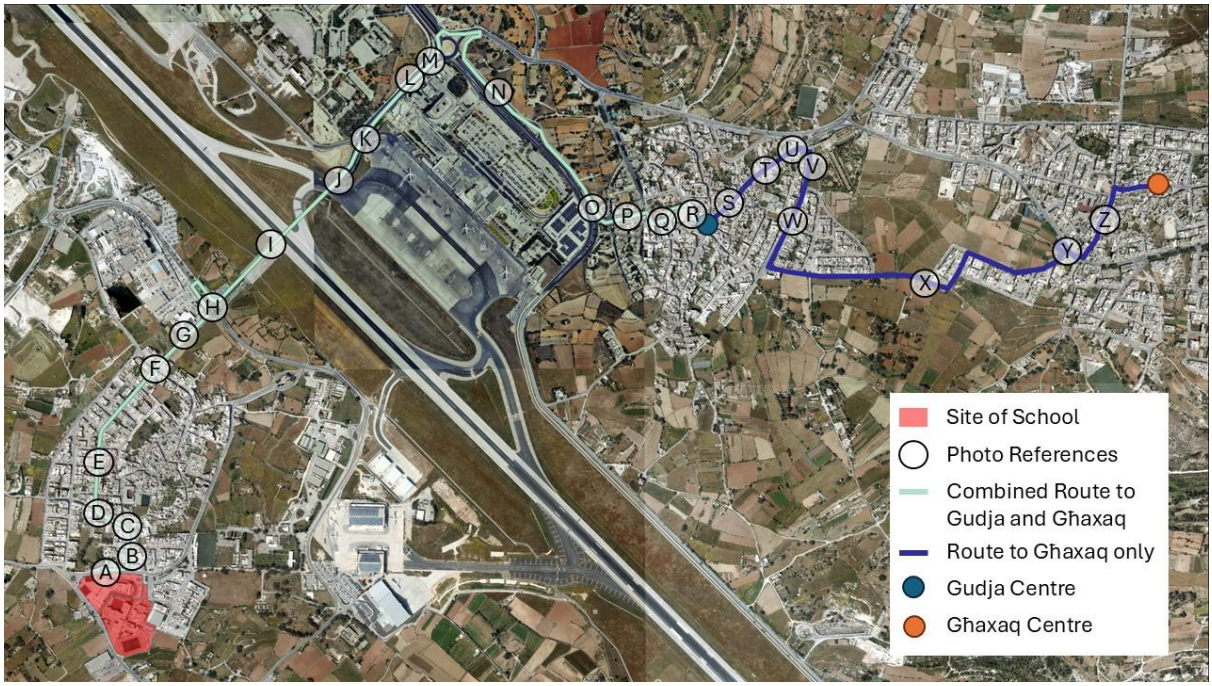


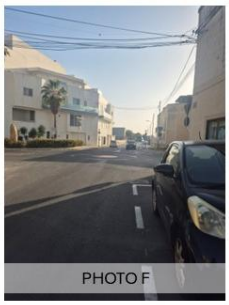

PHOTO A


PHOTO B


PHOTO C


PHOTO D


PHOTO E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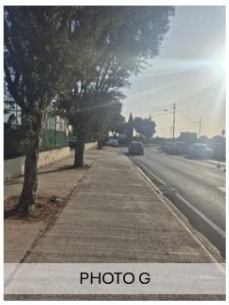
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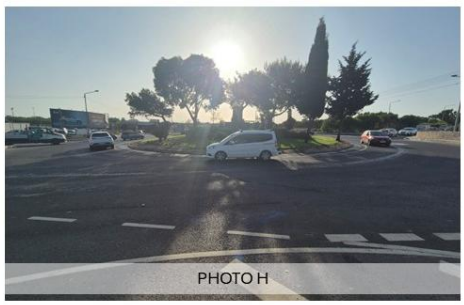
PHOTO H

PHOTO I

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PHOTO R

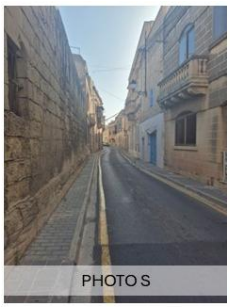

PHOTO S

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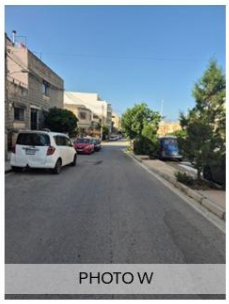

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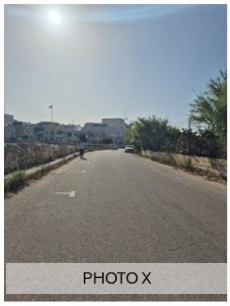

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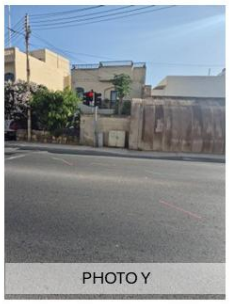

PHOTO Y

PHOTO Z

ArcGIS Mapping

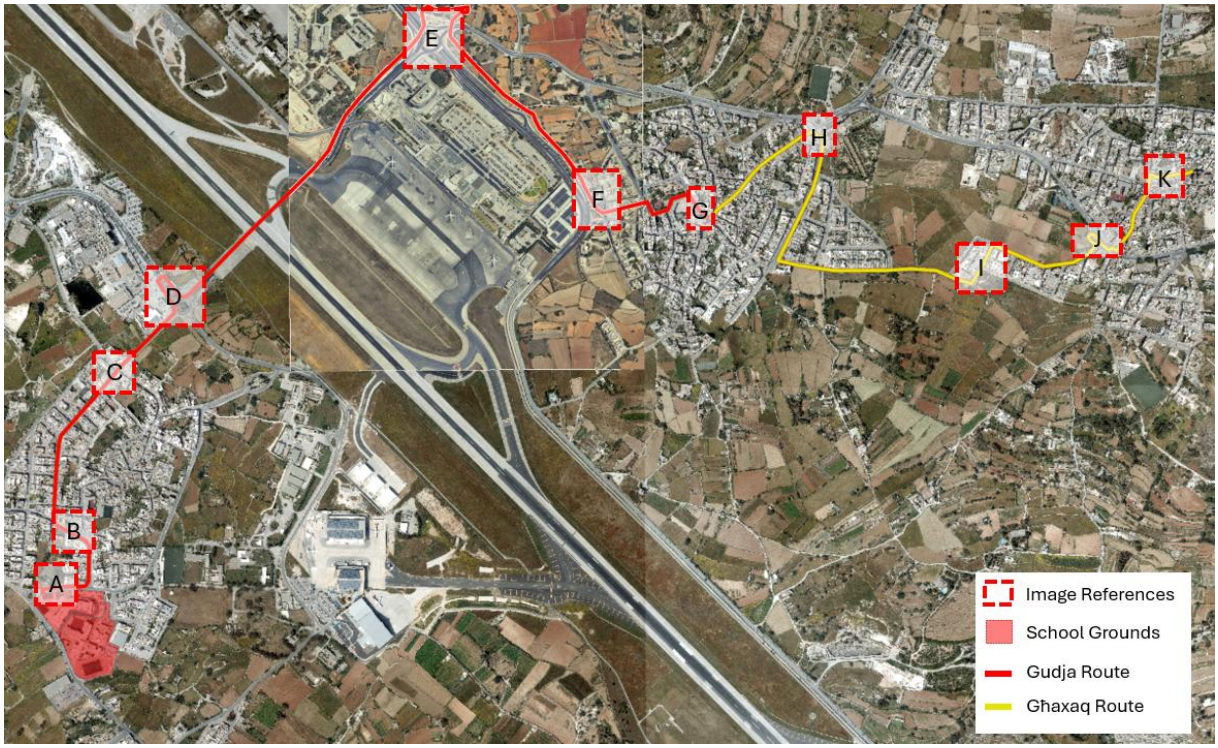

Image A	Width	Condition
Footpath 1	1.9m	G
Footpath 2	1.4m	G
Road	7.3m	G
Total width =9.6m		

Image B	Width	Condition
Footpath 1	1.0m	M
Footpath 2	1.2m	M
Road	6.0m	G
Total width =12.5m**		

* Road width refers to the total span between footpaths, including central strips, multiple carriageways, and any features located between the footpaths - excluding parking spaces.

** Total width includes the full cross-sectional width from edge to edge, encompassing road width as well as adjacent parking areas, green infrastructure, and any segregation or buffer zones present on the footpaths.

Image C	Width	Condition
Footpath 1	1.4m	G
Footpath 2	2.3m	G
Road	8.1m	G
Total width =11.8m		

Image D	Width	Condition
Footpath 1	1.3m	M
Footpath 2	1.2m	G
Road	19.8m*	G
Total width =31.7m**		

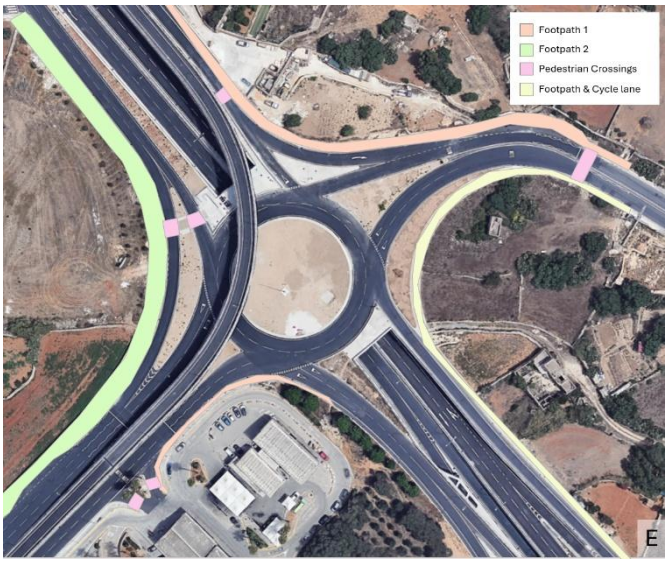

Image E	Width	Condition
Footpath 1	3.3m	G
Footpath 2	4m	G
Road	41.1m*	G
Total width =50.5m**		

Image F	Width	Condition
Footpath 1	1.1m	G
Footpath & Cycle Lane	2.6m	G
Road	30.2m*	G
Total width =34.1m		

* Road width refers to the total span between footpaths, including central strips, multiple carriageways, and any features located between the footpaths - excluding parking spaces.

** Total width includes the full cross-sectional width from edge to edge, encompassing road width as well as adjacent parking areas, green infrastructure, and any segregation or buffer zones present on the footpaths.

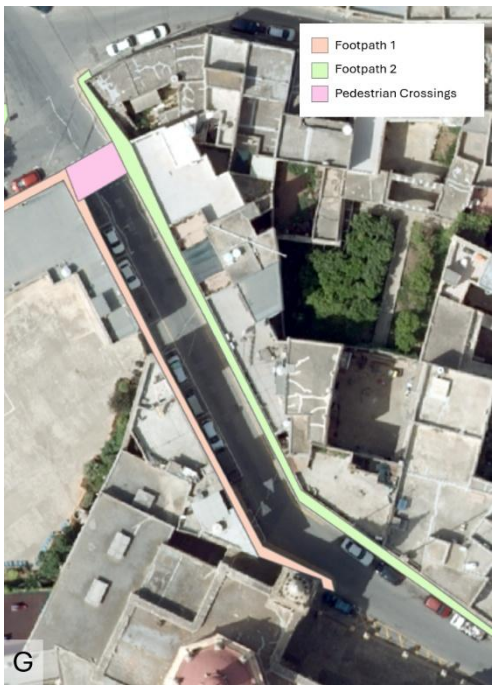

Image G	Width	Condition
Footpath 1	1.0m	M
Footpath 2	1.3m	G
Road	4.7m	G
Total width =9.2m**		

Image H	Width	Condition
Footpath 1	1.3m	G
Footpath 2	1.4m	G
Road	13.1m	G
Total width =15.5m		

Image I	Width	Condition
Footpath 1	1.0m	M
Footpath 2	0.9m	M
Road	4.4m	G
Total width =10.3m**		

Image J	Width	Condition
Footpath 1	1.2m	G
Footpath 2	1.0m	G
Road	9.8m	G
Total width =12.3m		

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* Road width refers to the total span between footpaths, including central strips, multiple carriageways, and any features located between the footpaths - excluding parking spaces.

** Total width includes the full cross-sectional width from edge to edge, encompassing road width as well as adjacent parking areas, green infrastructure, and any segregation or buffer zones present on the footpaths.

Image J	Width	Condition
Footpath 1	1.3m	G
Footpath 2	1.6m	G
Road	3.1m	G
Total width =6.2m		

* Road width refers to the total span between footpaths, including central strips, multiple carriageways, and any features located between the footpaths - excluding parking spaces.

** Total width includes the full cross-sectional width from edge to edge, encompassing road width as well as adjacent parking areas, green infrastructure, and any segregation or buffer zones present on the footpaths.

Qrendi and Mqabba Routes

On-site Observation


PHOTO A

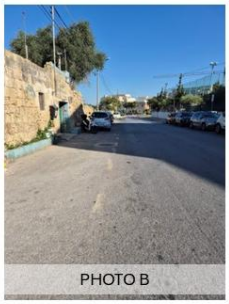
PHOTO B


PHOTO C

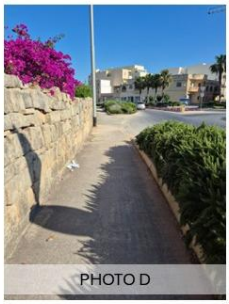
PHOTO D


PHOTO E

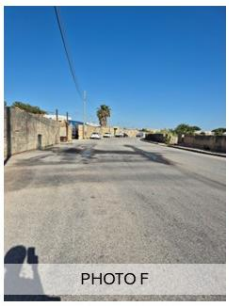
PHOTO F


PHOTO G


PHOTO H


PHOTO I

PHOTO J

PHOTO K

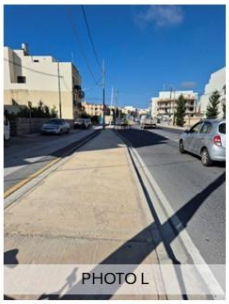

PHOTO L

PHOTO M

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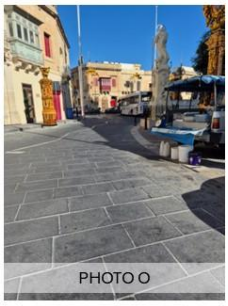

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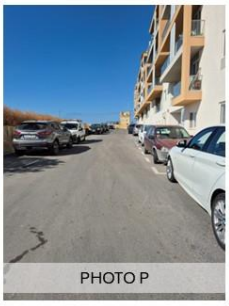

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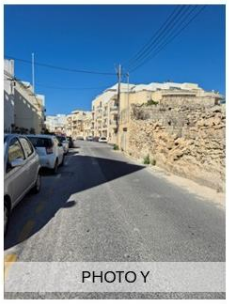

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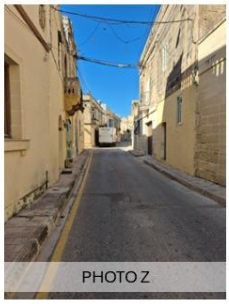
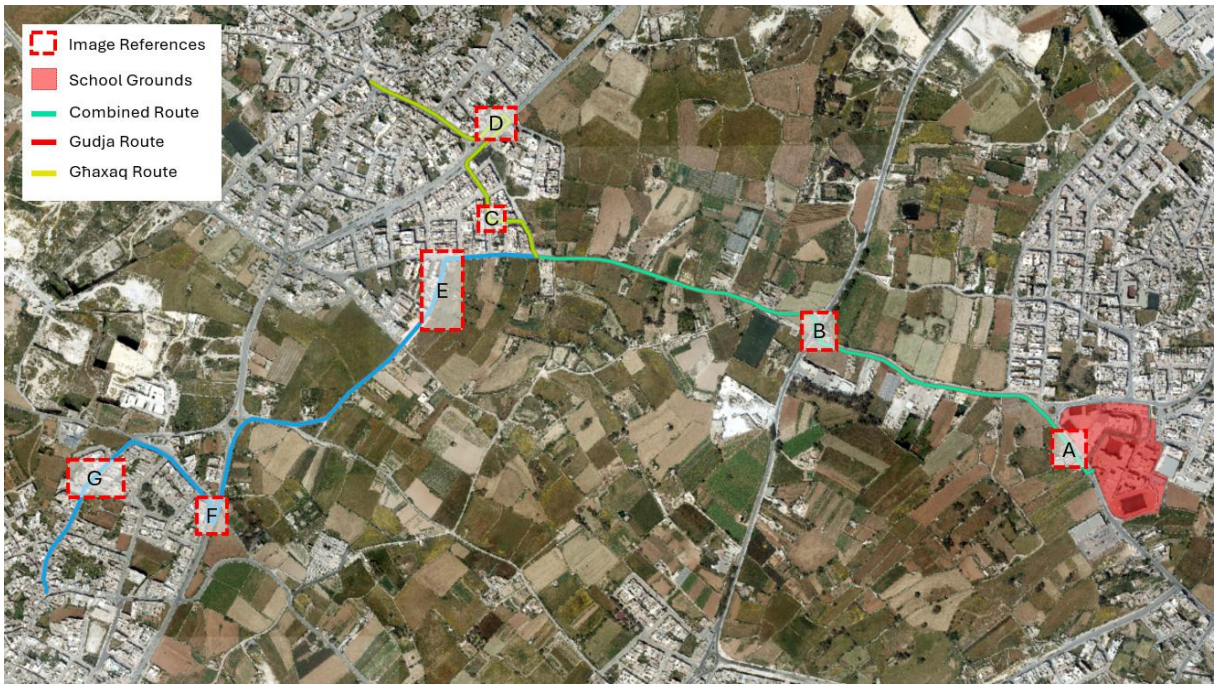
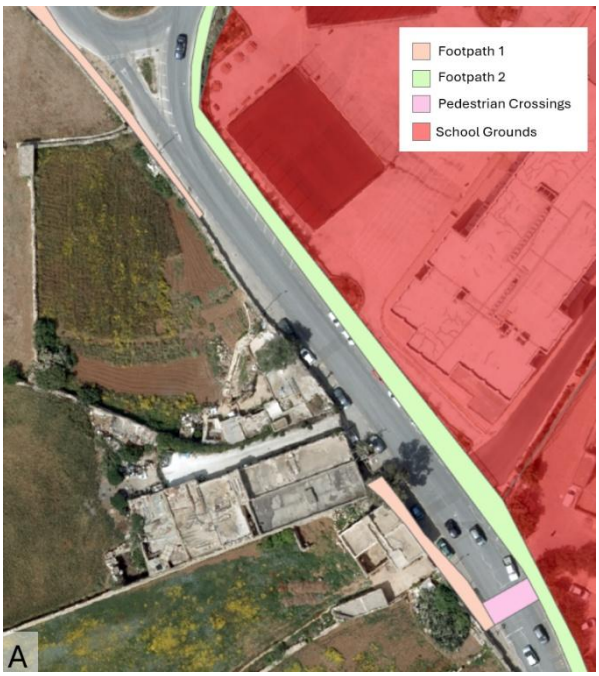


PHOTO Z

ArcGIS Mapping





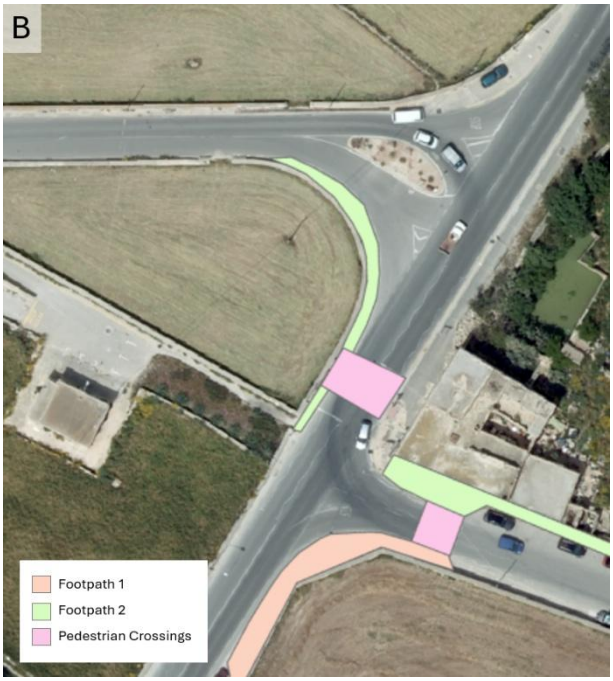


Image A	Width	Condition
Footpath 1	1.1m	G
Footpath 2	1.8m	G
Road	11.8m	G
Total width =15.5m		

Image B	Width	Condition
Footpath 1	1.9m	M
Footpath 2	3.7m	M
Road	6.3m	G
Total width =12.3m		

---

* Road width refers to the total span between footpaths, including central strips, multiple carriageways, and any features located between the footpaths - excluding parking spaces.

** Total width includes the full cross-sectional width from edge to edge, encompassing road width as well as adjacent parking areas, green infrastructure, and any segregation or buffer zones present on the footpaths.

Image C	Width	Condition
Footpath 1	0.8m	M
Footpath 2	1.0m	M
Road	6.3m	G
Total width =10.0m**		

Image D	Width	Condition
Footpath 1	0.9m	P
Footpath 2	2.1m	G
Road	15.7m*	G
Total width =20.9m**		

Image E	Width	Condition
Footpath 1	1.0m	M
Footpath 2	1.0m	P
Road	4.6m	G
Total width =8.41m**		

Image F	Width	Condition
Footpath 1	1.0m	G
Footpath 2	1.1m	M
Road	16.5m*	G
Total width =19.9m**		

* Road width refers to the total span between footpaths, including central strips, multiple carriageways, and any features located between the footpaths - excluding parking spaces.

** Total width includes the full cross-sectional width from edge to edge, encompassing road width as well as adjacent parking areas, green infrastructure, and any segregation or buffer zones present on the footpaths.

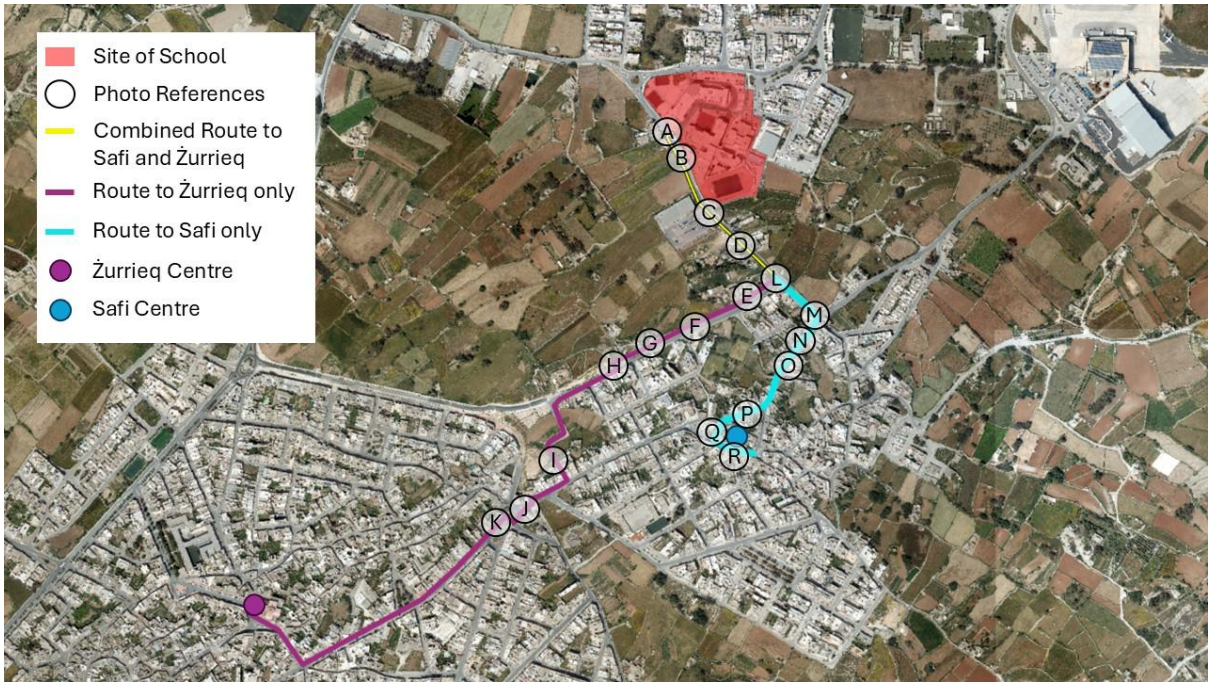
Image G	Width	Condition
Footpath 1	1.0m	M
Footpath 2	1.0m	M
Road	7.1m	M
Total width =13.1m**		

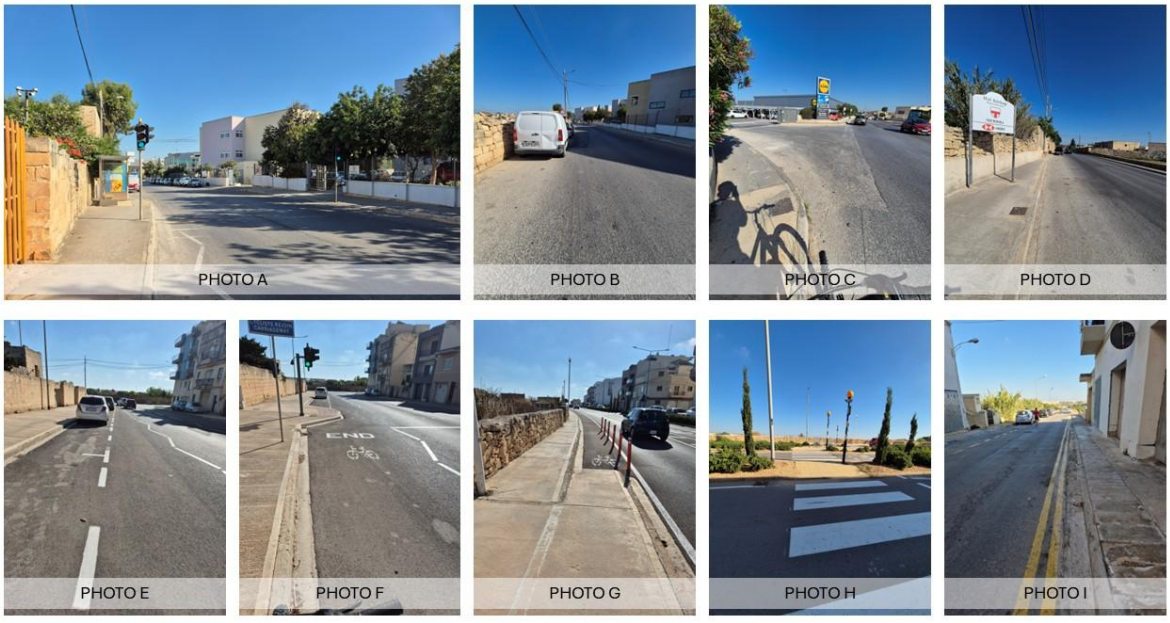
* Road width refers to the total span between footpaths, including central strips, multiple carriageways, and any features located between the footpaths - excluding parking spaces.

** Total width includes the full cross-sectional width from edge to edge, encompassing road width as well as adjacent parking areas, green infrastructure, and any segregation or buffer zones present on the footpaths.

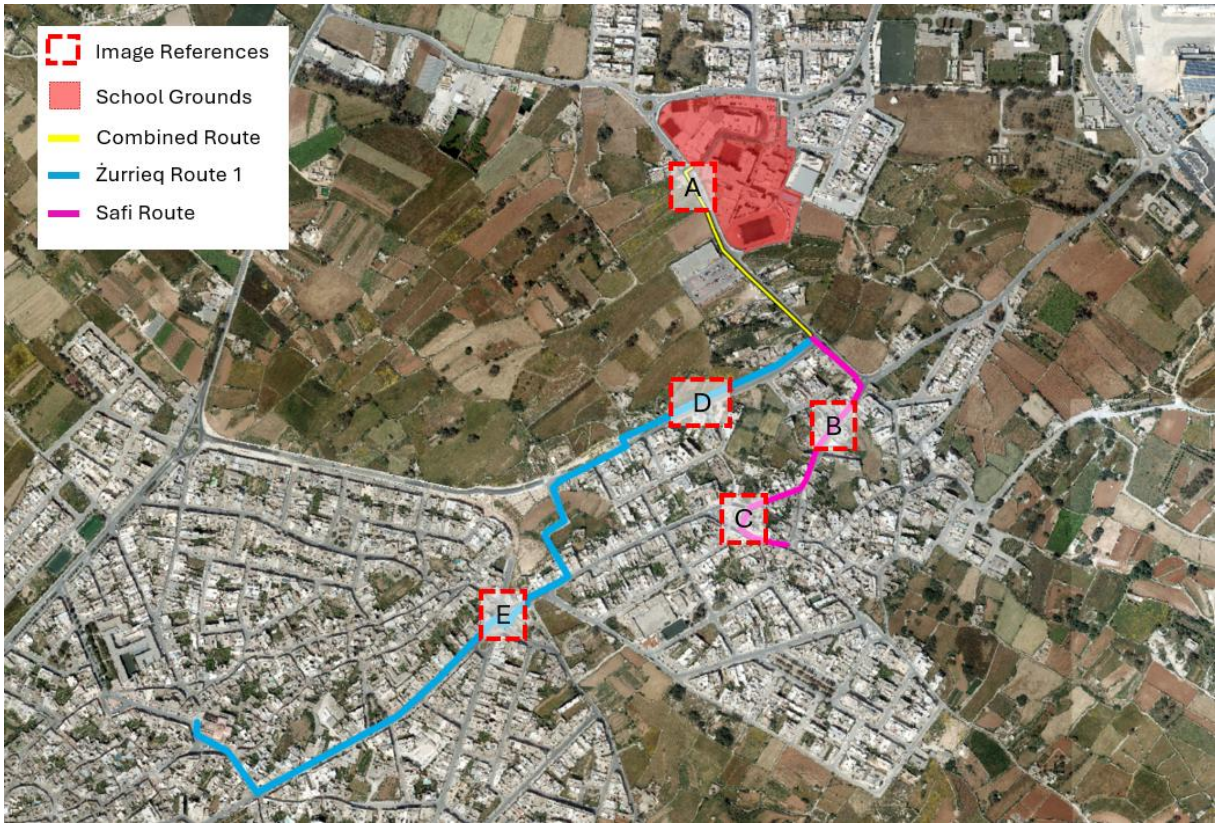
Safi Route and Żurrieq Route 1

On-site Observation





ArcGIS Mapping



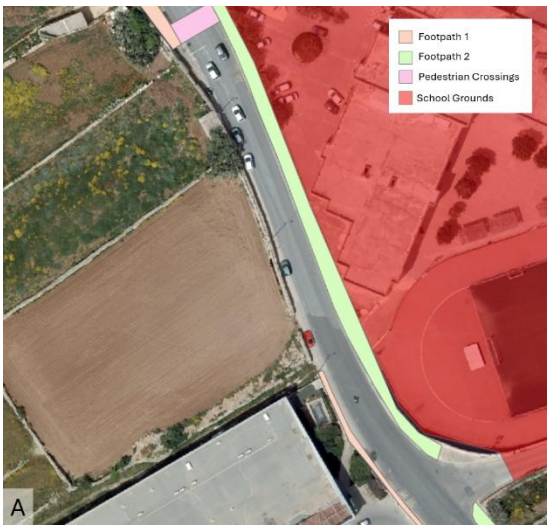


Image A	Width	Condition
Footpath 1	1.2m	M
Footpath 2	2.1m	M
Road	8.1m	G
Total width =11.3m		

Image B	Width	Condition
Footpath 1	0.9m	M
Footpath 2	0.8m	M
Road	5.6m	M
Total width =7.2m		

Image C	Width	Condition
Footpath 1	0.7m	M
Road	4.4m	G
Total width =5.2m		

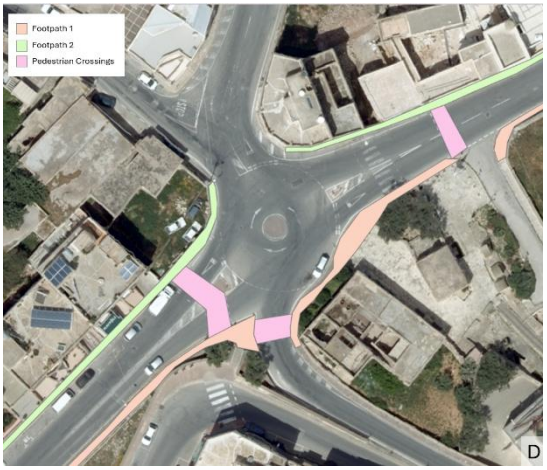


Image D	Width	Condition
Footpath 1	1.8m	G
Footpath 2	1.5m	M
Road	6.6m	G
Total width =11.4m**		

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** Total width includes the full cross-sectional width from edge to edge, encompassing road width as well as adjacent parking areas, green infrastructure, and any segregation or buffer zones present on the footpaths.

Żurrieq Route 2

On-site Observation

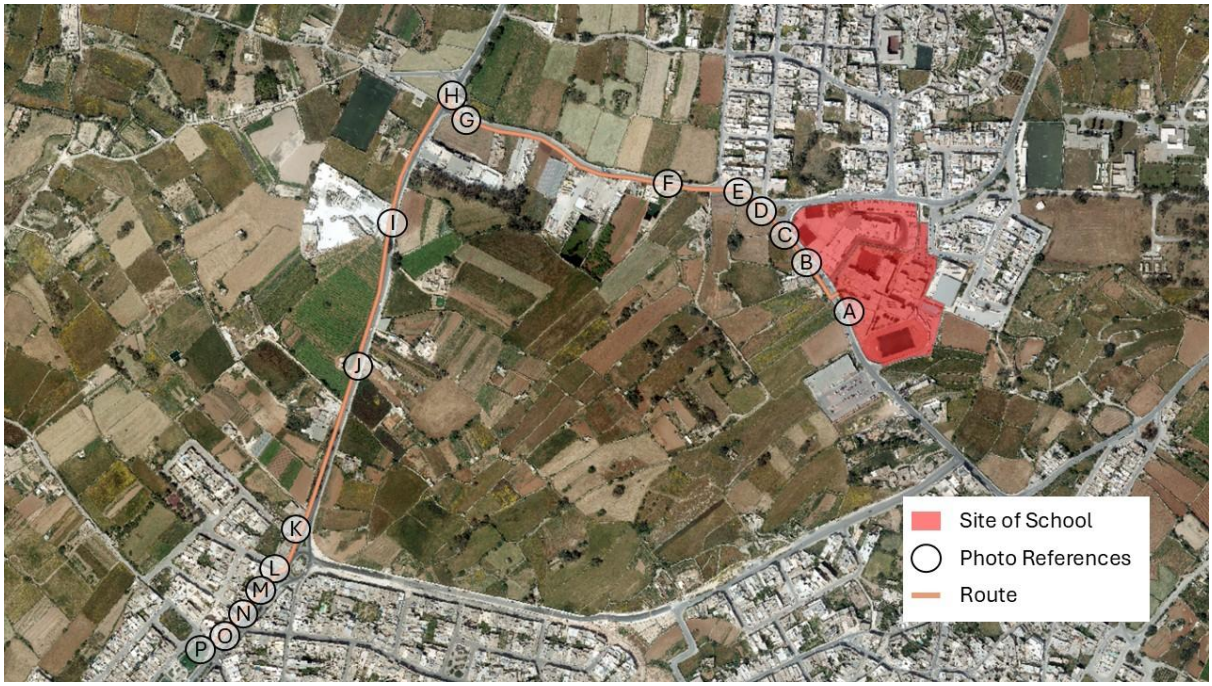

PHOTO J

PHOTO K

PHOTO L

PHOTO M

PHOTO N

PHOTO O

PHOTO P

ArcGIS Mapping

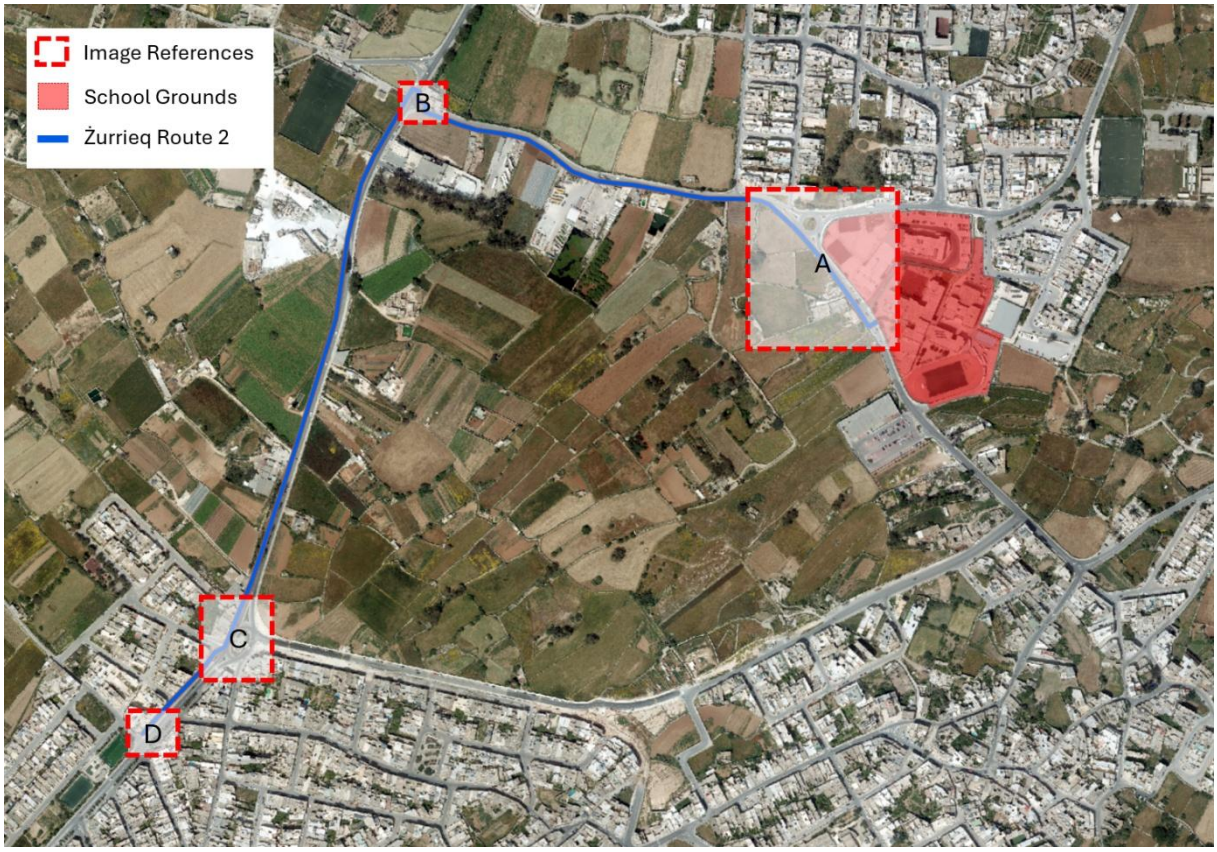

Image A	Width	Condition
Footpath 1	1.3m	G
Footpath 2	1.3m	G
Road	7.6m	G
Total width =11.0m		

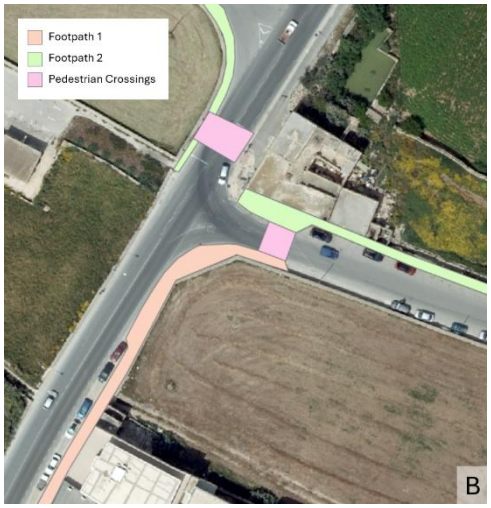

Image B	Width	Condition
Footpath 1	1.9m	M
Footpath 2	3.7m	M
Road	6.3m	G
Total width =12.3m		

Image C	Width	Condition
Footpath 1	1.4m	G
Footpath 2	1.3m	G
Road	7.2m	G
Total width =16.5m**		

Image D	Width	Condition
Footpath 1	0.7m	G
Footpath 2	1.4m	G
Road	22.8m*	G
Total width =25.6m**		

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Kirkop

On-site Observation

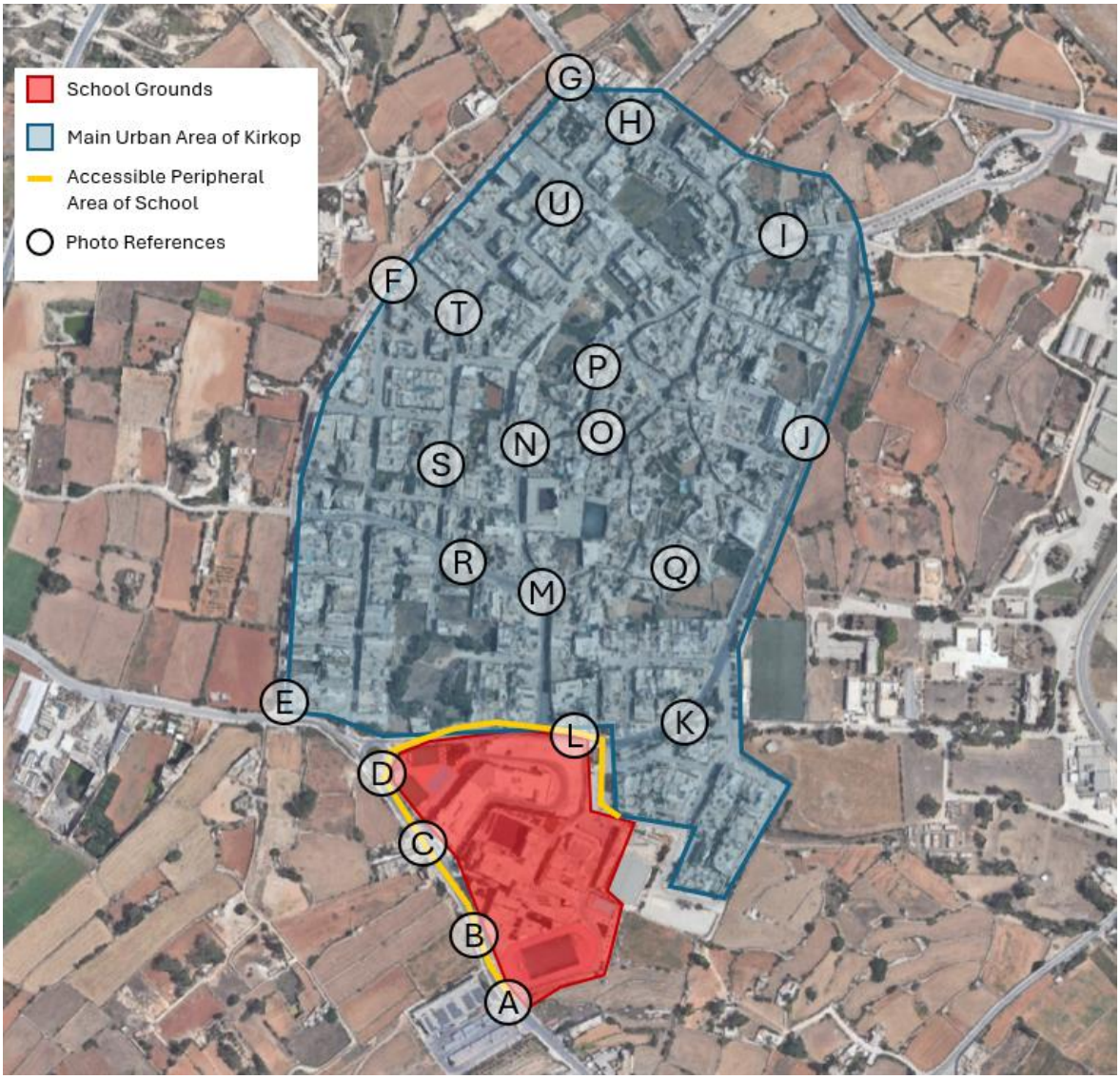


PHOTO A


PHOTO B

PHOTO C


PHOTO C1

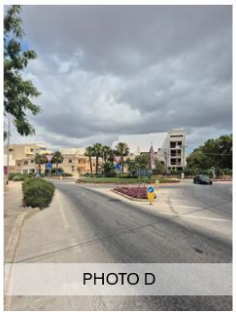
PHOTO D

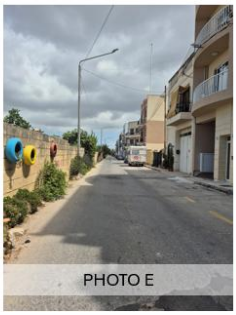
PHOTO E


PHOTO F

PHOTO G

PHOTO H

PHOTO I

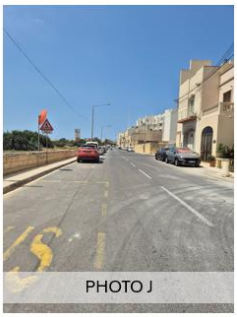

PHOTO J

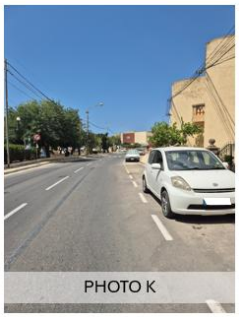

PHOTO K

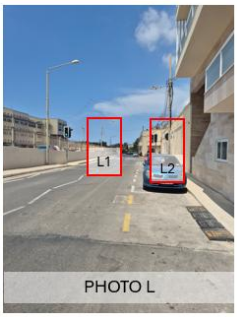

PHOTO L

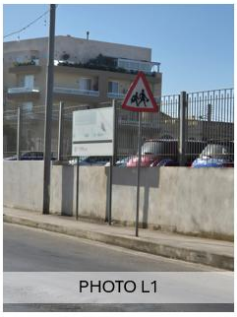

PHOTO L1

PHOTO L2

PHOTO M

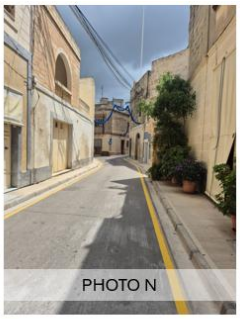

PHOTO N

PHOTO O

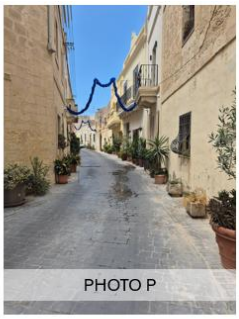

PHOTO P

PHOTO Q

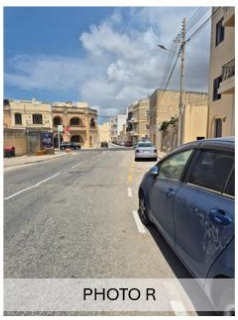

PHOTO R

PHOTO S

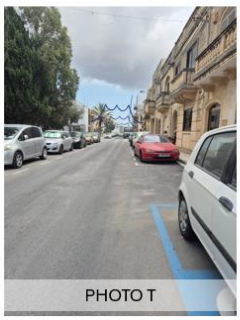

PHOTO T

PHOTO U

ArcGIS Mapping

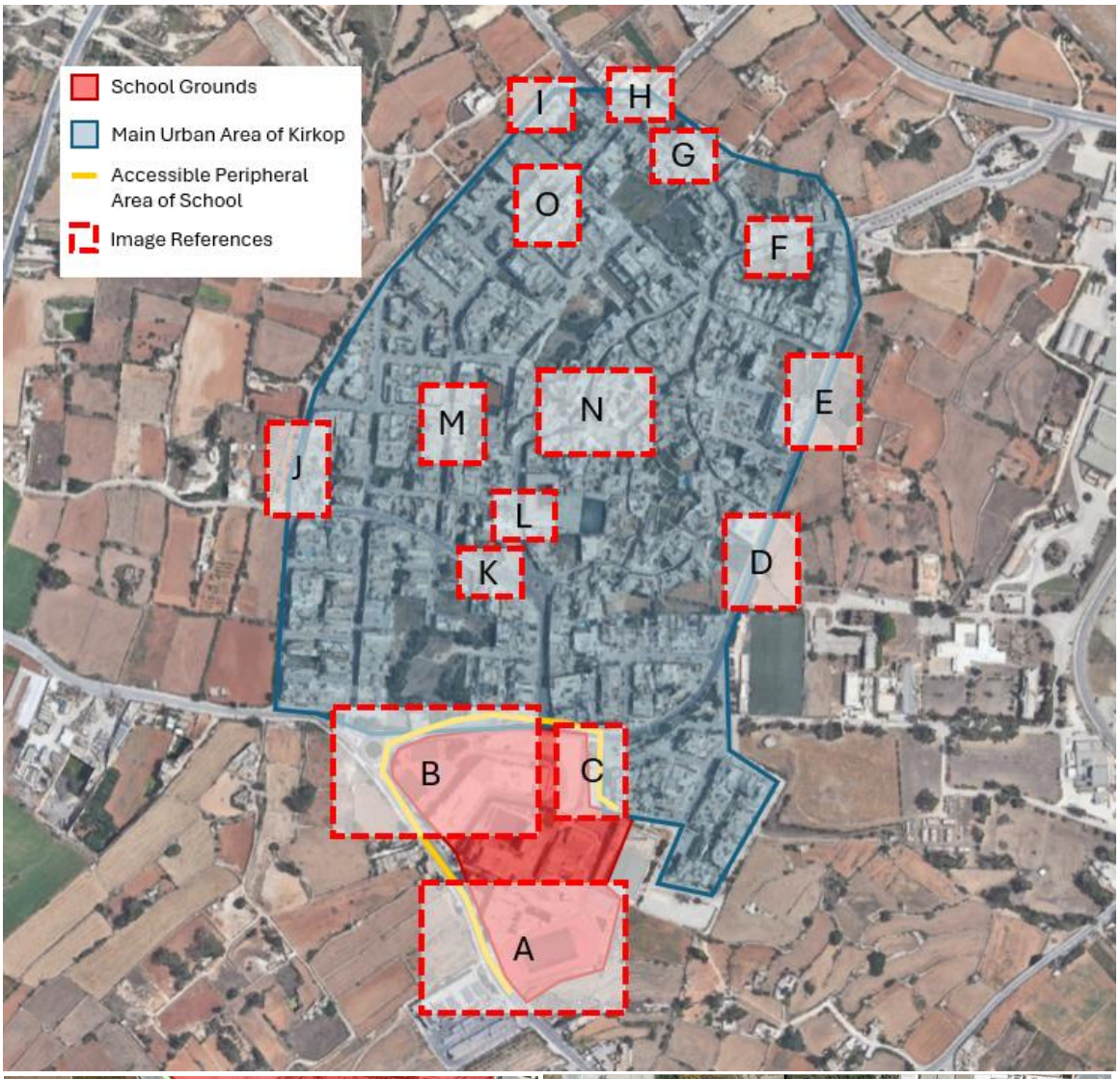

Image A	Width	Condition
Footpath 1	1.8m	M
Footpath 2	2.1m	M
Road	8.1m	G
Total width =11.3m		

Image B	Width	Condition
Footpath 1	1.5m	G
Footpath 2	1.2m	G
Road	7.6m	G
Total width =10.43m		

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Image C	Width	Condition
Footpath 1	1.5m	G
Footpath 2	1.0m	G
Road	5.6m*	G
Total width = 11.8m**		

Image D	Width	Condition
Footpath 1	0.8m	G
Footpath 2	1.0m	G
Road	6.5m*	G
Total width = 12.2m		

Image E	Width	Condition
Footpath 1	0.8m	G
Footpath 2	0.9mm	G
Road	6.2m*	G
Total width = 12.2m		

Image F	Width	Condition
Footpath 1	0.8mm	M
Footpath 2	1.0m	M
Road	4.1m	G
Total width = 6.0m		

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Image G	Width	Condition
Footpath 1	0.9m	M
Footpath 2	0.7m	M
Road	5.5m*	M
Total width = 11.2m		

Image H	Width	Condition
Footpath 1	1.0m	M
Footpath 2	2.1m	M
Road	8.0m	G
Total width = 11.5m		

Image I	Width	Condition
Footpath 1	0.9m	G
Footpath 2	0.7m	M
Road	4.5m	G
Total width = 8.4m **		

Image J	Width	Condition
Footpath 1	1.0m	M
Road	6.7m*	G
Total width = 8.9m		

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** Total width includes the full cross-sectional width from edge to edge, encompassing road width as well as adjacent parking areas, green infrastructure, and any segregation or buffer zones present on the footpaths.

Image K	Width	Condition
Footpath 1	1.3m	M
Footpath 2	0.8m	M
Road	6.5m	M
Total width = 12.7m		

Image L	Width	Condition
Footpath 1	1.6m	M
Footpath 2	0.5m	M
Road	4.0m	G
Total width =7.0m		

Image M	Width	Condition
Footpath 1	0.9m	M
Footpath 2	1.0m	M
Road	4.2m*	G
Total width = 10.1m		

Image N	Width	Condition
Footpath 1	0.5m	M
Road	3.7m	G
Total width =3.9m		

* Road width refers to the total span between footpaths, including central strips, multiple carriageways, and any features located between the footpaths - excluding parking spaces.

** Total width includes the full cross-sectional width from edge to edge, encompassing road width as well as adjacent parking areas, green infrastructure, and any segregation or buffer zones present on the footpaths.

Image O	Width	Condition
Footpath 1	0.7m	M
Footpath 2	1.0m	M
Road	4.3m*	M
Total width = 10m		

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** Total width includes the full cross-sectional width from edge to edge, encompassing road width as well as adjacent parking areas, green infrastructure, and any segregation or buffer zones present on the footpaths.