KAMPALA CAPITAL CITY SPEED MANAGEMENT PLAN

GUIDANCE FOR SPEED MANAGEMENT ON URBAN ROADS

DECEMBER 2024

KCCA
KAMPALA CAPITAL CITY AUTHORITY
For a better City

WORLD RESOURCES INSTITUTE | ROSS CENTER

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EXECUTIVE SUMMARY

Speed is a major factor in increasing the likelihood of crashes and the severity of injuries from crashes. Uganda ratified the 2nd decade of action for road safety 2021- 2030, which proposes the reduction of fatalities and injuries from road crashes in this period by at least 50%, with speed management noted as one of the key measures to achieve this target.

The Kampala Capital City Road Safety Strategy also has the goal of reducing road traffic deaths and injuries by at least 50% in the 10-year period from 2021-2030, with several strategic objectives to achieve this goal including: setting and enforcing safer speed limits appropriate for specific roads; and creating more and Safer infrastructure and promote sustainable transportation for all.

This speed management plan is a direct response to those objectives to give city officials and partners an appreciation of speed management as a multifaceted approach to road safety that requires a multipronged and concerted effort to optimize the use of roads by adjusting free-flow speeds for safer roads and livability in the city of Kampala.
Analyses discussed in this report show that while at least 71% of motorists travel under the urban speed limit of 50km/h, not more than 23% travel at or below the safe survivable speed of 30km/h, especially on the arterial and collector roads traversing the city. Analysis in this report also highlights the stark disparity between the crash outcomes between motorists and vulnerable road users. While 72% of road users in cars sustained no injuries, the same percentage of pedestrians involved in a crash were seriously injured.
This underscores the need to focus speed management efforts on the safety of vulnerable road users.

The plan provides a city-wide overview of the free-flow speed situation in Kampala in relation to serious injury and fatality data crashes involving vulnerable road users.

It highlights some of the low-cost data and information cities such as Kampala could use to make and prioritize evidence-based decisions to create safer roads for all road users, especially vulnerable road users.
The crash data analysis notes that 23% of the road segments with serious crashes account for 57% of the victims, therefore by targeting these areas, the goal of the city's road safety strategy can be achieved.

The plan further proposes speed management measures that can be applied taking into consideration the road user and road environment contexts. These measures include: implementing road diets and traffic calming devices; and implementing complete streets that would prioritize accessibility thus providing more road space for pedestrians and public transport.

Other key speed management measures are targeted and consistent traffic enforcement and strategic communication that utilizes mass media campaigns, public relations or media engagement, community engagement and school-based interventions.

The plan's concluding sections discuss the current and future speed management actions of the city. Section 7 reports on the pilots undertaken in 2024 towards speed management infrastructure measures and Section 8 articulates the city's short-, medium- and long-term actions towards speed management.

1. INTRODUCTION

The Kampala Road Safety strategy aims to reduce road crashes, fatalities and injuries by 50% between 2021 and 2030. According to the Kampala Annual Road Safety Report of 2021, there were 420 fatalities on the city's roads, an increase of 78% from 2020. There were 2,318 serious injuries in 2021, up from 1,619 in 2020. 34% of all fatalities on Kampala's roads were pedestrians, and 51% were motorcyclists. Table 1 shows the current road classification by Kampala Capital City Authority (KCCA) and related speed limits for each type of road.

*Table 1.1: KCCA road classification, speed limit and current speed situation. *source: Status Summary 2022: Road Safety Risk Factors, Johns Hopkins International Injury Research Unit*

KCCA ROAD CLASSIFICATION		
Road Type	Speed Limit (Km/h)	Situation on the road
Urban expressway	70	
Arterial	50	*14% of vehicles travel above 50Km/h
Collector	50	*71% of vehicles travel over 30Km/h
Local	30	
Industrial area	30	

1.1 Safe System Approach

According to the World Health Organization (WHO), road injuries were the leading cause of death for 15–19-year-olds, 2nd for 5-14 year olds and the 5th leading cause of death overall in Uganda in 2019[9].
The traditional approaches to road safety assumed that driver error was responsible for most of the fatalities on the road and therefore focused on regulation, education and enforcement, putting most of the burden for safety on the road on road users.

With recognition that the main causes of traffic fatalities and serious injuries also involve critical features of weak vehicle design, infrastructure and inadequate and slow post crash care, there is now a shift for road safety to be a shared responsibility among road users, government, private sector and civil society.
This is encapsulated in the safe system approach which is based on the principle that human errors are inevitable but traffic fatalities and serious injuries should not be; and that the human body is vulnerable to, and has limited physical ability to withstand the kinetic energy from moving vehicles before serious harm occurs. Therefore, road system should be designed so that human error does not have a serious or fatal outcome; and necessary help should be swiftly given to crash victims to further reduce the incidence of death or serious injury.
The safe system approach comprises six pillars: Road safety management; Safe road infrastructure; Safe speeds; Safe Vehicles; Safe road user behavior; and Post crash care.

In this approach, issues are treated by considering how these different components of the system interact to ensure that harm is minimized. The safe system approach proposes strengthening of all pillars as opposed to a reliance on a single pillar of action.
The multifaceted nature of speed management- involving policy, infrastructure enforcement and awareness raising- lends itself to the safe system approach.

The Global Plan for the Decade of Action on Road Safety, 2021-2031, stresses the importance of speed management as vital to improving road safety.

9 https://www.who.int/data/gho/data/themes/mortality-and-global-health-estimates/ghe-leading-causes-of-death

1.2 Relevant City and National Policies, and Plans

This work on speed management aligns with and supports the implementation of the Kampala Capital City Road Safety Strategy 2021-2030, which feeds into the National Road Safety Action Plan, 2021/22- 2025/26, which is the basis of all actions regarding road transport towards the key result area- Reducing fatality and causality per mode of transport- of the Integrated Transport Infrastructure and Services program of the national Development Plan 3.

It should be noted that both the Kampala Capital City Road Safety Action Plan (2021-2030) and the National Road Safety Action Plan are based on safe systems principles, and this is reflected in relevant goals/ objectives and action areas that align with this work, as figure 1.1 shows.

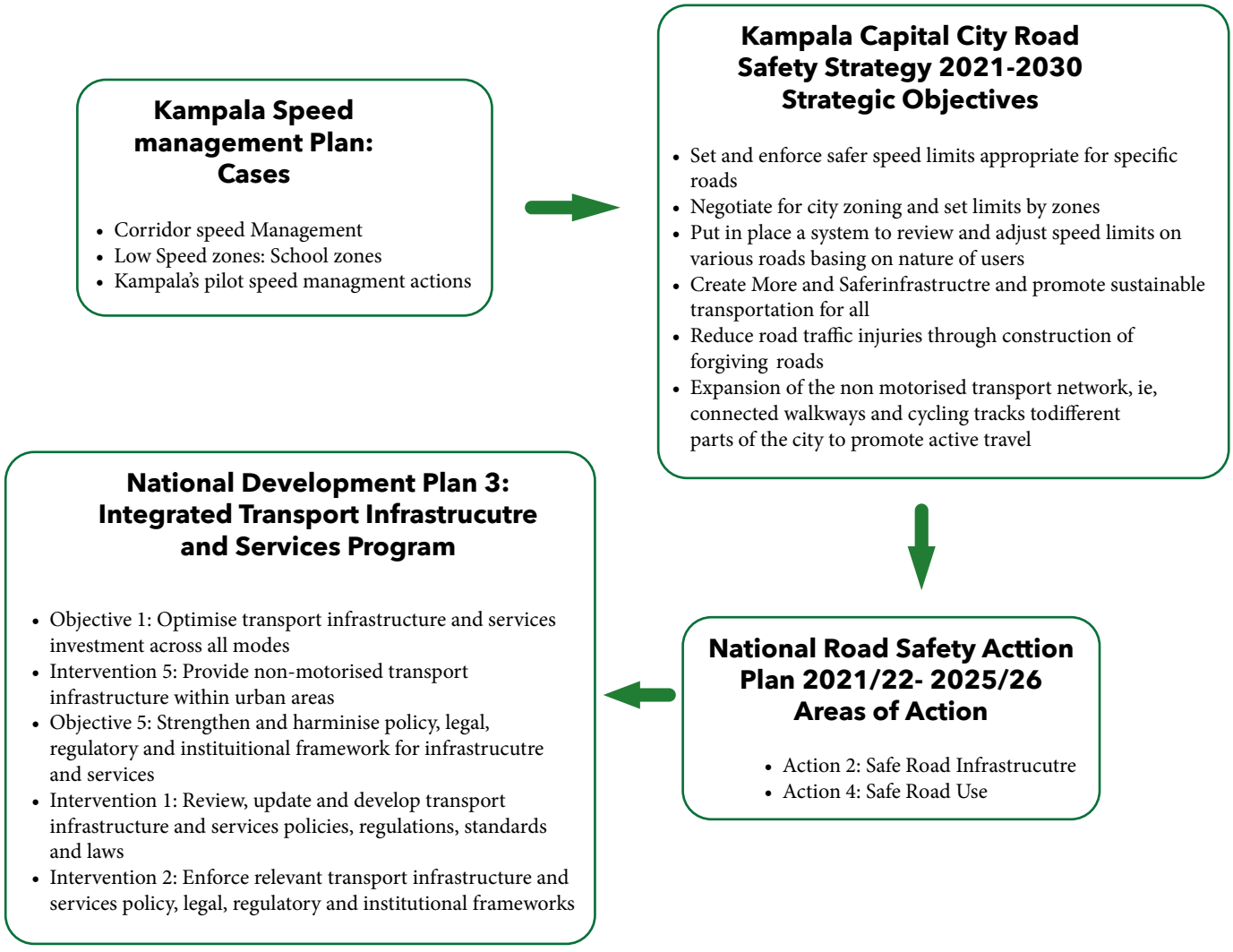

Figure 1.1: Alignment of Kampala Speed Management Plan with City and National Plans on Mobility and Road Safety

Figure 0.2.1: Changes in peripheral vision with change in speed. Source:Figure 3.1: Alignment of Kampala Speed Management Plan with City and National Plans on Mobility and Road Safety

1.3 Purpose of the Speed Management Plan

The purpose of this speed management plan is to give city officials and partners an appreciation of speed management as a multifaceted approach to road safety that requires a multipronged and concerted effort to optimize the use of roads by adjusting free flow speeds for safer roads and livability in the city of Kampala.

The plan provides a city-wide overview of the free flow speed situation in Kampala with relation to the serious injury and fatalities data crashes involving vulnerable road users. It highlights some of the low-cost data and information cities such as Kampala could use to make evidence-based decisions to create safer roads for all road users and most especially the vulnerable road users.

Apart from the Next Steps for Speed Management Section, the rest of this plan is not a prescriptive but, using on-ground cases, describes the speed and road infrastructure situation in Kampala and how the combination of these aspects of the safe system approach to road safety contribute to the risks faced by road users in Kampala.

It proposes general compliance measures to optimize safe use of the road space as well as an evidence-based criterion for prioritizing speed management interventions, and details demonstrations that the city has undertaken to systematically implement speed management.

The Next Steps for Speed Management section proposes the speed management related tasks to be implemented in the short, medium and long term in the city, taking into consideration Kampala City's transportation and road safety plans. Monitoring and evaluation of these tasks together with other planned interventions by KCCA is crucial to build the evidence of the need and efficacy of speed management in Uganda's cities.

2. WHY IS SPEED IMPORTANT?

The effects of speed on road safety is an important consideration for policy action. While travel time is related to speed especially on highways and in rural areas, and people want a high degree of mobility and the ability to travel fast, speed is also a key factor in road traffic injuries influencing both the risk of a crash as well as the severity of the injuries resulting from the crash. Considerations for safety should not be subordinate to those for mobility but rather a basis upon which to innovate safer, more reliable and more predictable mobility.

2.1 Effects of speeding on driver and other road users

Driving speeds have a direct impact on the driver and in turn the other road users sharing the road with drivers. **Higher speeds reduce driver's peripheral vision.** This is illustrated in figure 2.1. At lower speeds, a driver is able to take in more of the activities surrounding the road environment which informs their reaction to any action of other road users.

Figure 2.1: Reduction in peripheral vision due to increased speed. Source: thecityfix.com

Higher Speeds require longer stopping distances. Figure 2.2 illustrates that at lower speeds, a driver can react to a dangerous situation and stop within a shorter distance. For higher speeds, the inertia due to the force created by the speed acts on the vehicle in such a way that the distance needed to get the vehicle to a stop is longer, thus increasing the possibility of a crash with another object or with a vulnerable road user.

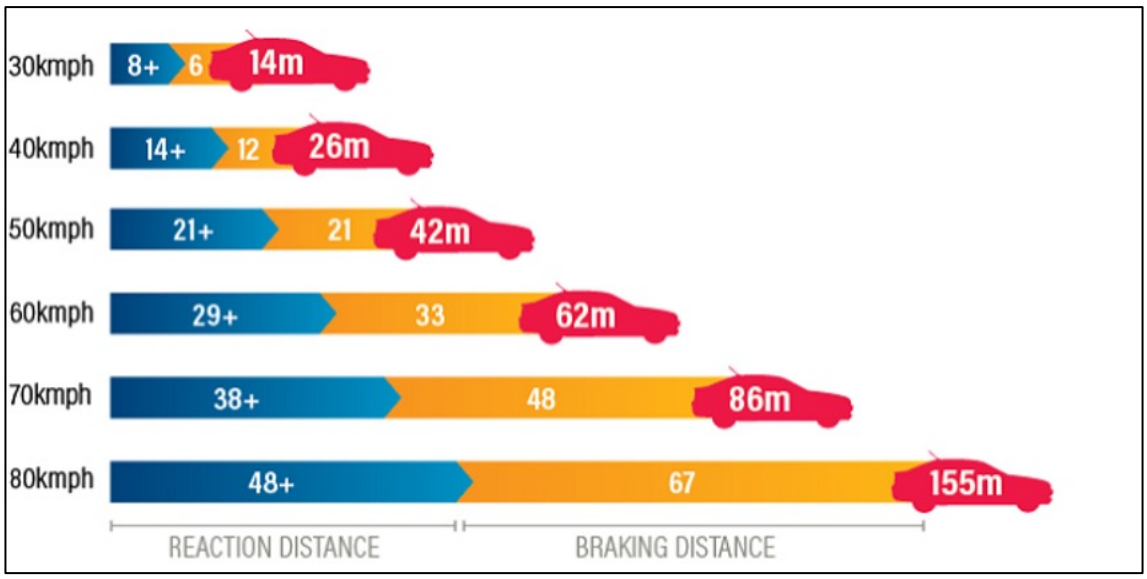

Figure 2.2: Required stopping distance as speed increases. Source: thecityfix.com

Higher vehicle speeds increase the likelihood of a pedestrian dying: There is an 85% likelihood of death when a vehicle travelling at 50Km/h crashes into a pedestrian, as opposed to a 10% chance of death at 30km/h (Figure 2.3). On most urban streets therefore, speeds of 30km/h and below are the safest, with 50km/h where infrastructure provides for the safety of vulnerable road users.

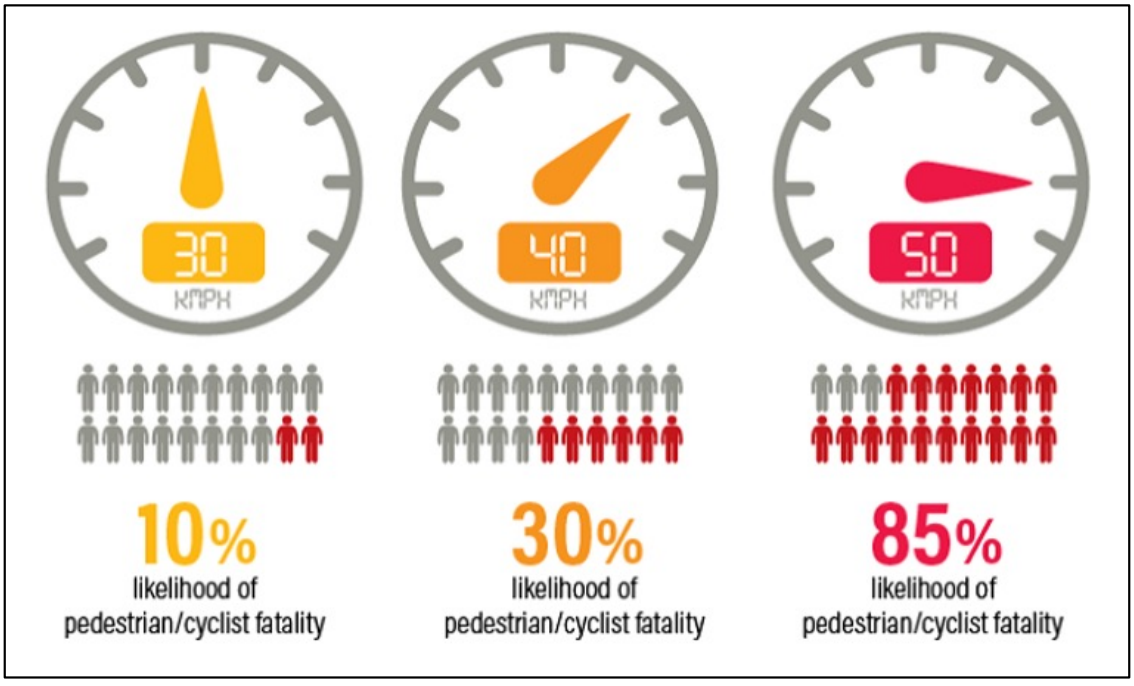

Figure 2.3: Risk of fatality for pedestrians or cyclists as speed increases. Source: thecityfix.com

2.2 Kampala's speed landscape

The speed limit in urban areas in Uganda is 50Km/h, except on expressways. A road authority such as Kampala Capital City Authority (KCCA) has the power to post lower speed limit when the need is identified. KCCA classifies urban roads and their related speed limits as shown in table 2.1.

KCCA Road Class	Urban Expressway	Arterial Road	Collector Road	Local Road	Industrial Area Road
Speed Limit (Km/h)	70	50	50	30	30

Table 2.1: Road Classification and speed limits in Kampala city. Source: KCCA Road Classification

A city-wide speed analysis using Google API data shows free flow speeds at 1am, 11am and 8pm. This is overlain with the concentration of traffic crash victims, particularly vulnerable road users (pedestrians, cyclists and motorcyclists). For some local and collector roads in Kampala, speeds are posted at 30Km/h and below at all times. Some of these roads, however, showed higher speeds along the entire corridor or sections of the corridor. Figure 2.4 illustrates the free flow speeds in the arterial, collector and some local roads network of Kampala.

The Northern bypass, an urban expressway consistently had speeds above 50Km/h. Arterial roads such as Entebbe Road and Jinja road have speeds between 41-50Km/h, with vehicles speeding over 50Km/h at some sections at certain times. Other arterial roads such as Yusuf Lule Road, Lugogo bypass and Kira Road consistently showed typical speeds between 31-40km/h, with some sections having 41-50Km/h typical speeds.

In the Central Business District (CBD), collector roads like Buganda Road, Lumumba Avenue and Nakasero Road consistently showed speeds between 31-40Km/h. Outside the CBD, some roads that consistently showed speeds above 30Km/h include (but not limited to): Lubiri Ring Road, Gaba Road, Ntinda Road and Robert Mugabe Road.

When the maps for typical free flow speeds are overlayed with the crash locations with the highest density of vulnerable road user victims (pedestrians, bicyclists and motorcyclists), Figure 2.4 shows linear patterns of crashes concentrated in the areas with speeds above 30Km/h, consistently or at particular times of the day such as late at night (1am).

Speed is a significant contributor to serious injury and fatality and its management should include careful consideration of other factors contributing to serious injury and fatalities from road crashes, such as the land use along the corridor, the infrastructure for both motor vehicles and non- motorized transport modes. In Kampala for example, while the Northern bypass was built to function as an urban expressway, the land use around it has changed to include markets, schools, residential and commercial areas in its immediate vicinity. Arterial and collector roads with a speed limit of 50Km/h have vibrant civil and social activities such as hospitals, schools, government offices and commercial businesses along them, that attract large numbers of pedestrians.

KCCA should consider reclassification of some of these roads as well as posting speed limits at 30Km/h and below as an initial step in speed management.
Lowering of speed limits is likely to attract pushback from the public and the city authorities should confidently respond to these queries with evidence on the pitfalls of higher speeds as well as the benefits of lowering speeds in the city. The next section (2.3) discusses some common myths about speed reduction and proposes counter arguments.

Photo Credit : KCCA Images
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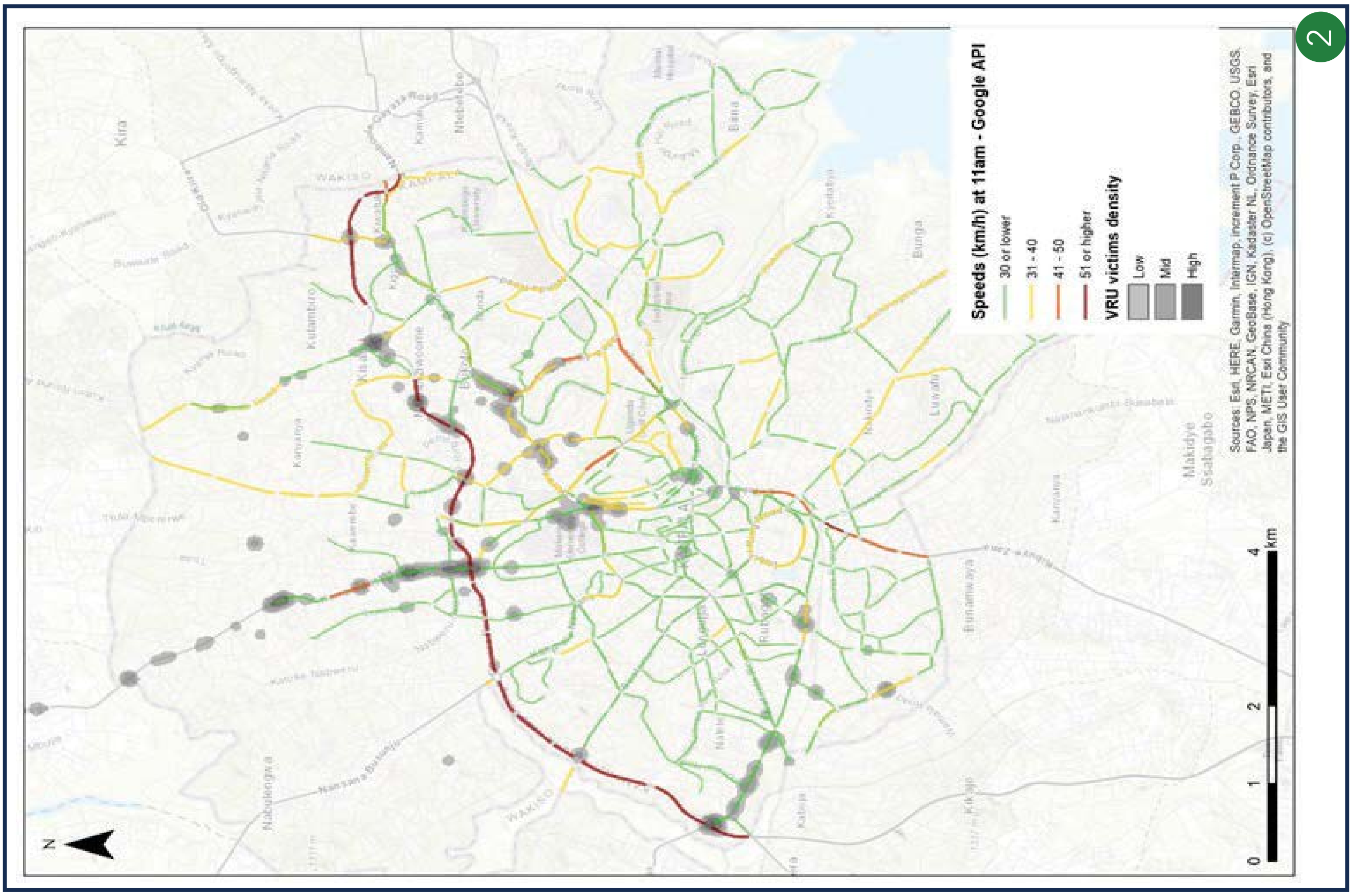
2
Speeds (km/h) at 11am - Google API
30 or lower
31 - 40
41 - 50
51 or higher
VRU victims density
Low
Mid
High
Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community
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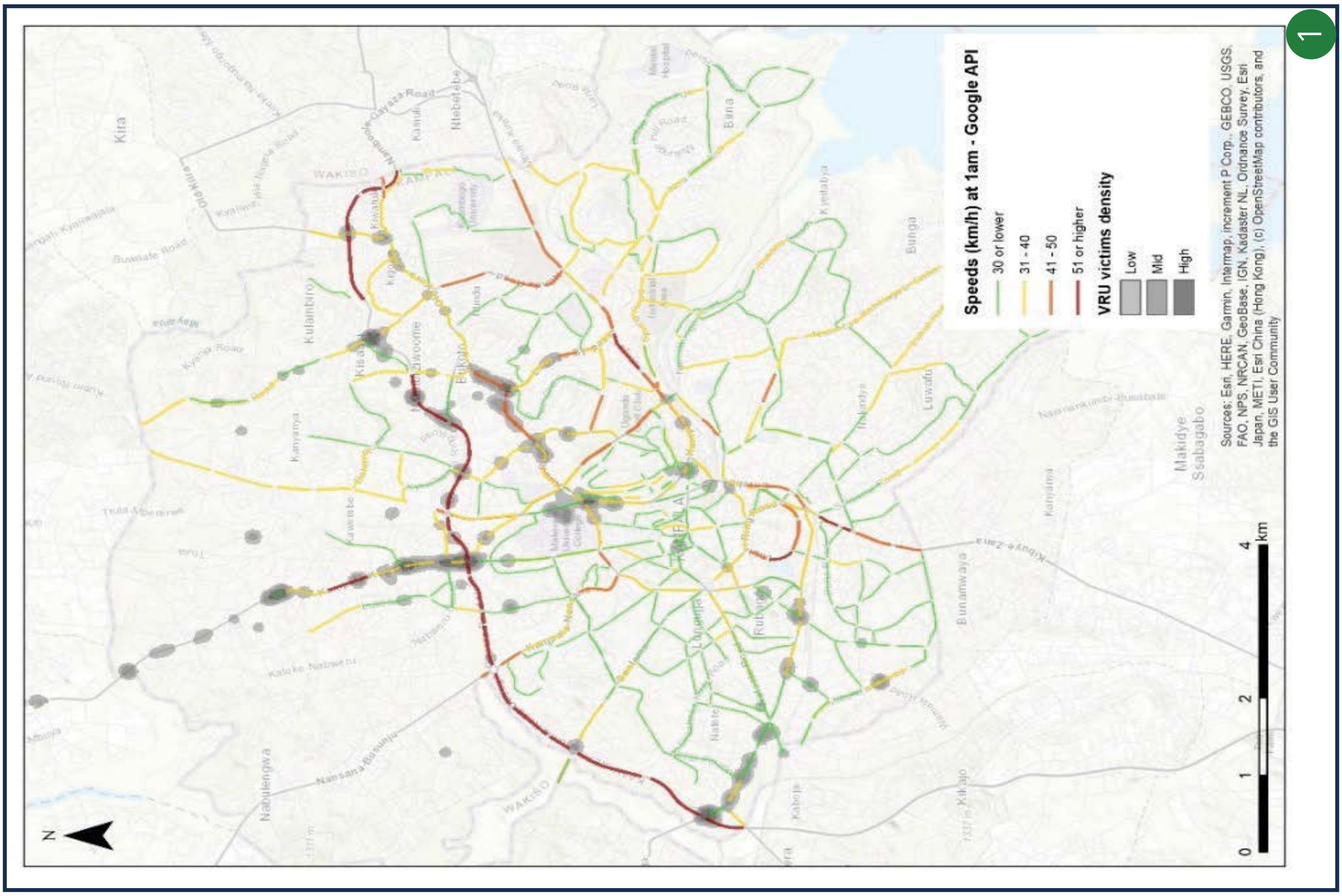
1
Speeds (km/h) at 1am - Google API
30 or lower
31 - 40
41 - 50
51 or higher
VRU victims density
Low
Mid
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Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community
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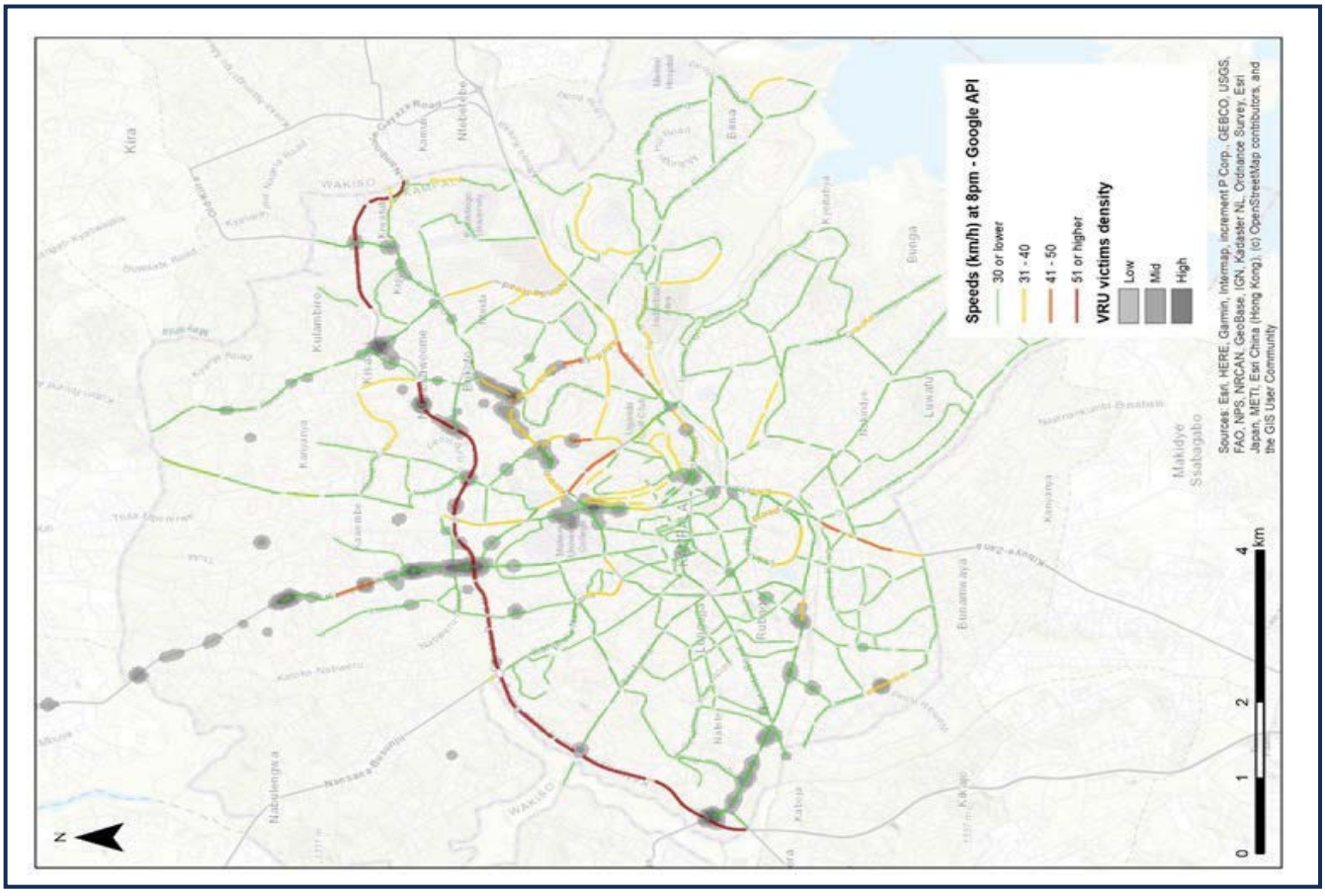

Figure 2.4: Typical free flow speeds for Kampala city at 1am, 11am and 8pm.
Source: Authors with data from Google API.

2.3 Debunking Speed Reduction Myths

Reducing speed limits will have a negative economic impact:
This may be based on the logic that the faster people and goods can be transported, the higher the productivity of an economy, and so lower speeds may reduce travel times leading to reduced productivity.

While reduction of speed will reduce travel time on highways and in rural areas, this is not the case in urban areas. In cities, average road speeds and travel times are more determined by the frequency of intersection rather than speed limits. A study in Grenoble, France, showed that lowering speeds from 50Km/h to 30Km/h only marginally increased travel time between two intersections 1km apart, by 18 seconds[9].

A multi-pronged approach to reducing speeds on urban roads, that includes speed limit reduction, more reliable public transport and better active mobility infrastructure has the benefit of reduced fatalities from road crashes, increased attractiveness for walking and cycling, relieving the need to create more space for cars, creation of more and safer space for urban recreation, thus creating more vibrant, lively cities, thus promoting urban economic growth.

Travelling at lower speeds increases fuel consumption and air pollution emissions: It has been argued that fuel consumption at lower speeds is less efficient and can also generate more emissions reducing air quality. This again does not consider the fact that typical travel patterns in urban areas with high speed limits (50km/h and above) consist of rapid acceleration and deceleration for intersections, turns, and congestion. Research has found that this type of travel pattern is worse for fuel consumption and emissions than traveling at a slower but more consistent operating speed, which lowers the amount of acceleration and deceleration between stops[10].

Speed management interventions should carefully consider the spacing and combination of traffic calming measures to require drivers to maintain a more consistent low speed rather than rapidly decelerating and accelerating tendencies.

Reducing speed causes congestion: This argument assumes that traffic congestion is because of lower speeds. It is related to the argument that reduced travel time in urban areas is an economic loss due to loss of travel time.

It has already been established travel time in urban areas is not because of travel speeds but because of the frequency of intersections. Furthermore, this argument assumes that traffic congestion is the most pertinent urban transport problem and fails to account for the disbenefits of eliminating this problem through interventions geared at increasing speed. A study conducted in Asian cities compared the per capita cost of different urban transport variables.

Figure 2.5 shows that traffic congestion does not pose the greatest cost per capita. Crash damages, and air pollution, both of which are related to higher speeds, cost an individual 2.5 to 3 times more than the cost of traffic congestion. Chronic traffic congestion is a symptom of a more fundamental transport system failure and cities with reliable and accessible public transport systems, integrated with active mobility infrastructure have less congestion than those without.

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9 *Cities Safer by Design (2015), wri.org/publication/cities-safer-design*

10 *Haworth, N., & Symmons, M. (2001). Safety and environment in Vision Zero. In J. Pauley, J. angford, S. Dobie, P. Todd, R. Smith, B. Elson, & T. Brown (Eds.), 24th Australasian Transport Research Forum: Zero Road Toll: a Dream or a Realistic Vision? (Vol. 1, pp.1 - 11) Department of Infrastructure, Energy and Resources.*

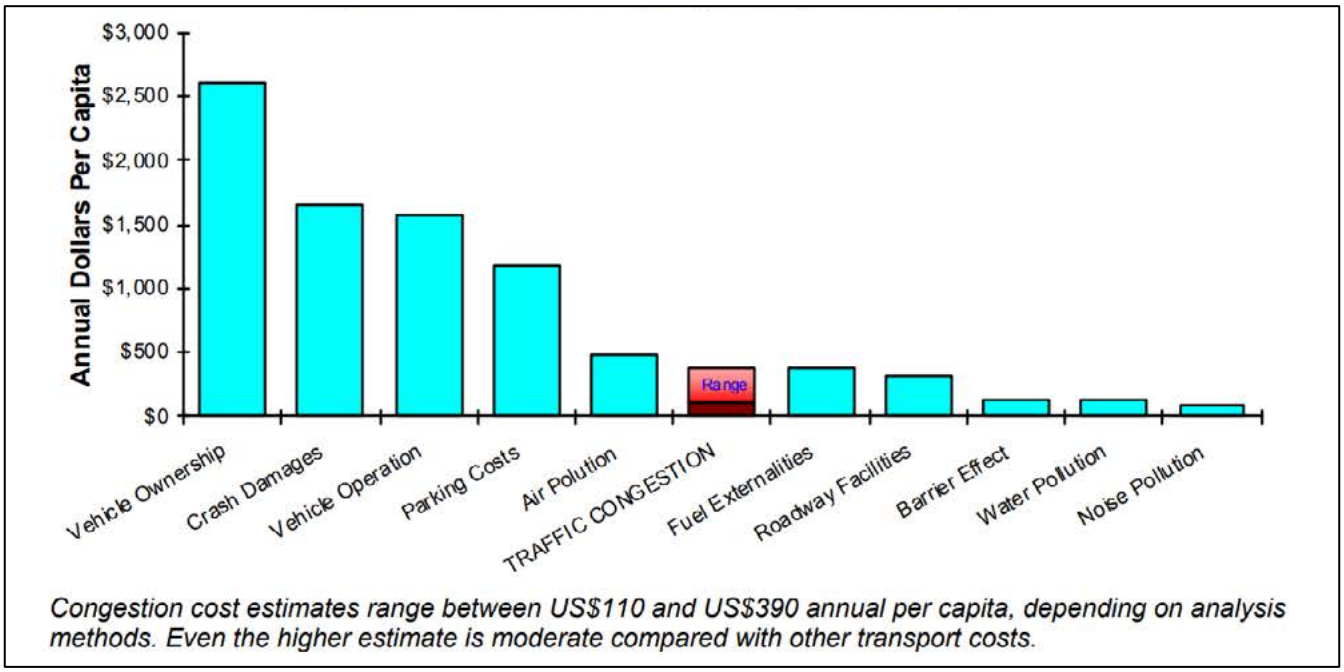


Figure 2.5: Comparing the cost per capita of externalities relating to urban transport. Source: https://www.unescap.org/sites/default/files/bulletin82_Article-1.pdf

Reducing speed by small amounts will not have any effect on the crash outcomes: Several studies have shown that the inverse is true. Each 1% increase in speed has been shown to result in 3.5% to 4% increase in fatalities from road crashes. Furthermore, a 1Km/h reduction from 50 Km/h can result in 7.8* reduction in fatal crashes while a 2Km/h reduction from the same speed can result in 15.1% reduction in fatal crashes[9].

The impact of this reduction is more noticeable on slower urban roads. It is important to note that the relationship between speed and crashes at any particular location is also dependent on other factors such as the traffic characteristics and road user behavior.

Speed management concepts are developed for western countries and are impossible to implement in Kampala's context: While speed management measures can be challenging and complex, the goal- that of saving lives- is worth the effort. Furthermore, many of the roads designed and built in Kampala are designed and built with the same engineering principles as those from western countries; and the laws of physics apply everywhere, be it, Kampala or in a western country.

The human body will suffer the same damage when subjected to the same forces.

Interventions that reduce serious injuries and fatalities on our roads should always be considered. "The vision to eliminate fatal and serious injuries on our roads goes beyond cultures and borders. No one should be killed or seriously injured on the road, and speed management is a proven preventive measure[5b10]" Remember, speed management is about saving lives, not just reducing speeds.

9 Nilsson, G. (2004). Traffic Safety Dimensions and the Power Model to Describe the Effect of Speed on Safety [Doctoral Thesis (monograph), Transport and Roads]. Traffic Engineering.

10 ,5b Global Road Safety FAQ | GRSF (roadsafetyfacility.org)

3. SETTING SPEED LIMITS

3.1 Considerations for Speed Limit Setting

A brief history[9]: The basis for setting speed limits has changed over the years as the benefits and dangers of cars have come to be better understood. In the 1960s, speed limits were set based on the 85th percentile. This assumed that humans were rational in their use of cars therefore, only the minority 15% would be considered as speeding. As speeding was shown to be related to increasing crashes, limits were set with a consideration of road design features such as sight distance and road curvature.

In the 1980s, cost benefit analysis, with the "value of time" savings as the justification for investment, was used and inevitably favored higher speed limits. The Vision Zero Philosophy, originating in Sweden in the late 1980s and 1990s is based on the principle that serious injury and death from crashes is unacceptable and should be the basis for setting speed limits.

Speed limit setting is a window into a government's priorities- economic benefit at all costs or reducing the death toll of the country. If the latter, then speed management based on the safe system approach is the solution. It does not consist only in setting the speed limit, but in strengthening the other pillars of the safe system such as infrastructure, road safety management and safe road users to ensure a speed appropriate for the context, that is, a speed that will not result in serious injury or death. Below, we discuss three considerations for setting appropriate speed limits.

Road Classification and Speed Limits: Section 2.2 noted the road classification used by KCCA, ranging from an urban express way to arterials roads, collector roads and local/ industrial area roads. It is based on the function of the road, that is, what is the user traffic- long distance or local access traffic? With the focus on travel time, roads are classified on how quickly they should move traffic from one area to another, with the roads moving traffic from one strategic location to another (such as between cities) classified with higher speeds. KCCA also proposes the nature of some pedestrian infrastructure such as crossings and footways for each class of road. It is important to note that road classification can change and therefore, setting speed limits based on road classification alone is inadequate. Local roads may be paved and upgraded to collectors and developments along arterial roads may require them to be reclassified as collector or local roads for the safety of pedestrians.

9 https://cdn.who.int/media/docs/default-source/documents/health-topics/road-traffic-injuries/speed-management-manual.pdf

Current road use and road environment: The impact of speed in determining serious injury or fatality on the road is compounded by the activity on the road and the road environment. It is therefore important to consider how a road is currently being used. What is the mix of modes on the road? Specifically, is there presence of pedestrians, bicyclists and other vulnerable road users?

What are the operating speeds of motorized vehicles on the road? Are routes for pedestrians, cyclists and motorized vehicles segregated, or do they have to share the space? Are there traffic calming measures? How well are they working? Are pedestrian crossings used and are they respected by motorists?

Land use around the road corridor: Related to the consideration of the activities on the road and road environment is the need to consider the land use surrounding the road corridor. What is the population density and the user density of the area along the road corridor. Is it such that it increases pedestrian volumes and other vulnerable road users as they look to access the opportunities along and across the road, for example, schools, hospitals, markets, places of worship?

Is it a residential area with the possibility of children playing on the road or absentmindedly running short errands? Is it an industrial area with high occurrence of heavy goods vehicles and other heavy movable equipment? If the land use is currently ambiguous, is it possible to roughly predict how the area may develop in the coming years? Consideration of current or known future land use surrounding a road should seek to prioritize the safety of vulnerable road users.

Limitations of data for setting and evaluating speed limits: Setting speed limits for each urban section of a road based on road safety metrics such as traffic volume and detailed crash data; infrastructure risk rating based on traffic mix, road width, roadside hazards, nature of intersections and other attributes, can be only time consuming but more so expensive. Road attributes change and there needs to be a consistent and resourced system of data collection and management for this type of data to be useful for decisions on setting speed limits.

Due to the resource constraints faced in data collection and management in many low income countries, other quick methods of determining speed limits have been developed to overcome the resource challenges while prioritizing vulnerable road users. The speed limit decision tree, developed by WRI is one such method.

3.2 Setting Safe Speed Limits

Principles for setting safe speed limits: Roads should not only prioritize the efficient movement of motorized transport but also consider the movement of vulnerable road users such as pedestrians and cyclists. Safe speed limits should be set with the safe system mindset that serious injury and fatalities should be mitigated. The Global speed management guide by the World Bank and WRI proposes four principles for setting safe speeds, applicable in any context.

Safety for all: This is a reminder of the safe system principles and urges the setting of speed limits to ensure that serious injuries and fatalities can be avoided when the speeds allowed can be tolerated by the human body; that theirs is shared responsibility for road safety to ensure that all pillars are strengthened to minimize serious injuries and fatalities from road crashes

Community wellbeing: Consider the co-benefits of safe speeds especially on local roads where the road itself could be a destination and a space that promotes community cohesion. Opportunities to community create buy-in and ownership for speed management interventions including speed limit setting through community engagements should be taken up and intentionally planned for.

Predictability: Set speed limits should be clear, easily understood, and consistent on roads with similar characteristics, environment and road user needs.
Speed limits should not change suddenly and too often. Where the road environment and user needs vary within a small area or shorter distances, the lower speed limit should selected for the wider area.

Network availability: speed limits should be set taking into consideration the safety, efficiency and functionality across the network for all road users. Speed limits should not be based solely on road classification but should reflect the infrastructure available, the road environment and the actual road use of the road to ensure safety of ALL road users. Complementary to this principle is the traffic management that would for example limit vehicular access in low speed zones or ban and physically restrict pedestrian and cyclist access on roads with high speeds.

Safe Speeds: Speed management is about saving lives not just reducing speeds, therefore, it is crucial that those in charge of speed limit setting understand the survivable impact speeds- speeds at which a human being is likely to survive with min0r injuries. These are the safe speeds. Table 3.1 notes the survivable impact speeds based on research to date, with the assumption that there is presence of adequate safe infrastructure and optimum visibility.
Figure 3.1 proposes the maximum speeds for different urban road environments, beyond which the risk of serious injury or fatality from a crash would increase exponentially. Understanding this provides a firm basis for speed limit setting especially in conditions where consistent data collection for speed limit setting are restrictive. In the rural context or in non- built-up areas, speed limits may differ or may even be higher than proposed in figure 3.1.

Speed limits in rural contexts will differ depending on whether the rural or non-built-up section has human activity along it such as a road side market, whether it is an access, link or access controlled road. Nevertheless, the principles for setting safe speed limits should always be adhered to. Non- built up road sections with the presence of vulnerable road users should prioritize them by setting lower speed limits at these sections.

Table 3.1: Safe System survivable impact speed. Source: Guide for Safe Speeds, World Bank and WRI, 2024

Type of road/road section	Safe System survivable impact speed
Roads/road sections with possible crashes between cars and vulnerable road users including 2- and 3- wheelers	Max. 30 km/h
Roads/road sections with intersections with possible side-on crashes between cars	Max. 50 km/h
Roads/road sections with possible frontal (head-on) crashes between cars	Max. 70 km/h
Roads/road sections with no likelihood of side-on or frontal crashes between cars and limited access (usually motorways/freeways)	Max. 100 km/h*

**In many countries motorways still have higher speed limits of up to 120 km/h or even 130 km/h. But setting speed limits on motorways should be about balancing three core priorities: safety, mobility and the environment. Introducing lower speed limits on motorways cuts both fuel consumption and pollutant emissions. Thus, speed limits over 100 km/h should generally be avoided.*

Type of road or road section	Description of road or road section	Safe speed
Shared road	road space where pedestrians and other vulnerable road users use the same road space as motorized vehicles; road or road section within schools, hospitals, nursing homes or similar social infrastructure	max. 10 kph
Urban human activity road/ city hub	road space where people gather, live, play and/or work on/next to the road/road section or cross; this includes: **School road:** road or road section close to schools or similar infrastructure **City center road:** road or road section with very high-density mixed use (high-rise residential/office buildings), downtown commercial use (shopping boulevards), civic spaces **Residential road:** road or road section which provides residential access for people of all ages and abilities, foster neighborhood spirit and facilitate local community access **Commercial road:** road or road section which provides access to shops and services by all modes, thus having a significant mobility as well as accessibility demand, which need to be managed within the available road space **Mobility hub:** road or road section with dense activity that have a high mobility demand for all modes of transport, especially public transport	max. 30 kph
Urban main road	road space which has an important accessibility demand as well as a relatively important mobility demand in supporting businesses, on-road activity and public life and connect with the wider transport network	max. 30kph - 50 kph*
Urban link road	road space which provides mobility for people and goods between city districts/strategic centres and mitigates the impact on adjacent communities and where vulnerable road users are protected from motorized traffic (e.g., by adequate sidewalks, bicycle lanes, safe and signalized pedestrian crossings) or even prohibited (i.e., controlled-access urban motorways)	max. 50 kph - 80 kph
* speed limits higher than 30 kph only for main roads with safe, adequate, and attractive provision for all vulnerable road users, including sidewalks/cycling paths with an adequate width and safe and adequately spaced crossing facilities		

Figure 3.1: Safe speeds for different road environments. Source: Guide for Safe Speeds, World Bank and WRI, 2024

The speed limit decision tree: There are different tools in use or that could be developed to aid speed limit setting. KCCA, in its speed management efforts, is free to choose the tools that it is comfortable with as long as it is aligned with the principles for setting safe speeds. One such tool is the speed limit decision tree. It is aligned with the safe system approach and the principles for setting safe speed limits, and provides a context specific way of speed limit setting that ensures consistency within similar road characteristics, environment and road user needs. The speed limit decision tree is a guide for setting speed limits based on the characteristic of the road or the zone. It can be used for:

- Assessment of a road network to set speed limits
- Evaluate speeds at a particular corridor identified through community engagement
- Assessment of speeds at hot spots with high risk of injuries and fatalities
- Review of new development or major changes, for example zoning change

The speed limit decision tree has been used successfully in the Bogota Speed Management Plan, outcomes of which include zero (0) fatalities in 23 years in the bus rapid transit corridor in downtown Bogota, where the speed limit is 20Km/h and the corridor transports 10,000 passengers per hour. The decision tree is not intended to be design guidance but rather a cut off for maximum allowable safe speed that considers safety for all road users, prioritizes vulnerable road users, and sets speeds that are survivable by the human body depending on the prevailing road conditions. It takes into account the surrounding conditions, road specifications, and the coherence between vehicle traffic and other road users. Figure 3.2 presents an elaborated speed limit decision tree flow chart that includes wider guidance outside the urban setting such as in rural areas, on highways and intercity connectors. This presentation of the decision tree is more deliberate about prioritization of vulnerable road users and includes the following considerations:

- Population density
- Type of road users
- Land use and surrounding activities
- Type of Traffic (long Distance, local, access)
- User segregation
- Infrastructure quality and design
- Crossing opportunities
- Crossing type, at grade on a bridge or underpass
- Specific spatial functions, markets, squares etc.

The elaborated speed limit decision tree as shown in figure 3.2 offers a range of speeds for different situations. The choice of the higher or lower range of the speed should be based on the presence and sufficiency of quality of infrastructure to support safety of all users at that speed. There should be a gradual transition between speeds and therefore the transition distance must be considered in the implementation of interventions to support changes in speed limits. If conditions vary within a small area or short distance, a guidance for slower speeds should be followed instead of setting varying speeds that can be confusing to road users but also contribute to fuel inefficiency and air pollution.

Safe Speeds for Kampala's Urban Roads: Kampala Capital City Authority, as a road management agency under the Roads Act 2019 has the authority to post speed limits lower than articulated in the law for urban roads. The city understands the importance of lowering speeds on urban roads as Kampala continues its rapid growth, and the need to post safe speed limits to guide motorists and aid enforcement efforts. While the Road classification for KCCA proposes 70Km/h for urban expressways; 50Km/h for arterial and collector roads; and 30Km/h for local and industrial roads, KCCA will post lower maximum speeds of 30Km/h on any arterial or collector roads where the conditions on the road are such that many people gather, play or work in locations accessed by these roads. KCCA will further look to implement 20Km/h in school zones. This is congruent with international best practices such as those discussed in this section.

Photo Credit : KCCA Images
John Paul Agaba

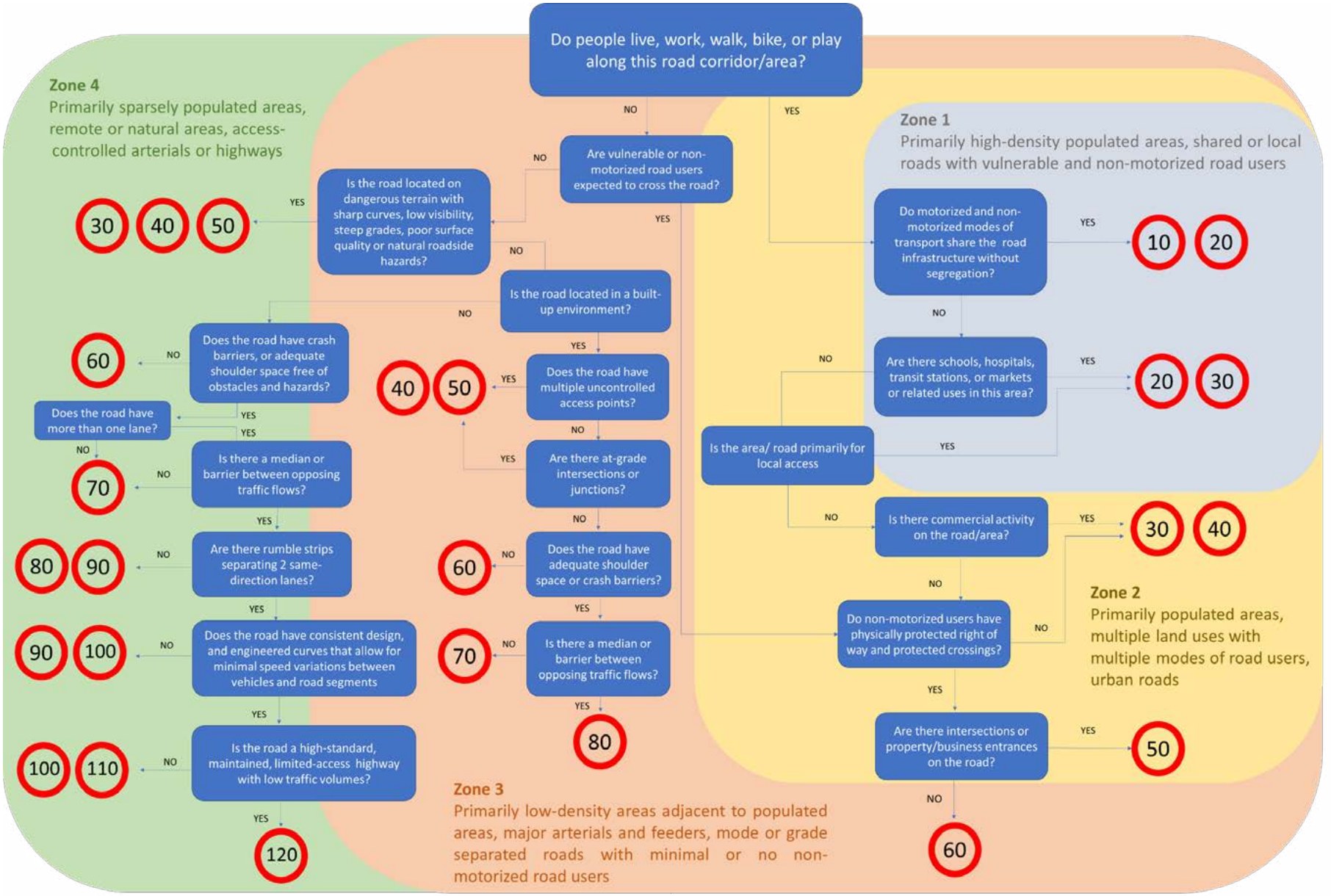


Figure 3.2: Speed Limit Decision Tree. Source: WRI

4 . DATA AND EVIDENCE FOR SPEED MANAGEMENT

4.1 Introduction

Setting an appropriate speed limit was noted as an initial step in speed management. Data and evidence are key in speed management as they help to describe the current situation and are a basis for measuring progress. The data and evidence can be gathered through counts, measurements, inspections and observations. This section provides examples of some data and evidence useful for assessing situations along corridors or within chosen areas through case study discussions.

CORRIDOR CASE

4.1.1 Corridor Overview

Figure 4.1 shows the corridor selected for assessment for speed management.

It is a 14.5km corridor comprising: part of Jinja road, Kampala Road, part of Bombo Road, Part of Kira Road, Lugogo bypass and Yusuf Lule Road. All these are classified as arterial roads by KCCA and the corridor surrounds most of Kampala central division, providing connection from Kampala's other four divisions, and the municipalities surrounding Kampala city to the central business district where many civil and social services such as the parliament building, a number of government offices, the Kampala "high street", places of worship and high end hotels and restaurants. It is also a gateway to downtown Kampala which is the center of commerce in the city.

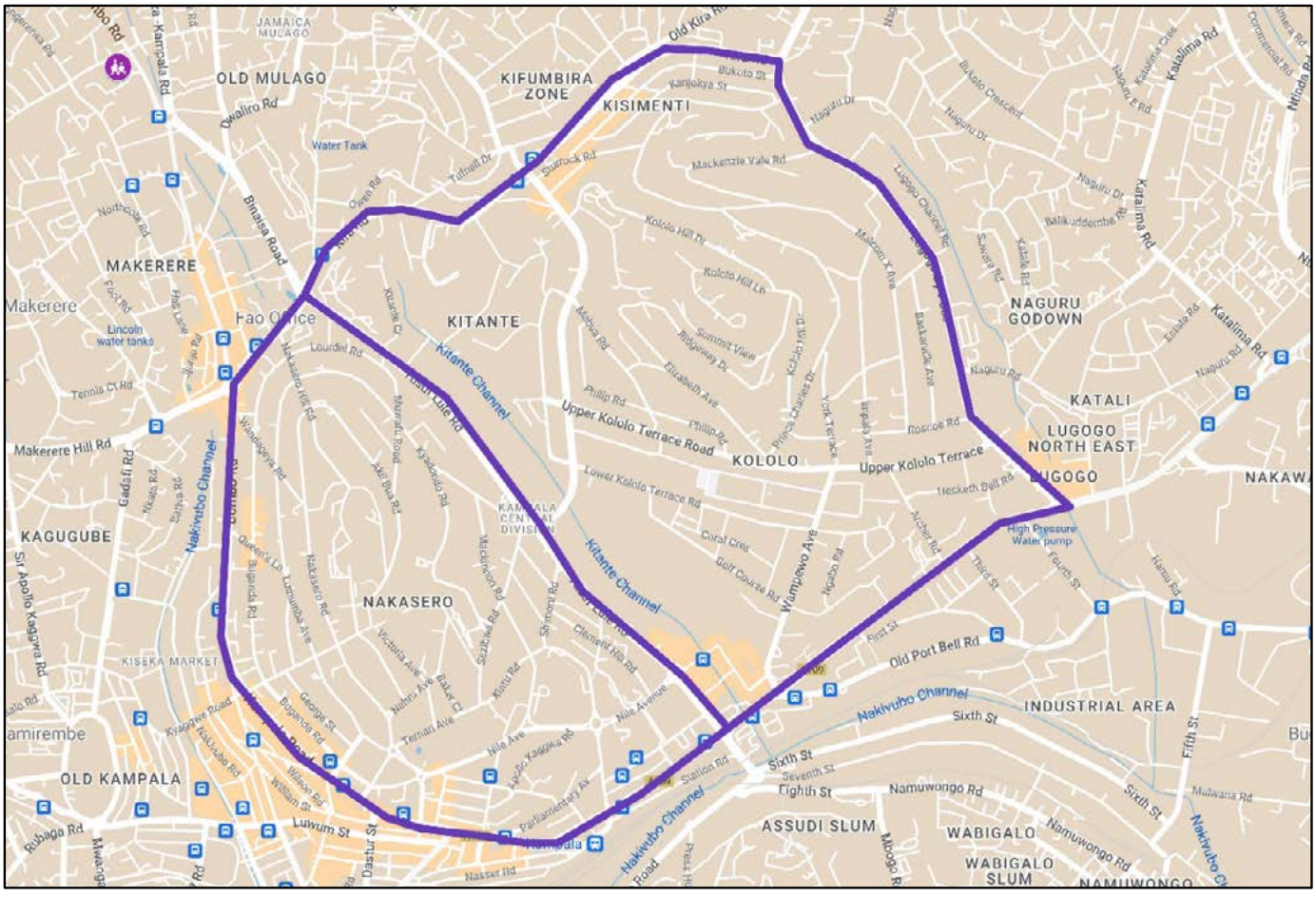


Figure 4.1: Corridor selected as a case for speed management

This corridor has high traffic volumes, a variety of land uses (ranging from government offices, schools, hospitals, businesses, markets, historical sites) along it, and many local and collector roads connecting to it. Safety and traffic flow here affects and is affected by these connecting roads. It was therefore considered an ideal case study for not only speed management interventions but also providing valuable learning from the monitoring and evaluation that should follow.

4.1.2 Corridor Speed and Crash Data Overview

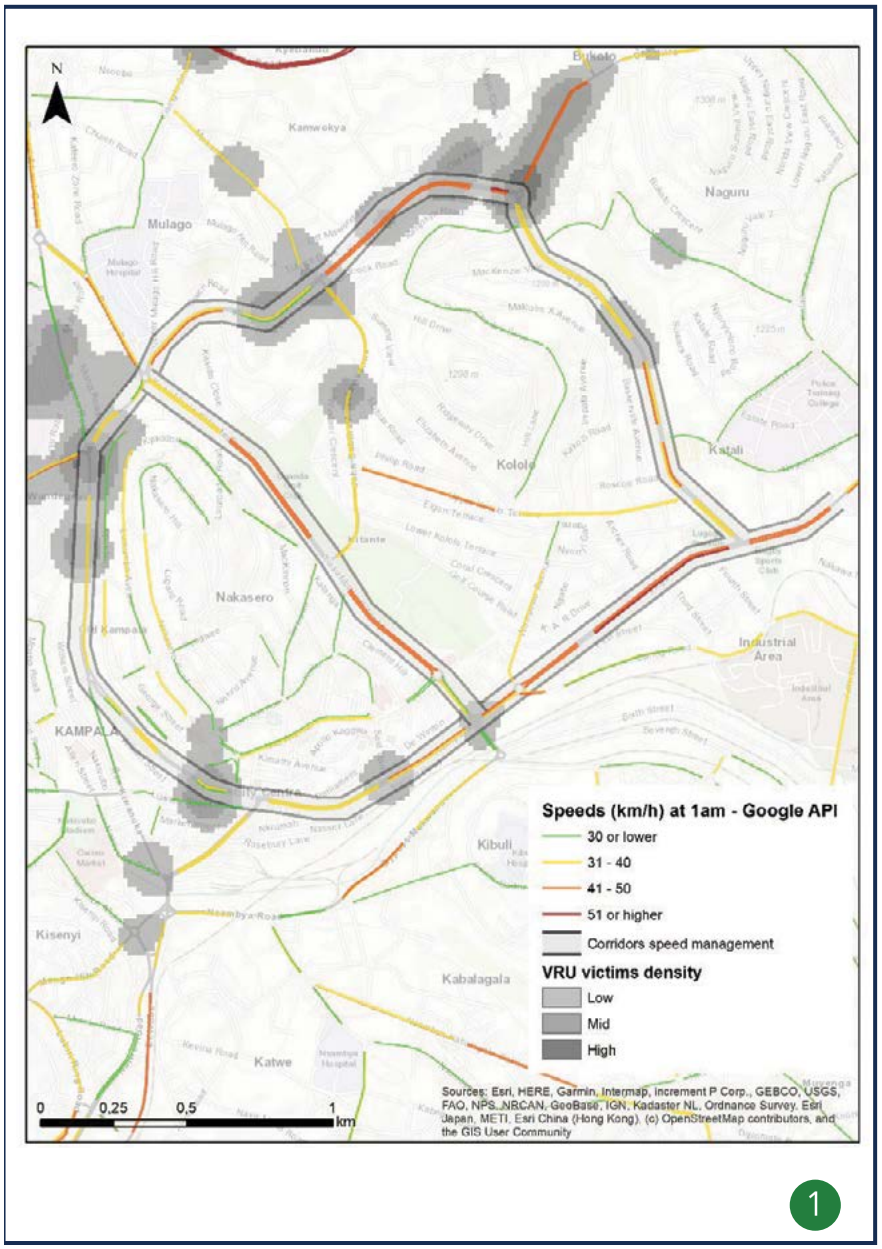
Figure 4.2 shows that the highest free flow speeds along the selected corridor are at night, with Kampala and Bombo Roads having average speeds of 31-40Km/h; Kira and Yusuf Lule Roads averaging 41-50Km/h as is the average speed of part of Lugogo bypass; and Jinja road speeds reaching over 51Km/h. During the day, as noted by the assessment at 11am and 8pm, Kampala Road speeds are mostly 30Km/h and below; Bombo Road and Kira Road are mostly 31-40Km/h; some sections of Yusuf Lule Road and Lugogo bypass are 31-40 Km/h while others are 41-50 Km/h; and Jinja road is mostly between 41-50Km/h.

A clear linear pattern of crashes can be seen at the northern section of this corridor comprising Bombo Road and Kira road. The spots with vulnerable road user (pedestrians, cyclists, motorcyclists) fatalities and serious injuries are mostly approaching and at the intersections namely:

- Wandegeya junction
- John Babiiha Road Junction (Acacia Junction)
- Kamwokya near the taxi stage and
- Kira Road Junction next to Kira Road Police Station

Other Junctions on the corridor where fatalities of vulnerable road users were reported are:

- Jinja Road and Access road junction
- Junction of Kampala Road and Station approach Road
- Junction of Kampala Road and Dastur Street
- Lugogo bypass and Nviri lane junction



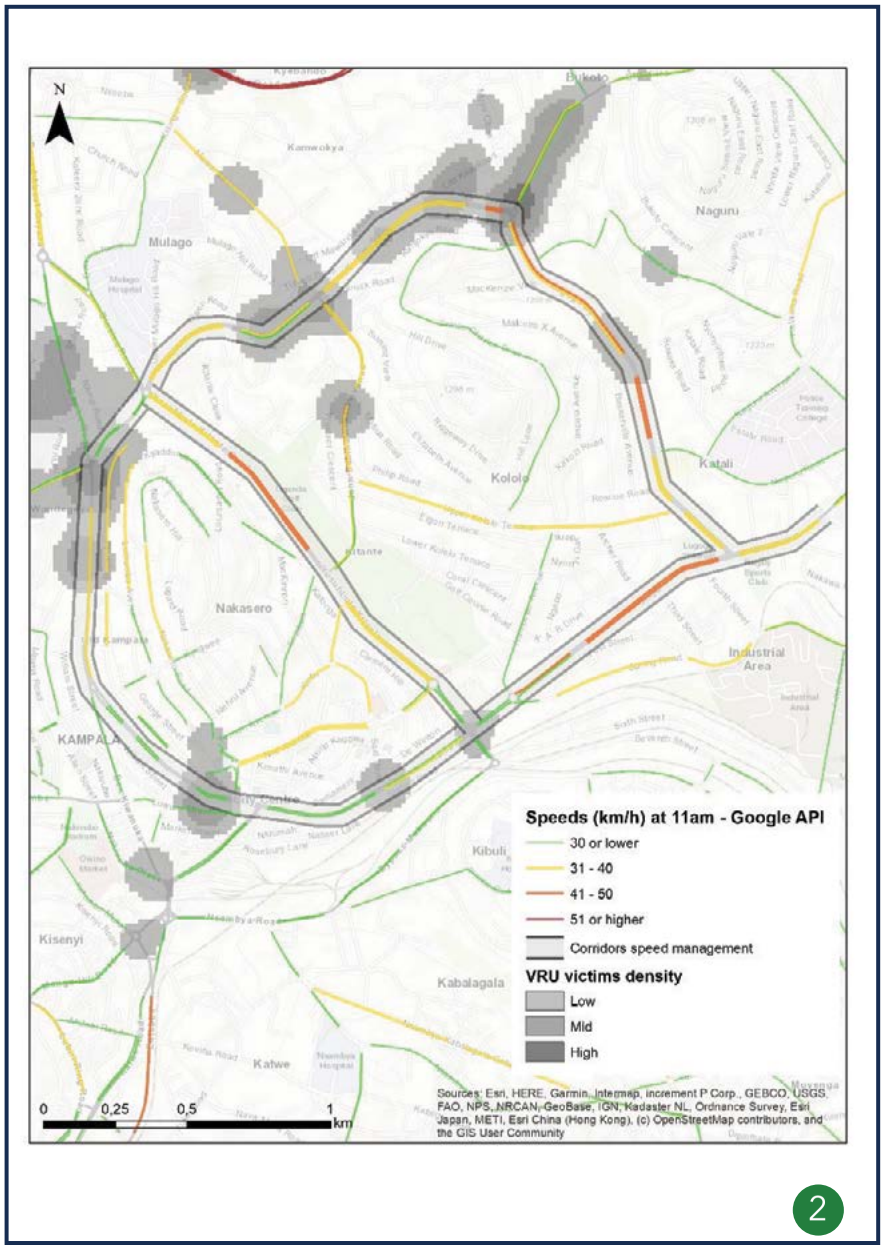


Figure 4.2: Typical free flow speeds for selected corridor at 1am, 11am and 8pm. Source: Authors based on data from Google API.

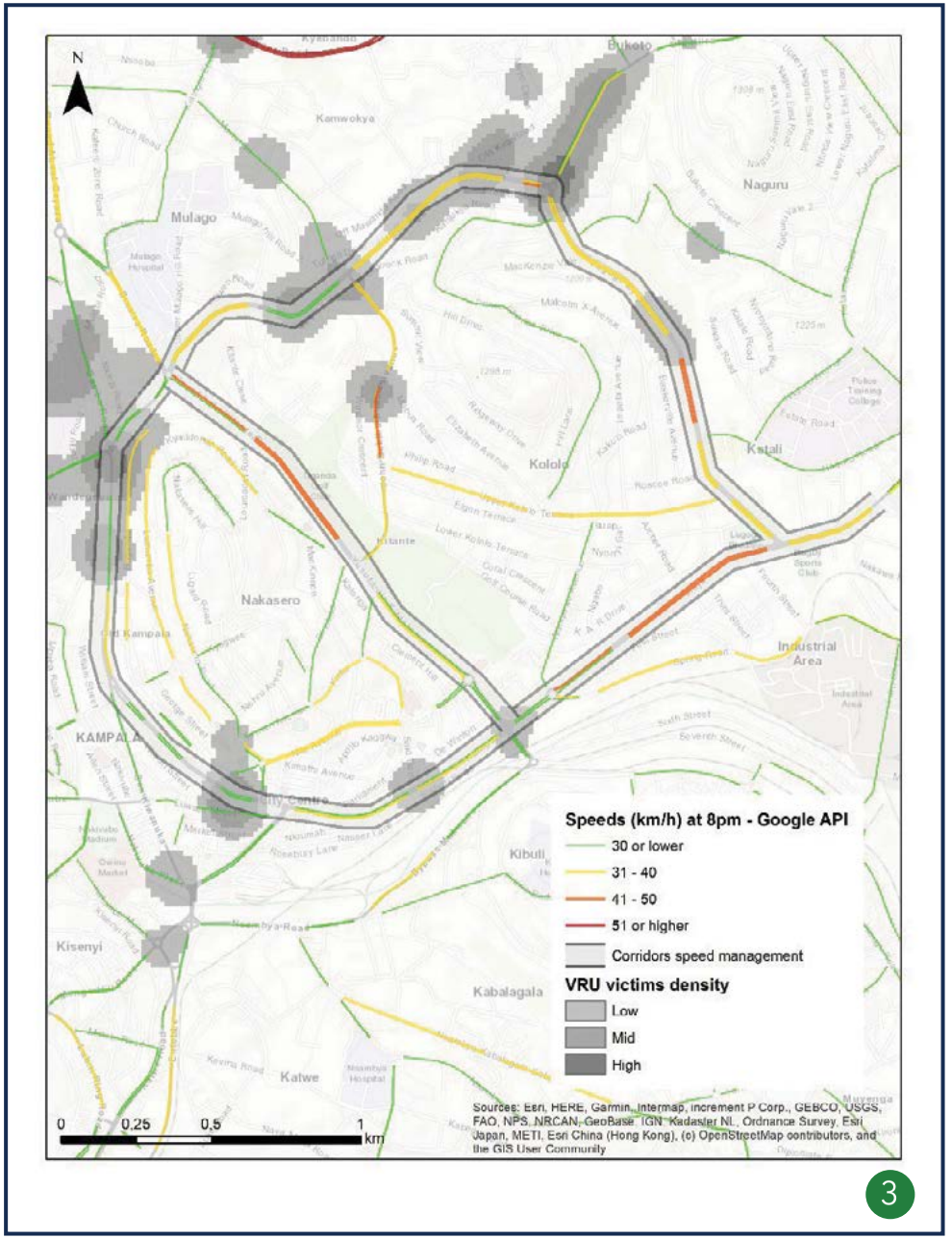


Figure 4.2: Typical free flow speeds for selected corridor - Continued

4.1.3 Spot Speed and Pedestrian Crossing Counts at Yusuf Lule Road and Lugogo Bypass

Spot speed and pedestrian crossing counts data collection was undertaken on Yusuf Lule Road and Lugogo bypass in June 2023 for 3 days- one over the weekend and two weekdays. The data collection exercise targeted times of free flow speeds. Data was collected in 40 minute periods every hour from 10am to 4pm. This section provides the highlights from analysis of this data. The locations for pedestrian observation and spot speed measurement chosen all had a designated crossing (painted at grade crossing), to enable comparison of crossing behavior at free flow speeds.

Yusuf Lule Road

Table 4.1 shows the percentage of all the traffic that was travelling at 30Km/h or below and at 50 Km/h or below on Sunday 4th, Monday 5th and Wednesday 7th June 2023. On average, less than 13.7% of the overall traffic on this corridor travels at a speed safe for pedestrians or other vulnerable road users, and above 23% travelled above the legal speed limit. Figures 4.3 and 4.4 show that about 50% of passenger vehicles travel at speeds over 50Km/h, while about 25% or motorcycles travelled at speeds of 50Km/h and above. Motorcycles were 50-63% of the overall motorized traffic observed. Some trucks and buses were also noted to be travelling at over 50Km/h.

Table 4.1: Percentage of traffic on Yusuf Lule Road travelling at or below 30Km/h and 50Km/h

	04/06/23	05/06/23	07/06/23
≤30 Km/h	12%	21%	8%
≤50 Km/h	74%	84%	73%

Figure 4.5 shows 78% of those observed did not use this designated crossing at Yusuf Lule Road. In other words, only 1 out of every 5 crossing is at a suitable and safe crossing. When this is combined with other factors, it is a situation that will lead to very serious road safety problems. Overall, over the three days on Yusuf Lule Road, it was observed that in total 73% of male children made a violated crossing, while 25% of female children made a violated crossing. In the same period, elderly men made a violated crossing at a rate of 75%, while elderly women never made a violated crossing.

The violation rate for adult men and women is around 80%. Serious consideration has to be made on raising the importance, design and placement of designated crossings.

Pedestrian exposure to crashes while crossing Yusuf Lule Road: The exposure to crashes on the road for pedestrians was assessed by considering the number of crossing violations within a given time, together with the number of vehicles within that time, and 85th percentile speed. The 85th percentile speed is the speed at or below which 85% of drivers are travelling. Figure 4.6 shows all but one of the 18 hours assessed had an 85th percentile speed above the legal speed limit (50Km/h).

The riskiest times, that is, times when number of violations and vehicle density were high, posing risk of serious injury and fatality on the road included: between 10:00-10:40, 12:00-12:40 and 14:00-14:40 on Sunday 4th June 2023; all assessed times on 5th June 2023 except 10:00-10:40; and all assessed times on 7th June 2023 except 12:00-12:40. The risk of pedestrian fatality in the event of a crash at this location is at least 85%.

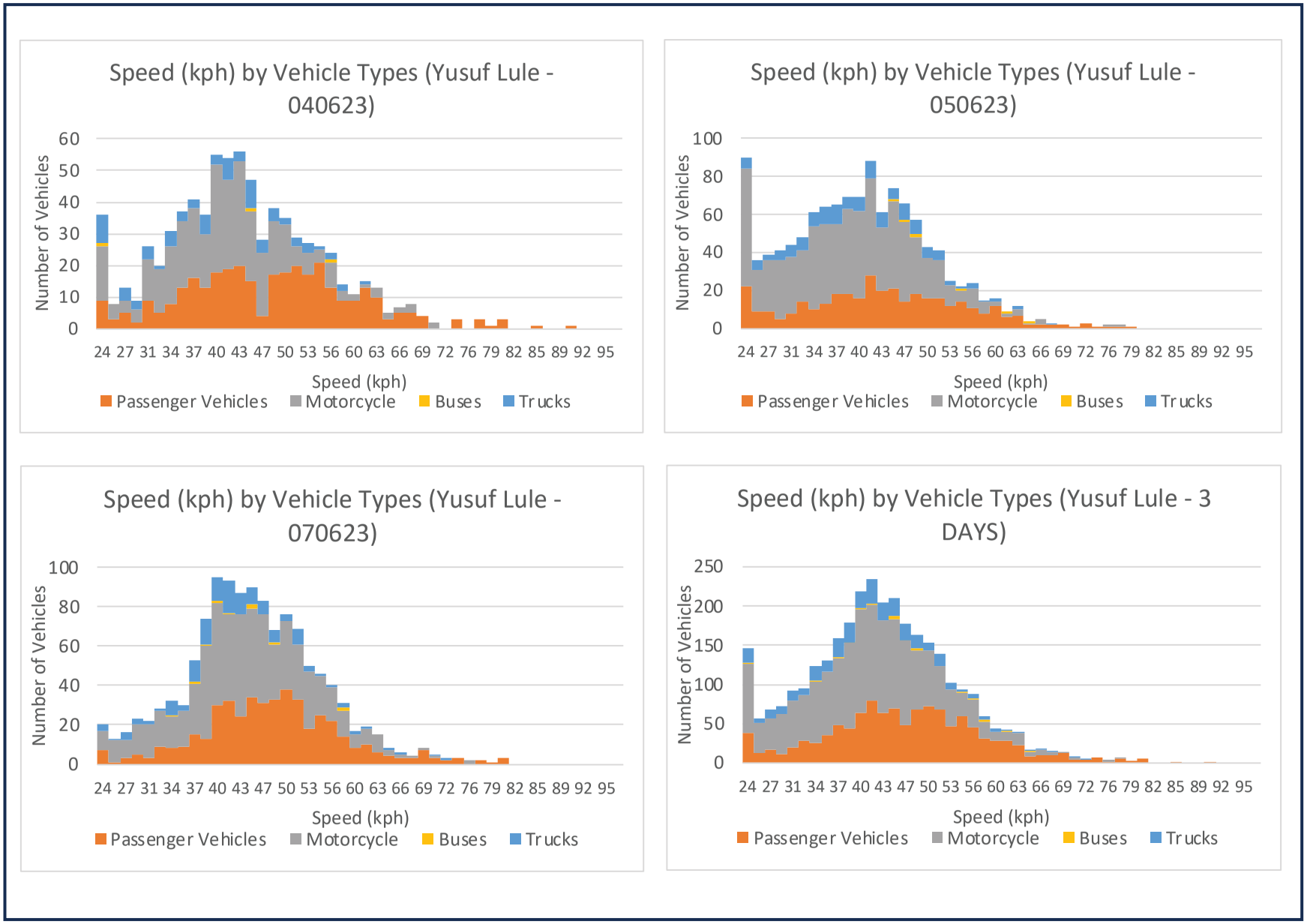


Figure 4.3: Comparison of number of type of traffic at specific speeds on Yusuf Lule Road over three days and overall

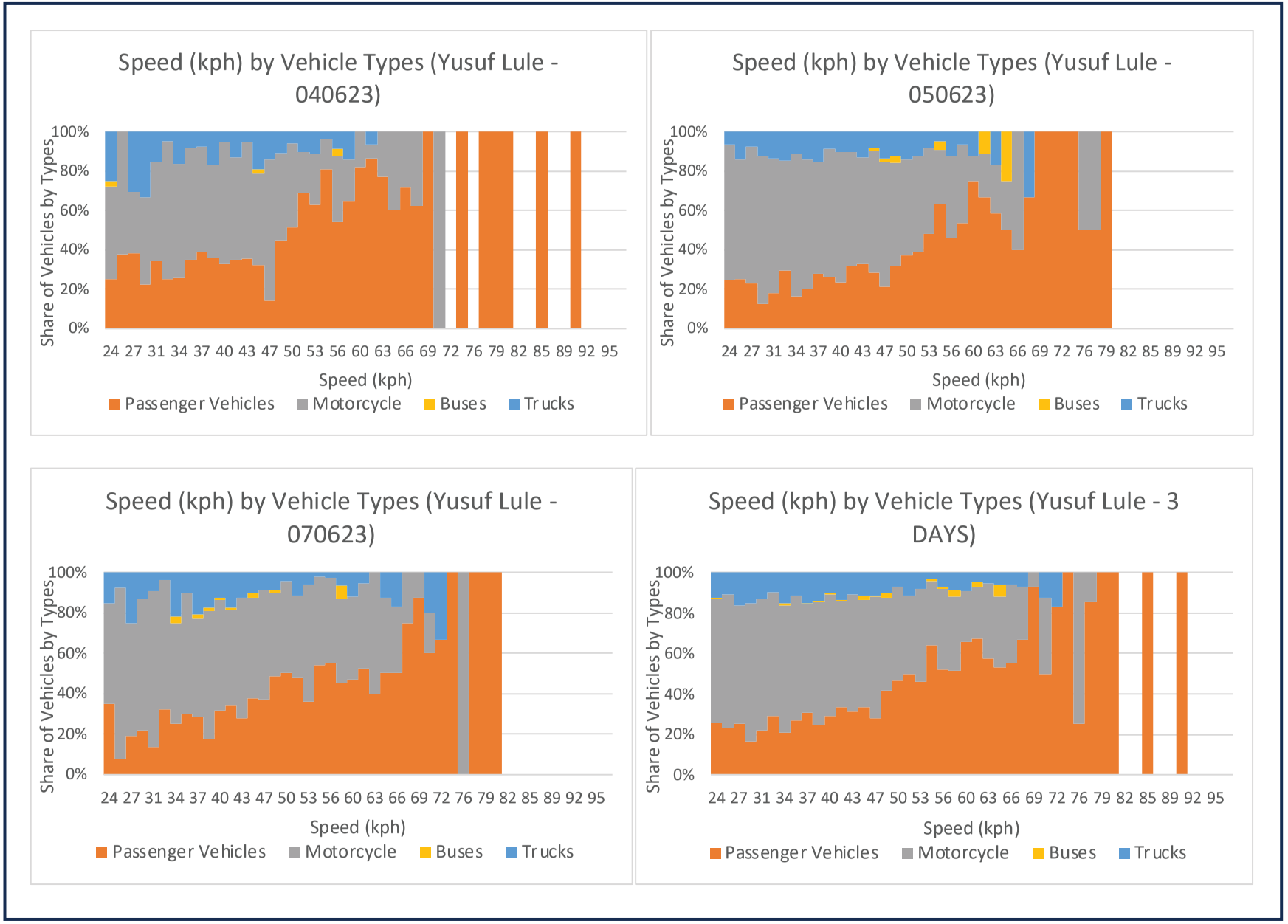
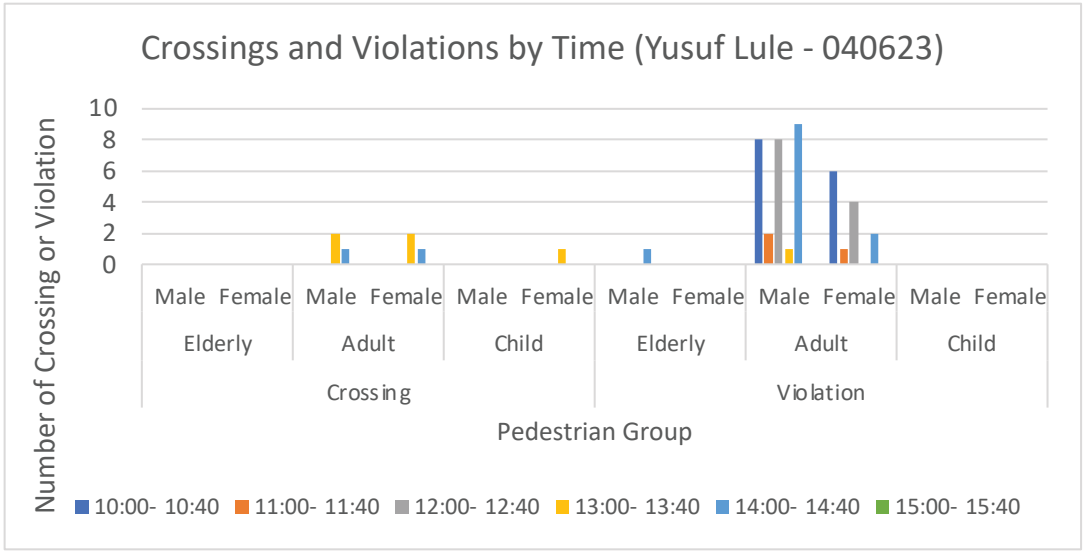
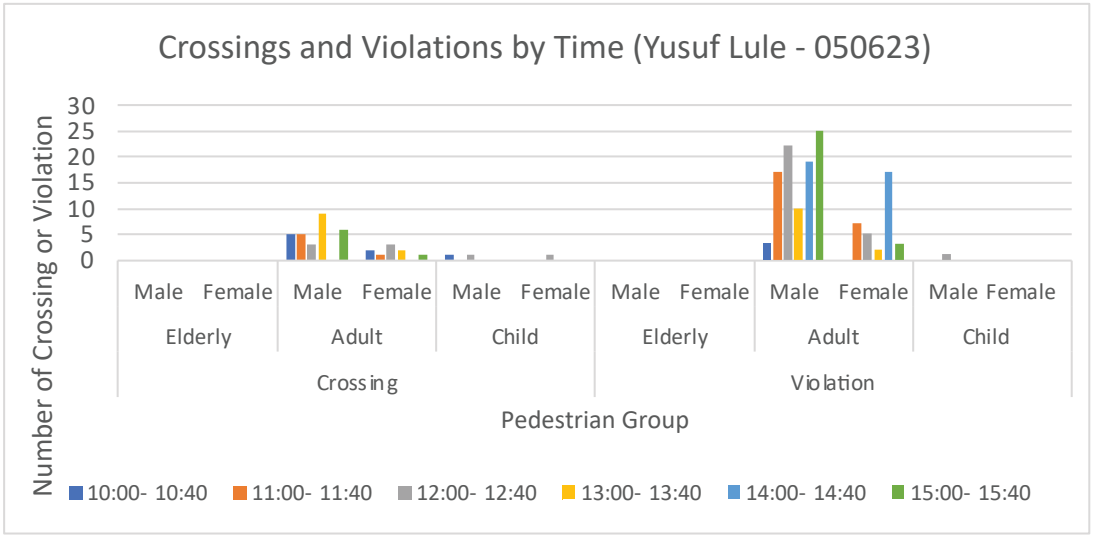


Figure 4.4: Comparison of proportion of type of traffic at specific speeds on Yusuf Lule Road over three days and overall





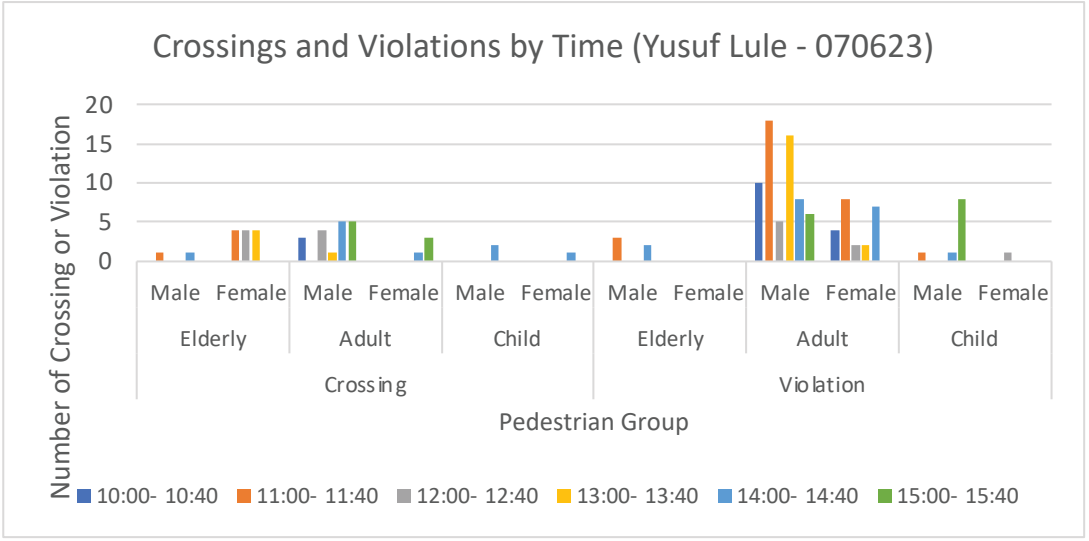
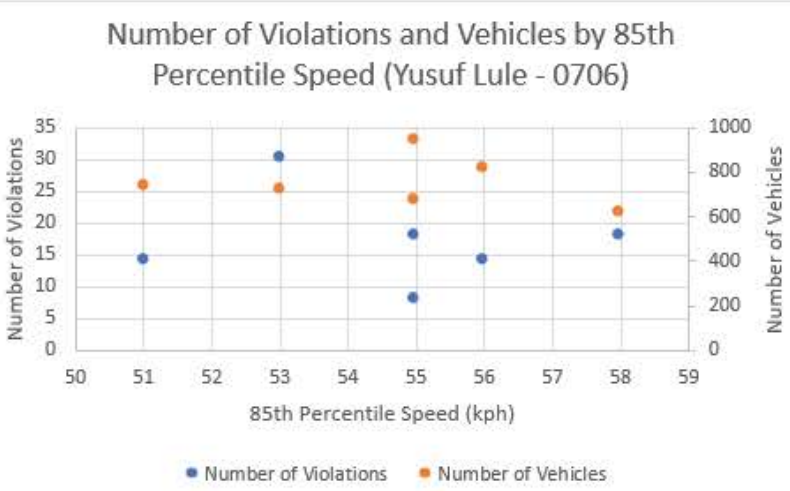


Figure 4.5: Comparison of pedestrian crossing behavior at Yusuf Lule Road over three days

04/06/23			
Time	Number of Vehicles	85th Percentile Speed	Number of Violations
10:00- 10:40	412	55	14
11:00- 11:40	311	60	3
12:00- 12:40	554	56	12
13:00- 13:40	495	51	1
14:00- 14:40	462	58	12
15:00- 15:40	578	53	0
Total	2812	55	42

05/06/23			
Time	Number of Vehicles	85th Percentile Speed	Number of Violations
10:00- 10:40	576	56	3
11:00- 11:40	818	50	24
12:00- 12:40	691	51	28
13:00- 13:40	644	50	12
14:00- 14:40	877	53	36
15:00- 15:40	795	47	28
Total	4401	51	131

Figure 4.6: Assessing pedestrian exposure during crossing by comparing crossing violation, number of vehicles, and 85th percentile speed on Yusuf Lule Road



07/06/23			
Time	Number of Vehicles	85th Percentile Speed	Number of Violations
10:00- 10:40	737	51	14
11:00- 11:40	724	53	30
12:00- 12:40	945	55	8
13:00- 13:40	613	58	18
14:00- 14:40	670	55	18
15:00- 15:40	818	56	14
Total	4507	55	102

Lugogo Bypass

Table 4.2 shows the percentage of all the traffic that was travelling at 30Km/h or below and at 50 Km/h or below on Sunday 4th, Monday 5th and Wednesday 7th June 2023. On average, less than 17.3% of the overall traffic on this corridor travels at a speed safe for pedestrians or other vulnerable road users, and above 23% travelled above the legal speed limit. Figures 4.7 and 4.8 show that on average about 25% of passenger vehicles and motorcycles travel at speeds over 50Km/h. Some trucks and buses were also noted to be travelling at over 50Km/h. There are certain periods such as recorded on 4th June 2023 between 12:00-12:40 where over half of the vehicles are over the legal speed limit.

Table 4.2: Percentage of traffic on Lugogo bypass travelling at or below 30Km/h and 50Km/h.

	04/06/23	05/06/23	07/06/23
≤30 Km/h	8%	23%	21%
≤50 Km/h	60%	84%	86%

Figure 4.9 shows 31% of those observed did not use this designated crossing at Lugogo bypass. Although this violation rate is much lower than Yusuf Lule Road, it means that at least 3 out of every 10 crossings made here are violated crossings. This is a very serious ratio. On 7th June 2023, while 44 children crossed the Lugogo bypass section under assessment between 13:00 and 13:40, none of these were crossing violations. This is the time when lower primary classes break off for the day and is an encouraging observation. Nevertheless, school zone safety efforts should not neglect education and awareness raising to ensure pedestrian crossings are used and respected by motorists. To support this effort, crossings should be well designed and placed to increase pedestrian visibility and reduce vehicle speeds.

Pedestrian exposure to crashes while crossing Lugogo bypass: 14 of the 18 hours during which assessment was undertaken had an 85th percentile speed above the legal speed limit (50Km/h). 85th percentile speeds on 4th June 2023 were 60Km/h and above for all but one of the hours of assessment. 7th June 2023 had the highest number of violations at Lugogo bypass for the days assessed. The riskiest time assessed was 12:00-12:40 on 4th June 2023 with an 85th percentile speed of 68Km/h. On that day, between 10:00- 16:00, 117 people crossed Lugogo bypass at an undesignated crossing, with 85% of 3,312 vehicles travelling at or below 61Km/h. On the 7th June 2023 during similar hours, 239 people crossed Lugogo bypass at an undesignated crossing, with 85% of 6,039 vehicles travelling at or below 50Km/h. The potential exposure to risk, based on 85th percentile speed is at least 85% likelihood of pedestrian fatality in the event of a crash.

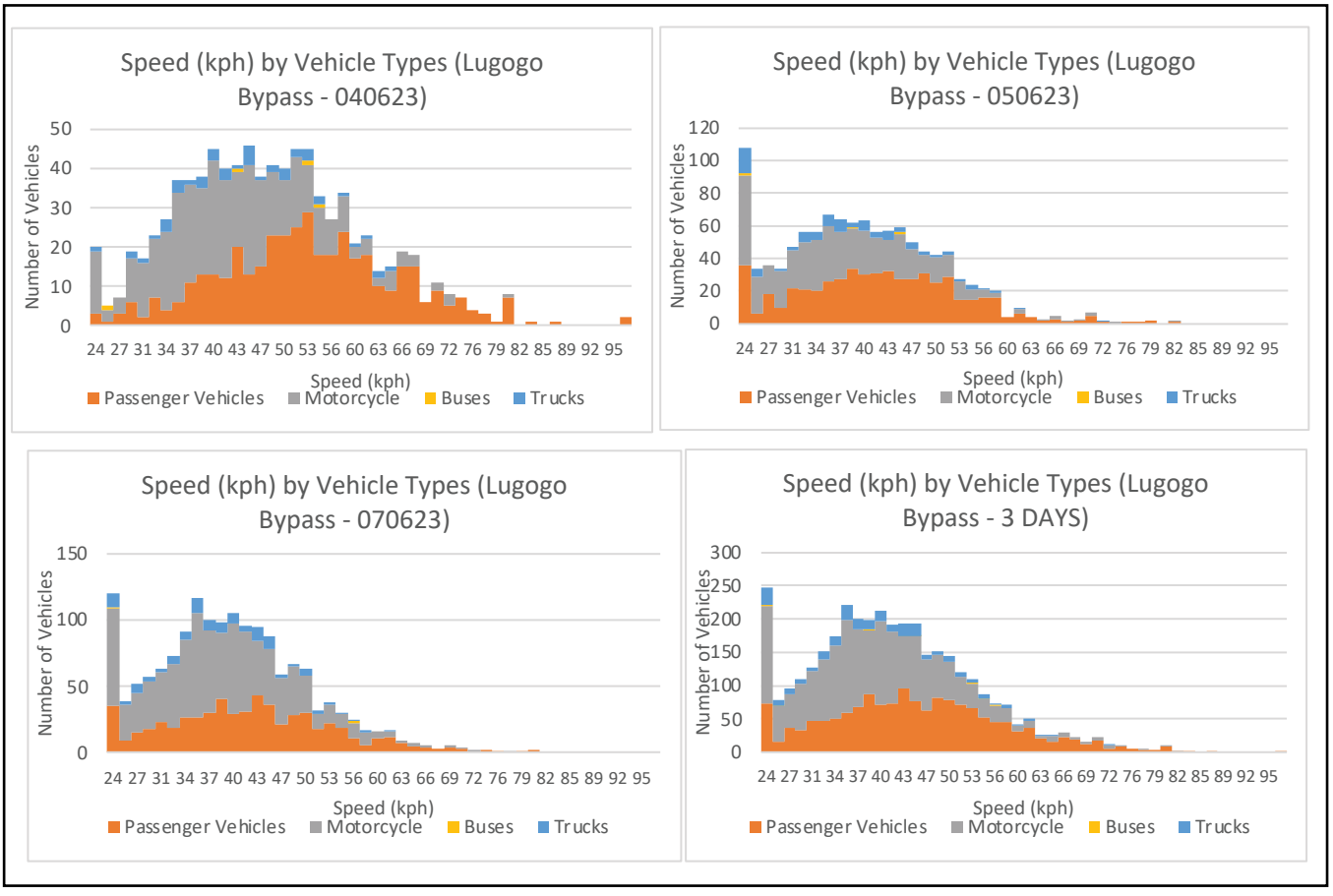


Figure 4.7: Comparison of number of type of traffic at specific speeds on Lugogo bypass over three days and overall

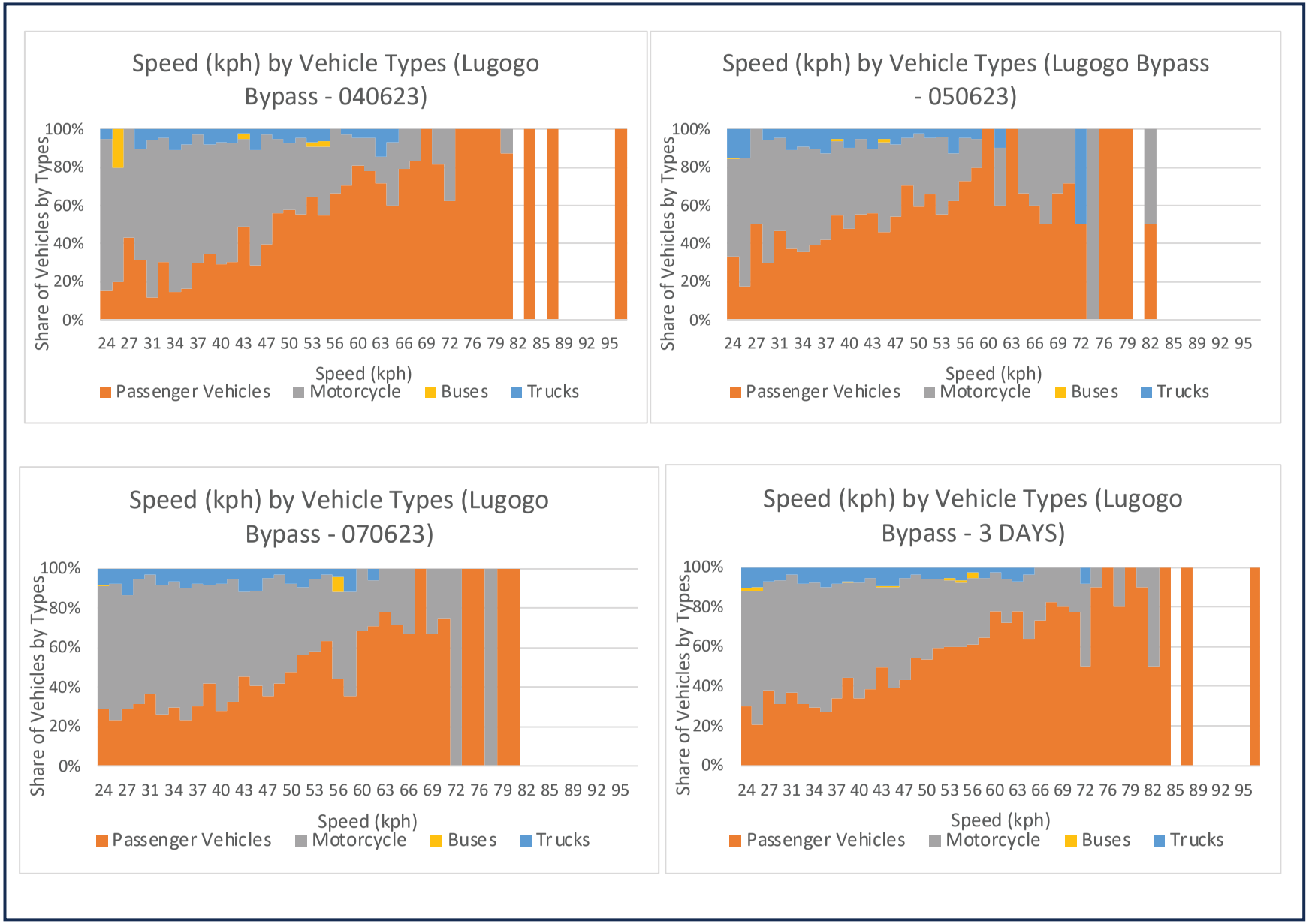


Figure 4.8: Comparison of proportion of type of traffic at specific speeds on Lugogo bypass over three days and overall

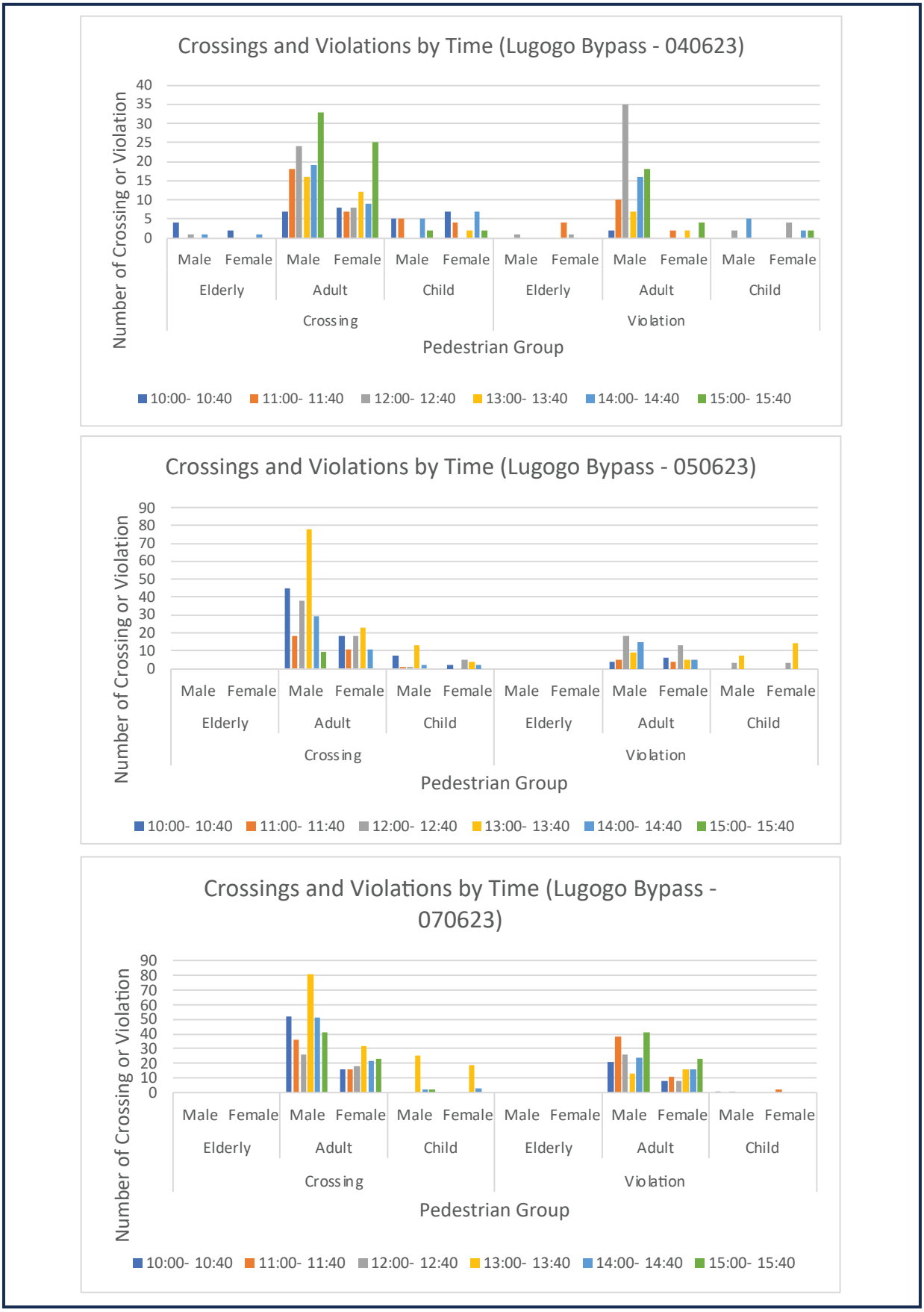
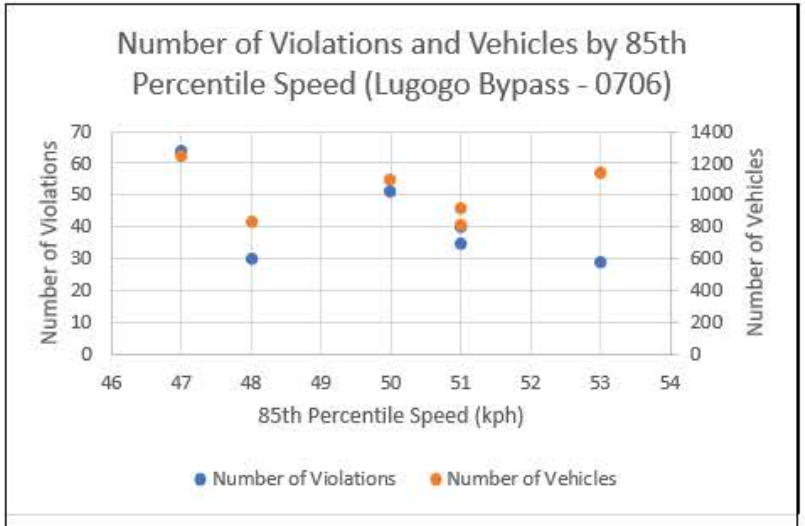


Figure 4.9: Comparison of pedestrian crossing behavior at Lugogo bypass over three days

04/06/23			
Time	Number of Vehicles	85th Percentile Speed	Number of Violations
10:00- 10:40	444	50	2
11:00- 11:40	613	60	16
12:00- 12:40	580	68	43
13:00- 13:40	528	60	9
14:00- 14:40	598	60	23
15:00- 15:40	549	61	24
Total	3312	61	117

05/06/23			
Time	Number of Vehicles	85th Percentile Speed	Number of Violations
10:00- 10:40	764	45	10
11:00- 11:40	837	42	9
12:00- 12:40	612	45	37
13:00- 13:40	747	51	35
14:00- 14:40	573	56	20
15:00- 15:40	668	55	0
Total	4201	51	111

Figure 4.10: Assessing pedestrian exposure during crossing by comparing crossing violation, number of vehicles, and 85th percentile speed on Lugogo bypass



07/06/23			
Time	Number of Vehicles	85th Percentile Speed	Number of Violations
10:00- 10:40	836	48	30
11:00- 11:40	1094	50	51
12:00- 12:40	919	51	35
13:00- 13:40	1147	53	29
14:00- 14:40	805	51	40
15:00- 15:40	1238	47	64
Total	6039	50	249

4.2 Low Speed Zones- Corridor and School Zones Cases

Low speed zones are defined areas with high pedestrian traffic, such as school zones, residential or commercial areas, that aim to improve the safety of vulnerable road users, particularly, those who walk and use bicycles, by ensuring consistently low speeds in the defined area through traffic calming measures. The cases selected to illustrate the evidence underpinning low speed zones have high pedestrian traffic at all times during the day or have vulnerable road users accessing services at specific times of the day, such as schools. It is important to note, that even though interventions in low speed zones target particularly pedestrians, they are beneficial for the entire community around the low speed zone, even those not accessing the services in the low speed zone.

4.2.1 Corridor Case- Kampala and Bombo Roads

This corridor makes up the "high street" for Kampala. It is the main access to the central business district and has a variety of services along it. It is adjacent to the pilot non-motorized transport corridor; is part of a lucrative informal public transport route into the CBD; and is part of the Kampala Bus rapid Transit plans.

Observations

The city wide speed analysis using google API data showed that speeds on Kampala Road and the Bombo Road section up to the Kyaggwe Road junction predominantly have typical free flow speeds at or below 30Km/h, except late in the night when the typical speeds are between 31-40Km/h. The Bombo Road section between the Kyaggwe Road junction and Wandegeya intersection also had typical day time free flow speeds of 31- 40Km/h.

Physical interventions are required in this section to ensure consistent low speeds and safety of crossing for pedestrians. In October 2022, WRI led a road safety inspection along half of this section, joined by officials from KCCA, Uganda National Roads Authority and Ministry of Works and Transport. The inspection report was submitted to KCCA and is available for further reference. Findings from that report are drawn on to highlight the areas needing safety improvement.

Pedestrian Crossings: At grade painted crossings can be seen at a number of the side roads along this section (Figure 4.11). Along the section itself, designated crossings a few and far between- one on Kampala Road near the main post office and one on Bombo Road near Norvik hospital. The traffic island along this section leaves spaces at intervals to aid crossing (figure 4.12). Often times, pedestrians cross some distance a few meters away from these crossing accesses and either walk through the raised island, or walk the short distance at the edge of the carriage way to get to these accesses. There are no designated crossings at the larger intersections along this stretch such as at Dastur street and Burton Street junctions.

Complementary to the pedestrian crossings, this section has wide walkways on either side (about 2m or more), with some sections even protected from encroachment by parking(figure 4.12). Unfortunately the walkways are often obstructed by advert boards, street vendors, and open manholes.

Figure 4.11: Painted crossing at One of the side roads of Kampala Roads

Figure 4.12: Traffic island access for pedestrians at Kampala Road; walkway protected from parking encroachment

4.2.3 School Zones Case

Treatment of school zones as low speed zones not only benefits the pupils and students accessing the schools but often times, because schools are nestled in communities, serve the entire community creating safer residential or commercial areas.

Overview of Selected Schools

Seven schools were selected from 4 of the 5 divisions of KCCA to assess possible implementation of school zones. All were primary government aided schools with pupils aged between 3- 16 years. At least 80 % of all pupils attending public primary schools assess the schools by walking. The demographic of children from mostly low income and lower middle-income families that make up the public schools is important as they have limited options for accessing the schools yet are put at risk every day by simply walking to school. These schools had been singled out as having road safety challenges for their learners and staff. They were proposed by KCCA officials in charge of Education at the divisions. Table 4.1 gives an overview of the schools.

Table 4.1: Overview of Selected Schools

School	Division	Road Name	Classification and Comments on Road
St Peters Primary Nsambya	Makindye	Gaba Road; Nsambya Estate Road	Arterial and collector roads; In vicinity of marked black spot on Gaba road
Mirembe Primary school	Makindye	Local road 10m off Ku-le-kaana Road	Collector road; Upgraded within last 5years, no walkways
Kitebi Primary School	Rubaga	Wankulukuku Road	Collector road; Upgraded within last 4 years including walkways and speed calming measures
Makerere University Primary School	Kawempe	Bombo Road	Arterial Road; High risk Corridor; 1 km from high risk Bwaise roundabout
Ntinda Primary School	Nakawa	Ntinda Road	Collector Road, Rehabilitated within last 2 years including walkways, no speed calming
Mbuya COU Primary School	Nakawa	Robert Mugabe Road	Collector Road; Upgraded in last 5 years, no walkways or speed calming
St James Primary School, Biina	Nakawa	Lower Church Road	Local road; school bordered by collector road (Mutungo Tank road)

4.2.4 Speed and Crash Data Overview Around Selected Schools

Free flow speeds on roads around these schools are between 31-40Km/h, at night (Figure 4.13). This shows that the road environment and design support high speeds. During the day (using 11am data), free flow speeds remain at 31-40Km/h for all the schools, except Kitebi and Biina Primary schools, where speeds in the vicinity were 30Km/h and below.

While there were no crashed reported just outside these schools, Figure 4.3 shows Kitebi, Ntinda and Makerere University Primary Schools were 500m-1.5km away from intersection that were noted to have crashes involving pedestrians. It is important to note the pupils in these public schools are known to walk distances even greater than 1.5km to school and many have to cross these intersections to get to their schools.

Despite the fact that hardly any crashes were reported in the immediate vicinity of the schools, the speeds noted coupled with the lack of pedestrian infrastructure requires further consideration of how these roads can be shared in a safe. way by all road users especially vulnerable road users, more so, children. This is discussed in the next section (4.2.5).

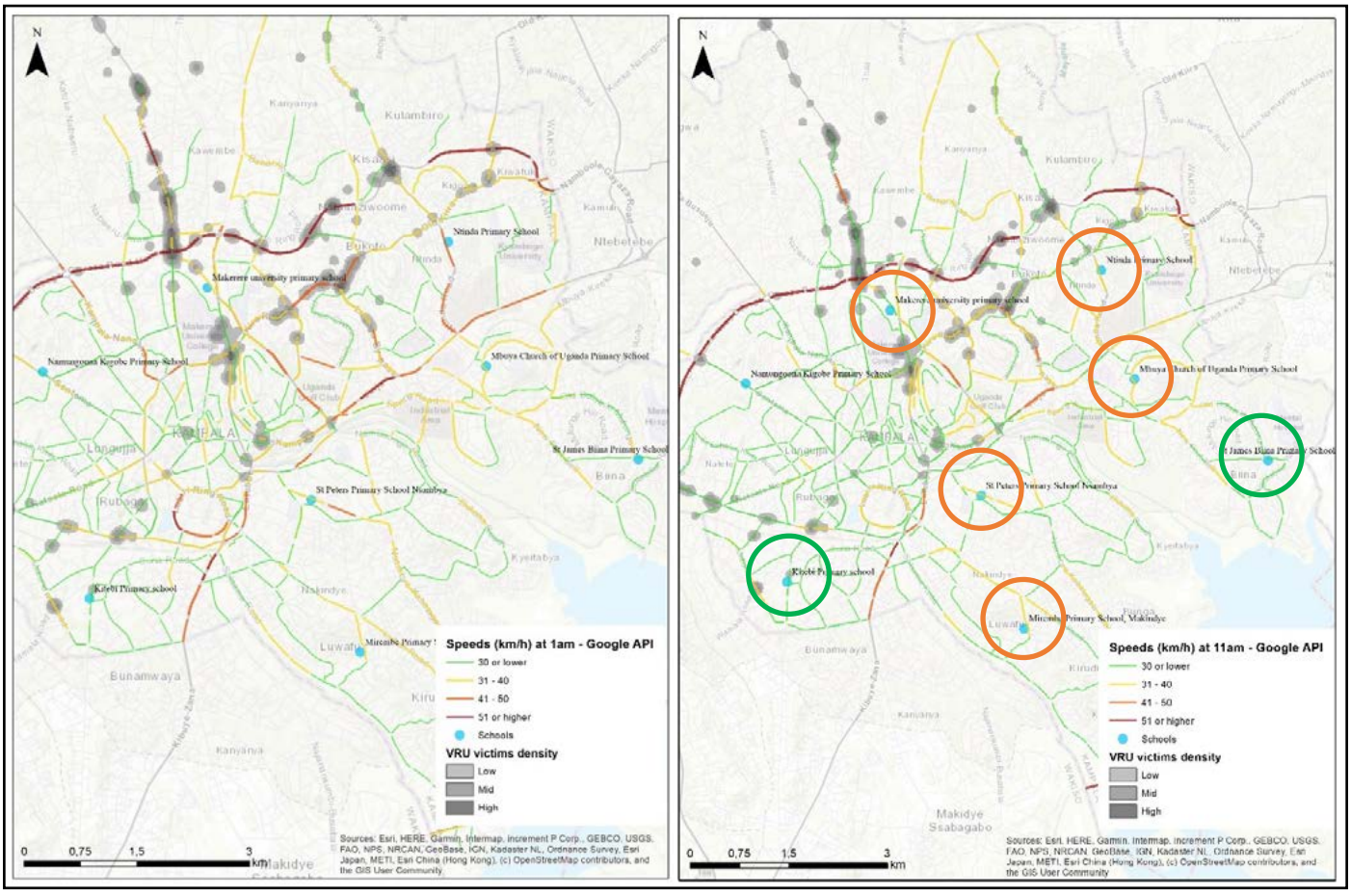


Figure 4.13: Typical free flow speed around selected schools at 1am and 11 am. Source: WRI based on Google API data.

4.2.5 Selected Schools- Observations

Designating low speed zones

Low speed zones can vary in size from a short stretch along a corridor to an entire neighborhood. Their designation should depend on significant features within the landscape. For example, for Kitebi Primary School, it could be 200m along Wankulukuku Road from the extent of the school's play field to the extent of the secondary school across the road.

For the Ntinda Primary school area, the low speed zone could be a 650m length of Ntinda Road from Capital Shoppers to St. Lukes Anglican Church. While for St. Peter's Nsambya, the low speed zone could be a wider area encompassing the other 4 public schools in the vicinity, Nsambya hospital, the babies' home, and the Catholic church. Figure 4.14 illustrates the varying sizes of low speed zones.

This is based on other significant features in the vicinity of the school, for example, next to Ntinda Primary school is the Uganda School for the Deaf, and a church after that. In the Nsambya area, there are a number of points of interest in the neighborhood creating pedestrian demand.

Designation of low speed zones should also take into account transition zones (also shown in Figure 4.14). These provide visual and physical cues to motorists before they enter the low speed zone. Being an urban area, it is expected that the transition zone from 50Km/h to 30Km/h will be a short distance of about 800m. Pavement markings, tapering of street width, use of bollards and speed humps are some of the ways to achieve transitions and gateways into school zones.

Infrastructure

Low speed zones are ineffective without appropriate infrastructure changes to ensure the low speeds. The current state of safe infrastructure for the school areas assessed is discussed in this section.

Schools along recently rehabilitated roads such as Kitebi and Ntinda primary schools have adequate walkways. For Kitebi primary school, there are also several speed calming measures along Wankulukuku Road such as humps and rumble strips (Figure 4.15), while there are no speed calming measures along Ntinda Road.

This may explain the 30Km/h speed and below noted in the google API analysis around Kitebi primary school and the 31-40Km/h speeds noted around Ntinda primary school. There are painted at grade crossings along the side roads of Ntinda Road but no designated pedestrian crossings on Ntinda road except where there are traffic lights.

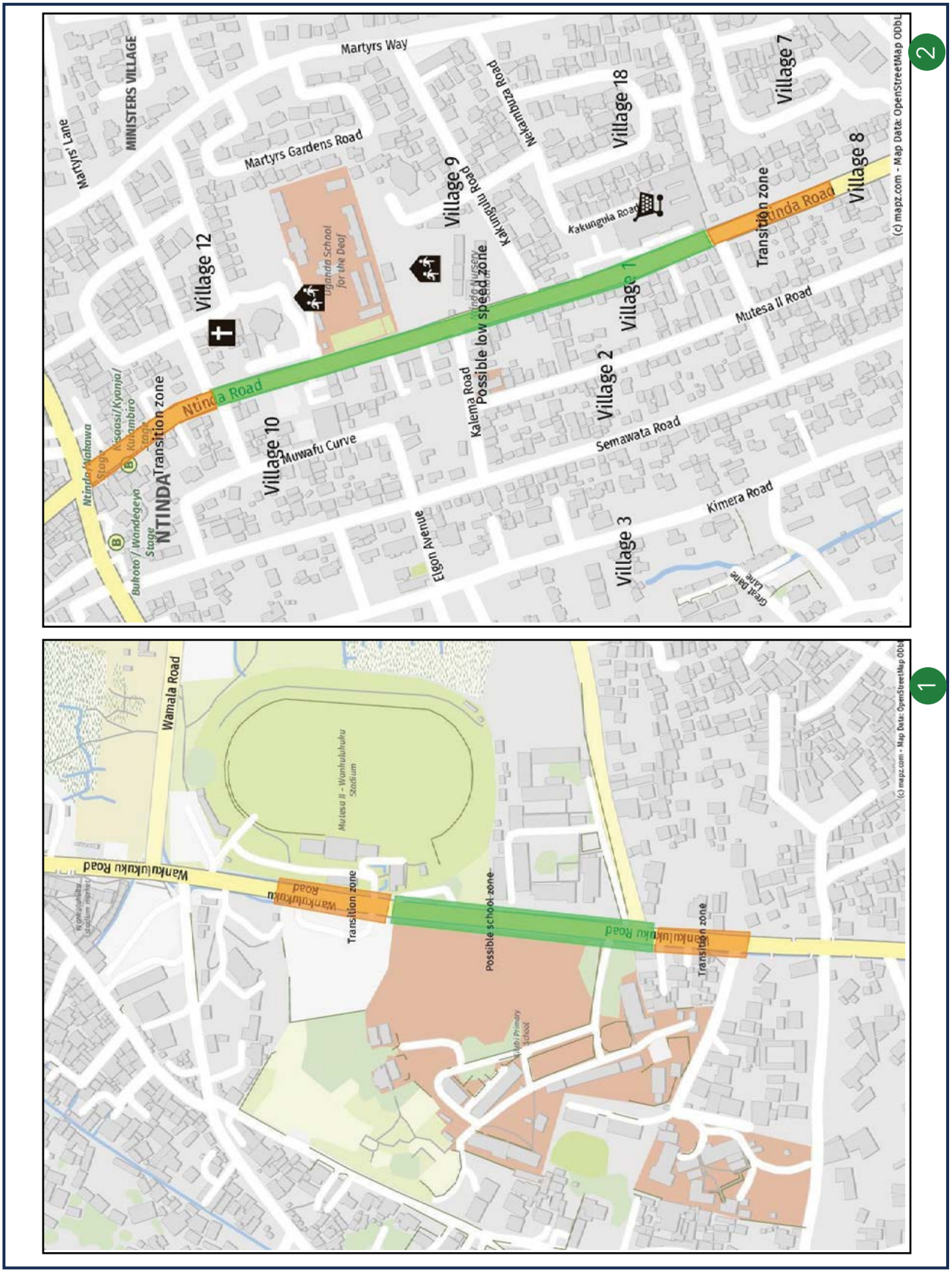


Figure 4.14: **1:** *Illustration of Low speed zone designated along one school;* **2:** *Ilustration of low speed zone designated along multiple linear points of interest;* **3:** *Illustration of Low speed zone designated around a neighborhood with several points of interest*

3

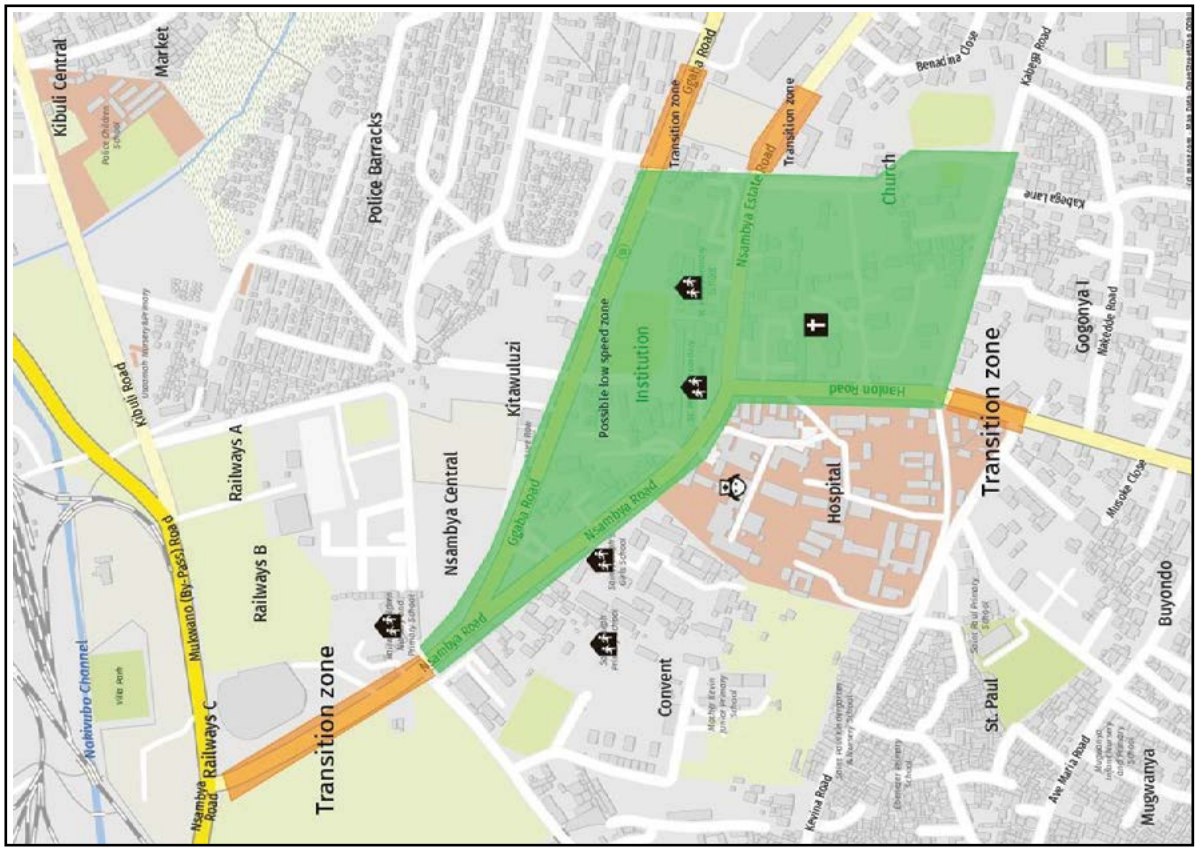

Kibuli Central
Market
Police Barracks
Kibuli Road
Railways A
Railways B
Railways C
Mukwano (By-Pass) Road B
Nsambya Road
Nakivubo Channel
Transition zone
Nsambya Central
Kitawuluzi
Ggaba Road
Possible low speed zone
Institution
Nsambya Estate Road
Transition zone
Ggaba Road
Transition zone
Church
Benadina Close
Kalenge Road
Kabega Lane
Harlon Road
Hospital
Convent
Transition zone
Gogonya I
Nakiddo Road
Masoke Close
Buyondo
St. Paul
Kevina Road
Ave Maria Road
Mugwanya

Figure 4.15: Wankulukuku Road at location between Kitebi Primary and Secondary Schools (adequate walkways)

Mirembe primary school is located about 100m of a recently upgraded road, Kulekaana Road, with no speed calming closer to the school. Walkways along this road are either on one side only or non existent (figure 4.16). Typical speeds along this road were noted to be between 31-40Km/h placing learners walking along this road at risk when they have to walk on the carriage way due to absence of walkways.

Figure 4.16: Kukekaana road at the junction going to Mirembe primary school (no walkways, pedestrian walking in the carriage way)

Roads accessing other schools such as Mbuya Church of Uganda Primary, St James Biina, Makerere University primary school and behind St Peters primary, Nsambya (along Nsambya estate road) have no walkways or informal walkways, and on one side of the road is usually an open drainage ditch (Figure 4.17). The open ditches compound the risk of serious injuries for pedestrians in the event of a crash. Few schools had crossings at or near the school entrance. Some of the crossings were poorly located, such as in figure 4.17 where the crossing does not connect to a safe pedestrian area such as a walkway.

Figure 4.17: Outside St James Biina Primary School. Typical open drainage ditches along schools

Intersections near schools

Some of the schools assessed, such as Kitebi and Ntinda Primary schools have large intersections at least 500m-1.5 km away from the school. While these intersections may not typically be within a designated low speed zones, pupils or students on the way to school may have to cross these intersections to access the school.

Figure 4.18 shows the wide intersection at Kabuusu, 1.5km away from Kitebi primary and secondary schools. The intersection has exists with 3 or more lanes; crossings are designated only by road studs; there is no traffic island at the crossing point and green time for crossing is very limited (as little as 15 seconds).

Crossings are often encroached upon by motor vehicles and motorcycles waiting for change of traffic signals. This type of intersection and its crossings is typical of the recently upgraded and signalized intersections, such as the Ntinda intersection just 500m from Ntinda Primary school.

Figure 4.18: Kabuusu intersection, 1.5km from Kitebi primary school (Designated crossing not very visible, no traffic island at crossing point)

5 SPEED MANAGEMENT MEASURES

5.1 Compliance Measures

Compliance measures must be implemented to ensure the speed limit is adhered to. They may be in the form of infrastructure, technology, and control. They vary according to road width, alignment, and number of lanes. Compliance measures, as part of speed management, can take the form of designation of low-speed zones and infrastructure measures usually take the form of traffic calming measures. Traffic calming measures vary by the desired speed limit and should recognize the presence of a diverse composition of road users for example the composition of pedestrians (children, adults, persons with disabilities), cyclists, motorcyclists, and other motor vehicles. Calming measures should be implemented multiple times along a road segment and distributed appropriately to ensure a constant operating speed that matches the speed limit.

This section discusses various compliance measures using cases, that is 2 Corridor cases and one zone based case. The Compliance measures proposed and articulated in this guide are drawn from deliberations during the speed management workshop held in Kampala on 24th October 2023, facilitated by WRI and attended by multiple stakeholders including from: KCCA, Uganda National Roads Authority (UNRA), Makerere University School of Public Health, Makerere University College of Engineering Design Art and Technology, Directorate of Traffic and Road Safety- Uganda Police, BIGRS Kampala embedded staff, CSO- Hope for Victims of Traffic Accidents.

5.1.1 Corridor Case 1- Lugogo bypass

Description of road environment: Lugogo Bypass was built as an arterial road to bypass the Kampala central business district to connect from city outskirts in the East (Nakawa area) to those in the North (Kamwokya area). It is mostly two lanes in either direction with a median. Currently there are three public and two private schools along or accessing from Lugogo bypass, a private university, hospitals, offices, restaurants and other commercial activities. Sidewalk (1-1.2m) are mostly on one side of the road. There are some 30Km/h speed limit signs along the corridor but average operating speeds range between 35-45 Km/h.

There is a constant flow of pedestrians along this road at all times of the day with peak pedestrian traffic between 7-8am, and 4-6 pm at the start and end of the school day. There are also a number cyclists at this time accessing education at Kololo senior secondary school. Closer to Kololo SSS, and at Nviri lane are faded zebra crossings and worn out speed bumps and rumble strips.

Proposed speed Limit: 30Km/h

Speed management measures proposed:
These included:

- Introducing road diets to create wider sidewalks on both sides of the road
- Transforming of existing crossings to raised crossings, construction of more raised crossings where necessary and traffic calming devices at suitable intervals to be determined following thorough inspection and observation of pedestrian patterns
- Erecting safe fencing around the median except at designated crossings to channel pedestrians to safer crossing areas. This could be complemented by enacting jaywalking laws.
- Erection of speed cameras at strategic locations
- Improving street lighting.

Box 1: Road Diet and Traffic Calming Devices

Road Diet: A road diet is a transportation planning technique to improve traffic safety by reallocating space from multilane roadways to uses other than for motorized traffic through curb extensions, bulb-outs, bike lanes, pedestrian medians, landscaping, and other relatively low-cost interventions. Road diets are traffic calming owing to their narrowing of the carriageway; have been shown to reduce crashes and improve safety for pedestrians, cyclists and other vulnerable road users; and can help to reclaim space for bikeways, transit lanes and other multimodal infrastructure. When timed with regular maintenance works, implementation of road diets can be cost-effective- requiring a little more than road marking paint and adequate enforcement. Caution should be exercised when implementing road diets on corridors carrying more than 20,000 vehicles per day as it may not be possible to slim down such large traffic overnight.

Traffic Calming Devices: These are combinations of street designs that are deliberately introduced to slow traffic speeds by necessitating vertical or horizontal maneuvering or necessitating the driver to exercise extra caution as with the case of narrower lanes. Traffic calming devices are means to promote road user safety by limiting speed and diverting traffic. They are usually applied on local roads in residential areas, making a route less attractive for drivers seeking quick shortcuts ("rat runs") between higher-order routes that may be congested. They can also be applied across a residential area to maintain a low-speed environment to improve accessibility, safety and amenity.

For the Lugogo bypass corridor, in combination with the road diet illustrated above and in figure 5.1, raised crossings should be introduced at previously assessed and approved locations. In addition to that, the tactical pavements (rumble strips) must be installed 30 meters (appropriate spacing for 30km/h desired speed) ahead of the raised crossings to warn drivers. The vertical warning sign must also be placed at min 60m before the traffic calming device.

Sections approaching the access roads and U-turns should also have speed calming devices such as speed humps and/or rumble strips, also placed 30meters from the junction or U-turn.

In summary, this corridor would benefit from the introduction of a road diet and traffic calming devices to keep the speed at or below 30Km/h. Box 1 provides more detail on this. Figure 5.1 illustrates part of the corridor before and after introduction of a road diet and raised crossings. A thorough road safety assessment of the corridor would have to be undertaken to ascertain the placement and extent of any of these proposed measures.

Figure 5.1: Top- October 2023 state of Lugogo bypass near Kololo Senior secondary school; Bottom- Rendering of the same location with introduction of road diet- expansion of the sidewalk into one lane of the road and a raised crossing extended through the median. Credit: Siba El- Samra/WRI

5.1.2 Corridor Case 2- Kampala Road

Description of road environment: Kampala Road has a lot of urban human activity and the uses along this road include commercial space, schools, office buildings, civic spaces, and residences at the top of a number of these buildings.

Operating speeds during the day are normally below 30Km/h but at less congested times, there are speeding boda bodas. Kampala Road is part of the planned BRT corridor potentially increasing the density of pedestrians and other vulnerable road users. Some of the areas for improvement identified include:

- There are slits at intervals along the traffic island to aid crossing but none of these crossings are marked. This makes crossing for pedestrians unsafe and cars and boda bodas rarely yield to pedestrians.
- There are no traffic calming devices making the corridor unsafe during periods of no congestion.
- There is unclear channelization at junctions
- Limited enforcement
- The street does not feel like a high street

Proposed Speed Limit: 30Km/h

Speed management measures proposed include:

- Redesign of junctions for the safety of ALL road users. This can be achieved through improved channelization of vehicular traffic and possibly bulb outs at designated crossings at these intersections and providing adequate space for sidewalks and crosswalks.
- Implement traffic calming measures to allow safe crossing of pedestrians. These may include:
  - Island improvements
  - Speed bumps
  - Raised and marked crossings.
- Landscaping to raise the profile of the corridor as a high street.

Safety and mobility in this corridor and corridors in Kampala with similar characteristics would greatly benefit from a "complete streets" approach due to the high human activity in this corridor and the planned multimodal transit along this corridor.

With the implementation of the BRT in future, mass transit hubs should be properly designed to take into account the large numbers of pedestrians at these hubs and appropriately integrate the mass transit hub with the non-motorized transport infrastructure on this corridor.

Furthermore, there may be a need to manage the type of traffic that can access this corridor, and when, to ease the flow of the BRT fleet. Box 2 provides some guiding principles to implement complete streets while figure 5.2 illustrates some aspects of a complete street.

Box 2: The Complete Streets Approach

On streets with mixed traffic—motor vehicles, pedestrians, and bicyclists—all road users have to be considered in designing safer streets. The complete streets concept is based on the principle of shared public space and use. It focuses on safe access, an attractive streetscape, and effective mobility for all street users, including pedestrians, bicyclists, motorists, and transit riders of all ages, gender, and abilities.

The Complete Streets concept puts a priority on active transport, making it easier for people to cross the street, walk to shops, and bicycle. They are also designed around efficient street networks and context-sensitive solutions, allowing buses to run on time and making it safe for people to walk to and from transit stations. Complete Streets coordinate all street elements—infrastructure, paving, street furniture, signage, lighting, trees, and vegetation—for the use, enjoyment, and understanding of the public realm. Notwithstanding the variety of street types a city has, the Complete Streets concept aims to offer as many possible choices for safe transit as possible to the widest range of users, seeking a balance in their levels of service. Complete Streets must then be designed with the following in mind:

- **Accessibility first.** Street design and management should focus on accessibility before vehicle flow and capacity so as to be accessible to everyone.
- **Safety principles**. Streets design should prioritize the comfort and well-being of all its users through smart design. Street design should be inclusive- catering for the most vulnerable road users including children, persons with disabilities and the elderly.
- **Urban integration.** Streets should take into account the street's multifunctionality, compatibility, and diversity of use.
- **Continuity.** Streets should be envisioned not only in a plan or street section, but consistent in space and time along their corridor.

Adapted from: Cities Safer By Design: Guidance And Examples To Promote Traffic Safety Through Urban And Street Design, World Resources Institute, 2015

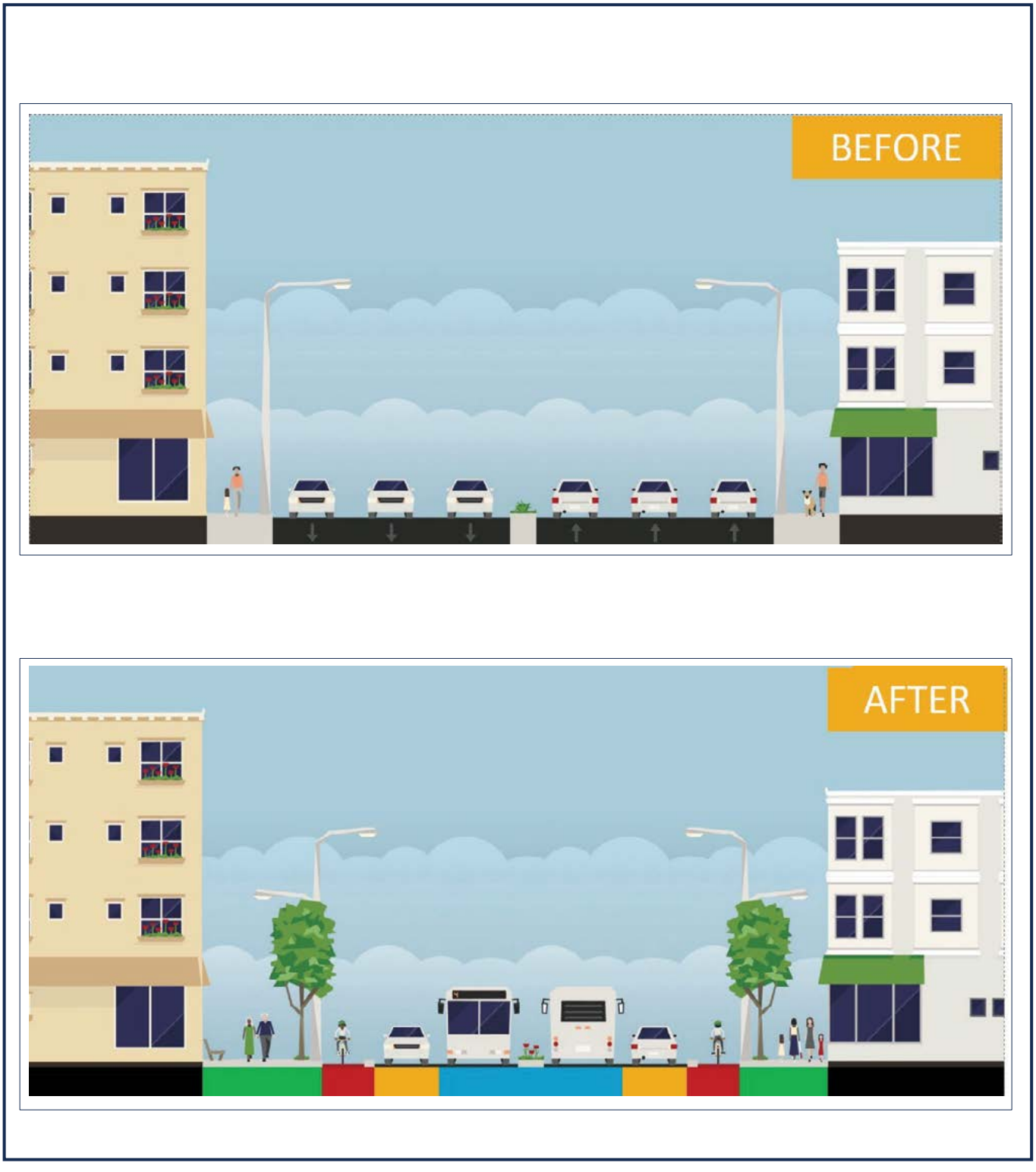


Figure 5.2A: Illustration of aspects of a shared or complete street. Top: Street section showing motorized traffic prioritization Bottom: Reallocation of space to mass transit, cycling, and wider sidewalks for pedestrians.

Figure 5.2B: Illustration of aspects of a shared or complete street. Top: Street illustration with over half street space allocated to cars Bottom: Traffic calming through narrower lane for cars, and allocation of more space for wider sidewalks to accommodate street furniture to support businesses and other street activities

5.1.3 Zone case- Around Makerere University Primary School

Description of zone environment: Makerere University Primary School is located along Bombo Road. The 1km radius around this school (Figure 5.3) comprises: Schools, Part of the Mulago- the National referral hospital, halls of residence of Makerere University and private hostels for university students, churches, and residential neighborhoods including very low-income neighborhoods like Katanga slum. Arterial roads in this zone include: Bombo Road, Sir Apollo Kaggwa Road and Gayaza Road. Collector Roads include: Mawanda Road, Binaisa Road and Muganzi Awongerera Road.

Proposed speed limit: 30Km/h

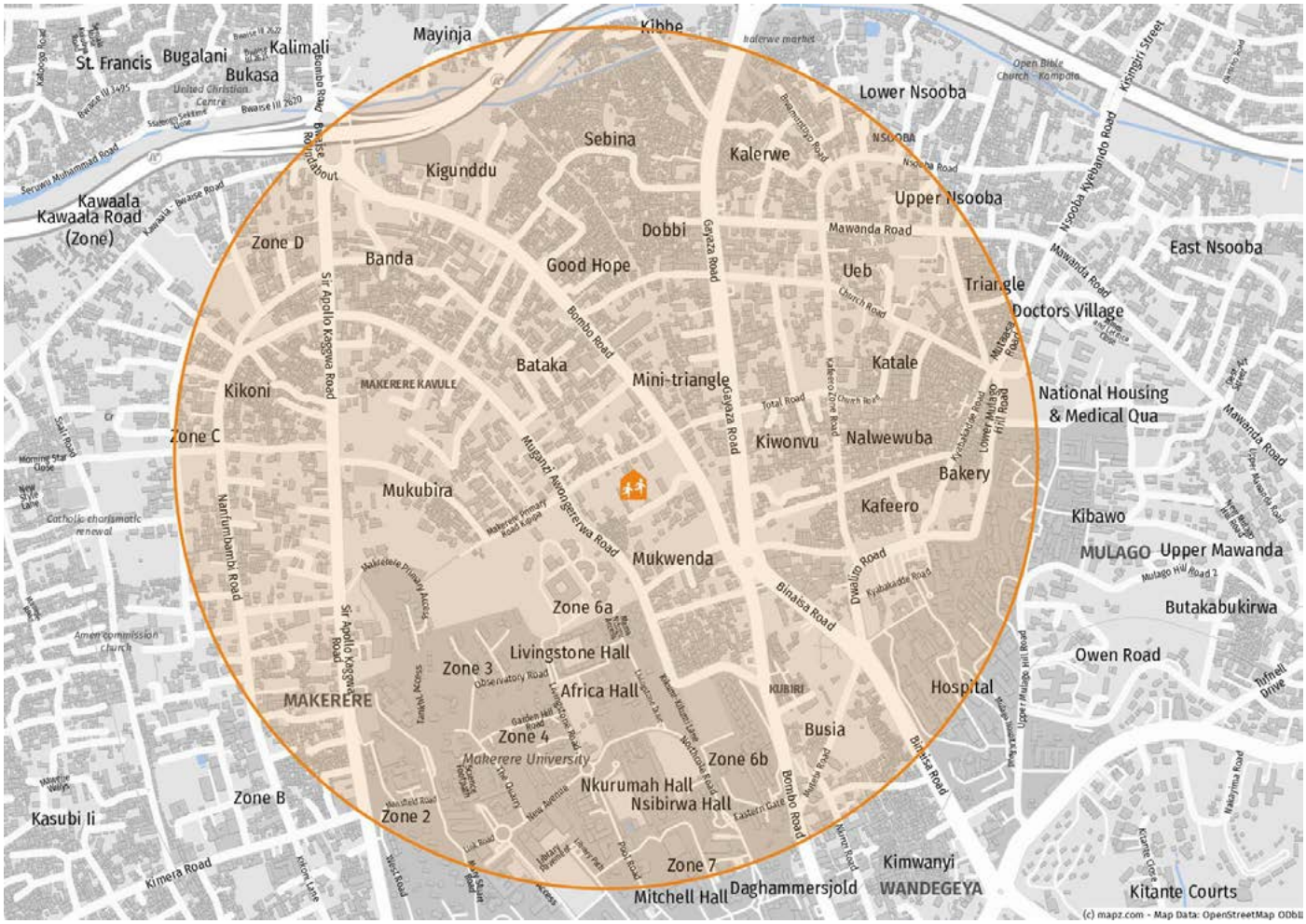


Figure 5.3: Zone of 1 km radius around Makerere University Primary School

Speed management measures proposed: Due to the high number of pedestrians in this area, accessing to or from the various points of interest noted above, the following interventions to improve safety and save lives were proposed They are both short and long term interventions:

- Improvement of and segregation of NMT infrastructure. This could include provision of infrastructure and services for electronic bicycles to encourage cycling up Makerere hill by university students and other visitors to the university.

- Provision of raised crossings at intervals along the arterial and collector roads; and at intersections for example at Bwaise junction (Bombo Road- Northern bypass junction), and the four-way intersection where Gayaza, Binaisa and Bombo Roads meet.
- Provision and management of mass transit along the corridor.
- Manage encroachment in the right of way for the roads.
- Improve delineation and traffic signage of the roads to improve communication of the road to road users.
- Provide speed calming devices such as speed bumps.
- Improve the street lighting in the zone.
- Improve the parking management along the arterial and collector roads in the zone.

Most of the proposed measures mentioned above align with the livable neighborhoods/ livable cities concept. KCCA's vision is to be a vibrant, attractive and sustainable city. Mobility and accessibility are a major part of realizing this vision because the way cities manage mobility dictates quality of life and access to opportunity for urban residents. Box 3 highlights some of the shared mobility principles city management should have in mind as they aim to create livable cities.

Box 3: Shared Mobility for Livable Cities

Livability is often measured by factors that provide quality of life such as access to basic needs like food and water; and opportunities such as education and health. In urban areas, shared mobility maximizes this access. Some of the principles of shared mobility for a livable city include (but not limited to):

- **Plan cities and their mobility together:** The way cities are built determines mobility needs and how they can be met. Development, urban design and public spaces, building and zoning regulations, parking requirements, and other land use policies impact how compact, accessible, livable, and sustainable cities can be.
- **Prioritize people over vehicles:** The mobility of people and not vehicles should be in the center of transportation planning and decision-making. Cities should prioritize walking, cycling, public transport and other efficient shared mobility, as well as their interconnectivity.
- **Support the shared and efficient use of vehicles, lanes, curbs and land:** Transportation and land use planning should maximize the number of people getting value from these public goods through promotion of mass transit, taxis, car and bike shares; and minimization of parking space.
- **Engage with stakeholders:** Residents, workers, businesses, and other stakeholders may feel direct impacts on their lives, their investments and their economic livelihoods by the unfolding transition to shared mobility. City authorities need to actively engage these groups in the decision-making process and support them as they move through this transition.
- **Aim for public benefits via open data:** The data infrastructure underpinning shared transport services must enable interoperability, competition and innovation, while ensuring privacy, security, and accountability.
- **Work towards integration and seamless connectivity:** All transportation services should be integrated and thoughtfully planned across operators, geographies, and complementary modes. Seamless trips should be facilitated via physical connections, interoperable payments, and combined information.

Adapted from: Shared Mobility Principles for Livable Cities https://www.wri.org/initiatives/shared-mobility-principles-livable-cities

5.1.4: Challenges to Implementation of Compliance Measures and Proposed Mitigation

Challenges or barriers to implementation of these safety measures were similar across the three cases assessed. They are presented in table 5.1 together with possible mitigation measures. One of the cross-cutting mitigation strategies was the need to continuously and consistently engage with communities, elected leaders and other stakeholders on the nature and reasons behind the project emphasizing its benefits for them.

Table 5.1: Possible barrier and proposed mitigation for smoother implementation of safety measures

	Challenge/ Barrier	**Possible mitigation**
1	Lack of funding and seeming low prioritization of mobility and road safety interventions	Align road safety improvements, particularly those improving the safety of vulnerable road users with ongoing already funded projects. Implement tactical urbanism interventions to demonstrate and test interventions in order to build buy-in with communities and decision makers
2	Preference to optimize mobility for motorized over non—motorized transport	Leverage projects such as the NMT corridor, car free days to promote the idea of safe streets for pedestrians and cyclists Continuous engagement with road designers, politicians and economists to consider the economic impact of more and safer NMT infrastructure for urban areas Engage with local elected officials to build community awareness and positive outlook for walking and cycling
3	Limited enforcement and impunity of some road users	Engage with government MDAs to implement punitive measures for their officials misusing the roads Collaborate with the Ministry of Works and Transport to integrate speed camera monitoring into the upcoming integrated traffic management system

5.2 Enforcement

Along with infrastructure, speed enforcement is another very important compliance measures that will aim at adjusting operating speeds towards new speed limits set in the speed management strategy. There are two types of enforcement: Police physical enforcement or automated enforcement (typically based on fixed speed cameras or average speed systems).

The main objective of enforcement must be to change behaviors, in the context of speed management the focus should be reducing speeding amongst all drivers, rather than collecting money. To properly execute enforcement in the roads, the next factors should be considered:

- Planning properly the locations and times to be enforced. The locations for enforcement should be data based by using crash records and, if available, speed data to identify locations with the highest potential improvement in road safety[9] . It is recommended to find riskiest location at a corridor or segment level rather than point based to minimize the possibility of a relocation of hotspots found due to compensation behaviors[10].
- Know the available technology or resources for enforcing: It is key to collaborate and engage with the stakeholders involved in laws and procedures that influence enforcement. Such entities are regularly the police and local, regional, and national transport authorities. Such entities should be involved to understand available procedures and to define the optimal methods for enforcement locally in Kampala.
- For speed enforcement, we must use a combination of highly visible and covert enforcement operations, with which we achieve unpredictability for road users. This approach is supported by the deterrence theory illustrated in figure 5.4. The public should understand that enforcement can occur anywhere, at any time and will affect anybody.

9 Hidalgo, D., López, S., Lleras, N., & Adriazola-Steil, C. (2018). Using Big Data for Improving Speed Enforcement and Road Safety Engineering Measures: An Application in Bogota, Colombia. Journal of Road Safety, 29(2), 12–19.

10 Valderrama, S. L., Palacios, M. S., Botello, V. P., Perez-Barbosa, D., Arrieta, J. V., Kisner, J., & Adriazola-Steil, C. (2024). On Speed Management, Public Health, and Risky Behaviors: Examining the Side Effects of Automated Speed-Enforcement Cameras on Traffic Crashes in Bogotá, Colombia. Transportation Research Record, 2678(3), 590-600.

Figure 5.4: Speed enforcement- Deterrence theory approach

- Especially at the beginning, after implementing new speed limits, the priority should be on highly visible and high-profile speed enforcement operations, with which we want to make maximize general deterrence effect. Following on from this, enforcement needs to be unpredictable, regular and sustained. Unsafe drivers should not be able to guess where enforcement will be, but know it is regular and on-going.

- Important is dosage of enforcement. Enforcement needs to be delivered in sufficient quantity to ensure the likelihood that offending will result in detection. Persistent offending must result in regular detection and increasing penalties.

- Enforcement will provide better results if communication efforts are made to maximize awareness and improve its reception from the public.

Even with scarce resources, enforcement can bring significant results in decreasing both speeding and traffic crashes. A combination of enforcement with infrastructure measures or other traffic management measures such as traffic lights programming assuring green waves are at a safe speed, would be desired.

5.3 Strategic Communication

Communication efforts must be incorporated in all phases proposed by this guide to improve risky behavior and create acceptance of the speed management initiatives. Approaches that can be used as part of a speed management plan include:

Mass media campaigns play an important role in changing risky behavior and must be sustained to gradually shift drivers' attitudes, behaviors and social norms related to these behaviors. Speeding remains a critical risk factor that requires focus. For impact, media campaigns need to run intensively for at least four weeks during periods of increased risky behavior and be paired with strong enforcement.
The media campaign strategy should be informed by a detailed analysis of granular crash data (when, where and how the crashes happen) and consideration of planned speed management initiatives. Campaign target audiences, objectives and the strategic launch timing must be precisely defined. The message must be evidence based-validated through the message testing study.
Mass media campaigns help to raise concern about the health, legal, economic, and personal consequences of unsafe behaviors on the road and to motivate compliance with regulations, as well as encourage support for new speeding laws. Sufficient funding and targeted media planning is required to achieve adequate target population exposure to campaign messages.

Public Relations/Media Engagement: Communication across multiple channels and platforms is needed, with specific approaches tailored for each project. Media engagement is an important communication strategy, which can influence public discourse on road safety issues. Within the context of speed management, regular public relations efforts should be used to inform the public of what issues need to be addressed, what actions are being taken to improve safety, and what changes in policy or practice are needed, being implemented, or require public action.

The media are a key tool in disseminating important data and other information, including stories of success, to the public, as well as stakeholders.

As part of a campaign strategy, media engagement can be used to enhance campaign messaging, share perspectives of different stakeholders-enforcement officials or victims, for example.

A media engagement strategy, which emphasizes data-driven and solutions-based reporting, should be designed in support of this guide. Regular briefings with journalists should be planned to update on progress toward the plans and implementation, as well as to share outcomes.

Community Engagement: Communication at the community level particularly where speed management interventions are being implemented—is key both for acceptance of the changes and for improvement. This approach could also be a good opportunity for implementers to gain knowledge from the locals in specific issues that might not be observable from the data.

Community members must feel empowered as stakeholders in local change; communication at the local level is critical at all phases of speed management projects and should be shaped for each population's needs and issues.
Community engagement at every level of planning and implementation is important. In Uganda, elders and religious leaders are well accepted, thus it would be important to have them onboard while reaching out to the community.

School-based interventions: Promotion of education for safe mobility, speeding, safe speed zone and other actions to prevent road traffic risks should be built into school engagement in the age-appropriate form. This can be as part of the school curriculum or as a separate program that incorporates periodic road safety lessons and activities.

5.4 Monitoring Interventions

Monitoring is a key element in speed management during the complete process since pilot projects all the way to implementation. It helps both understanding the effects but also for communicating the impacts and improving the governance of speed management in the city.
It is crucial to plan the monitoring before implementations to have a strong baseline, depending on each measure to be monitored. The appropriate set of indicators varies depending on each specific project and scale.

- Types of projects to evaluate: Basically, all projects of speed management should be evaluated. The main difference would be the geographical area covered as it would vary significantly to evaluate the change on 100m in front of a school than in a busy arterial road. Especially, the appropriate set of indicators would vary as the target population would be significantly different and the baseline such as current rate of crashes or speeds.

- The scale: Speed management measures can be planned for an area, a segment or a point and could even be in the form of citywide measures such as a speed limit change. The scale of the intervention can imply the sample and indicators to evaluate vary significantly and different approaches need to be taken in order to assure the results of the monitoring are actual impacts of the measures and not random variations or biases. An example of this can be the research carried out in Bogota by WRI, where the team used differences in speeds to estimate the impact of speed cameras to eliminate the impact of the pandemic on traffic crashes counts (Lopez et al., 2023).

Appendix 1 provides a list of indicators that may be used for baseline and monitoring assessments. The choice of indicator depends on the type of intervention and the scale of the project.

6.0 PRIORITIZATION OF LOCATIONS

The goal of prioritization is to identify locations with the highest expected fatalities and serious injuries, to prioritize resources towards specifically saving lives and not just reduction in number of crashes. Thus, an optimal use of resources for saving lives would also be achieved.

Methodology Brief: Kernel density was used to analyze the 2019 and 2020 Kampala crash data from the Uganda Police[9]. It uses the "Bayesian logic" [10], that is, the areas where most serious injuries and fatalities from road crashes occurred are likely to have the most serious injuries and fatalities from road crashes in the future, and a good substitute is kernel density[11].

Our prioritization methodology aimed to identify the locations where there were more crash incidents resulting in at least 1 serious injury or fatality. Data on minor injuries was therefore excluded, as was data on serious injuries but involving cars or buses where there were multiple serious injuries or fatalities from one incident. This was so as not to skew the analysis to assume several incidents where in fact there one incident was only but with several injured or deceased persons. The analysis therefore focused on data from incidents involving vulnerable road users (pedestrians, cyclists and motorcyclists) as these were more likely to be single incidents.

Findings: Using Kampala's available data set from 2019 and 2020, a crash map was produced (Figure 6.1). This map shows the locations with 5 or more traffic crashes victims 2019 to 2020 that can be considered the priority for the following reasons:

- Vision zero or safe systems approach, which is often the framework of speed management efforts, has as a key target to reduce both fatalities and serious injuries.
- Statistical significance: Since there is only available data for two years and literature suggest for hotspots analysis to use at least 3 years. This makes necessary to use the highest number of crashes that might be like fatal events. In this case, vulnerable road users might have a similar pattern while bus passengers might be overrepresented if compared with fatalities.
- Bayesian logic: According to literature, if a place has a high count of crashes, it should be expected to continue this trend in the future as higher concentration of serous crashes can respond to a local pattern rather than just randomness.
- According to the conflict analysis technique by Christer Hyden[12] and its following work in the field of surrogate road safety indicators[13], it is key to use similar events to estimate the number of fatalities. Thus, since most fatalities were vulnerable road users and passenger injuries are overrepresented, it is best to use serious injuries of vulnerable road users.

This map shows the locations with 5 victims or more have different patterns. Some of these hotspots seem to have linear patterns (**Bombo Road at and after Bwaise roundabout; Kira Road between the police station and Bukoto; Masaka Road approaching and at Busega roundabout; Northern bypass along Kyebando stretch**) and therefore suggest more corridor rather than spot interventions to curb serious injuries and fatalities from road crashes. Others seem to have a more localized issue **(Wandegeya intersection; Kampala Road- Dastur street intersection; Kira Road- John Babiiha Road intersection; Bombo road near Makerere Eastern gate (Katanga area)),** therefore spot interventions could be applied. The only two hotspots located in local roads, are along Kawaala Road and Tarmac Road just off Tula Road.

9 This data was collected by the Vital Strategies surveillance team under the BIGRS program.

10 Montella, A. (2010). A comparative analysis of hotspot identification methods. Accident Analysis & Prevention, 42(2), 571-581.

11 Yu, H., Liu, P., Chen, J., & Wang, H. (2014). Comparative analysis of the spatial analysis methods for hotspot identification. Accident Analysis & Prevention, 66, 80-88.

12 Hydén, C. (1987) The development of a method for traffic safety evaluation: the Swedish traffic conflict technique. Doctoral thesis. Lund University, Department of Traffic Planning and Engineering

13 https://thecityfix.com/blog/new-way-measure-road-safety-doesnt-wait-crashes-happen/

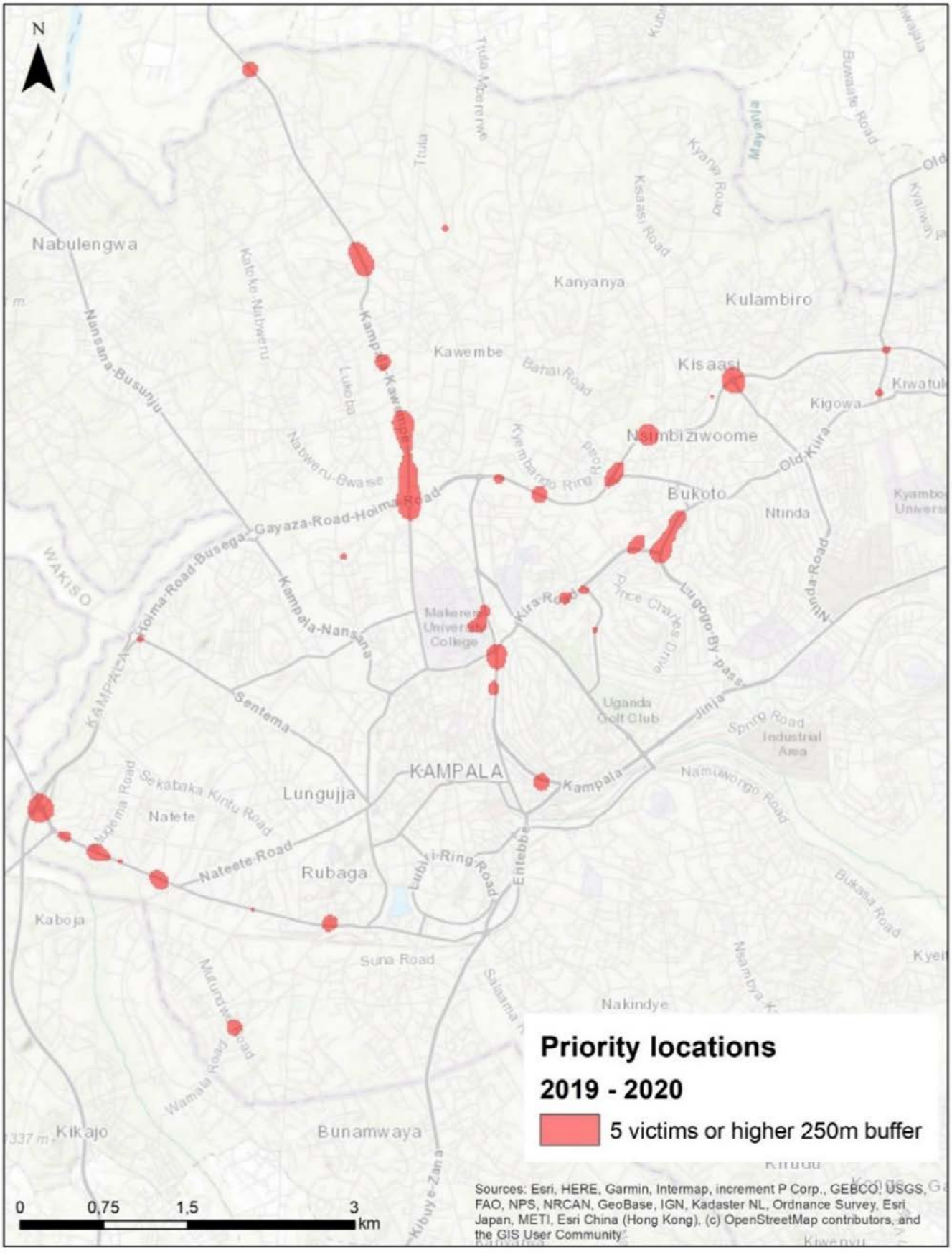


Figure 6.1: Priority locations for speed management in Kampala based on crash data

Figure 6.2 shows that for Kampala, 23% of crash locations account for 57% of the victims. This 23% is about 17.5km of the priority locations, therefore by focusing on these areas, there is potential to halve the number of serious injuries and fatalities from road crashes involving vulnerable road users in Kampala. All hotspots should have a follow up analysis depending on the intended implementation to define the most appropriate action.

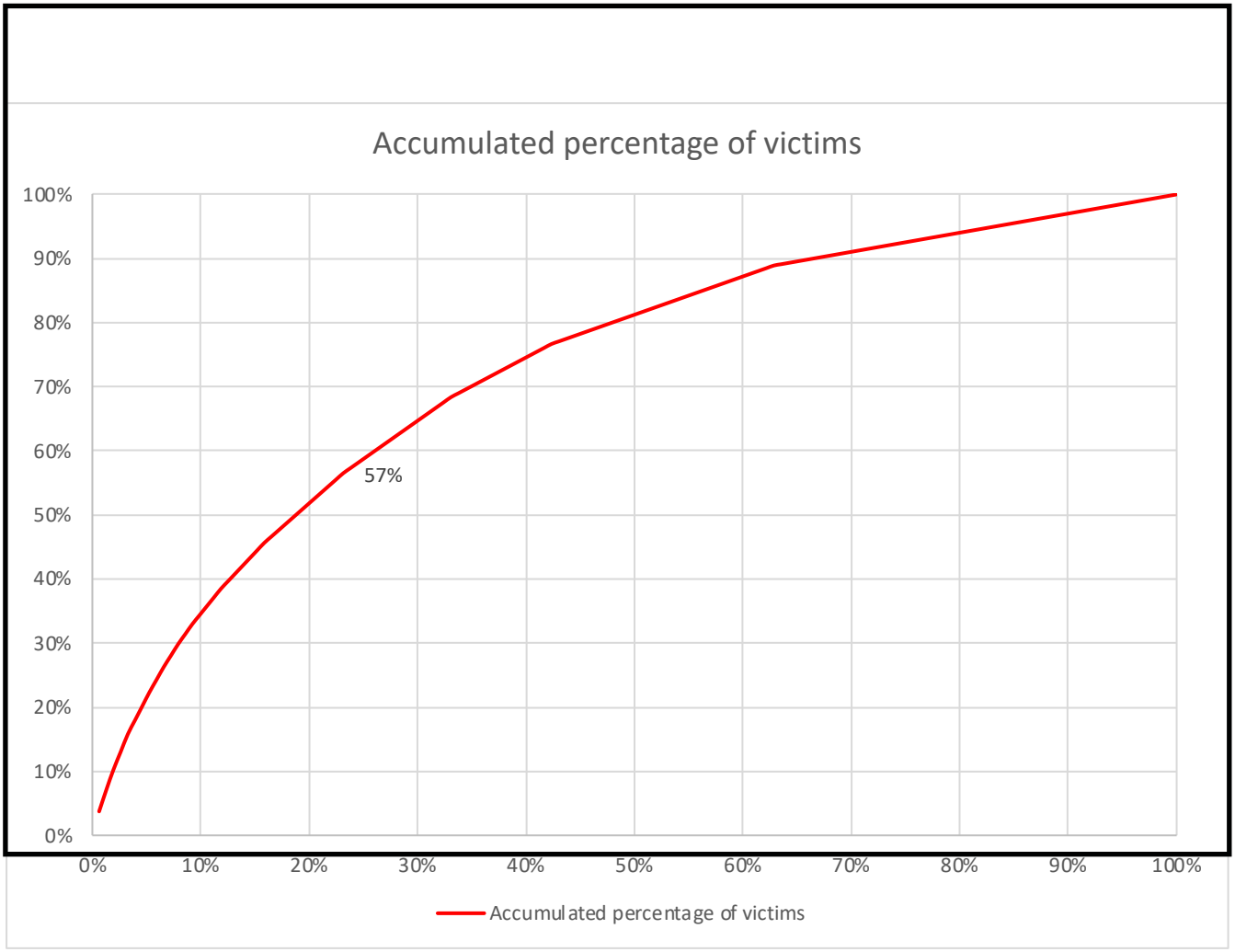


*Figure 6.2: Accumulated percentage of victims by locations *500m segments*

7.0 PRIORITIZATION OF ACTIONS

This section proposes criteria for the prioritization of speed management actions; describes the city's general areas of intervention concerning speed management; and describes cases of the speed management activities undertaken by the city in 2024, to pilot these general areas for speed management intervention.

7.1 Multi-Criteria Basis for Prioritization of Speed Management Interventions

Due to the financial resource limitations, coupled with the need to build a strong evidence base to support scaling of road safety and particularly speed management interventions, it is necessary to have a multi-criteria basis for prioritization of interventions. Below is a list of criteria that should be considered when planning for and prioritizing road safety interventions for Kampala city:

1. **Georeferenced crash data:** Having crash data for and around particular locations being considered for intervention is important as an impact measure. Crash data can be further disaggregated to focus on vulnerable road users in particular, as demonstrated in section 6. Oftentimes, the number of crashes for a location is dominated by motorized vehicles yet the severity of the crashes for motorized vehicles- four-wheeled vehicles in particular- is low. Crashes involving pedestrians, cyclists and motorcyclists tend to have higher severity rates, therefore areas with high vulnerable road user victim concentration should be prioritized. Furthermore, the numbers of serious injuries and fatalities should be combined to give a clearer picture of the danger that needs to be reduced or eliminated as per Vision zero and Kampala City's goal to halve the numbers of serious injuries and fatalities due to road crashes.

2. **Volumes of Vulnerable road users:** Because pedestrians, cyclists and motorcyclists are more prone to serious injuries and fatalities, areas with high volumes of pedestrians and cyclists such as market and commercial areas should be considered for improvement. Among the vulnerable road users are even more vulnerable groups like children, the elderly, and persons with disabilities. School zones should therefore be strongly considered, particularly schools that cater to special needs students such as visual or hearing impaired students.

3. **Potential Risk for Vulnerable Road Users:** The character of certain corridors and areas can change overtime, for example, areas where wide fast expressways were constructed may grow to become bustling towns or; businesses may crop up around major intersections. Road infrastructure in such cases may be rendered inadequate to safely accommodate all road users especially vulnerable road users. These areas may not currently show that they are high risk locations based on the crash data and may not yet have high volumes of vulnerable road users. Nevertheless, they should be taken into consideration owing to the fact that while the occasion of a crash is low (based on historical crash data), the outcome of the crash is likely to be a serious injury or a fatality.

4. **Allocation of financial resources:** City authorities should consider what financial resources they have that can be allocated to planned speed management interventions. The city may for example have funds earmarked for road marking and other road maintenance work in their road maintenance budget, and would therefore need to consider the first two criteria to determine which locations are likely to produce the most impact from simply undertaking certain road marking and maintenance works. Funds may already be allocated to a corridor or other locations for rehabilitation or improvement withing the road development budget. The city in this case could consider what design interventions should be incorporated in these locations to improve road safety and speed management.
   The city may also have corporate entities willing to incorporate certain road safety interventions into their corporate social responsibility budgets. Having a long list of priorities based on the georeferenced data and volumes of vulnerable road users will be helpful in this case to guide such partners with the location and type of support the city requires. This ensures that all available resources are harnessed to support the city's general road safety plan.

7.2 General Areas for Intervention in Speed Management

Kampala will focus its speed management interventions around three thematic areas relating to infrastructure. These are:

1. Creation of **low-speed zones** including school zones and market zones
2. **Improvement of intersection**s to ensure safety of all road users especially vulnerable road users, and to reduce the serious injuries and fatalities at these locations of traffic conflict.
3. Quasi-road diets to **reclaim road space for pedestrians**, as public space for rest but also acting as a speeding deterrent.

A fourth area of intervention relates to long term strategic planning for embedment of speed management into all transportation and traffic management activities. It involves building up a repository of data to aid planning and developing and communicating guidance documents on the integration of traffic and transportation areas key for Kampala, such as, e-mobility, street parking, public transport and informal transport.

Road Safety Database: In 2023, WRI supported a pilot to map road safety infrastructure around five selected school areas and part of the arterial roads making up the speed management zone. In 2024, this mapping was extended to the corridor feeding into the speed management zone and all the arterial roads traversing the speed management zone. This mapping provides an inventory of traffic signs, road markings, traffic signals and intersections.
It also provides a road condition in relation to safety of pedestrians mapping aspects such as lane width, presence of formal or informal sidewalks, presence of open drains and presence of crossings.

KCCA plans to scale this road safety data base to all parts of the city to collect baseline data and develop a schedule for collecting monitoring data.
KCCA is also working with partners such as Vital Strategies and the Uganda Police Force to develop a road crashes data base. This together with the road safety data base will be key inputs into the strategic planning for transportation management and road safety for the city.

Guidance Documents: Transport and traffic management is multifaceted and requires one to make connections amongst all the different aspects of transport in the city to ensure seamless integration and working of the city's urban transport system. KCCA already has several documents relating to transportation in the city. The key aspects identified as requiring further or more coherent guidance are:

- Electric Mobility: A clear policy and strategy guidance on the integration of e-mobility in Kampala's envisaged urban transport system in required.
- Public transportation: A coherent resource incorporating all the different documents on transportation in the city is needed
- Street Parking Management: Guidance on its integration in transportation planning and road safety.
- Boda Bodas: Guidance on the feasible direction for the city to manage boda bodas in such a way as to complement the city's envisaged urban transport system.

The guidance documents are also intended to be a resource for communication and engagement with the public on these issues and general transportation and traffic management in the city.

In 2024, apart from the road safety infrastructure mapping work, KCCA initiated the implementation of the Kampala Speed Management zone and piloted intersection improvements, discussed in sections 7.3 and 7.4

7.3 Kampala Speed Management Zone

The Kampala Speed Management Zone (SMZ) is proposed as a low-speed zone surrounding the central business district and its immediate. Figure 7.1 is a map showing its extent and the public schools within. Within this zone and along the routes surrounding it, the speed limit is proposed at 30Km/h, and 20 Km/h around school areas. The city has several actions geared at readying to designate and roll out the SMZ. Initial actions include: installation of 30Km/h speed limit signage; installation of speed calming at specific locations. Other interventions for the SMZ are to ensure adequate (size and quality) walkways throughout the zone and cover any open drains in the zone, signage for boda boda stages and bus stops.

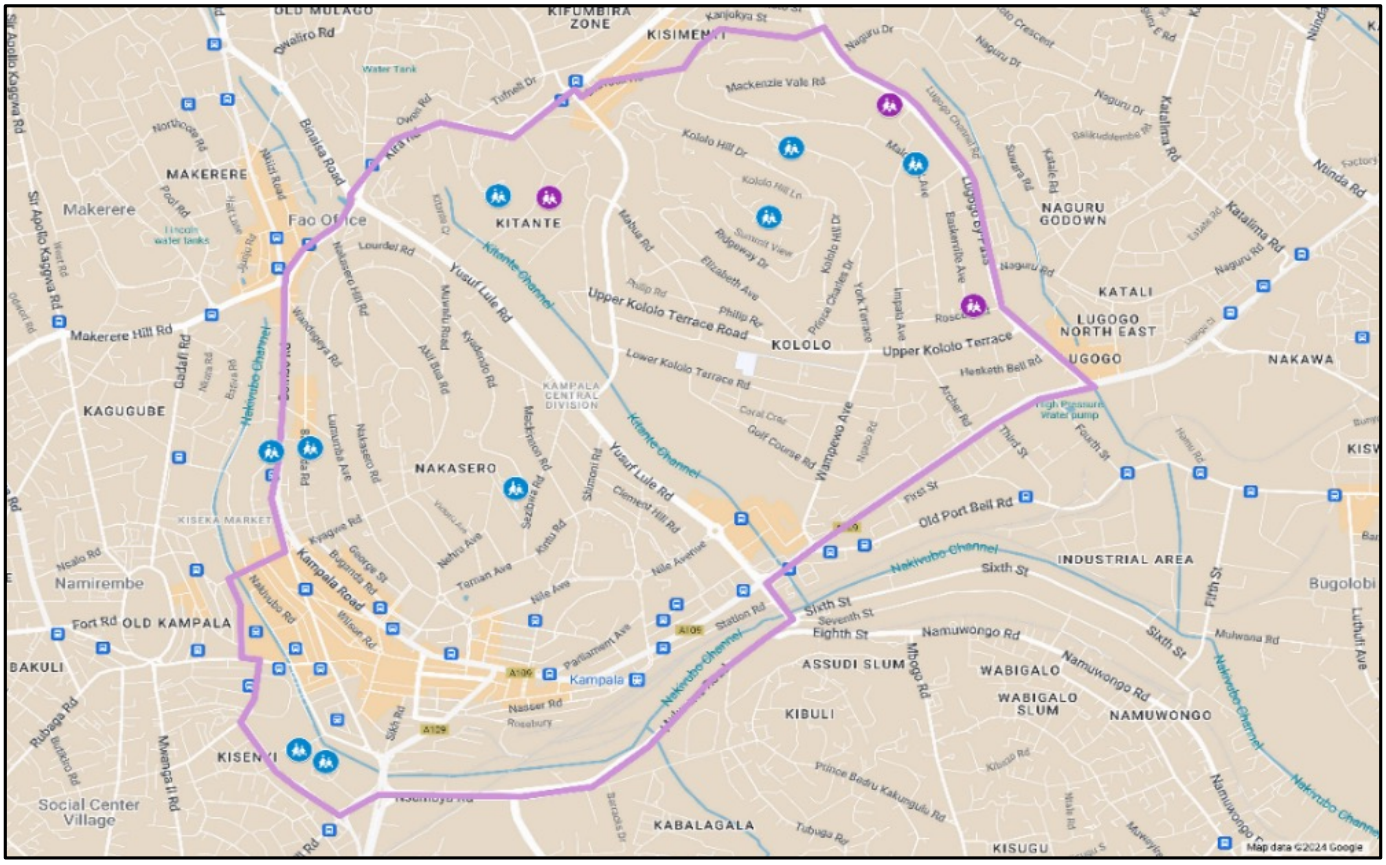


Figure 7.1: Extent of Kampala Speed management zones and public schools therein.

Initial actions undertaken in 2024 towards achieving these actions are installation of speed limit signage at some transitions into the SMZ, some of the arterial roads at the boundary of or crossing the SMZ. roads at the SMZ boundary; mapping of road safety infrastructure and assessment and improvement of some high risk intersections in the SMZ.

7.3.1 Mapping of road safety infrastructure in the SMZ

In 2023, with support from WRI, a pilot mapping exercise of road safety infrastructure was undertaken on paved roads within a 1.5km of five select schools and along the loop bounded by Jinja Road, Yusuf Lule Road, Kira Road and Lugogo Bypass.

This mapping involved mapping the location, type and condition of road signs, road markings, intersections, traffic signals and general safety conditions of road sections with regard to pedestrian safety. In 2024, this mapping was extended to the proposed SMZ. KCCA identified approximately 24 km of routes to be mapped. These include:

- 100m of routes transitioning into the SMZ
- The entire corridor surrounding the SMZ
- All Arterial roads traversing the SMZ
- Sections of roads that provide access to the 9 primary and 3 secondary public schools within the SMZ

The road classification and associated speed limits of the routes transitioning into the SMZ is shown in Table 7.1.

No	Arterial Road (50 Km/h)	Collector Road (50 Km/h)	Local Road (30 Km/h)	Industrial Road (30Km/h)
1	Kira Road	Mawanda road	Naguru Drive	Eight street
2	Lugogo Bypass (From Kira Road to Prince Charles Drive)	Upper Mulago Hill Road	Bukoto Street	Sixth street
3	Binaisa Road	Tufnell Drive	Katego Road*	Old Portbell (Spring) Road
4	Makerere Hill Road	Nakivubo Road	Nkizi Road	First Street
5	Queens way	William Street	Ssemugoma Road*	
6	Nsambya Road	Mengo Hill Road	Kafumbe Mukasa (Kisenyi) Road	
7	Jinja Road	Naguru Road	Prince Badru Kakungulu Road	
8	Bombo Road (near Wande-geya intersection		Press House Road	

Table 7.1: Routes Transitioning into the Kampala Speed Management Zone

The arterial roads traversing the SMZ and their lengths in the SMZ are:

- Kampala Road (1.9km)
- Bombo Road (1.4km)
- Lugogo Bypass (2.25km)
- Yusuf Lule Road (2.65km)
- Mukwano Road (1km)
- Nsambya Road (1.1km)
- Jinja Road (2.45km)
- Access Road (0.23km)
- Kira road (1.85km)

The access roads to schools to be assessed are summarized in table 7.2.

	School	Access Road
1	Nakivubo Blue PS	Nakivubo Road
2	Nakivubo Settlement PS	
3	Bat Valley PS	William Street
		Bombo Road
4	Buganda Road PS	Queens Lane
		Buganda Road
5	Nakasero PS	Sezibwa Road
		Kyadondo Road
6	Kitante PS	Nakayima Road
		Kira Road
7	Daffodils PS	Prince Charles Drive
8	Summit View PS	Kololo Hill Lane
9	East Kololo PS	Malcom X Avenue
		Nviri Lane
		Lugogo Bypass
10	Kololo SSS	Lugogo Bypass
11	City High school	Lugogo Bypass
		Roscoe
12	Kitante Hill school	Kira Road

Highlights from the mapping:

Road signs: There are 386 road signs in the 100m of the corridors transitioning into the SMZ, the corridors on its boundaries, and the arterial roads passing through it. 32 of these signs are speed limit signs (30 km/h), 15 around the arterial roads bounding the SMZ (Jinja Road, Kira Road, Lugogo Bypass), and 14 on some of the corridors transitioning into the SMZ.

School zones on Lugogo bypass have 30 km/h signs on their approaching corridors. Speed limit signs less than 30km/h can also be found on Kira Road and Buganda Road approaching Kitante Primary and Buganda Road Primary schools respectively. These are complemented by "children crossing" signs at the zebra crossings.

Road Markings: 121 road markings were mapped in select corridors of the SMZ and corridors transitioning into the low-speed zone. 59.5% were visible and clear, while 18% were faded. 41 uncontrolled pedestrian crossings were mapped, 28 of which are found on the arterial roads that border or cross the SMZ. 19 of the 21 signal-controlled crossings mapped are also found on the SMZ arterial roads. The entire Kampala Road and the section of Bombo Road mapped were found to have faded, unclear markings or unmarked.

Intersections and Traffic Signals: 164 three-legged, 19 four-legged (or more) intersections and 12 roundabouts have been mapped in the SMZ and transition corridors. Only 28% of the three-legged intersections are marked with pedestrian crossings or are signalized (32 with pedestrian crossings and 14 with signals). 9 four/more-legged intersections have marked pedestrian crossings and 5 are signalized.

Pedestrian Road Safety Attributes: 20.9km of Roads were mapped in 2024 including the SMZ boundary, boundary, arterial roads passing through the SMZ, 75-100m of corridors transitioning to the SMZ, and access to public schools in the SMZ. This excluded Yusuf Lule, Lugogo Bypass and parts of Kira Road and Jinja Road which were previously mapped in 2023. The mapping of the basic road safety infrastructure for pedestrians showed that 76.7 % of the total length of the roads mapped have pedestrian walkways on both sides of the road, 16.7% have walkways on one side, while less than 6.7 % of the total length of the roads have no walkway on either side of the road. (Figure 7.2). Furthermore, 45.7% of the total length of the roads mapped have open drains on both or one side of the road and 54.3% do not have open drains on either side of the road (Figure 7.3).

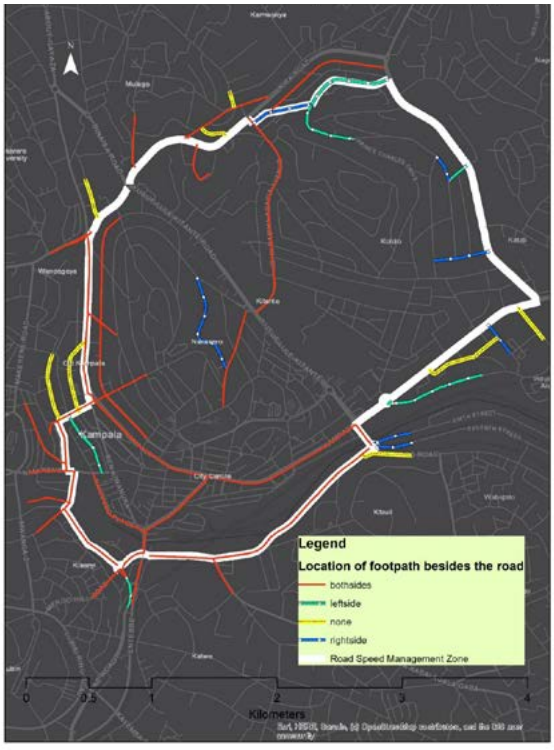


Figure 7.2: Mapping of formal and informal pedestrian sidewalks for transition corridors into SMZ, public school accesses and part of the SMZ boundary.

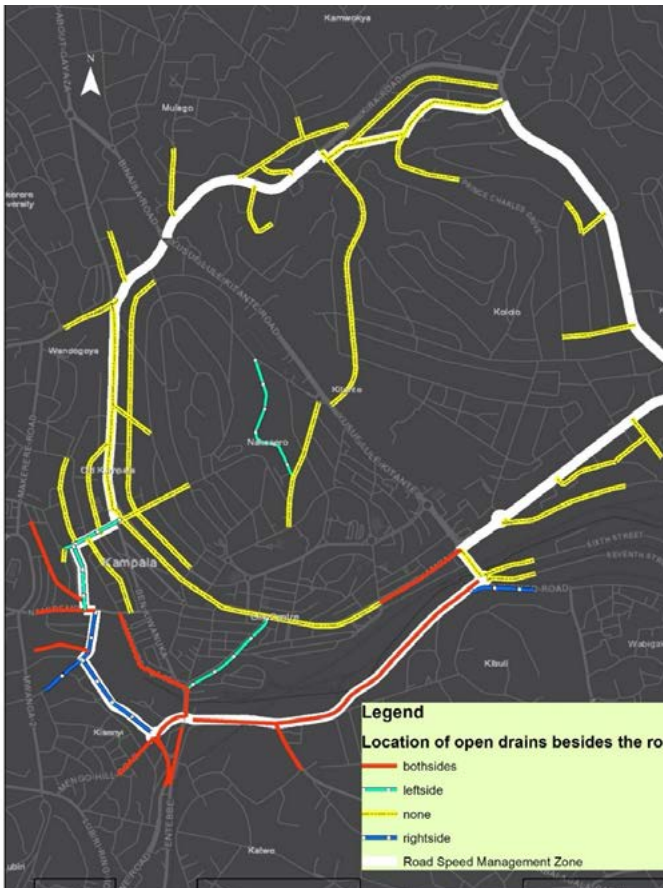


Figure 7.3: Mapping of open roadside drains for transition corridors into SMZ, public school accesses and part of the SMZ boundary.

7.3.2 SMZ Intersection Assessments and Improvements

To synergize the zone and intersection interventions, five high risk intersections in the SMZ were identified for deeper assessment.
The selection was based on WRI analysis of 2019 and 2020 crash data with a focus on vulnerable road users and the 2022 Kampala Annual Road Safety Report that identifies the top high-risk intersections for pedestrians in Kampala.

The selected intersections are Kira Road-Lugogo Bypass; Kira Road-John Babiiha Road, Wandegeya, Kampala Road- Dastur Street, and Jinja Road- Access Road junctions. This section discusses the interventions at Kira Road- Lugogo Bypass intersection.
Assessment of other selected intersections are documented in the report "Designing Safer Intersections in Kampala: An Assessment of Select Intersections"

Crash Data Analysis

Crash data from 2019 to 2022 of incidents occurring at or within 150m from the intersection were analyzed. Figure 2.4 shows that while there was a decline in the number of crashes between 2020 and 2021, the number has since increased in 2022. Figure 7.6 compares the crash times for all crashes with the crash times for pedestrians and motorcyclists.

The peak time for all crashes is 5pm to 6pm, likely influenced by the fact that 59.8% of all the crash incidents involved road users in four wheeled vehicles (cars). Disaggregating the crashes into different road user categories shows that there are two peak times for pedestrians (8-9am and 6-8pm) and road users on motorcycles (9-10am and 5-7pm).

In addition to this, the crash outcome comparison between pedestrians, motorcycles and cars (Figure 7.5) shows that while 72% of road users in cars were not injured, the same percentage of pedestrians sustained serious injuries, and 36% of road users on motorcycles sustained serious injuries.

Improvements for road safety are geared at reducing serious injuries and fatalities. This crash trend points to the need to focus any improvements at this intersection towards improving the safety of pedestrians and motorcyclists.

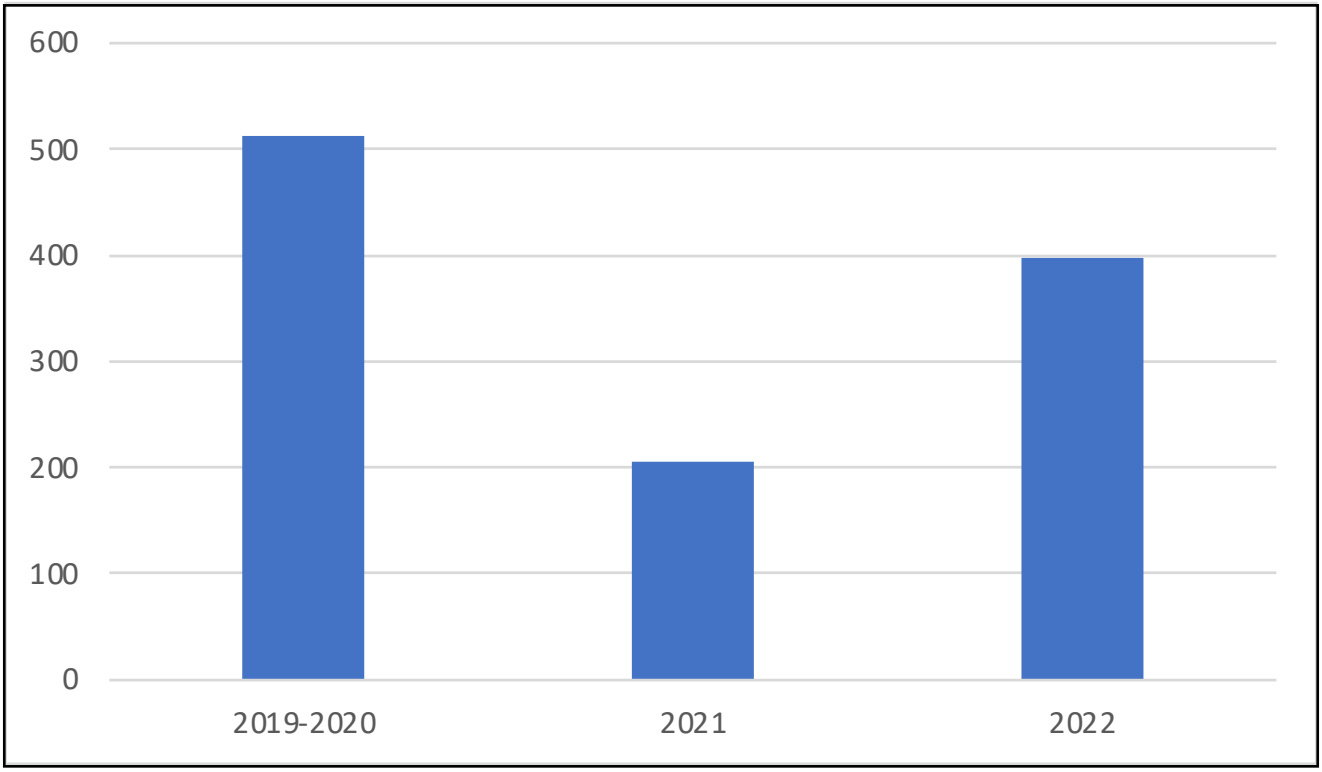
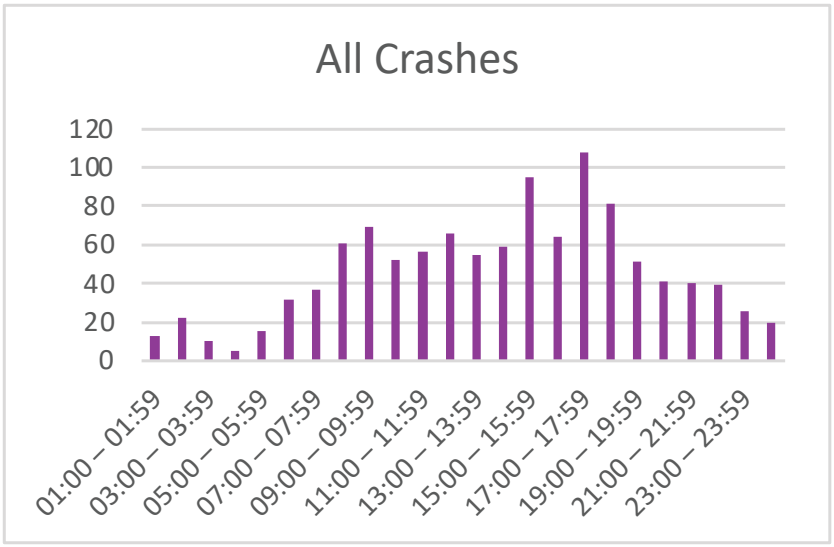
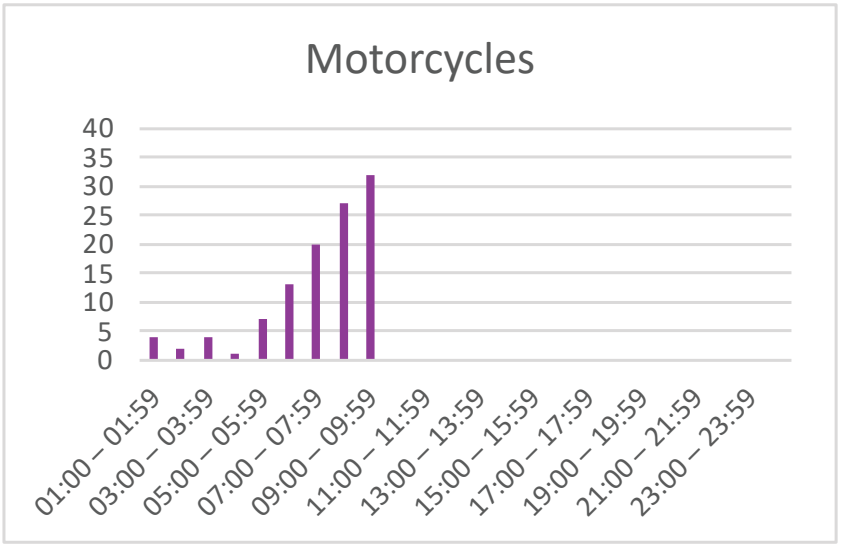


Figure 7.4: Number of Crashes by Year around Kira Road- Lugogo Bypass Intersection





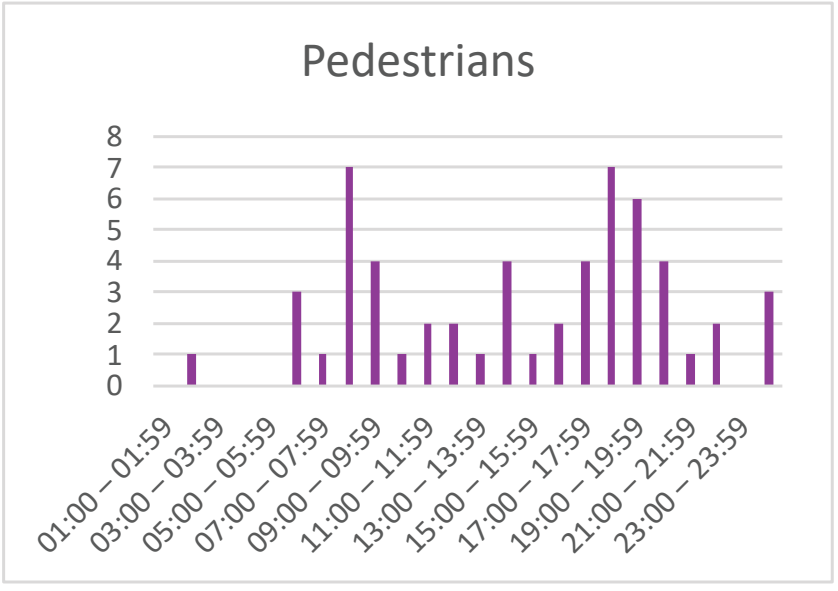


Figure 7.5: Crashes by time of day at Kira Road- Lugogo Bypass Intersection

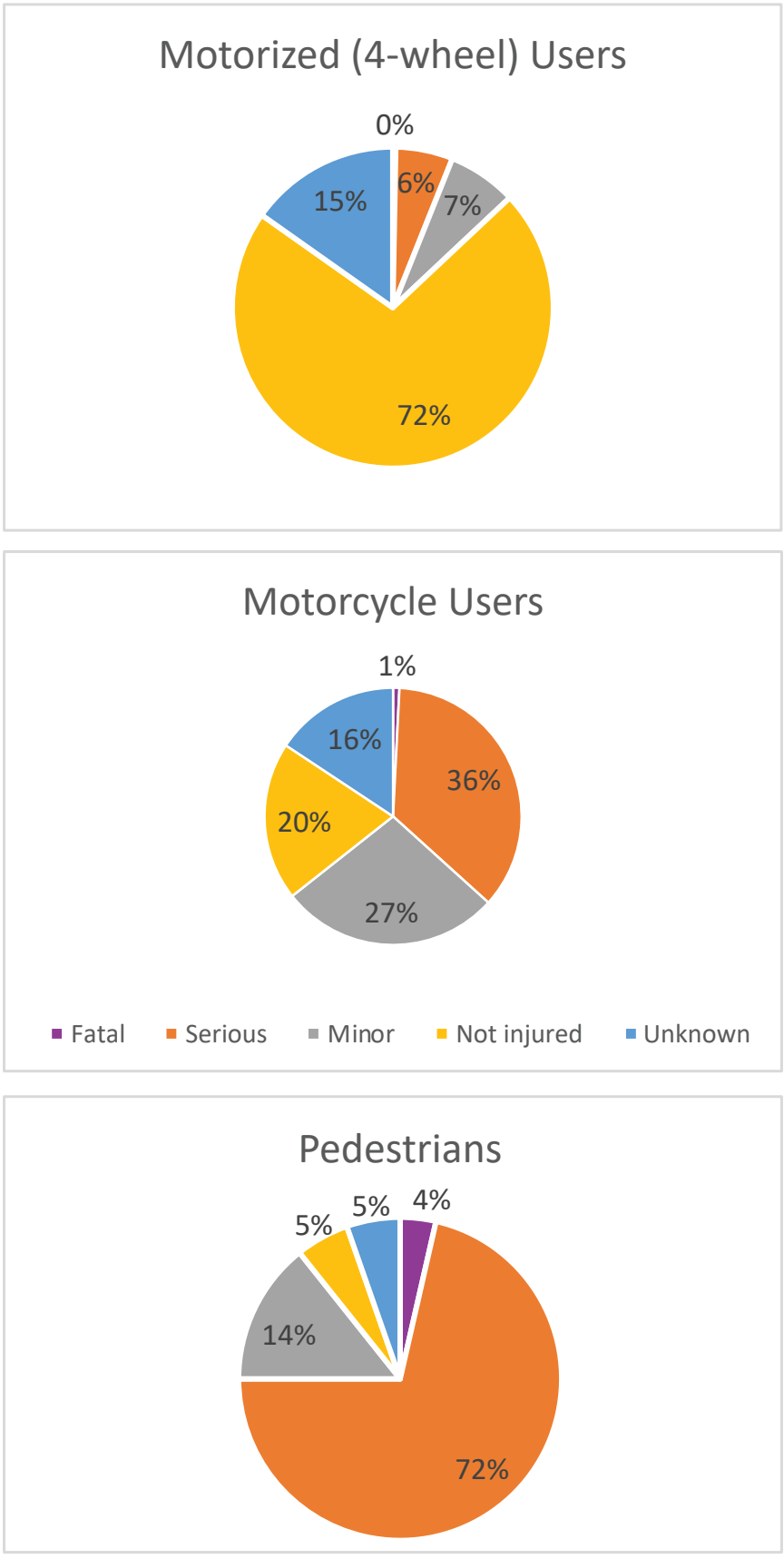


Figure 7.6: Crash outcomes for different road users at Kira Road- Lugogo Bypass intersection

Photo Credit : KCCA Images

Road User Behavior Observations: Four wheeled vehicles were observed to stop before the yellow box junction when their signal is red. They did not necessarily stop before the designated pedestrian crossing and were observed often to stop right at or just after the crossing.

Most motorcycles were observed stopping within the yellow box junction; some making illegal turns such as U-turns at designated crossings, and many made left turns even when their traffic signal was still red. This interfered with the crossing path of pedestrians at the designated crossings.

Pedestrians: Most pedestrians were observed crossing at or within a meter of the designated crossings at the intersection when the traffic signal stopped cars. Some pedestrians were observed taking advantage of the median at Lugogo bypass, having crossed the first part of the road at an undesignated location and making their way to the designated crossing for the final part of the crossing. Vendors were also observed walking within the carriage way.

Intersection Safety Inspection: A safety inspection was undertaken at this intersection and below are key observations:

Large Intersection Area: Figure 7.7 demonstrates the long distance at the intersection that vehicles have to cross. A large intersection area means that vehicles spend more time crossing the intersection, thus allowing them more time to speed at the intersection making it unsafe for vulnerable road users at such a point of traffic conflict. A large intersection area also increases the crossing distance for pedestrians, which apart from increasing the exposure to conflict with motorized vehicles may also encourage them to take short cuts at undesignated crossing areas, thus exposing them even more to moving traffic.

Figure 7.7: Large intersection area at Kira Road- Lugogo Bypass intersection

Wide Slip Lanes and Large Turning Radii: A wider slip allows for unauthorized movements (such as the left turns when the signal is red for motorcycles) as creates a sense of "enough space to maneuver". This creates conflicts at the intersection especially for crossing pedestrians (Figure 7.8). They also encourage parking at the intersection obstructing vehicles turning and blocking pedestrians crossing. A large turning radius encourages speeding of vehicles at the junction making it unsafe especially for vulnerable road users.

Figure 7.8: Wide slip lane, large turning radius and resulting conflict at Kira Road- Lugogo Bypass intersection

Worn-out or Absence of Road Markings: Absence of road markings such as crosswalks, lane markings or stop lines leave the users disoriented at the junction. It confuses the users creating chaos at the junction. Inaccessible traffic islands: At Lugogo Bypass and the Kira Road section opposite Lugogo Bypass, traffic islands are beautified by planters and green landscaping making them inaccessible for pedestrians to cross along their desire lines. This may force pedestrians to walk on the carriageway exposed to fast moving vehicles. At some places, height of the island also obstructs visibility. Some of the crossings at this intersection are offset from pedestrians' desire lines (Figure 7.9).

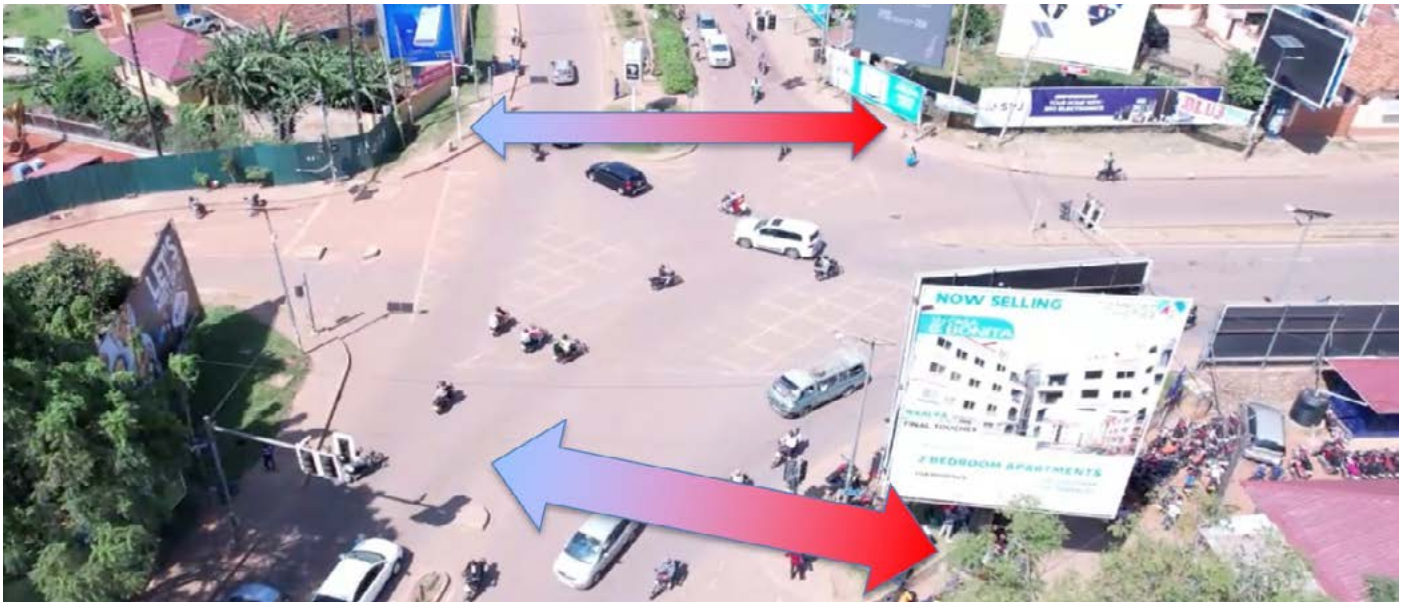


Figure 7.9: Inaccessible and offset traffic islands at Kira Road- Lugogo Bypass intersection

Limited Infrastructure for Vulnerable Road Users: The intersection design accommodates motor vehicles more than other road users. There is limited infrastructure for vulnerable street users such as pedestrians, people with disabilities, elderly and children. The prioritization for motorized vehicles as demonstrated in the large turning radii, for example, also increases the risk for vulnerable road users.

In addition, the intersection is not designed to support the management of motorcyclist circulation at the intersection. Figure 7.10 shows how some motorcyclists create their own informal advanced stop box at the intersection

Figure 7.10 : Informal advanced stop box created by motorcycles at the Kira Road- Lugogo Bypass intersection

Proposed Interventions: From the above observations the following are the proposed interventions to improve safety at this intersection, illustrated in Figure 7.11:

Renewal of Road Marking: Marking at the intersection needs to be renewed to guide road users. Stop lines, lane direction markings and more visible designated crossings should be implemented.

Advanced Stop Lines (ASL): To improve circulation of the motorcyclists at the intersections, advanced stop lines or boxes can be implemented. Advanced stop lines also reduce the invasion of pedestrian crossings by motorcycles. For ASL to work effectively, an enforcement and education campaign should be organized to coincide with implementation, and enforcement efforts should be sustained for a longer period of time.

Curb Extensions: Curb extensions are extensions of the sidewalk, usually at intersections that improve pedestrian visibility and reduce crossing distances. An expansion of the curb line into the lane of the roadway adjacent to the curb can reduce speeds of turning vehicles and offer protection to pedestrians.

Make pedestrian crossing more direct: Kira Road-Lugogo Bypass intersection is a multimodal intersection operating with pedestrians, bicycles, cars, motorcycles, buses, and trucks. The diverse uses of intersections involve a high level of activity and shared space. Crossings at such intersections should be direct and as short as possible for pedestrians to safely reach the other side of the street.

The goal is to minimize pedestrian exposure and to provide a safer, marked area for when they are exposed. Figure 7.11 shows two of the crossings at the intersection brought forward, which together with curb extensions, places them at pedestrian desire lines and reduces crossing distance. The pedestrian islands at the crossings are also protected from encroachment by turning vehicles. This was not an issue at this intersection but is a recurring issue at many other intersections in the city and should be rectified where it occurs.

Figure 7.11: Proposed interventions for Kira Road- Lugogo Bypass Intersection- road marking renewal, advanced stop boxes, curb extensions, more direct crossing points.

Intervention so far (July 2024): With the available budget, KCCA has implemented intersection improvements at six selected intersections including the Kira Road- Lugogo Bypass intersection and two other intersections along the Kira Road corridor approaching this intersection.

The improvements at and towards this intersection were informed by the kernel density analysis (discussed in section 6.0) that identified the high risk situation at this Kira Road intersection as requiring a corridor rather than a spot intervention. The intervention at this intersection includes lane lines, lane direction markings, speed limit markings, stop line and "Keep Clear" markings (Figure 7.12).

This was done at this intersection and at two intersections immediately before it (Old Kira Road and Bukoto intersections) (Figure 7.13).

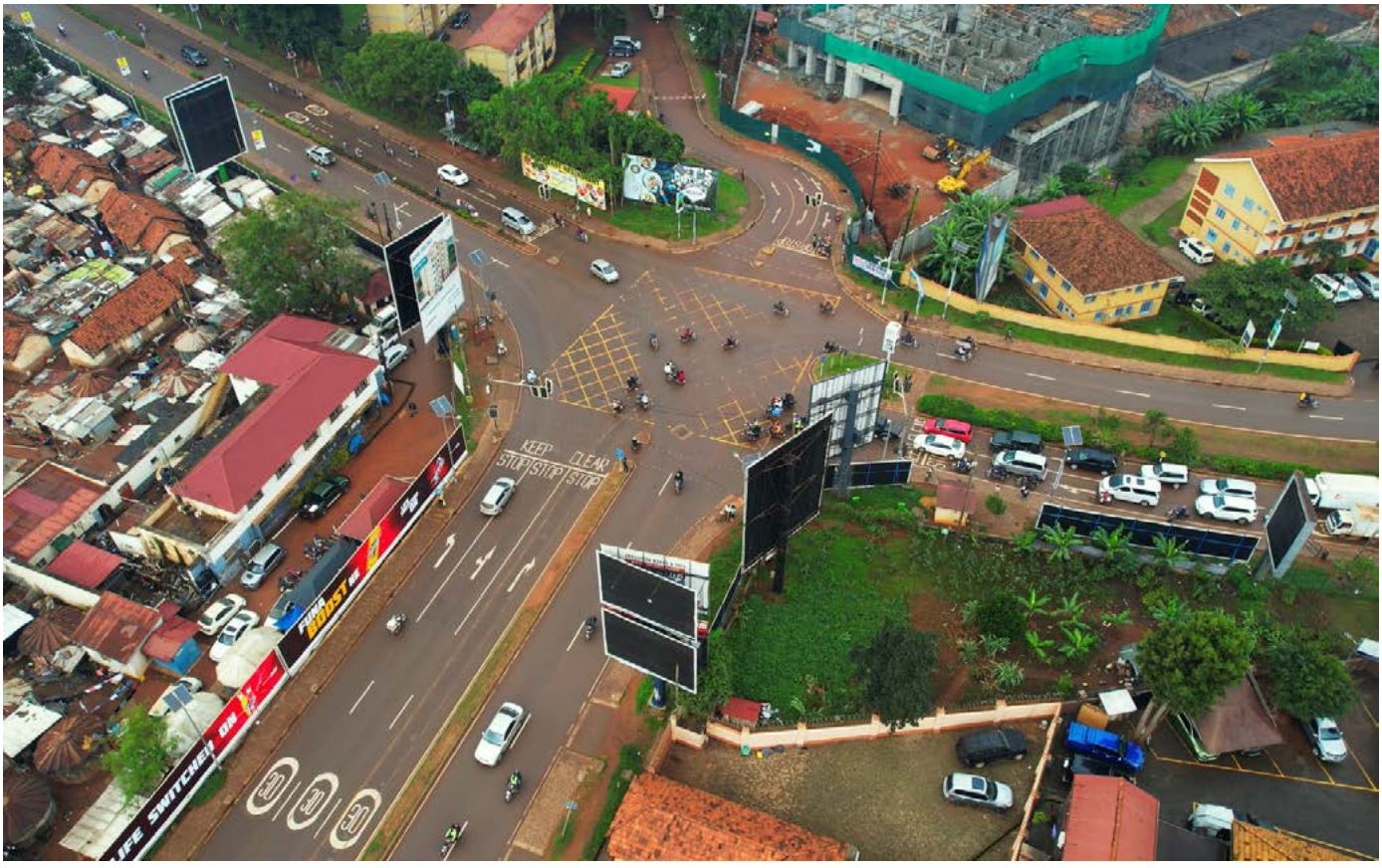


Figure 7.12: Marking of Lane lines, lane direction, speed limit, stop lines and Keep clear at Kira Road- Lugogo Bypass intersection. Source: WRI

Figure 7.13: Marking of Lane lines, lane direction, speed limit, stop lines and Keep clear at Kira Road- Old Kira Road intersection. Source: WRI

Intervention Outcome: The majority of cars were observed to stop at the stop line while motorcycle behavior remains unchanged.

Potential Lives Saved: Table 7.3 shows the potential lives saved by the interventions at the Kira- Road Lugogo Bypass intersection as well as four other intersections where KCCA undertook road marking or signalization works in 2024. These estimates are determined using the dominant common residuals method. The analysis shows that by the end of the period of the Kampala Road Safety Strategy-2030, these interventions could potentially save 20 lives. This number could be increased by implementing the other recommendations for the intersections such as the curb build-outs and extending the improvements to other intersections. Pedestrian safety improvements on the Jinja Road -Access Road intersection, for example, which was noted in the Kampala Road Safety Report 2022 among the top 10 risky intersections for pedestrians, could potentially save 5 and 12 more lives by 2030 and 2040 respectively.

PROJECT NAME	LIVES SAVED BY 2024	LIVES SAVED BY 2025	LIVES SAVED BY 2027	LIVES SAVED BY 2030	LIVES SAVED BY 2040
Road Safety Assessment of Kira road-Lugogo Bypass intersection	0	1	2	5	12
Road Safety Assessment of Kira road-John Babiiha Road intersection	0	1	2	5	12
Road Safety Assessment of Wandegeya intersection	0	1	2	4	11
Road Safety Assessment of Makerere Hill road- Makerere University main entrance intersection	0	1	3	5	14
Road Safety Assessment of Nakulabye intersection	0	0	1	1	3
Totals		3	10	20	53

Table 7.3: Estimated potential Lives saved in the short medium and long term by 2024 interventions. Source: WRI

7.3.3 Further Work Required in the Kampala SMZ

Further work required to implement the Kampala speed management area fully includes:

- Mapping of the road safety infrastructure of the entire SMZ, identifying and prioritizing necessary remedial and improvement works.
- Installation of 30Km/h speed limit signage on all routes transitioning into the SMZ and at the SMZ boundary; and installation of 20Km/h around school zones.
- Installation of speed calming at specific locations and at approaches to schools.
- Cover all open drains to create more space for walkways and construct walkways where there are none, especially on arterial and collector roads.
- More intersection improvements. KCCA is currently (2024) undertaking signalization of intersections such as Kira Road- John Babiiha Road, along Kyaggwe Road and at the Kamwokya stage. Intersection improvements are also underway at the Wandegeya intersection.
- Integration of the bicycle network plan and other NMT network plans with upcoming mass transit plans to ensure safe and reliable mode transition.

All this work requires robust monitoring and evaluation to ensure that lessons learned are taken forward into subsequent projects and to identify aspects of the intervention that may require more work either from infrastructure, enforcement or education and strategic communication.

8.0 NEXT STEPS FOR SPEED MANAGEMENT

This section lays out the city's next short, medium and long-term interventions concerning speed management in Kampala City. Apart from the phased implementation of the SMZ, KCCA is looking to scale improvements piloted to other divisions of the city. The short-term interventions are expected to be completed within 18 months; medium-term within 3 years and long-term in 5 or more years.

Short term Interventions

In the next 18 months (January 2025 to June 2026), the city will implement the following actions towards speed management in Kampala:

Scaling intersection assessments: The city aims to select 20 unsignalised intersections to scale the assessment piloted in 2024. The city has access to crash data analysis from 2019 to 2023 that will be used as a basis for the selection of these intersections. This activity is aimed at improving safety for vulnerable road users at known points of traffic conflict and identified high risk areas.

Phased Mapping of Road Safety Infrastructure: The city has approximately 640km of paved roads within its road network. Approximately 90Km has been mapped in the pilots undertaken in2023 and 2024. The city will develop a phased plan for mapping the traffic signs, traffic signals, road markings, intersections and the general safety condition of all paved roads in the city, starting with school zones. This will be a comprehensive baseline to guide maintenance planning and planning for improvement of the safety of vulnerable road users such as improving sidewalks, designated crossings and the general walking network.

Pilot School Zone Treatment: The city has identified a school zone area to implement school zone safety interventions. The interventions will include covering of open drains to create protected sidewalks, speed calming measures, raised crossings and the necessary speed limit and school zone signage. KCCA is engaging with partners to ensure robust before and after safety assessments are conducted. This will be the first school zone pilot in the country following the development of the National Guide for Establishing School Zones in Uganda and will therefore not only be an important pilot for Kampala but for the entire country to learn lessons and scale across the country within each school's context.

Annual Kampala Road Safety Campaign: In partnership with Vital Strategies, the city has for the last 2 years run a road safety campaign focusing on various road safety risk factors. The city will continue to run these campaigns ensuring that lessons from previous campaigns are taken forward and that more and more people in the city are exposed to the messaging of the campaign. The 2025 campaign will focus on safety around school zones.

Promotion of Active Mobility: KCCA has in the last two years led partners in implementing a car free day in the heart of the city. The main goal of the car-free day is to raise the profile of walking and cycling in the city and their importance for promoting inclusion and accessibility in the city, and therefore the need to ensure the city's streets are safe for active mobility users. The city in collaboration with partners such as eBee Uganda, Fun Cycling Uganda and other partners will continue to raise the profile of cycling in the city at the Kampala monthly cycling day with the aim of advocating for safer cycling infrastructure. These events have secondary objectives of highlighting the benefits of active mobility for health, air quality, social inclusion and other environmental, social and economic sustainability concepts. KCCA will work to involve more government agencies and other partners in these awareness events.

Formation of a Road Safety Unit: The city is in the process of establishing of a Road Safety Unit to manage road safety issues across the city. This is an important opportunity for the city to situate road safety as an issue cutting across transport, engineering, public health, environment, education, social growth and inclusion, physical planning, and communication, and thus emphasize the need to prioritize it across the institution. The establishment of strong, systematic and intentional collaboration across KCCA's directorates and with other relevant government agencies such as the Ministry of Works and Transport, Uganda Road Fund, Uganda National Roads Authority and Ministry of Finance Planning and Economic Development will be key to sustain road safety as a priority for the city and will have important lessons for secondary cities, Municipalities and urban areas across Uganda.

Medium-term Interventions

Within three years, KCCA will implement the following actions to strengthen speed management in Kampala city:

Mid-term Evaluation of the Kampala Road Safety Strategy: The Kampala Road Safety Strategy is now in its third year following its launch. It is necessary to undertake a mid-term evaluation of how far the city has gone in achieving the various objectives relating the safe systems pillars, to identify the barriers leading to delays in achieving some objectives and the enablers for other objectives that should be strengthened. This evaluation is key for the speed management efforts as speed management directly aligns with the safe system approach upon which the strategy is based and ensures a multi-pronged approach to road safety.

Installation of Intelligent Enforcement System: Kampala Capital City Authority will install speed cameras and work with the Ministry of Works and Transport and the Uganda Police to analyze the data gathered and embed this enforcement into the enforcement by the traffic police and follow up by the relevant judicial systems.

Embedment of Road Safety Interventions into the GKMA Projects: With financing from the Government of Uganda and the World Bank, the Greater Kampala Metropolitan Area Urban Development Programme (GKMA- UDP) includes a strategic roads program, public transportation program, land management, environmental management among other programs. The city will proactively ensure that the safety and accessibility needs of vulnerable road users including safe walking and cycling routes, roads designed for safe speeds near schools, markets and other areas of high pedestrian activity, access to and safe interchanges at public transport stops, are incorporated in the different project's planning, design and implementation. KCCA will also engage partners such as academia and other international organizations to support the monitoring and evaluation of these projects including baseline data collection before project implementation.

Engaging with Key Stakeholders on Road Safety on National Roads traversing the city: KCCA manages a road network of 2100km of urban roads. There are several urban expressways and highways classified as national roads that are management by the Uganda National Roads Authority (UNRA). Analysis of 2019/2020 crash data showed some of these roads as high risk areas. These include: Masaka Road approaching Busega roundabout, Northern bypass along Kyebando, and Bombo Road from Bwaise roundabout northwards up to the Maganjo/ Kagoma area. Consistent engagement with key stakeholders such as UNRA, Ministry of Works and Transport, Traffic police on the possible interventions to improve safety on these and other identified sections is key for Kampala to achieve its goal of halving serious injuries and fatalities by 2031, as per the road safety strategy.

Long-term Interventions

KCCA together with the Ministry of Works and Transport has plans for the implementation of large infrastructure projects in the next five or more years. One such project is the Kampala Bus Rapid Transit (BRT) project and the quick wins identified as key to supporting access to and operation of the BRT.

Quick wins for the BRT Project: The quick wins that were identified as key to supporting BRT implementation include development of safe cycling infrastructure between Bwaise and Kalerwe markets, improvement of pedestrian infrastructure on Kyaggwe road and Bombo Roads, improvement of the connection between the main railway station and the proposed BRT, safety improvements on Archer Road including raised pedestrian crossings and speed calming measures, safety improvements at various intersections and roundabouts including extended medians at crossing points, raised crossings and curb extensions at some of the intersections, and various other traffic flow improvements at identified intersections which though geared at improving motorized vehicle flow will be designed to also improve pedestrian safety.

The Kampala BRT: KCCA will take advantage of the Kampala BRT planning process to plan for multimodal public transport integration including integration with walking and cycling networks, the safe access to interchanges, and the provision of infrastructure to prioritize and encourage the shift from private motorized transport to public transport combined with NMT options.

Reclaiming of road space for pedestrians: KCCA is exploring implementation of road diets by reclaiming of some space from the motorized vehicles for pedestrians in areas and streets with high pedestrian counts. This would be a joint effort between the traffic and transport management and landscaping departments.

APPENDIX 1: LIST OF POSSIBLE PERFORMANCE INDICATORS

1. Speed indicators
i. Average speed.
ii. Speed percentile 85.
iii. Vehicles exceeding the speed limit by 10 km/h, or complying with it.
iv. Project's impact study based on the above indicators
v. (by measure and by road user).
vi. Road crash ratio indicators
vii. Total number of crashes with victims (preferably standardized by length, for example: victims/km).
viii. Location of the crashes with victims (identifying changes or trends).
ix. If possible, the traffic conflict analysis technique is very useful to measure impacts (Hydén and Linderholm, 1984).

2. Perception indicators
i. Proportion of the population surveyed on the acceptance of speed management.
ii. Percentage of people in favor of the government's actions to reduce speeding.
iii. Data from interviews or written questionnaires on the community's perception (regarding compliance measures, speed limits, etc.).
iv. Clarity understanding the speed limits (percentage of people who know and understand the limits, etc.).
v. Risk perception surveys.

3. Supplementary indicators
i. Reduction in the severity of road crashes.
ii. Reduction in drivers' speed rates.
iii. Survey on time-recorded speed data.
iv. Crash reports filed by police / crash investigators (IPAT).
v. Data regarding traffic volume and road design.
vi. Number of or rate of fatalities associated with speeding or severe injuries in time.
vii. Data from police, hospitals and emergency services on the crash cause and severity of wounds.
viii. Reduction in number of pedestrian deaths.
ix. Cost-efficiency of measures.
x. Number of pedestrian deaths where speeding was a factor.
xi. Increase in public acceptance of speed management (percentage of people in favor).
xii. Supplementary indicators for low-speed zones
xiii. Noise.
xiv. Changes in user behavior and city living standards (number of times that pedestrians cross the street, number of vehicles that give way to vulnerable users).

4. Supplementary indicators for commercial areas
i. Changes in sales commercial establishments adjacent to the road.
ii. Changes in user behavior and city living standards (number of times that pedestrians cross the street, number of vehicles that give way to vulnerable users)
iii. Volume change of active transport.
iv. Measures to calibrate the speed-flow curve to estimate the impact in traffic congestion.

5. Supplementary indicators for arterial roads
i) Average speed of buses.
ii) Changes in the volume of non-motorized transport modes.
iii) Metrics to gauge the speed-flow curve in order to estimate impacts on congestion.