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CYCLING SAFETY PROBLEMS IN URBAN CONTEXT

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Abstract

Cycling as an urban peculiarity has been well-informed as far as quantifiable area plan characteristics like road lattices, cycle paths, misfortunes; in any case, there is less exploration that objectives the security issues in metropolitan climate. This review portrays the consequences of subjective examination led with bikers and other street users. This phase of exploration has been dominatingly 'descriptive', determined to give a guide of the scope of security related inspirations, perspectives, insights, and conduct among cyclists and other street users. Cycling meets with a scope of strategy issues, going from street wellbeing to difficulties and failures. The outcomes in this report will be valuable to a wide scope of crowds; in any case, our essential concentration all through the exploration's plan, execution, and announcing has been on worries of security issues influencing the quantity of bike users in urban communities. Every one of the distinctions made would profit from quantitative approval and scaling through reviews since they depend on subjective review utilizing perception and meetings.

Keywords

Urban Safety, Risk assessment, Cycling Mobility, Safety Perception

1. INTRODUCTION

Public transportation emerges with the change and advancement of society. Cycling as an elective method of transport is energized in metropolitan regions due to its public wellbeing and climate benefits, despite the fact that vehicles are overwhelming in many urban communities (Limin He, 2018). Bike sharing plans have become progressively famous in nations all through Europe, Asia, and America to support cycling as an elective method for transport in metropolitan regions. Propelled by the developing difficulties of worldwide weight and environmental change, global associations have been calling for multisectoral and multidisciplinary ways to deal with increment actual work and lessen dependence on vehicles (BMJ, 2011). All things considered, cycling hazard and distress can't be ignored and late examinations research a few boundaries adding to bicyclists' weakness, for example, among others, connections between bicyclist's physical issue seriousness and streets, climate, vehicle and bike wellbeing gear, human segment and conduct, speed and mass of engine vehicles, and street formats. (Cantisani, G.; Durastanti, C.; Moretti, L. 2021)

McCarthy (2011) finds that "in addition to the fact that cyclists identify a large number of issues identified with vehicle conduct and mentalities, yet they have likewise settled, through the course of sense-production, a common system that clarifies the starting points of the dangers presented via vehicles." Cycling, as indicated by analysts, is a tangible encounter that recognizes it from different method for transportation. Cycling addresses a feeling of energy use, risk insight, climate conditions, metropolitan movement, and what Middleton alludes to as "equipmentality" (Manton et al. 2016; Middleton 2010; Spinney 2008).

This work consolidates information on cycling on various levels, the safety issues of cycling, the dangers, and failures. To begin with, the principle titles are the speed of mechanized vehicles, the utilization of caps, cycling against the traffic and absence of perceivability. Second, the sections are offering the way to different users, demonstrations of hostility, failures of disposition, failures of comprehension, failures of assumptions, tension from other street users, other situational factors, not looking lastly the terrible infrastructure. Then in the second phase, the data collected above will be applied and tested on some cases to reach at the end a tool for a model design aiming to evaluate the urban cycling safety and create a reliable reference.

2. METHODOLOGY

This paper will analyse, through observation, several cyclists going through threats and weaknesses in order to evaluate the safety level and the impact on the cyclist at different levels.

Lack of visibility, pressure from other road users and the bad infrastructure are the main exterior factors causing the threats for the cyclist. On the other hand, cycling against the traffic and the failures of attitude are the main interior factors generating the weaknesses. These specifications make the impact on the cyclist vary differently according to the case studied between the integration of the cyclist with his environment, the relation with roads and other road users and finally the self-safety of the cyclist.

The selected areas of the case studies were chosen to study the different factors of threats and weaknesses leading to the impact affecting the safety of the cyclist, based on the results of biker’s questionnaires. The study focuses on a successful example of a European city (London, UK) and the other one, a middle eastern city (Tripoli, Lebanon) showing an opposite example, where the safety of cycling faces some difficulties. These cities located in two different continents have two different cultural behaviour, political atmospheres, environmental conditions, and different statuses of safety at the level of transportation and cycling.

The suggested framework consists of two phases. The first step was creating a Google Form questionnaire as a pilot study to monitor the level of the cyclist safety by measuring the threats through the exterior factors affecting thy cist and the interior factors representing the weaknesses. Second, choosing the hotspots in Tripoli where the cyclist has communities in order to facilitate addressing the questionnaire, which could be deeply studied in terms of documenting and analysing the status of Tripolitan cycling safety problems, and criticizing the effect on the cyclist and his integration with the environment.

After presenting the case studies the research discusses the criteria that should be considered when creating a reference for a safer city for bikers, to control the risks and the different kinds of safety problems that could face any cyclist in the city.

3. THE SPEED OF MOTORIZED VEHICLES, THE USE OF HELMETS, CYCLING AGAINST THE TRAFFIC AND LACK OF VISIBILITY

In blended metropolitan rush hour gridlock, when bicycles share the street with other mechanized vehicles, motorized traffic speed is a fundamental part in both impact hazard and impacts. Speeding vehicles in a blended rush hour gridlock circumstance are a critical danger factor for genuine injury and demise crashes. At the point when the speed of a vehicle increments and the halting distance required builds, the shot at an auto collision increments. The shot at a lethal physical issue to a bike builds multiple times when vehicle speeds surpass 64.4 km/h and multiple times when vehicle speeds surpass 80.5 km/h. (World health organization, 2019)

Cyclists who don't wear protective caps have more genuine head wounds than the individuals who do. The underlying case-control investigation of protective cap viability demonstrated a decrease in head and mind harm of 85% for helmeted bikers and 88 percent for unhelmeted riders. It is pivotal to feature that improper utilization of bike caps might diminish their adequacy in limiting head harm in a mishap. (World health organization, 2019)

Cycling against traffic, if it builds rider vision, is another component that adds to crashes. This methodology, nonetheless, improves the probability of a mishap and the seriousness of wounds. Counter-traffic cycling brought about 3.6 occasions the risk of riding with the progression of traffic and 6.6 occasions the danger for riders younger than 17. (World health organization, 2019)

Besides, rising danger factors including absentminded driving have been connected to an expanded danger of injury. As per a cyclist disposition study directed in the United States, 21% of cyclists utilize their cell phones on at minimum a portion of their movements, with 9% utilizing such gadgets on for all intents and purposes their rides in general.

A huge danger factor associated with bicycle mishaps helpless vision because of deficient light around evening time or during top hours in the day. (World health organization, 2019)

4. SHARING THE ROAD WITH OTHER USERS, ACTS OF AGGRESSION, FAILURES AND THE BAD INFRASTRUCTURE

Crashes between a cyclist and another vehicle are not the principle wellspring of mischief to cyclists out and about: single cycle mishaps represent 16% of cyclists killed or

seriously injured (KSI), and 17 percent of KSI deaths. In any case, almost four out of each five KSIs and KSI deaths are the outcome of a crash with another vehicle. Better street sharing by cyclists and other road users (ORUs) stays a basic issue for street safety, as per these discoveries.

A review in Finland watched vehicle drivers and cyclists at intersections between bicycle paths and streets and found that 30% of cars didn't permit bikes to pass when legally necessary. The extent was lower when velocities were more prominent, or bicycle traffic was lower. Rules and signage were only inadequate to support safe driving conduct among drivers. Jonsson (2007)

Riders' reports of how communications among cyclists and ORUs might turn out badly were considered, and some significant classifications of trouble were found. ORUs have been known to be opposing against cyclists, for example, blocking a bicycle's sifting by opening an entryway, cutting bicycles off, yelling at cyclists, and in any event, throwing objects at them.

Failures of mentality allude to circumstances in which a driver or biker is seen to be 'not thinking often enough' about the requests of ORUs or the principles of the street. Jonsson (2007)

'Not caring enough' is now and again viewed as an overall nonattendance in an individual — young men, for instance, are more inclined to being marked in this manner by others, regardless of whether they are riding or driving. In these circumstances, the street user might be supposed to be indifferent with regards to their own security. Hopping red lights was seen by both different cyclists and ORUs as a particular mark of this sort of broad disappointment of mentality in cyclists. Uninsured driving was often associated with an overall absence of disposition among drivers. (Department of transport, London 2010)

There are a few examples of issues brought about by drivers' absence of mindfulness or capability, including: not realizing how much room a bicycle must be conceded while surpassing (especially by a huge vehicle that causes a side-draft); and misinterpreting the speed of bikes. These hardships unavoidably got more noteworthy consideration - various ORUs did, truth be told, do not have the capacity to perceive these were issues. Some ORUs, nonetheless, were undeniably more educated: for instance, a transport driver underscored the meaning of leaving a wide space while overwhelming a bicycle because of side-draft challenges. Both ORUs and riders accepted that numerous cyclists did not have the essential arrangement or capability. Coming up next were central points of contention: misinterpreting the speed of vehicles or the time needed to start going; wobbling while at the same time switching gears or looking back behind one; and not knowing the guidelines of the street. Various ORUs were frightened by the way that cyclists are not needed to partake in any preparation, which they considered to be both dangerous and unjustifiable. (Simon Christmas Ltd, 2012)

Some unpleasant occasions may drive one to zero in on the particular work close by and fail to focus on the bigger setting. In any case, the evident strain to pass a bicycle that a driver might feel when being followed by different vehicles drew the best consideration. This pressure may be intensified when the driver also needs to do another move. For instance, one London driver told how he understood past the point of no return that his left turn was drawing nearer, leaving him (as he saw it) just two choices: overwhelm and remove a bicycle before him, or end startlingly, making a risk for the traffic behind him. He had gone with the best option and there had been a minor impact. What's fascinating with regards to this case is that there was a third choice: miss the left turn and take another way. The way that this chance didn't go to the driver, even subsequent to handing-off the occasion, might be deciphered to act as an illustration of how stress can create a limiting of consideration on the job needing to be done. On the other hand, it very well may be deciphered as a kind of mentality disappointment.

At long last, cyclists and ORUs distinguished an assortment of situational factors that can make street sharing troublesome, for example, bad climate, helpless street surfaces, driving around evening time, etc.

These elements can act in an assortment of ways, including constraining the cyclist into the way of the vehicle, for instance, to keep away from a pothole; testing the cyclist's or alternately driver's capability, for instance, frosty conditions; diverting the driver or (less as often as possible) cyclist; and making the cyclist less apparent.

The last option may, obviously, be compounded by an absence of demeanor on the cyclist, like neglecting to use lights around evening time. (Department of transport, London 2010)

One charming theme is the place where 'look but failed to see ' (LBFTS) squeezes into this structure. One might attempt to associate LBFTS to, say, consideration shortfalls brought about by stress or situational interruption.

This is an unexpected revelation, considering how much of the time individuals engaged with mishaps guarantee to have looked at this point neglected to see. There are somewhere around three potential translations: individuals might be unconscious of the conceivable outcomes of looking however neglecting to see since they don't appreciate the restrictions of their own perceptual frameworks; LBFTS statements are roused by the longing to protect one's conduct following making a blunder - individuals simply neglect to look. From a cycling angle, 'driving logic' offers various clear issues. The one that accumulated the most consideration in our meetings was that having " somewhere else to go " is oftentimes lacking. We heard a few instances of cycling paths that: unexpectedly ended, constraining the bicycle to reappear traffic; they were specked with channels and sewer vent covers, or were torn up pretty bad; constrained the rider to shut down constantly, for example, a cleared cycle path that goes across side streets; and they were disregarded by traffic or were used to leave autos. (Department of transport, London 2010)

A quick web search will yield various more instances of foundation considered deficient or risky by cyclists endeavouring to use it.

In view of the reasoning referenced above, the issue here isn't just the inferior quality of the cycling offices provided, yet in addition the truth that these offices might additionally lessen

the legitimacy of cyclists out and about without truly giving them a suitable other option. Shoddy bike foundation might intensify the street sharing issue.

The fundamental issues seem, by all accounts, to be: foundation that is excessively perplexing and requires disentangling by the street user rather than fitting with their natural comprehension of how the street functions; an inability to convey and disclose to individuals – including the people who breezed through their driving assessments sometime prior – how to utilize imaginative framework; and an absence of consistency starting with one spot then onto the next, so when one goes to another space one doesn't have the foggiest idea what one is intended to do. (Department of transport, London 2010)

5. URBAN CYCLING SAFETY ANALYSIS MODEL

From the previous literature review the research suggest a model to evaluate the safety of cycling in urban settlements by identifying the level of threats and weaknesses as shown in the table below.

The first column represents the threats specifications showing the exterior factors affecting the cyclist such as speed of motorized vehicles, lack of visibility, sharing the road with other road users, acts of aggression, pressure from other road users and the bad infrastructure. the second column shows the weaknesses specifications as the interior factors such as the use of helmets, cycling against the traffic, failures of attitudes, failures of understanding, failures of expectations and not looking. The third column contains the impact of these specifications on the cyclist like summed up in integration and environment, the relation with roads and other road users and the self-safety.

Table 1: Urban Cycling Safety model (Reference: The Author)

Threats specifications (Exterior factors)					Weakness specifications (Interior factors)					The impact on the cyclist		
speed of motorized vehicles	lack of visibility	sharing the road with other users	acts of aggression	pressure from other road users	the bad infrastructure	the use of helmets	cycling against the traffic	failures of attitude	failures of understanding	failures of expectations	not looking	Integration and environment	Relation with roads & ORU	Self-safety

6. CASE STUDIES:

The case studies areas were selected to present the difference in the safety problems in two different urban centers. The two examples are two crowded cities. The first case study selected is in London UK and the second in Tripoli Lebanon.

6.1 Case Study: London UK

This case study investigates cycling hazard and reports a case-control in London in 2013–2014, utilizing displayed cyclist stream information close by datasets covering a few attributes of the London course organization. A staggered parallel calculated relapse model is utilized to research factors related with injury hazard, contrasting injury destinations and control locales chose utilizing the demonstrated stream information. Discoveries offer help for 'security in larger groups': A 18% drop in injury chances was found for every augmentation of a characteristic logarithmic unit (2.71828) in cycling streams. Expanded engine traffic volume, then again, is associated with expanded dangers of cycling injury, with one logarithmic unit increment related with a 31% expansion in injury probabilities. Speed limitations of 20 miles each hour, instead of 30 miles each hour, were related with a 21% diminished danger of injury. Private roads related to lower injury probabilities, while convergences were related with altogether more noteworthy injury odds. When different

elements are considered, transport paths have no impact on injury hazard. These discoveries suggest that setting speed limitations of 20 mph might limit the probability of cycling wounds, just as diminishing car traffic. Moreover, developing cycle ways that make new bicycle excursions should result in ‘safety in numbers' benefits.

Fig.1: Injury (red) and control (green) points in North-East London, OpenStreetMap base (©OpenStreetMap contributors) (For interpretation of the references to color in this figure legend, the reader is referred to the web version of this article).

Injury information is gotten from Stats19 police insights from 2013 and 2014, and is utilized for correlation with Cynemon. 5 Out of an aggregate of 9769 cycle wounds, 2790 were wiped out in light of the fact that they didn't happen on a work day between 7 a.m. what's more, 7 p.m., and another 735 were overlooked in light of the fact that they didn't relate to ITN or Cynemon organizations (the last option characterized as linkages with substantial streams >0). This left 6244 cycling injury locales accessible for assessment, of which 16 were deadly, 545 were not kidding, and 5683 were minor. When matched with the 6046 control focuses, this came about in a dataset of 12,290 joined control and injury focuses, which was then utilized in extra examination. In North-East London, control (green) and injury (red) destinations are portrayed in Fig. 1.

Fig.2: TfL opens southeast London's first major protected cycleway | Infrastructure Intelligence

In London, a survey is done exhibiting the connection between the probability of harm and the quantity of cycles every day. The reference case in this occurrence is 1000 cycles each day, which addressed the 62nd percentile for control focuses for the situation study. The diagram goes from the 10th to the 90th percentiles of the information's cycle volumes.

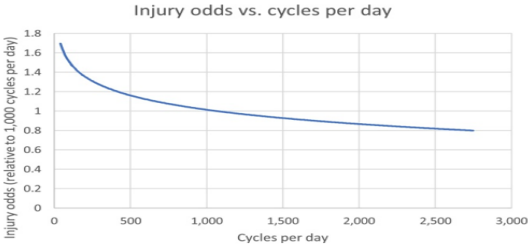

Fig.3: injury odds vs. cycles per day in London.

Table 2: Urban Cycling Safety model in London (Reference: The Author)

		Threats specifications (Exterior factors)					Weakness specifications (Interior factors)						The impact on the cyclist			
		speed of motorized vehicles	lack of visibility	sharing the road with other users	acts of aggression	pressure from other road users	the bad infrastructure	the use of helmets	cycling against the traffic	failures of attitude	failures of understanding	failures of expectations	not looking	Integration and environment	Relation with roads & ORU	Self-safety
Region	Outer	+	-	+	+	+	-	-	+	+	+	+	+	medium	good	good
	Inner	-	+	-	-	-	+	+	+	-	-	-	-	good	average	bad
Road type	Residential	-	+	-	-	-	+	-	-	+	+	+	+	average	bad	good
	Primary	-	+	+	+	+	+	+	+	-	-	-	-	good	good	bad
	Secondary	+	-	+	-	+	-	-	+	-	-	-	-	medium	medium	bad
Speed limit (mph)	20	-	-	+	-	+	-	-	+	+	+	+	+	average	medium	good
	30	+	-	+	+	-	-	-	-	+	+	+	+	average	medium	good
	40+	+	+	-	+	-	+	+	-	-	-	-	-	good	medium	bad
Inter-section	Yes	-	+	-	+	-	+	+	+	-	-	-	+	medium	medium	average
	No	+	-	+	-	+	-	-	-	+	+	+	-	average	medium	good

Outer: suburbs/ Inner: center/ +: positive status/ -: negative status
Good ++++; medium +++; average +; bad -

As seen in the last table, the threats and weaknesses are more severe in unorganized urban settlements. The impact on the cyclist at the level of integration and environment are upgraded in inner regions, primary roads, and 40+ speed limit areas. On the other hand, the impact on the cyclist depending on his relationship with roads and other road users is more positive in outer regions, primary roads, and 40+ speed limit. And finally, the self-safety of the cyclist is increased in outer region, residential roads, 20 and 30 speed limit and out the intersections zones.

6.2 Case study: Tripoli Lebanon

Tripoli is the largest city in north Lebanon and the centre of the city has a flat topography suitable for cycling. However, the bad infrastructure and the absent laws make the city unwalkable therefore difficult in practicing urban activities like cycling, skating… At the same time, there are a community for bikers in Tripoli working to enhance the status of cycling in the city. Hotspots in Mina and Maarad for selling, buying, and repairing all kinds of bicycles.

Fig.4: Bicycle Stores in Tripoli

Regarding the urban safety problems, consistently, over 1000 people are killed in Lebanon with around 33% of those killed being weak street users like walkers and motorcyclists. Over two times as many are for all time debilitated because of their wounds. This information should be compounded and found with regards to significant family distress, immeasurable misfortune and torment, and gigantic wellbeing, financial, and handicap outcomes.

As per the Internal Security Forces (ISF), 4447 mishaps happened in 2011, bringing about 508 fatalities and 6040 wounds at the location of the mishap; along these lines, assuming a harmed individual passes on a couple of days after the fact from wounds supported in a car crash, that individual is excluded from the injury measurements on passing's from auto collisions. It ought to be underscored that the worldwide meaning of 30-day traffic casualty isn't applied in Lebanon, consequently the traffic casualty insights given

by ISF, on which the accompanying investigations are based, are fundamentally lower than the genuine figures revealed, for instance, by the Lebanese Red Cross (LRC).

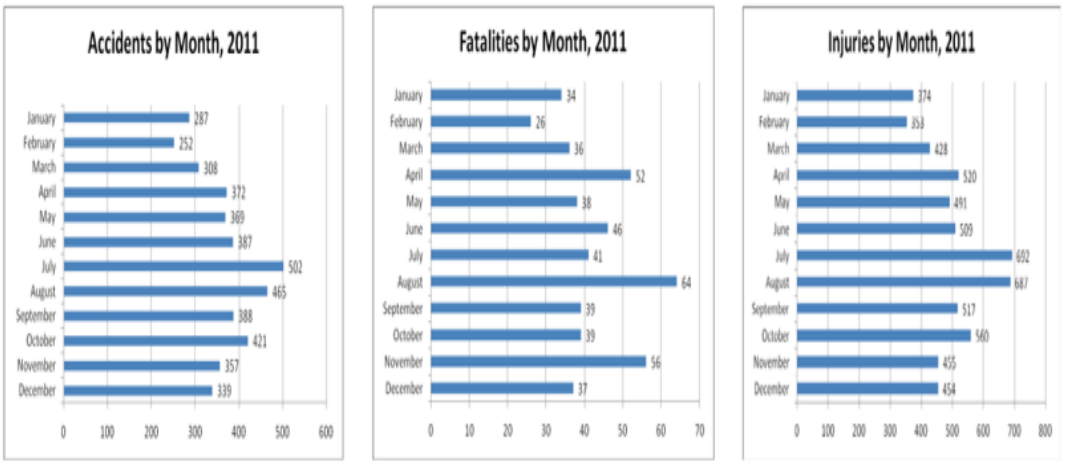

Fig.5: Road accident per month

The figure underneath subtleties the main sources of street mishaps in Lebanon in 2011. Extreme speeding for the conditions, like climate, street, light, traffic, etc., was the main source of mishaps, representing 22% of all episodes. Driver inconsiderateness, for example, utilizing phones while driving, following too intently or closely following, neglecting to stop at red lights, etc., came in second, representing 21% of all mishaps. Different elements, for example, overlooking traffic need guidelines, driving in some unacceptable path, making helpless turns, switching, and abrupt stops, added to around 26% of the occurrences. Walkers' improper intersection strategies were answerable for around 10% of the mishaps.

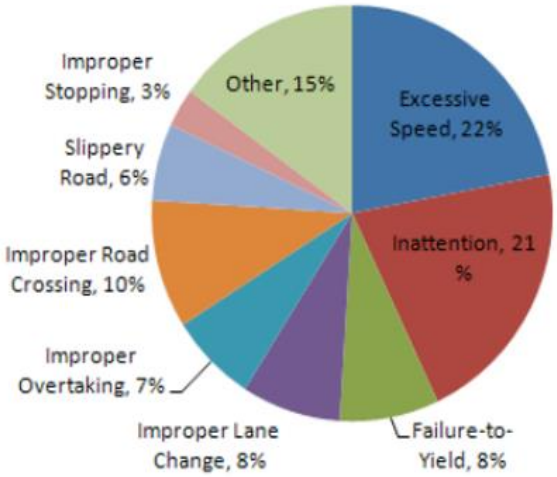

Fig.6 Road accident by cause

In terms of accident by type, multi-vehicle episodes represented 47% of all mishaps and the heft of fatalities in streetcar crashes (40% killed and 55 percent harmed). Pedestrian accidents represented 29% of all mishaps, killing 33% and harming 20%. It ought to be noticed that the high level of person on foot casualties is because of the way that walkers should every now and again share the street with street vehicles because of an absence of walkways

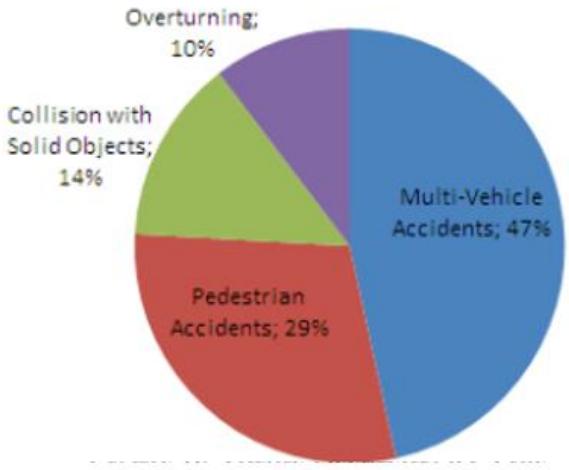

Fig.7: Road accident by type

(and in any event, when there are walkways, numerous drivers regularly disregard leaving rules and park their vehicles on the walkways) and passerby intersections, just as driver obliviousness in regards to person on foot privileges while out and about.

Accidents including traveler vehicles came about in 71% of those killed and 73% of those harmed; accidents including trucks came about in 12% of those killed and 6% of those harmed; and accidents including cruisers (and bikes) came about in 17% of those killed and 21% of those harmed.

Regardless of the way that the Lebanese populace is almost equally split among guys and females, more than 3/4 of streetcar crash casualties (81% killed and 76 percent harmed) are male, owing essentially to exorbitant speeding with respect to guys in open regions just as inside private and business regions. It ought to be featured that, inferable from a lack of jungle gyms in Lebanon where youngsters might play, mingle, and unwind, the car has turned into a device for youthful drivers to deliver their dissatisfactions while out and about, without thought for other people or the extreme repercussions that they might confront.

People younger than 30 record for over portion of all streetcar crash casualties, with those matured 15 to 29 representing 35% or more, those matured 4 to 14 representing 7% and higher, and those matured under 10 representing around 5%.

As far as street mishaps, the figure beneath shows a breakdown of street mishaps by street type. As per the information, a big part of all auto collisions (50%) occurred on unified two-way streets, which represent by far most of streets in Lebanon. On split expressways, the quantity of auto collisions was most minimal (21%).

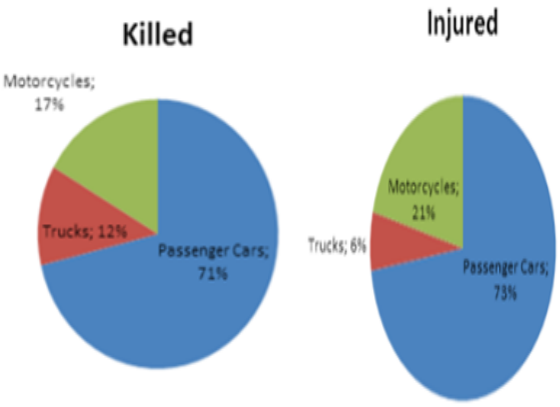

Fig.8: Deaths and injuries by vehicles

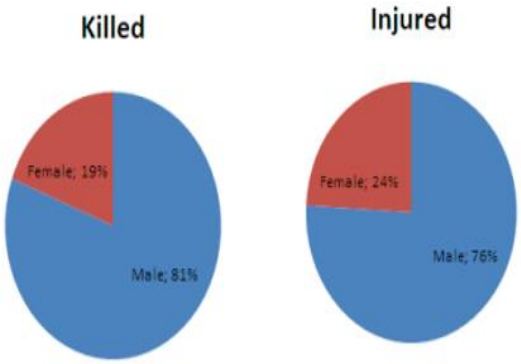

Fig.9: Deaths and Injuries by gender

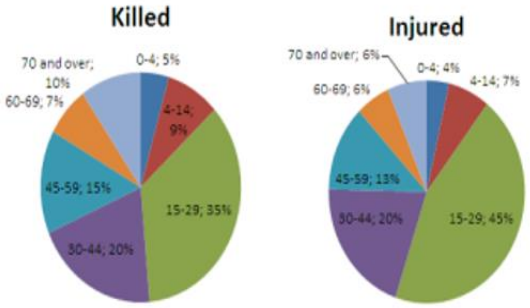

Fig.10: Deaths and injuries by age

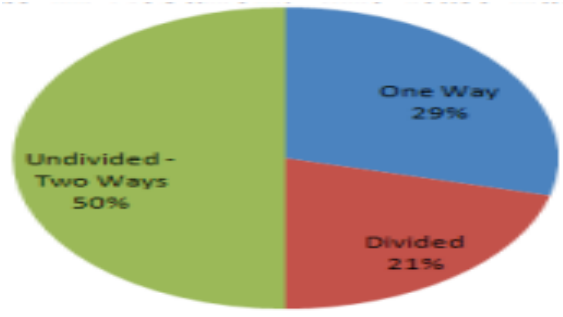

Fig.11: Road accidents by road type

It ought to be noticed that the Lebanese street network comprises of roughly 22000 km of streets, of which around 6400 km (or almost 30%) are delegated cleared streets represented by the Ministry of Public Works and Transport (MOPW&T) and the Council for Development and Reconstruction (CDR), while the excess 70% are unclassified streets administered by districts (Choueiri et al., 2010; Choueiri et al., 2007). Lacking upkeep, deficient traffic limit, bringing about languid traffic streams and blockage, and helpless street security conditions plague the street organization. The accompanying outline portrays an arrangement of the Lebanese street organization.

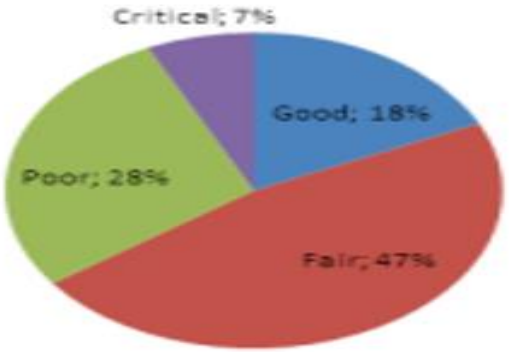

Fig.12: Classification of the road network

Table 3: Urban Cycling Safety model in Tripoli (Reference: The Author)

		Threats specifications (Exterior factors)						Weakness specifications (Interior factors)					The impact on the cyclist		
		speed of motorized vehicles	lack of visibility	sharing the road with other users	acts of aggression	pressure from other road users	the bad infrastructure	the use of helmets	cycling against the traffic	failures of attitude	failures of understanding	failures of expectations	not looking	Integration and environment	Relation with roads & ORU	Self-safety
Region	Outer	+	-	+	+	+	-	-	+	+	+	+	+	medium	good	good
	Inner	-	-	-	-	-	+	-	+	-	-	-	-	average	average	bad
Road type	Residential	+	-	-	-	-	+	-	+	+	+	+	+	medium	bad	good
	Primary	-	-	-	+	-	-	-	-	-	-	-	-	bad	average	bad
	Secondary	+	-	+	-	+	-	-	+	-	-	-	-	medium	medium	bad
Speed limit (mph)	20	+	-	+	-	+	-	-	+	+	+	+	+	average	medium	good
	30	+	-	-	-	-	-	-	+	-	-	+	+	average	bad	medium
	40+	+	+	-	+	-	+	-	-	-	-	-	-	average	medium	bad
Inter-section	Yes	-	-	-	+	-	+	-	-	-	-	-	+	bad	medium	average
	No	-	+	-	-	-	-	-	-	-	+	+	-	average	bad	medium

Outer: suburbs/ Inner: center/ +: positive status/ -: negative status
Good ++++; medium +++; average +; bad -

As seen in the table above, the threats and weaknesses are more severe in many urban settlements within Tripoli. The impact on the cyclist at the level of integration and environment are upgraded in outer regions, residential roads, and secondary road types. On the other hand, the impact on the cyclist depending on his relationship with roads and other road users is more controllable in outer regions, secondary roads and 20, 30 speed limit. And finally, the self-safety of the cyclist is increased in outer region, residential roads, 20 speed limit.

7. SURVEY RESULTS OF THE TWO CASE STUDIES

The questionnaire created by using Google Forms tool was sent to around 350 people who are bikes users. The questionnaire fulfilled by 300 persons from London and 120 from Tripoli Lebanon.

The questionnaire was based on urban cyclists in two cities: London, England and Tripoli, Lebanon. Due to the good number of teenagers and youth, the majority of daily users of public transportation are between eighteen and twenty-four years old and of both genders.

The questionnaire completed by British and Lebanese bikers leads to the following.

The contrast between the threats facing the cyclist including the exterior factors affecting the safety of the bikers vary between the two studied cases London and Tripoli.

In London, the speed of motorized vehicles and the pressure from other road users are the main two causes of the problems safety. However, in Tripoli, the causes are different; the main is the bad infrastructure, and the others differ between the lack of visibility and the pressure from other road users.

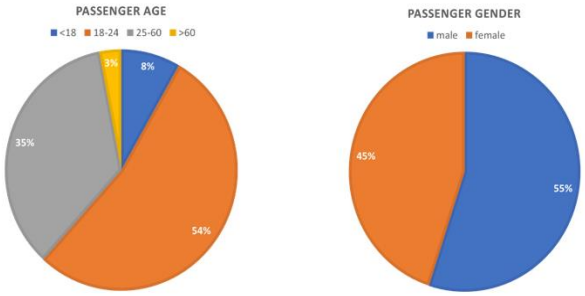

Fig.13: Questionnaire results in terms of bikers age and gender (Reference: The Author)

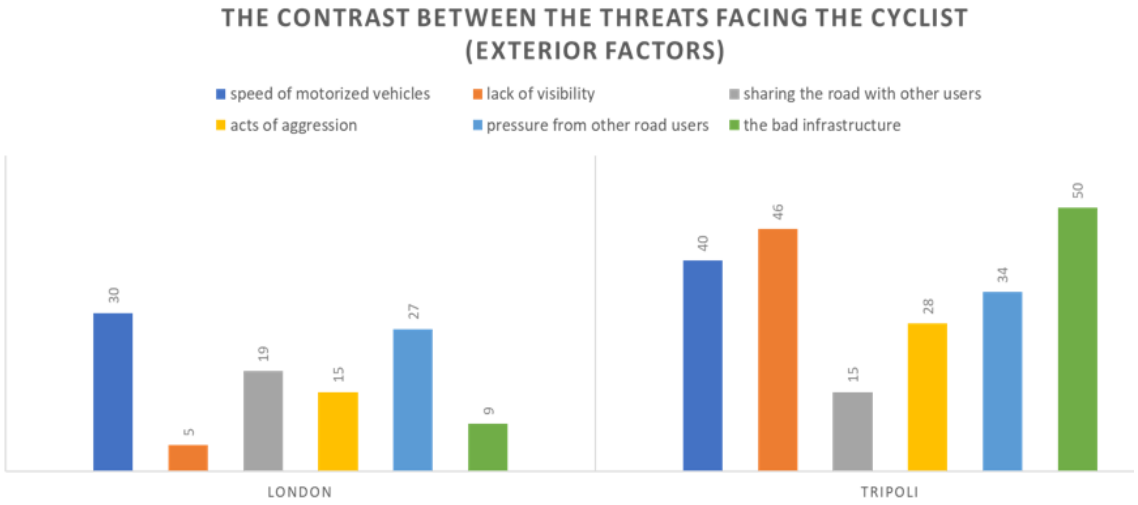

Fig.14: the contrast between the threats facing the cyclist (Reference: The Author)

On the other hand, the contrast between the weaknesses facing the cyclist including the interior factors influencing the safety is clear. The use of helmets in London is obligatory however in Tripoli the percentage is so low. The personal behaviours are affecting the level of safety of the Tripolitan cyclist due to the failures at the many levels shown in the chart below.

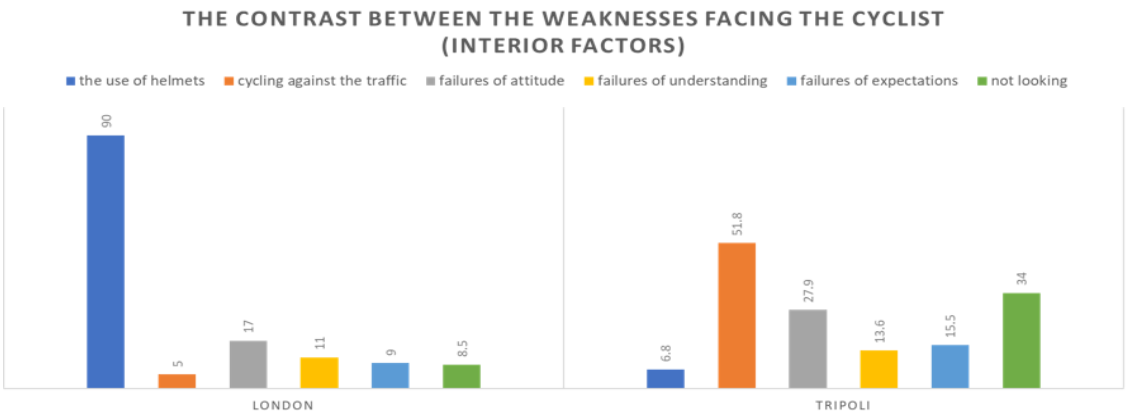

Fig.15: the contrasts between the weaknesses facing the cyclist (Reference: The Author)

In general, the integration of the cyclist in his environment, his relationship with the roads and the other road users then the self-safety was fitting well in the case of London, on the contrary in Tripoli where the safety threats and weaknesses were less controlled.

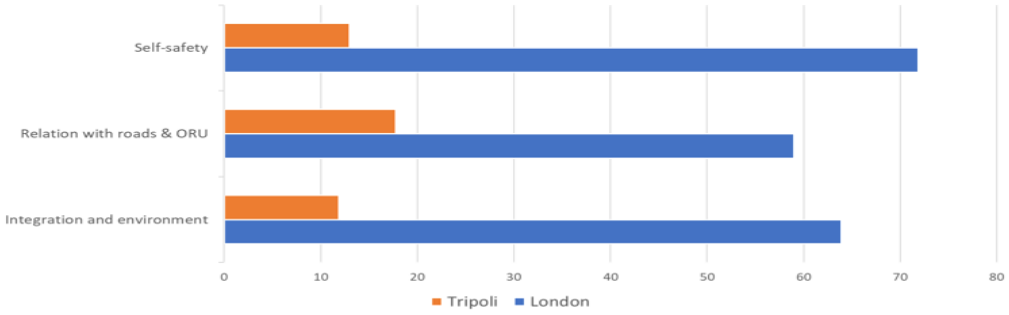

Fig.16: the general impact on the cyclist (Reference: The Author)

8. CONCLUSION

In both areas of the case studies, there is some difficulties facing the cyclist in general especially regarding the failures of behaviours and the interior factors causing the safety problems due to the acts of aggression and others.

However, the efficient visibility in London, the good infrastructure and the laws and regulations are making the safety problems more controllable having a balanced percentages in the safety model.

In Tripoli, the case is riskier knowing that the city is adaptable to the use of bikes but unfortunately lack of the minimum infrastructure and governance are making the situation getting worse.

Through observation and surveying, it is evident that the status of the safety problems of cycling in London differs from Tripoli due to the reasons and analyses listed in the previous chapters.

Those results and analyses have been done and interpreted because of the model table designed by the author. The model was efficient and helpful to discover the problems and failures of urban cycling and had showed the difference of the situation in two different cities Tripoli and London.

The concept of the model was based on the literature review in the first chapters. The speed of motorized vehicles, the use of helmets, cycling against the traffic and lack of visibility was some factors affecting the cycling status. Those factors included some inner and outer issues regarding the biker or the exterior environment. On the other hand, Sharing the road with other users, acts of aggression, personal failures and the bad infrastructure were also the other reasons showing the relation of the biker with his environment. All the safety problems are relative according to the city studied, the urban planning, the topography and the level of awareness.

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