

Promotion Of Cycling In Secondary Cities In Ghana

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Abstract- In pursuit of transport policies toward sustainable mobility, the promotion of cycling as a better alternative is very crucial. Conversely, the share of cycling is dwindling in some cities. By virtue of this, studies are being conducted to understand measures to promote cycling. However, in Ghana, many of these studies are mainly conducted in mega (primary) cities. Therefore the study investigated measures to promote cycling in secondary cities in Ghana using Wa Municipal as a case study. The study also ascertained the level of cycling experience and cycling frequency of the respondents as well as the challenges of cycling in the Municipality. This is to establish a policy direction within which cycling can be promoted in Wa Municipal.

400 participants were selected from the Municipality as the unit of enquiry. With the use of a questionnaire, 70 participants were interviewed online while the remaining 330 respondents were interviewed by trained field officers. The responded questionnaires were analyzed using Statistical Package for Social Sciences (SPSS).

The results indicated that 76.8% of the respondents ever used a bicycle. Out of the 76.8% of the respondents who had cycling experience, 58.3% are non regular cyclists. Lack of cycling lanes, disregard of cyclists by motorists, Weather conditions, low social status of cyclists, Topography, streets animals, placement of construction materials on roadways and street sellers were identified as barriers to cycling in the Municipality. The survey participants proposed the provision of cycling infrastructure, respect of cyclists as legitimate road users, cycling programs, public educations, controlling of road obstacles such as construction materials; domestic animals and street sellers on roadways as measures to motivate the use of bicycle in the Municipality. The policy proposition in this study is the provision of cohesive cycling infrastructure with a corresponding attitudinal change to encourage people to take advantage of this intervention. The findings of this study could be of guide for effective planning for increasing bicycle usage.

Index Terms- Ghana, Secondary Cities, Cycling, Wa Municipal

I. INTRODUCTION

The promotion of cycling as a daily activity is a win-win approach; it promotes good health as well as positive environmental effects, particularly if cycling replaces short

automobile trips (WHO, 2011). Studies have been conducted on the environmental, health as well as the economic benefits of cycling (Gotschi et al., 2016; Oja et al., 2011; Whyte & Crawford, 2014; Zander et al., 2013).

Economically, it is an affordable means of mobility, and it is also found to create more local jobs as well as jobs for lower skilled labors in some developing economies (Blondiau et al., 2016). In terms of environment, cycling does not produce environmental pollutants such as carbon dioxide and noise thus decreasing cases of cardio-vascular and upper respiratory diseases, and sleeping disorders (Hook, 2003). Moreover, a study conducted using Health Impact Assessment Framework found that, a changed from motorized modes to cycling led to health gains for people and cities (Stevenson et al., 2016).

Notwithstanding these apparent merits of cycling, its mode share continues to dwindle in some countries (Mullan, 2013; Nielsen et al., 2016). In recent years, studies have been conducted to understand the challenges of cycling as well as measures to promote bicycle usage in both developed and developing countries (Aldred et al., 2019; Berger et al., 2018; Wang, 2018).

In pursuit of measures to promote cycling in Ghana, the ministry of transport in collaboration with the United Nations Environment Institute for Transportation and Development Policy carried out an assessment of the existing mobility situation and challenges of NMT in the mega-cities of Ghana (Accra, Kumasi, Tamale and Tema metropolises). This was undertaken to prepare a non-motorized transport (cycling) promotion Strategy (UNEP, 2020). While studies have been carried out in the mega-cities of Ghana, not much has been done in secondary and smaller cities. Therefore this study seeks to examine the state and challenges of cycling as well as strategies for promoting cycling in secondary cities in Ghana using Wa Municipal in the Upper West Region as a case study.

The findings of studies of this nature could be a guide for effective planning in cycling promotion. It is also expected to build on existing knowledge about cycling in secondary cities.

II. PROMOTION OF CYCLING IN SECONDARY CITIES – A THEORETICAL PERSPECTIVE.

2.1. Description of a Secondary City

There is no obvious description of what exactly a secondary city or town is (UN-Habitat, 1996). However, Robert & Hohmann,

(2014) opined that a Secondary city is a term that is primarily used to explain the second level, or tier, in the classification of cities beneath the primary level and some nationalities have several levels or orders of cities.

A primary city is described as the leading city, disproportionately larger than any other urban hierarchy in its country or region (Goodall, 1987). However the concept of secondary city is contextual. It may relate to the size of the population, the administrative area, the political, economic and historical importance of a system of cities within a country or geographic region below the primary order of cities (Robert & Hohmann, 2014). The concept "secondary town" has been popularized by Rondinelli in the 1970s. In his classification, he defined secondary towns as urban settlements with a population not less than 100,000 but not including the country's mega-city. His study was initially aimed to help design and implement policies to spur the development of rural economies surrounding secondary settlements (Rondinelli 1983 cited by Robert & Hohmann, 2014)

Moreover, UN-Habitat (1996) defines a secondary city as an urban center with a population of 100,000 to 500,000. A secondary town today, however, can have a population of several million people. Some secondary towns in China have populations in excess of five million.

For the purpose of this study, secondary cities are towns with a population of 100,000 to 250,000 of whom at least 60% are urban residents (World Bank, 2018b).

2.2. *Cycling in Cities*

The role of cycling in most European countries as a mode of transportation has been increasing in the last years, especially in urban areas (Hook, 2003). European cities perceived an efficient cycling as providing a competitive advantage over other cities in attracting tourists and key workers, and therefore, have integrated non-motorized transport (cycling) in mainstream planning. Cycling portrays a picture of prosperity and health and has substituted the motorized transport as the engine of public health and economic prosperity (Oldenziel et al., 2016). However, among European cities, variations exist in terms of mode share of cycling and trips generated by cyclists. The urban centers of Copenhagen and Amsterdam are perceived as classical models of world-leading cycling cities, and many other rural centers have significant share of regular cyclists. In Zwolle and Copenhagen over 30% of all travels are made by cyclists (EPOMMA, 2016).

In developing countries, cycling is often perceived as a preferred mode for the poor and vulnerable groups such as women, the elderly and children; however, it has a positive impact on social equity, job creation, and the economy; it has an important role in the urban freight system; is environmentally sustainable; and it eases movement in narrow and congested roads in underdeveloped cities (Rahman et al., 2010).

On average, about 37% of trips in developing cities are generated by cycling (UNEP, 2016). Approximately, half of the

trips are made entirely by cycling in Nairobi and Dares Salaam, while 10 percent rely on private motorized transport and the remaining share is made on public transport (Servaas, 2000).

2.3 *challenges of NMT*

Studies have investigated challenges to cycling as a modal choice using cities and countries as case studies (Berger et al., 2018; Cheyne et al., 2007; Shaaban, 2020; Wang, 2018) In one of the studies, (Shaaban, 2020) using Qatar as a case study, the male respondents identified unfavorable conditions of weather, lack of cycling amenities, and motorist's behavior as important barriers to cycling. Whereas the female respondents in the survey cited dressing, consent of guardian and cultural norms as far more important. Also a study carried out in Hamburg discovered the following barriers to cycling: lack of dedicated cycling infrastructure, lack of political will and parking of cars on cycling paths (Wang, 2018). Furthermore, a survey in Toronto found the following barriers to cycling: Weather conditions, fear of accidents, inadequate cycling infrastructure and reckless driving (Bidordinova, n.d.).

2.4. *Initiatives/Measure to Increase Cycling*

Some studies have been undertaken to understand how bicycle ridership can be promoted in cities (Hull & O'Holleran, 2014; Rissel et al., 2010; Savan et al., 2017). Some of the studies established that the provision of dedicated cycling infrastructure can encourage more cycling culture (Shaaban, 2020). The design of cycling infrastructure should include: spacious cycling lanes, Direct lanes linking all land uses, speed barriers and clear signage that are visible at night and do not make the cyclist dismount, straight lights and bicycle parking amenities (Hull & O'Holleran, 2014). This is mutually reinforced the assertion that the presence of bicycle infrastructure enhances cyclists' safety. (Reynolds et al., 2009)

Furthermore, it was discovered that social psychological behavior change was particularly successful in enhancing cycling (Savan et al., 2017). Because attitudes are a more direct way to increase bicycle use, the promotion of the bicycle as a practical, environmentally friendly, inexpensive, and healthy mode of transport may help to foster more positive attitudes, which may lead to stronger intentions and more frequent bicycle use (Milković & Štambuk, 2015). Other interventions include: Bicycle inclusive Urban infrastructure design, Bicycle inclusive Planning, Strong Political will, and Public awareness campaigns to overcome negative perceptions about cycling (Wang, 2018).

III. MATERIALS AND METHODS

3.1. *Study area,*

The study area is Wa Municipal in the Upper West Region of Ghana. The Municipality is one of the secondary cities in Ghana by virtue of its population (World Bank, 2018a). It has a population of 107,214 (Ghana Statistical Service, 2014). And 2018 projected population of 126,609 (World Bank, 2018a). Approximately 54.8% of the population is economically active and 45.2% are economically inactive. While 91.5% of the economically active population are employed, 8.5% are unemployed. Majority of the economically inactive population

(66.6%) is students (Ghana Statistical Service, 2014). The Municipality and some peri-urban communities are shown in figure 3.1

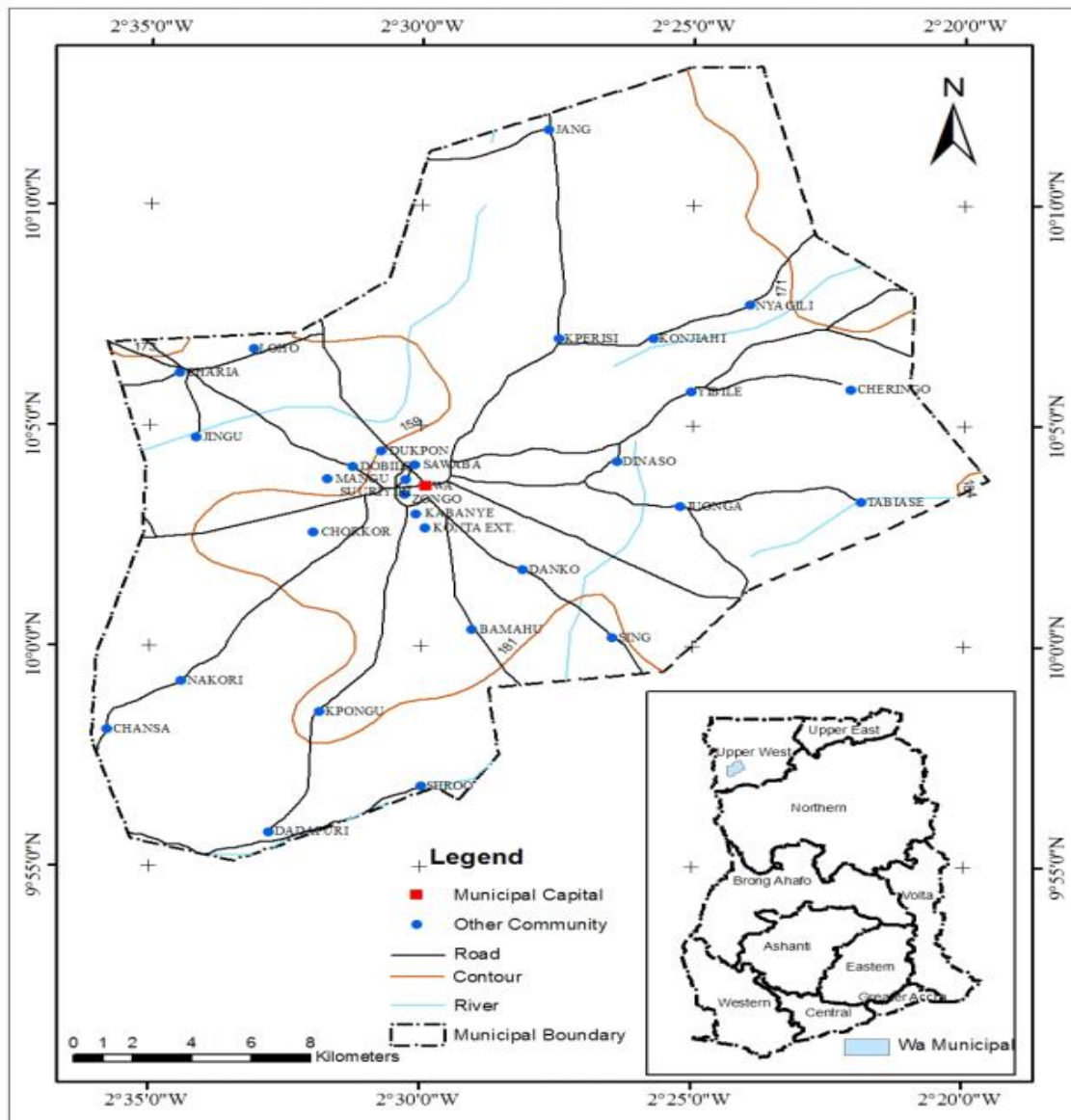


Figure 3.1: Wa Municipal with some of the Peri-urban Communities
 Source: (Aduah & Aabeyir, 2012)

3.2. Unit of Enquiry

The units of inquiry for the study were residents of Wa Municipality in Ghana. The residents consist of people in the Municipality at the time of the survey irrespective of their ethnicity, educational level and employment. However, a respondent has to be at least 18 years of age due to legal challenges in Ghana. This unit was the source of primary data on demographic characteristics of respondents, cycling experience, challenges and strategies to promote cycling.

3.3. Sample size and sampling techniques

The study employed probability sampling. In the probability sampling each variable in the population has the same chance of getting into the sample; and all choices are independent of one

another (Kathori, 2014). Under the probability sampling, the simple random sampling without replacement was employed, in it; each resident once selected can't be chosen again. The result obtained from this has a high validity and accuracy (Showkat & Parveen, 2017). Of this, 400 residents of the Municipality were selected and each respondent was interviewed once. The purposive sampling was also used under the non-probability sampling, by this; the Municipality was selected as it is one of the secondary cities in Ghana.

3.4. Research instruments design, Methods of Data Collection and data processing

The research started with a pilot survey, 70 people in the municipality were randomly recruited and interviewed. The goal

of the pilot study was to understand the challenges of cycling and ways to increase cycle ridership in the municipality. To that purpose, an open-ended questionnaire was created in which study participants were requested to provide information about their cycling experience, obstacles, and ideas for increasing cycling. The primary study instrument was designed using the results of the pilot survey, as well as insights gained from the existing literature on cycling, to find out how to promote cycling in secondary towns.

A structured questionnaire was the main tool used to collect the data. The questionnaire was built on closed ended questions. Closed-ended questions were used to solicit data on how to promote cycling in secondary cities. In all, the survey participants responded to four set of questions. The first question solicited the demographic characteristics such as age, gender and level of education of the respondents. Besides, respondents were also asked to indicate their cycling experience out of two options namely; (i) Yes; (ii) No, in furtherance to this, participants who indicated “Yes” to the previous question were also required to indicate their cycling frequency by choosing (i) “Yes” or (ii) “No” to the question; did you cycle three or more times a week?

In addition, the survey participants were asked about the challenges they face in using the bicycle or what might have prevented them from cycling. Under this, respondents were requested to select one or more of five barriers namely; (i) “Lack of cycling lanes” (ii) “Disregard of cyclists by motorists” (iii) “Low social status of cyclists” (iv) “Weather conditions” (iv) “Topography”. In order to allow the participants to express their opinion regarding the barriers beyond the items provided in the questionnaire, their feedback was obtained through the “others” option on the questionnaire

Finally, in the light of the challenges, the participants were asked to suggest what could be done to curtail the barriers and

eventually promote cycling in the municipality. To this, they chose one or more of predefined solutions namely; (i) ‘Provision of cycling infrastructure’ (ii) ‘Respect of cyclists by motorists’ (iii) ‘public campaigns and programs’. Their opinions beyond these were elicited through the “others” option on the questionnaire.

Data was obtained using a variety of techniques, bearing in mind all the elements that were predetermined as units of enquiries. The survey was conducted on both weekdays and weekends. Study respondents who could not read and write were interviewed face-to-face by trained field enumerators and those who could read and write completed the questionnaire with the assistance of an enumerator. Besides, some of the participants who were familiar with the use of social media were interviewed via whatsapp with the use of google structured questionnaire. In all, 70 participants were interviewed online while the remaining 330 respondents were interviewed by trained field enumerators.

Results from the responded questionnaires were inputted into the Statistical Package for Social Sciences (SPSS) version 16 for display and analysis. The data were then analyzed using the SPSS 16.0. The software created frequencies and tables to illustrate the result of the data analysis

4. Results

4.1. Demographic Characteristics of Sample Population

A total of 400 questionnaires were administered and the same number of responses was received. This was due to the mixed approach (face-to-face and online) administration of questionnaires to respondents. As shown in Table 4.1, out of the 400 responses, 45.8% were males and 54.2% were females. The survey respondents were aged between 18 and 60 > years. In terms of level of education, 14.0% attained tertiary education, 16.5% had senior high school education, and 35.8% had basic education while the remaining 33.5% had not been to school.

Table 4.1. Demographic Characteristics of Survey Respondents

| Characteristics | Frequency | Percentage (%) |
|-------------------------------|-----------|----------------|
| Age Brackets | | |
| 18-35 | 156 | 39.0 |
| 36-59 | 137 | 34.2 |
| 60 and above | 107 | 26.8 |
| Gender | | |
| Male | 183 | 45.8 |
| Female | 217 | 54.2 |
| Educational Attainment | | |
| Tertiary | 56 | 14.0 |
| Senior High | 66 | 16.5 |
| Basic Education | 143 | 35.8 |
| Illiterate | 134 | 33.5 |

Source: Field Survey (2021)

4.2. Cycling Characteristics of Sampled Population

Respondents were asked to describe their cycling experience and frequency as part of the study. As shown in table 4.2, (76.8%) of the respondents had previously cycled, while the remaining (23.2%) had never used a bicycle in their entire lives. However, majority (58.3%) of those who had cycling experience are irregular cyclists while (41.7%) were regular cyclists.

4.2 Cycling Characteristics of Study Population

| Characteristics | Frequency | Percentage |
|---------------------------|-----------|------------|
| Cycling Experience | | |
| Had cycling Experience | 307 | 76.8% |
| Had no cycling Experience | 93 | 23.2% |
| Cycling Frequency | | |
| Cycled Frequently | 128 | 41.7% |
| Cycled Infrequently | 179 | 58.3% |

Source: field survey (2021)

4.3. Challenges of Cycling In Wa Municipal

The purpose of this section was to identify what the survey participants perceived as barriers to cycling in the Municipality. Of this, the study participants were requested to select one or more of five barriers. Each barrier and the frequency that it was mentioned by interviewees are summarized in table 4.3. From the table, the more pronounced challenge was Lack of cycling lanes (70.8%), followed by disregard of cyclists by motorists (58.4%), Weather conditions (43.4%) low social status of cyclists (38.8%) and Topography (13.1%). Others (7.1%) such as animals on the streets, placement of construction materials on roadways and street sellers were also identified as barriers to cycling in the Municipality.

4.3 Challenges of cycling in Wa Municipal

| Challenge | Yes (%) | No (%) |
|-----------------------------------|---------|--------|
| Lack of cycling lanes | 70.8 | 29.2 |
| Disregard of cyclist by motorists | 58.4 | 41.6 |
| Weather conditions | 43.4 | 56.6 |
| Low social status | 38.8 | 61.2 |
| Topography | 13.1 | 86.9 |
| Others | 7.1 | 92.9 |

Source: Field Survey (2021)

4.4 Interventions to overcome barriers and Increase cycling in the Municipality

A number of measures to tackle the barriers and increase cycle ridership were proposed by the respondents. Under this, the study participants were requested to select one or more of four predefined measures. Each measure and the frequency that it was mentioned by interviewees are summarized in table 4.4. As shown in the table, the survey respondents proposed the provision of cycling infrastructure (85.1%), respect of cyclists as legitimate road users (47.2%), cycling programs (42.8%), public campaigns and educations (40.3%) and others (8.1%) such as provision of speed ramps and controlling construction materials, sellers and domestic animals on roadways

Table 4.4: Measures to Promote Cycling in Wa Municipal

| Measure | Yes (%) | No (%) |
|-------------------------------------|---------|--------------|
| provision of cycling infrastructure | 85.1 | 14.9 |
| respect of cyclist as road users | 47.2 | 52.8 57.2 |
| Cycling programs | 42.8 | |
| Public campaigns and education | 59.7 | 40.3 |
| Others | 91.9 | 8.1 |

Source: Field Survey (2021)

IV. DISCUSSIONS

Majority of the survey respondents were females 54.2%. This underlines female dominance in the Municipality hence empowering cyclists and improving cycling culture through the adoption of appropriate measures will indirectly lead to gender empowerment/equality within the Municipality. The results also revealed a youthful population of 39.0% in the municipality. This finding is consistent with previous findings, where the population of the municipality was found to depict a youthful based population of 35% (Ghana Statistical Service, 2014). The youthful population can be a potential for promoting cycling since there is a positive correlation between regular cycling and youthful population (Sallis et al., 2013). Illiteracy was high in the municipality with 33.5% of the respondents being illiterates. This finding is in conformity with results of previous research findings (Ghana Statistical Service, 2014).

In generally, cycling is more famous in the municipality compared to megacities in Ghana such as Kumasi; about 76.8% of the respondents had cycling experienced as against Kumasi metropolis which had a cycling experienced of 70% (Acheampong, 2016). These findings are peculiar to secondary

cities as similar studies have shown bicycle usage to be more common in smaller and secondary towns (Karanikola et al., 2018; UN-Habitat, 2013).

Notwithstanding the high cycling experience, the absence of cycling lanes in the Municipality was expressed as a challenge to cycling by the respondents. The absence of cycling paths in Wa municipal is a common finding in similar studies (Damsere-Derry & Bawa, 2018). Cyclists therefore share the roadway with motorized traffic, a situation which may not only reduce bicycle usage but can endanger the safety of cyclists. The absence of dedicated cycling lanes is a common barrier that discourages bicycle usage (Nelson & Allen, 1997). Moreover, the study participants perceived the constant hounding and disregard of motorists as legitimate road users as a barrier to cycling in the municipality. This is mostly caused by the lack of cycling infrastructure to separate cyclists from motorists. The perception of motorists of cyclists being irritants and nuisances on the road is a common finding in similar studies (Basford et al., 2002). Besides, the low social status of cyclists was itemed by respondents as a challenge to cycling in the municipality. Social barriers concerned with the problem of acceptability or change in perception of a program (Banister cited by Wang, 2020). Social norms governing transport behavior tended to favor motorized travel in terms of prestige over active transport (cycling), even for short journeys that can be completed by bicycle (Bauman et al., 2008). In Wa municipal, the bicycle was regarded as mode of the poor and people with low social standing. In effect, it was perceived as an index of poverty. The low social status of cycling is a common phenomenon in other cities in Ghana (Acheampong, 2016). In the survey, bad weather conditions were mentioned as a challenge to cycling. This was in response to the Harmattan season and the hot weather condition which precedes the Harmattan. Participants indicated that when cycling in Harmattan, they are exposed to dust and the scorching sun in the hot season. In similar studies in Qatari, hot weather condition was found out to be the number one barrier to cycling (Shaaban, 2020). Furthermore, the presence of construction materials on roadways was indicated by respondents as a challenge to cycling in the Municipality. The placement of materials such as sand and waste construction materials narrows existing roadways used by both motorists and non-motorists (cyclists). In some situations, double lanes are narrowed to single lanes thus forcing both motorists and cyclists to ply a single lane, a situation that exposes cyclists to road traffic accidents. Finally, the presence of livestock and sellers on streets are some of the identified obstacles to cycling in the Municipality. In Ghana, street selling is a common road traffic obstacle facing both cyclists and motorists (Agyapong & Ojo, 2018).

In order to overcome these challenges and to promote cycling, the provision of cycling lanes could spur bicycle ridership in the municipality, given the fact that over 81.5% of the respondents perceived the provision of cycling lanes to be the surest way of promoting cycling. Bicycle lanes and parking lots should be included when new roads are planned, constructed, or as conditions permit, when existing facilities are rehabilitated. Studies highlighted the role of cycling infrastructure in increasing cycle ridership (Fishman et al., 2015; Hull & O'Holleran, 2014). Respect of cyclists as road users by motorists was one of the proposed means of promoting cycling by survey respondents. In

the case of the Wa Municipality, both cyclists and motorists ply the same roadway, a situation which appears to have aggravated cyclist-motorists road conflict in the Municipality (Damsere-Derry & Bawa, 2018). Such conflict can be addressed by rerouting motorized transport, restricting parking in zones or streets, and traffic calming measures. Moreover, bicycle ridership could be promoted in the city by rolling out public educations and cycling programs. Such programs may include: Bike or walk to Work Day, campuses and schools cycling competitions, and bicycle Commuter Week. These programs encourage more people to use bicycle and dispel the negative perception about cycling. It has been documented in previous studies that such initiatives create more positive attitudes that could contribute to stronger intention and more frequent use of the bicycle (Milković & Štambuk, 2015). Besides, other measures such as getting construction materials, domestic animals and street sellers off roadways can make the road more safe and convenient for cyclists to ply thus motivating the use of bicycle in the Municipality.

V. POLICY IMPLICATIONS

The findings of the study have a number of policy implications. Firstly, cycling promotion programs could be anchored on the fact that the majority of the study populations are potential cyclists. However, such interventions would have to dedicate extensive effort in providing cycling infrastructure. In ensuring an efficient and effective cycling infrastructure in the municipality, a cohesive network is paramount because cyclists' trips are generated at various points and ends at many destinations. From the literature, it is evident that a cohesive infrastructure helps cyclists to move from an origin to many destinations; and is also regarded as an effective way of fully integrating cycling into mainstream planning (Deffner et al., 2012). This argument is supported by Pucher & Buehler (2010) who opined that visible cycling infrastructure encourage and sanction the use of a bicycle.

Although a cohesive cycling infrastructure would be necessary for a successful cycling promotion, planners and policy makers should be attentive to the fact that attitudinal change is needed to convince and encourage people to take advantage of this intervention. Public educations, campaigns and promotional programs such as Bike or walk to Work Day; campuses and schools cycling competitions; bicycle Commuter Week and "bic-to-city" project could build positive perceptions about cycling. Moreover, people's own experience of a behavior or habit will give them their strongest perceptions of that behavior. Providing a good cycling experience to an individual is an effective way to efficiently and convincingly give that person positive perceptions towards cycling. These positive expectancies and values increase goal commitment (Azjen, 1972).

Albeit the insight gained from this study, it has some limitations. The study did not capture potentials of cycling in the Municipality. Given that cycling potentials could provide detailed knowledge to local authorities on conditions of the Municipality to take up cycling. Therefore future research is necessary on the potentials to guide effective planning for increasing bicycle usage.

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