Maldives Journal of Engineering and Technology
ISSN: 3007-6536 (Online)
https://mjet.mnu.edu.mv/

Exploring the factors affecting the movement of female pedestrians at night-time in Dhaka city

F.A. Taslim[1], N.B. Momin[2], H.N. Labiba[3], T.M. Sameen[4], M. Hossain[5] and S.M. Rifaat[6]

[1] *Masters Student, Bangladesh University of Engineering and Technology, Bangladesh, e-mail: faiyazahmed@iut-dhaka.edu;*

[2] *Masters Student, Bangladesh University of Engineering and Technology, Bangladesh, e-mail: nafisa46@iut-dhaka.edu;*

[3] *Research Associate, Bangladesh Institute of Governance and Management, e-mail: hurmetunnesa@iut-dhaka.edu;*

[4] *Masters Student, RMIT University, Melbourne, Victoria, Australia, e-mail: tahseensameen@iut-dhaka.edu;*

[5] *Lecturer, Islamic University of Technology, Bangladesh, e-mail: maishahossain@iut-dhaka.edu;*

[6] *Professor, Islamic University of Technology, Bangladesh, e-mail: smrifaat@iut-dhaka.edu;*

**Corresponding: faiyazahmed@iut-dhaka.edu;*

Abstract: In Bangladesh, where women make up half the population, the majority have experienced sexual harassment or violence in public spaces. Urban areas, especially during nighttime, pose notable challenges to women's safety and mobility, resulting in heightened insecurity and a reluctance to venture outdoors. Existing research in Bangladesh focuses on specific groups like garment workers, leaving a gap in understanding women's experiences compared to studies in developed nations. This study aims to find the factors that discourage and encourage female pedestrian movement at night from the perspective of a developing country. Based on literature review, local insights, and a pilot survey, a questionnaire with six subsets, covering areas such as socio-economic, demographics, road infrastructure, etc. was prepared. A survey was conducted collecting data from 500 women of diverse ages and backgrounds in Dhaka city. Independent variables were formed based on the responses provided in this survey. The dependent variable for this study is whether women commute outside during nighttime. Employing an Ordered Probit Model due to the ordinal nature of the dependent variable, the analysis will reveal whether certain factors encourage or discourage women from walking at night. The model assists in finding out the most affected group of women. The study's outcomes will assist policymakers to prioritize the components of road infrastructure enhancements and enact legislation to enhance the safety and well-being of female pedestrians during nighttime in developing cities like Dhaka.

Keywords: Female Pedestrian; Night-time Mobility; Dhaka City; Ordered Probit Model.

Received: 24 March 2026
Accepted: 2 May 2026
Published: 28 May 2026

1. INTRODUCTION

A woman experiencing sexual harassment is a very common occurrence in urban spaces. The situation is worse in the perspective of developing countries like Bangladesh. According to the Population and Housing Census 2022, 82% of women face sexual harassment in public spaces. Another report from the Bangladesh Bureau of Statistics shows that 54% of women have experienced physical and sexual abuse at least once in their lifetime. This all makes an impact by discouraging female pedestrians' movement in Dhaka City. During night time the situation is worse. But, walking, as an active mode of transportation holds significant importance for individuals, communities, and society as a whole. It not only serves as a vital connector for intermodal transitions in key urban hubs but also its benefits extend beyond just physical exercise and include various environmental, economic, and social advantages [1]. For age differences, a notable pattern of reduced cardiovascular disease was observed as duration of walking increased [2]. Further, investigating the effects and expenses associated with strategies aimed at alleviating traffic congestion, it was found that walking shows the most potential for reducing congestion effectively while maintaining reasonable cost [3]. In the most recent surveys conducted as part of the Strategic Transport Plan in metropolitan Dhaka, walking emerged as a prominent mode of transportation, constituting 22% of the total personal trips (STP, 2005). A higher proportion of women utilize the current transportation system (comprising at-grade crossings, underpasses, and overpasses) compared to men. Female pedestrians in Dhaka are particularly vulnerable at night [4]. Addressing the vulnerability of female pedestrians in Dhaka at night is essential to creating a more equitable and just society. Numerous studies have been conducted on the issue of women's safety when moving around at night in developed countries as well as in developing countries like Bangladesh [5]. However, existing research in Bangladesh focuses on specific groups, such as garment workers, leaving a gap in understanding the factors that influence women's experiences in other sectors compared to studies in developed nations [6]. Hence, to find the influence of demographic traits of the victims, for instance, the effect of age, income, profession, car ownership, marital status, location of residence, prior experience of harassment, and road infrastructure factors such as road network connectivity, lighting conditions, presence and condition of sidewalks, foot-over bridges, traffic density, and other various reasons are explored in this research. This study will explore the perception of female pedestrians moving at night, considering diverse backgrounds from the perspective of a developing country as well. It aims to facilitate the policy-makers in creating and implementing strategies, policies and infrastructures to increase the favorable environment of safety and security of women pedestrians of Dhaka city during the night.

2. METHODOLOGY & DATA COLLECTION

The data was gathered from 505 working and non-working women from a range of socioeconomic backgrounds in several neighborhoods of Dhaka city by using a questionnaire survey. Data was collected through direct interviews from hospitals, schools, colleges, garments industry, government & non-government offices, and on-street surveys. The questionnaire was prepared based on prior literature reviews, interviews with stakeholders, and consideration of the local context. It is divided into six sections containing a total of 47 questions. These sections are Socio-economic & demography, Road Infrastructure, Incident Report, Safety & Security, Surrounding Environment, and Policy & Social Awareness. Some major questions were about age, marital status, profession, income, location, previous experience, perception of safety, preference for road infrastructure, and views on policy and laws. We have used the Ordered Probit Model for our data analysis and the model was run using Stata 15 software as our dependent variable is ordinal.

Model Equation:

$$y_i^* = x_i\beta + \varepsilon_i$$

Where, y_i^*= a latent, unobservable and continuous dependent variable;

x_i= a row vector of observed non-random explanatory variables;

β= a vector of unknown parameter;

ε_i= the random error term, which is assumed to be normally distributed.

Our dependent variable is "Do you go out at night in Dhaka city?" The four possible choices are 'No', 'Rarely', 'Sometimes', and 'Often' which are coded with 1, 2, 3, and 4 respectively. Our independent variable is based on the significance of x_i, they are retained in the final model after iterations. A 95% confidence interval has been taken based on which the independent variables are retained in the final model.

3. RESULTS & DISCUSSION

Table 1: Summary Statistics of the Explanatory variables used in the model.

Explanatory Variables	Description of the Variables	Mean	Standard Deviation
1. Socio-economic & Demography			
i. Profession			
Student	If Student = 1, otherwise = 0	0.3412	0.4746
Housewife	If Housewife = 1, otherwise = 0	0.0476	0.2131
Teacher	If Teacher = 1, otherwise = 0	0.1011	0.3018
Service Holder	If Service Holder = 1, otherwise = 0	0.2222	0.4161
Businesswoman	If Businesswoman = 1, otherwise = 0	0.0039	0.0629
Medical Personnel	If Medical Personnel = 1, otherwise = 0	0.0952	0.2938
Housemaid	If Housemaid = 1, otherwise = 0	0.0932	0.2910
Laborer	If Laborer = 1, otherwise = 0	0.0952	0.2938
ii. Marital Status			
Unmarried	If Unmarried = 1, otherwise = 0	0.4027	0.4909
Married	If Married = 1, otherwise = 0	0.5753	0.4947
Widowed	If Widowed = 1, otherwise = 0	0.0079	0.0888
Divorced	If Divorced = 1, otherwise = 0	0.0138	0.1117
iii. Timing of going out at night			
6 P.M. to 8 P.M.	If 6 P.M. to 8 P.M. = 1, otherwise = 0	0.4960	0.5004
8 P.M. to 10 P.M.	If 8 P.M. to 10 P.M. = 1, otherwise = 0	0.3194	0.4667
10 P.M. to 12 P.M.	If 10 P.M. to 12 P.M. = 1, otherwise = 0	0.0912	0.2882
After 12 P.M.	If After 12 P.M. = 1, otherwise = 0	0.0019	0.0445
Doesn't go out at night	If Doesn't go out at night = 1, otherwise = 0	0.0892	0.2854
iv. Purpose of going out at night			

Work	If Work = 1, otherwise = 0	0.3690	0.4830
Education	If Education = 1, otherwise = 0	0.0396	0.1954
Recreation	If Recreation = 1, otherwise = 0	0.1488	0.3562
Physical Exercises	If Physical Exercises = 1, otherwise = 0	0.0813	0.2736
Emergencies	If Emergencies = 1, otherwise = 0	0.2916	0.4549
Doesn't go out at night	If Doesn't go out at night= 1, otherwise = 0	0.0694	0.2544
v. Reason behind the unwillingness to go out at night			
Road Infrastructure	If Road Infrastructure = 1, otherwise = 0	0.0793	0.2705
Social/Religious Norms	If Social/Religious Norms = 1, otherwise = 0	0.1388	0.3461
Fear of Harassment	If Fear of Harassment = 1, otherwise = 0	0.4345	0.4961
Familial Restrictions	If Familial Restrictions = 1, otherwise = 0	0.1825	0.3866
Doesn't face any problem	If Doesn't face any problem = 1, otherwise = 0	0.1309	0.3376
Others	If Others = 1, otherwise = 0	0.0297	0.1700
vi. Companionship			
Never having another individual as a companion	If Never = 1, otherwise = 0	0.0972	0.2965
Rarely having another individual as a companion	If Rarely = 1, otherwise = 0	0.3376	0.3082
Sometimes having another individual as a companion	If Sometimes = 1, otherwise = 0	0.0957	0.2504
Always having another individual as a companion	If Always = 1, otherwise = 0	0.4695	0.4819
2. Incident Report			
i. Experience of being a victim of harassment in a well-lit environment			
No	If No = 1, otherwise = 0	0.2142	0.4107
Sometimes	If Sometimes = 1, otherwise = 0	0.0436	0.2045
Yes	If Yes = 1, otherwise = 0	0.2876	0.4531
Not Applicable	If Not Applicable = 1, otherwise = 0	0.4543	0.4984
3. Road Infrastructure			
i. Lacking sidewalk features that discourage women from walking at night			
CCTV	If CCTV = 1, otherwise = 0	0.1071	0.3096
Street Light	If Street Light = 1, otherwise = 0	0.1805	0.3850
Wide Sidewalks	If Wide Sidewalks = 1, otherwise = 0	0.1646	0.3712
Safety Rails	If Safety Rails = 1, otherwise = 0	0.0178	0.1325
Cleanliness	If Cleanliness = 1, otherwise = 0	0.2738	0.4463
Vendor-free Sidewalks	If Vendor-free Sidewalks= 1, otherwise = 0	0.1130	0.3170
Police Presence	If Police Presence = 1, otherwise = 0	0.1408	0.3482
ii. Type of road that makes women feel unsafe to walk on at night			
Local Roads	If Local Roads = 1, otherwise = 0	0.1428	0.3502
Collectors	If Collectors = 1, otherwise = 0	0.4246	0.4947
Arterials	If Arterials = 1, otherwise = 0	0.3670	0.4824

Highways	If Highways = 1, otherwise = 0	0.0476	0.2131
iii. Perception of safety for using foot over bridges at night			
Unsafe	If Unsafe = 1, otherwise = 0	0.3035	0.4602
Safe when it is crowded and dark	If Safe when it is crowded and dark = 1, otherwise = 0	0.0039	0.0629
Safe when it is empty and dark	If Safe when it is empty and dark = 1, otherwise = 0	0.0059	0.0769
Safe when it is empty and well-lit	If Safe when it is empty and well-lit = 1, otherwise = 0	0.1825	0.3866
Safe when it is crowded and well-lit	If Safe when it is crowded and well-lit = 1, otherwise = 0	0.5039	0.5004
iv. Willingness to walk because of proper road network connectivity			
Never	If Never = 1, otherwise = 0	0.0277	0.1644
Rarely	If Rarely = 1, otherwise = 0	0.0972	0.2965
Sometimes	If Sometimes = 1, otherwise = 0	0.5000	0.5004
Always	If Always = 1, otherwise = 0	0.3750	0.4846
No Impact	If No Impact = 1, otherwise = 0	0.3988	0.4901
4. Surrounding Environment			
i. Impact of traffic congestion on walking at night			
No Impact	If No Impact = 1, otherwise = 0	0.3988	0.4901
Less Traffic	If Less Traffic = 1, otherwise = 0	0.2976	0.4576
More Traffic	If More Traffic = 1, otherwise = 0	0.3035	0.2440
ii. Impact of extreme weather on walking at night			
No Impact	If No Impact = 1, otherwise = 0	0.0634	0.2440
Slightly	If Slightly = 1, otherwise = 0	0.0992	0.2992
Moderately	If Moderately = 1, otherwise = 0	0.2658	0.4422
Heavily	If Heavily = 1, otherwise = 0	0.5714	0.4953
5. Policy & Social Awareness			
i. Effectiveness of social organizations to ensure female pedestrian safety			
Ineffective	If Ineffective = 1, otherwise = 0	0.3511	0.4778
Slightly Effective	If Slightly Effective = 1, otherwise = 0	0.3650	0.4819
Effective	If Effective = 1, otherwise = 0	0.2202	0.4148
Highly Effective	If Highly Effective = 1, otherwise = 0	0.0634	0.2440
ii. Effectiveness of existing policies to ensure female pedestrian safety			
Ineffective	If Ineffective = 1, otherwise = 0	0.2896	0.4540
Slightly Effective	If Slightly Effective = 1, otherwise = 0	0.4444	0.4973
Effective	If Effective = 1, otherwise = 0	0.2420	0.4287
Highly Effective	If Highly Effective = 1, otherwise = 0	0.0238	0.1526

Table 2: Estimated Parameter of the Model

Variables	t-statistic	Estimated Coefficient, β	P>|z|
Socio-economic & Demography			

1. Profession			
Student	-2.54	-0.565	0.011
Housemaid	2.67	0.661	0.007
Medical Personnel	1.94	0.534	0.053
Laborer	1.98	0.598	0.048
2. Marital Status			
Married	-3.19	-0.647	0.001
3. Timing of going out at night			
6 P.M to 8 P.M	9.18	2.453	0.001
8 P.M to 10 P.M	10.44	2.981	0.001
10 P.M to 12 P.M	8.79	3.168	0.001
4. Purpose of going out at night			
Work	7.21	1.046	0.001
Education	2.79	0.810	0.005
5. Reason behind the unwillingness to go out at night			
Fear of Harassment	-2.70	-0.374	0.007
Familial Restrictions	-2.39	-0.426	0.017
6. Companionship			
Always having another individual as a companion	-3.28	-0.432	0.01
Incident Report			
1. Experience of being a victim of harassment in a well-lit environment			
Never	3.13	0.462	0.002
Road Infrastructure			
1. Lacking sidewalk features that discourage women from walking at night			

Cleanliness	-2.52	-0.348	0.012
Police Presence	-2.21	-0.439	0.027
2. Type of road that makes women feel unsafe to walk on at night			
Highway	-1.92	-0.489	0.054
3. Perception of safety for using foot over bridges at night			
Unsafe	3.14	0.408	0.002
4. Willingness to walk because of proper road network connectivity			
Sometimes	3.40	0.419	0.001
Surrounding Environment			
1. Impact of traffic congestion on walking at night			
More Traffic	1.94	0.247	0.052
2. Impact of extreme weather on walking at night			
Heavily	-2.02	-0.248	0.044
Policy & Social Awareness			
1. Effectiveness of social organizations to ensure female pedestrian safety			
Highly Effective	3.59	0.995	0.001
2. Effectiveness of existing policies to ensure female pedestrian safety			
Effective	2.35	0.375	0.019

			Threshold Values		
No. of Observations	**Log-likelihood**	**Pseudo R^2**	**Cut-1**	**Cut-2**	**Cut-3**
504	-399.88501	0.3687	0.4026	1.4617	3.5436

It is to be noted that, our model indicates that female pedestrians in Dhaka feel more inclined to go outside at night if the order of our dependent variable is higher. The goodness of fit is expressed by chi square =483.94 (the variables are considered significant for p value less than 0.05) and pseudo R^2 = 0.3687.

Profession: Four factors were found to be significant: 1. Student 2. Housemaid 3. Medical Personnel 4. Laborer. The findings indicate that individuals in professions such as housemaid (0.661, p = 0.007), laborer (0.598, p=0.048), and medical services (0.534, p= 0.053) exhibit a higher likelihood of going out during nighttime compared to homemakers and professionals as they might have nighttime work obligations, such as night shifts or returning home late from work [7]. A negative co-efficient (-0.565) with a p value of (0.011) suggests that students are unlikely to go out at night possibly because of academic commitments, fear of harassment as teenage girls or young women often face behaviors like stalking, whistling, and receiving lewd remarks from men or curfews that restrict their nighttime activities [8].

Marital Status: A negative coefficient (-0.647, p = 0.001) shows that married women compared to unmarried, widowed and divorced women are more discouraged from venturing out at night. This may be because they prioritize family responsibilities or prefer staying at home.

Timing of going out at night: Three specific timings were found to be significant: (i) 6-8 P.M. (2.453, p = 0.001) (ii) 8-10 P.M (2.981, p = 0.001) and (iii) 10-12 P.M. (3.168, p = 0.001). Women tend to go out more during these times compared to after 12 AM. This may be because women tend to feel safer when others are around, whereas the sparse presence of people after midnight might make them feel uneasy.

Purpose of going out at night: Work (1.046, p=0.001) and education (0.810, p = 0.005) are the two significant factors associated with the purpose of going out at night. Our findings suggest that women are more inclined to venture out at night due to work or educational commitments, which often require adherence to specific schedules and deadlines.

Reason behind the unwillingness to go out at night: Two main reasons women avoid going out at night are fear of harassment (-0.374, p=0.007) and familial restrictions (-0.426, p=0.017) as they are very likely to be worried about road infrastructure, societal expectations, or religious norms and often feel insecure in various settings, such as bus stations, crowded public places, pathways between houses & areas with dense foliage [9].

Companionship: Our findings show that women who always have a night-time companion are more discouraged from going out without a partner at night (-0.432). Males significantly outnumbering females on streets creates feeling of insecurity among women resulting a need of companion while venturing outdoors [10]. This reliance on companions may heighten their sense of security and dependence, making solo outings less appealing.

Experience of being a victim of harassment in a well-lit environment: The positive coefficient (0.462) and p =0.002 indicates that women who have never been victim of any sort of harassment in a well-lit environment are more likely to go out at night. They might use well-lit roads for commuting as they feel safe and avoid using streets without sufficient lighting after dark. On the other hand, women who go out at night are more likely to get harassed in places where there is absence of sufficient lighting. So, the lighting condition has an impact on the occurrence of harassment. Sidewalks should be well-lit to enhance visibility and discourage criminal behavior [11]. According to a study, improving the lighting infrastructure in public spaces is crucial for enhancing night-time pedestrian safety for women [12].

Lacking sidewalk features that discourage women from walking at night: Our study indicates that women are discouraged from venturing out at night due to lack of cleanliness (-0.348, p = 0.012) and lack of presence of security personnel (-0.439, p = 0.054). A dirty environment may contribute to feelings of discomfort or unease and also be a source of potential hazards. At the same time, the absence of police may imply a lack of immediate assistance in case of emergencies or threats as the presence of security personnel creates a sense of security among women [13].

Type of road that makes women feel unsafe to walk on at night: Negative coefficient (-0.489) and p = 0.054 indicates that female pedestrians feel less safe at night along highways as highways typically have higher speeds of traffic, limited pedestrian infrastructure, and fewer sources of illumination, all of which may contribute to heightened feelings of vulnerability and exposure to potential risks.

Perception of safety for using foot over bridges at night: Female pedestrians who feel unsafe while using foot over bridges (0.408, p = 0.002) are more likely to go out at night, even when crowded and well-lit, due to concerns about personal safety and the potential for encountering harassment or unwanted attention in elevated and relatively secluded spaces. They might avoid using foot over bridges and use any other alternative for crossing

roads. Despite the presence of crowds and adequate lighting, the elevated nature of foot-over bridges may create feelings of vulnerability, as individuals may perceive them as less accessible to assistance or escape routes in emergencies. Besides these, the presence of vagabonds and drug addicts makes female pedestrians feel unsafe while using foot over bridges.

Willingness to walk because of proper road network connectivity: Because of proper road network connectivity, women sometimes (0.419, p = 0.001) feel more encouraged to go out at night. Properly planned road networks and designated pedestrian walkways separate from vehicular lanes possibly encourage and provide a safe space for female pedestrians to walk at night [14].

Impact of traffic congestion on walking at night: More traffic (0.247, p = 0.052) positively impacts a woman's decision to go out at night. This might be due to the perception of safety as it usually means more people around, which can deter potential threats and provide a sense of visibility and support in case of any incident.

Impact of extreme weather on walking at night: Extreme weather conditions heavily (-0.248, p = 0.044) discourage a woman from walking at night. When weather conditions can be quite extreme, like heavy rain, scorching heat waves, or strong winds may not only pose physical challenges but also create a sense of unease. When such weather prevails woman may take transit modes over walking [15] as it is also a barrier to physical activity [16].

Effectiveness of social organizations to ensure female pedestrian safety: The positive value (0.995) with a p value of 0.001 indicates women who perceive social organizations as highly effective in pressuring authorities to ensure female pedestrian safety are more likely to venture out at night. This might be due to their belief in the impactful role of social organizations in advocating for safety measures which is a psychological factor impacting on the process of their decision making.

Effectiveness of existing policies to ensure female pedestrian safety: The positive value (0.375, p =0.019) indicates that women who think the existing policies in the country are effective have a higher tendency to go out at night. Individuals who perceive policies as highly effective perhaps have confidence in the measures implemented by authorities to address various social concerns, such as safety, crime prevention, or infrastructure improvement thus encouraging them to venture out at night. This further suggests that a person's faith or belief has a significant influence on their approach to making choices.

4. CONCLUSION

The objective of this study was to evaluate the variables that influence a female pedestrian's decision to go outside at night in Dhaka city and to identify the significant factors that either discourage or encourage women to take this decision. The study revealed noteworthy findings related to socio-economic and demographic factors, timing of going out, purpose of going out, unwillingness to go out, companionship, incident reports, road infrastructure, surrounding environment, and policy and social awareness. Based on the aforementioned findings, a safer and more inclusive environment would be created by improving street lighting, sidewalks and road infrastructure, addressing socioeconomic and demographic concerns, promoting safe public transportation, raising awareness and strengthening policies, and mitigating environmental barriers. Policymakers will benefit from this study's insights on how to improve and prioritize road infrastructure in order to better meet the particular demands and experiences of women. It would also contribute to the strengthening of the current legislation and offer female pedestrians a safe and secure environment at night.

Conflicts of Interest: The authors declare no conflict of interest.

Data Availability Statement: The data supporting the findings of this study are available from the author upon reasonable request.

5. REFERENCE

[1] Hasan T, Siddique A, Hadiuzzaman M, Musabbir SR (2015) Determining the Most Suitable Pedestrian Level of Service Method for Dhaka City, Bangladesh, through a Synthesis of Measurements. Transportation Research Record: Journal of the Transportation Research Board 2519:104–115. https://doi.org/10.3141/2519-12

[2] LEE I-M, BUCHNER DM (2008) The Importance of Walking to Public Health. Med Sci Sports Exerc 40:S512–S518. https://doi.org/10.1249/MSS.0b013e31817c65d0

[3] Litman T (2013) SMARTER CONGESTION RELIEF IN ASIAN CITIES Win-Win Solutions to Urban Transport Problems

[4] Saha M, Rahman T, Islam M, Mitra S (2013) Pedestrian Behavioral Pattern and Preferences in Different Road Crossing Systems of Dhaka CityPedestrian Behavioral Pattern and Preferences in Different Road Crossing Systems of Dhaka City. Journal of Bangladesh Institute of Planners 6:149–160

[5] Souza ACS, Bittencourt L, Taco PWG (2018) Women's perspective in pedestrian mobility planning: the case of Brasília. Transportation Research Procedia 33:131–138. https://doi.org/10.1016/j.trpro.2018.10.085

[6] Chowdhury T, Rifaat S, Tay R, Amin M (2023) An Exploratory Study on Ready Made Garment Workers' Road Safety Risk Perception

[7] Nasrin S (2016) Work Travel Condition by Gender-Analysis for Dhaka City. MOJ Civil Engineering 1: https://doi.org/10.15406/mojce.2016.01.00017

[8] Brownson RC, Baker EA, Housemann RA, Brennan LK, Bacak SJ (2001) Environmental and Policy Determinants of Physical Activity in the United States. Am J Public Health 91:1995–2003. https://doi.org/10.2105/AJPH.91.12.1995

[9] Mutesi L, Abbott P (2017) Kigali Safe City for Women and Girls

[10] Mohamed AA, Stanek D (2020) The influence of street network configuration on sexual harassment patterns in Cairo. Cities 98:102583. https://doi.org/10.1016/j.cities.2019.102583

[11] Zumelzu A, Estrada M, Moya M, Troppa J (2022) Experiencing Public Spaces in Southern Chile: Analysing the Effects of the Built Environment on Walking Perceptions. Int J Environ Res Public Health 19:12577. https://doi.org/10.3390/ijerph191912577

[12] Fotios S, Atli D, Cheal C, Hara N (2015) Lamp spectrum and spatial brightness at photopic levels: Investigating prediction using S/P ratio and gamut area. Lighting Research & Technology 47:595–612. https://doi.org/10.1177/1477153514542295

[13] Doyle, M., Frogner, L., Andershed, H. et al. Feelings of Safety In The Presence Of the Police, Security Guards, and Police Volunteers. Eur J Crim Policy Res 22, 19–40 (2016). https://doi.org/10.1007/s10610-015-9282-x

[14] Clark A, Scott D (2016) Barriers to Walking: An Investigation of Adults in Hamilton (Ontario, Canada). Int J Environ Res Public Health 13:179. https://doi.org/10.3390/ijerph13020179

[15] Goodspeed R, Xie T, Dillahunt TR, Lustig J (2019) An alternative to slow transit, drunk driving, and walking in bad weather: An exploratory study of ridesourcing mode choice and demand. J Transp Geogr 79:102481. https://doi.org/10.1016/j.jtrangeo.2019.102481

[16] Bird S, Kurowski W, Feldman S, Browning C, Lau R, Radermacher H, Thomas S, Sims J (2009) The Influence of the Built Environment and Other Factors on the Physical Activity of Older Women from Different Ethnic Communities. J Women Aging 21:33–47. https://doi.org/10.1080/08952840802633669.