



Identify the Social and Economic Impact of the Rajagiriya Flyover Construction

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Abstract: Well-organized delivery of urban services and an efficient transportation system can be considered the keystones on which the success of a metropolitan area primarily depends. An appropriate and adequate transport system is a main requirement for the sustainable economic and social development of cities. The Rajagiriya flyover has direct and indirect beneficial impacts on the economy of Colombo, which is in the main district of Sri Lanka. But the construction of these kinds of structures is close to populated town areas, and they are surrounded by a natural environment. And also, they will have some unfortunate impacts on the social, physical, and ecological environments. The main objective of this study was to identify the social and economic impact of the Rajagiriya flyover construction. Hence, to achieve the target, 50 commuters, 50 traders, both permanent and mobile, surrounding the flyover, and 50 householders were selected through the purposive sampling method. Focus-group discussion and questionnaire surveying techniques were used to collect primary data from around the Rajagiriya junction, while other secondary data sources such as traffic and land use data were also collected. The study found heavy congestion along the Sri Jayawardenapura Mawatha between 07:30 h and 09:00 h in the morning and 16:30 h and 19:45 h in the evening, with the majority of the sample being daily commuters. During the construction period, fuel consumption was higher than before. People encountered two major issues: fuel waste and having to stay in the flyover for an extended period of time. Before the flyover construction, 85% of the customers visited their shops. But after the construction, the number of customers was as low as 25%, the traders said. Finally, the researcher found that the number of vehicles is higher than before the construction. As a result, traffic congestion has increased even more than before. Moreover, this study demonstrated that the construction of the flyover project was a failure due to an insufficient feasibility study.

Keywords: Commuters, Feasibility, Peak Time, Socio-Economic

1. Introduction

Public construction infrastructure facility projects have been identified as one of the critical elements in improving community socioeconomic conditions for community development and increasing a country's sustainable productivity. [5] Due to the increased interest in private vehicle ownership with the introduction of the open economy in Sri Lanka, traffic congestion in Colombo has been an endless issue. The boom in vehicle imports and the propensity to move towards using private vehicles is the main issue. This matter has expanded to other adjacent districts such as Gampaha, Kaluthara, Kurunagala, and Galle significantly since the year 2000 in Sri Lanka. The development of the industrial areas and the expansion of

businesses in those populated districts might have caused such a traffic jam, along with the enhancement of affordability for using private vehicles that has been increasing among individuals due to the reduced import tax, increased per capita income, affordable fuel prices, lack of road pricing schemes, etc. [7] This mode shift has been further encouraged by substandard public transport facilities for commuters, overcrowding in bus transportation during peak hours, missing time schedules for the railway department, improved roadway facilities, etc. Traffic congestion has increased as a result of the oversupply of private vehicles and the lack of proper and systematic traffic management systems in urban and suburban areas.

The following are some of the possible causes of the current traffic congestion on urban-suburban road links:

1. Road capacity is insufficient to handle the increased traffic levels.
2. Intersection delays as a result of the junctions being the bottleneck at the intersection approach.
3. In the main intersections, signals are delayed and excessive weaving actions are taken at un-signalized intersections. [12]
4. Increased tendency for violations of traffic rules.
5. Driving disciplines are absent.

In urban transportation network, traffic congestion is likely to occur at traffic bottleneck. [17] Therefore, the mitigation of such traffic congestion with integrated and systematic engineering solutions is sufficient for optimizing the road network's capacity in urban areas of Sri Lanka. As a developing country, Sri Lanka is facing rapid urbanization, which increases the need for mobility. Lack of comfort, safety, and ride quality in public transportation modes, such as buses and trains, have led people to use a higher number of private vehicles on the roads. This has caused heavy traffic

congestion and a higher demand for parking spaces in major cities.

The town of Rajagiriya, the area under study, is administered by the Kotte Municipal Council and is situated about 10 kilometres from the centre of Colombo. There are supermarkets, schools, religious places, educational centers, a children's park, and government and private sector institutions located in this area. There are three junctions in the town, namely, "Police Station Junction," "Bo-tree Junction," and "Kohilawatta Junction." Heavy traffic congestion is observed in the town of Rajagiriya during morning, afternoon, and evening rush hours. There are many simultaneous and conflicting movements at these junctions. A motorist approaching Borella via Rajagiriya along Kotte Road and Nawala-Rajagiriya Road has to undergo much inconvenience, especially during peak hours. During off-peak hours, the congestion is not that severe. In the morning, traffic flows mainly towards Colombo, and in the evening, its direction reverses. The three junctions mentioned above are the primary points that lead to this traffic congestion.



Source – Based on Secondary data – Road Development Authority

Figure 1. Cross Section of the Flyover.

Rajagiriya Intersection at Welikada, Rajagiriya is situated on the important traffic carrying road corridors between Colombo and Sri Jayawardhanapura Kotte, the administrative capital and recently developed high density residential land use at Malabe, Athurugiriya etc. Also, the commercial attraction to the office complexes at Battaramulla area has demanded more traffic between Colombo and Battaramulla area since in the recent past. The main road of Sri Jayawardenapura Mawatha at and near the Rajagiriya Intersection carries over 60,000 to 78,000 ADT at Colombo approach and Battaramulla approach respectively in a weekday (as per the survey data). The peak hour traffic at these approaches to the main intersection carries two-way traffic of 5,000 to 5,500 per hour in the morning peak and

5,000 to 7,000 in the evening peak respectively. The average intersection traffic at Welikada Plaza Intersection including all the turning movements is around 107,000 as per the traffic surveys carried out in September 2015. [7] This shows very significant impact to the prevailing traffic congesting at the main intersection at present. The main intersection is associated with many other junctions and traffic movements making the entire Rajagiriya Junction is very complicated node for traffic management concerns at present.

In terms of finding solutions to the daily heavy traffic congestions, Rajagiriya town has become a serious concern for traffic planners and transportation professionals. Additionally, commuters suffer huge economic losses due to travel time and vehicle operation costs, which are major

components of their economic parameters.

Different short- to long-term solutions have been proposed from time to time but have yet to be implemented, so the problem remains as it is and worsens over time, resulting in such an economic loss to the Western Province, which has the highest GDP of the Sri Lankan national economy. This study reveals that there is heavy congestion along the Sri Jayawardenapura Mawatha in the morning peak and evening peak as well as other times of the day. Congestion appears to be caused primarily by conflicting movements, particularly

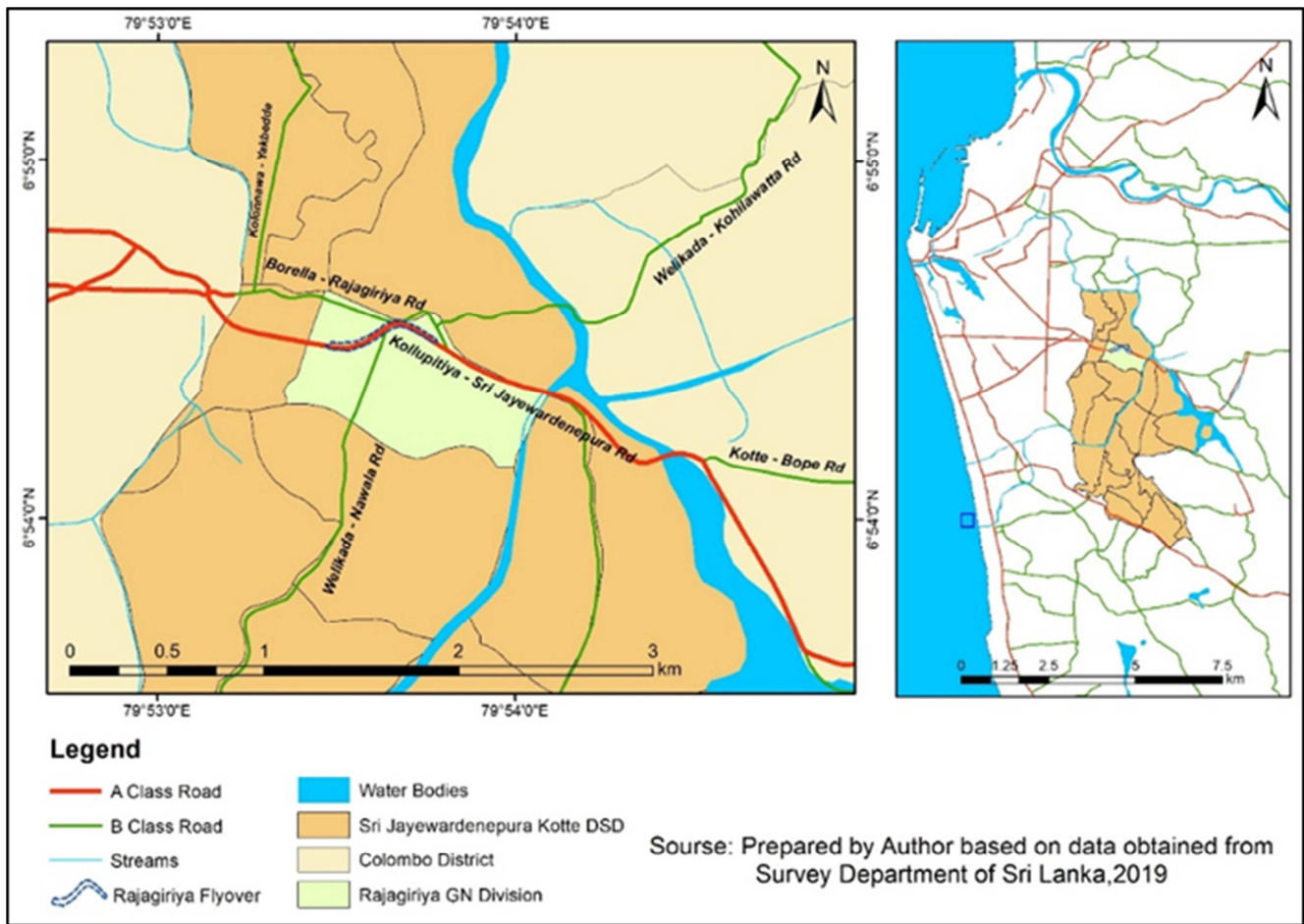
right turn movements at major intersections and center median openings for connecting roads to the main road.

1.1. Study Objectives

The Main objective is to assess the social and economic impact of the rajagiriya flyover construction

- 1) Identify the issues of the daily commuters
- 2) Impact on fixed & mobile merchants in Rajagiriya Area

1.2. Study Area



Source – Prepared by the Author based on secondary data by Department of Survey, Sri Lanka (2019)

Figure 2. Study Area Map.

2. Methodology

In order to alleviate the aforementioned transportation issues, initiatives were taken to separate out the traffic flows by constructing a flyover. [8]

Hence, to achieve the target, 50 commuters, 25 traders, both permanent and mobile, surrounding the flyover, and 25 householders were selected through the purposive sampling method. Focus-group discussions and questionnaire surveying techniques (2019.05.18-2019.12.18) were used to collect primary data near Rajagiriya junction, while other

secondary data sources such as traffic data and land use data were collected from the U.D.A., R.D.A., and other government institutions. Focus-group discussions and questionnaire surveying (2019.05.18–2019.12.18) techniques were used to collect primary data near Rajagiriya junction, while other secondary data sources such as traffic and land use data were collected from the Urban Development Authority, the Road Development Authority, and other government institutions. To analyze the data, descriptive statistics such as percentage and mean score measures were used, and inferential statistical methods such as paired two-sample means were used to determine the peak time.

2.1. Data Collection methods & Analysis

Table 1. Methods & Analysis.

Type of Data	Source of Data	Methods of Data Collecting	Data Analyzing	Data Presenting
Traffic Data	Secondary Data	Master Heli's engineering (year-2017) consultants (PVT), RDA, U. D. A (year-2015-2018)	Descriptive Statistical Methods	Charts, Tables
Information of residential groups, fixed & mobile group vendors, daily commuters in Rajagiriya Intersection	Primary Data	Questionnaire, Focus group - Discussion	Descriptive Statistical Methods, Inferential statistical Methods	Charts, Table, Maps
Land use - 1 st , 2 nd ,	Secondary Data	Satellite Images	Spatial Analysis	Using GIS maps, (Google earth)
Road Data -	Secondary Data	Road Development Authority, Satellite images	Spatial Analysis	Using GIS, Maps (Google earth)

Source – Prepared by the Author based on secondary data by Road Development Authority, Sri Lanka

2.2. Conceptual Framework

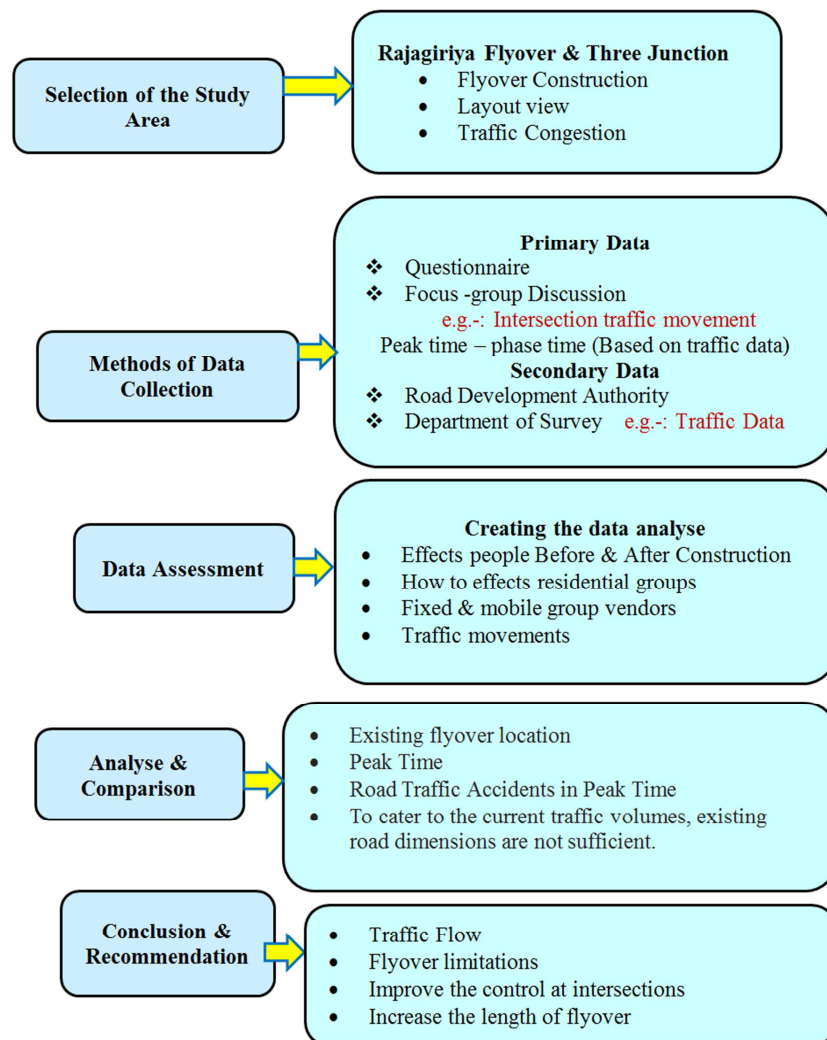


Figure 3. Methods and Data Analysis.

3. Results and Discussion

Infrastructure projects in urban areas are usually

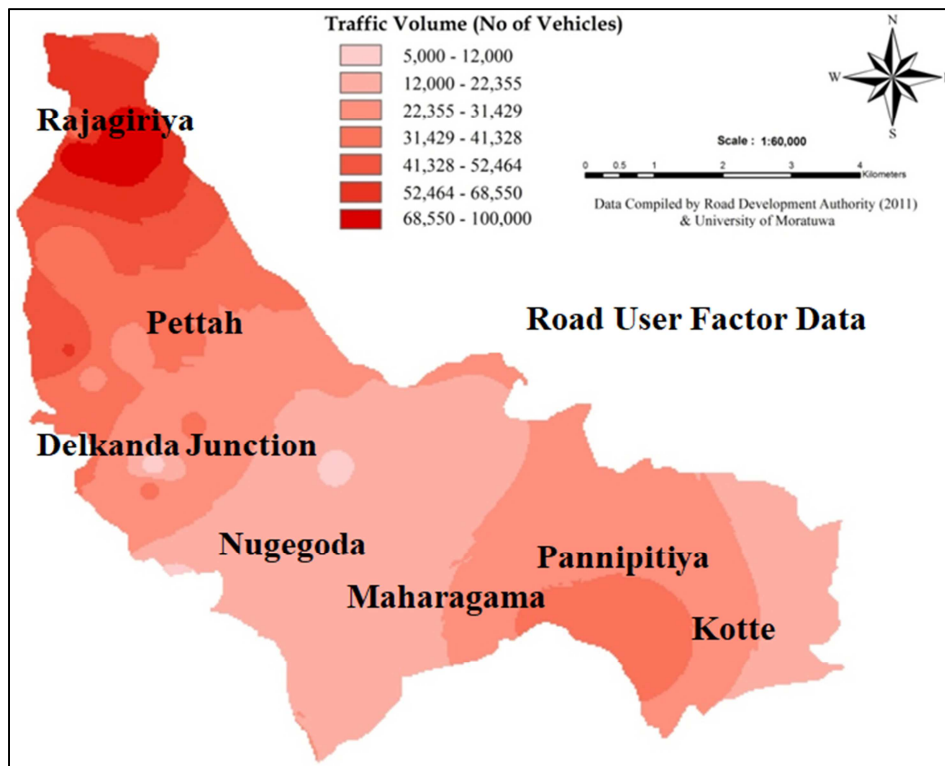
constructed to support the local population and make it feasible for them to access resources and find solutions to rural challenges. Consequently, this has a beneficial effect on the rural environment as a whole and aids in the achievement

of numerous community goals and objectives. [6]

During the morning, afternoon, and evening rush hours, heavy traffic congestion is observed in the town of Rajagiriya. There are many simultaneous and conflicting movements at these junctions. Additionally, during off-peak hours, a motorist approaching Borella via Rajagiriya along Kotte Road and Nawala-Rajagiriya Road has to endure much inconvenience. The congestion is not that severe. In the morning, traffic flows mainly towards Colombo, and in the evening, its direction reverses. The three junctions mentioned above are the primary points that lead to this traffic congestion. The road sections under this study encounter

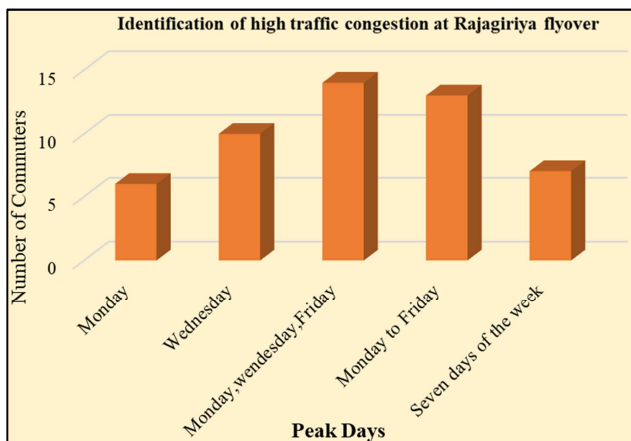
huge traffic heading towards Battaramulla, Parliament Road, and also towards Obeysekarapura, Borella, and Kollupitiya, and on these road sections, a large number of public transport buses ply along with hundreds of other privately owned vehicles. Buses take a considerably long time to pass Rajagiriya while moving towards Nawala and Kohilawatta. The three junctions hinder the flow of traffic along the main route, thereby increasing traffic congestion along the main route (i.e., Sri Jayawardhanapura Road).

After the analyzing of the primary data, the researcher prepared maps for Data Presenting.



Source – Prepared by the Author based on secondary data by Road Development Authority, Sri Lanka (2019)

Figure 4. Traffic Volume.



Source – Prepared by author based on primary Data, 2019

Figure 5. Traffic Congestion.

It has been noted that the Rajagiriya town area becomes very congested during rush hours as a result of traffic and pedestrian activity. A one-way road system is now being implemented as a solution, although the issue is still not fully resolved. [11] Therefore, when passing Rajagiriya town, people spend time on the road that they could use more effectively.

The Study revealed that there was heavy congestion along in the Sri Jayewardenepura Mawatha in the morning and peak time was 07:30 h - 08:15 h while 17:15 h - 18:00 h was in the evening.

The majority of the sample can be considered daily commuters (75%). And the traffic congestion was most severe on Monday, Wednesday, and Friday. Due to the high volume of traffic on Mondays and Fridays, the weekly was able to identify temporarily out-of-service residents returning home and returning to their permanent residences. A 28

percent percentage of commuters was mentioned.

For daily commuters, time waste and inefficient oil usage were major annoyances. And there were a significant number of fixed merchants who mentioned the traffic jam on the flyover as an existing issue. Furthermore, all fixed merchants have prior construction experience as well as knowledge of the current situation. The number of vehicles is higher than before the flyover was built, and as a result, traffic congestion has increased. And the convenience of using a flyover causes a rapid increase in vehicle congestion. With the construction of the flyover, fuel consumption was higher than before. The waste of fuel and having to stay in the flyover for a long time are two major problems they face. Before the flyover construction, 85% of the customers visited their shops. But after the construction, the number of customers was as low as 25%, the traders said.

4. Conclusion

Humans now require more mobility as a result of the swift development taking place in places like Sri Lanka. Commuters who primarily use public transit, such as buses and trains, are frequently confronted with problems with ride quality, comfort, and safety. [1] As a result, people have been making everyday travels in private vehicles. The usage of private vehicles increases urban air pollution levels, creates parking issues, creates noise pollution, causes congestion, and results in poor transfer velocity (and inefficient use of public resources). Due to traffic congestion during peak hours, a sizable amount of gasoline is lost. [4] Several nations have implemented carpooling as a solution to these problems. A flyover is a structure that is constructed to provide passage over natural obstacles without closing the way below it. The obstacles may be rivers, canals, valleys, or roads. Infrastructure availability is determined by the country's development. [5] In terms of finding solutions to the daily heavy traffic congestions, Rajagiriya town has become a serious concern for traffic planners and transportation professionals. And also, accounting for huge economic losses due to travel time and vehicle operation costs as major components of daily commuters' economic parameters the relevant authorities have implemented various short- and long-term solutions, but the problem remains unresolved. Authorities have been proposed from time to time but have yet to be implemented, so the problem remains as it is and worsens over time, resulting in such an economic loss to the Western Province, which has the highest GDP of the Sri Lankan national economy.

The success of a city's primary economy depends on the efficient delivery of urban services, of which an efficient transportation system can be identified as the key element. An adequate and efficient transport system is a pre-requisite for sustainable economic development. Otherwise, it has an impact on the outcomes of poor socioeconomic interruptions.

Sustainable transportation facilitates economic growth and poverty reduction by addressing complex issues requiring the collaboration of all development sectors and focusing on

equity in a country. Also included are societal welfare and environmental protection. [12] The study then reveals that although these megaprojects benefited the communication system, they literally failed to fulfil core public demands and interests by making people marginalized and vulnerable because of insufficient feasibility studies and a preference for political involvement. Apart from that, this study investigated how megaprojects like the flyover are the consequence of bureaucratic decisions in which social and environmental impact assessments were ignored. [2, 13]

5. Suggestions

- 1) Floating lanes should be given
- 2) Operate Bus priority lane regularly
- 3) Extra lane should be given for vehicle on peak hours especially morning
- 4) Implement a Parking Policy where parking spaces are restricted & where parking fees are increased in keeping with the demand for the limited spaces [7]
- 5) Limitation or prohibition of U turning around flyover
- 6) The construction and repair of road works should be carried out during the night, otherwise they should be avoided during peak hours [3]
- 7) Introduce one way vehicle flow pattern at Ayurveda junction

References

- [1] Amila Sandaruwan, T. K. (2019). Carpooling: A Step to Reduce Traffic Congestion in Sri Lanka. *Conference: 13th International Conference of Eastern Asia Society for Transportation Studies (EASTS)* (p. 356). Battaramulla,: At: Waters Edge.
- [2] Arefin, S., Rashid, T. and Habib, D. (2019) Infrastructural Development and Vulnerabilities: A Sociological Study of Two Selected Flyovers in Dhaka City, Bangladesh. *Open Journal of Social Sciences*, 7, 18-29. <https://doi.org/10.4236/jss.2019.77003>
- [3] Dammulla R, Mudunkotuwa R. Analysis on the Road Traffic Congestion in Colombo Metropolitan Area. *CINEC Academic Journal*. 2022; 5 (1): 15–22. DOI: <http://doi.org/10.4038/caj.v5i1.70>
- [4] Emer, T. Quezon. A Study on the effects of flyover Construction on Traffic Flow, The Case of Metro- Manila, University of Philippines. (<https://www.academia.edu.com>) 30.12.2019
- [5] Hiremath V. S., Vengadeshwari R. S., ANALYSIS AND DESIGN OF FLYOVER SUB-STRUCTURE, International Advanced Research Journal in Science, Engineering and Technology ISO 3297: 2007 Certified, ISSN (P) 2394-1588.
- [6] Hussain, S.; Maqbool, R.; Hussain, A.; Ashfaq, S. Assessing the Socio-Economic Impacts of Rural Infrastructure Projects on Community Development. *Buildings* 2022, 12, 947. <https://doi.org/10.3390/buildings12070947>
- [7] Kumarage, A. S. (2004). URBAN TRAFFIC CONGESTION: THE PROBLEM. *Economic Review*.

- [8] Mututantri, P. L., Abesinghe, W. D. P., Wijewardhana, L. S. S. (2015) Design of a flyover and Roundabout underneath it to ease the traffic congestion at the Rajagiriya Junction, Engineer: Journal of the Institution of Engineers, Sri Lanka, 48 (4), pp. 33–47. DOI: <http://doi.org/10.4038/engineer.v48i4.6879> 30.12.2019.
- [9] Narabodee, S. & Pichai, T. (2015) A Study of a flyover–Bridge – improved Intersection, Engineering Journal 19 (1): 1-12pp DOI: 30.12.2019.
- [10] National Road Master Plan (2021 – 2030), Main Report, Road Development Authority, 2022.
- [11] P. L. Mututantri, S. W. (2015). Design of a Flyover and Roundabout underneath it to ease the Traffic Congestion at the Rajagiriya Junction. *Engineer - Journal of the Institution of Engineers*, 33-47.
- [12] Thisa. U. Liyanage (2009 September),” Flyover as Measure to improve Intersection Capacity” The Institution of Engineers, Sri Lanka.
- [13] Traffic impact Assessment Khilgaon Flyover (Dhaka), Nafis Anwari M. D. Rakibul Islam and M. D. Shamsul Hoque, (<https://researchgate.net/publication>), 12.11.2019.
- [14] Traffic study for impact Evaluation of proposed flyover at Rajagiriya Intersection at Welikada – Rajagiriya, Ministry of Higher Education & Highways of Sri Lanka, Road Development Authority of Sri Lanka 12.11.2019.
- [15] Tucho, G. T. A review on the socio-economic impacts of informal transportation and its complementarity to address equity and achieve sustainable development goals. *J. Eng. Appl. Sci.* 69, 28 (2022). <https://doi.org/10.1186/s44147-022-00074-8>
- [16] Weerasinghe, T. D and Karunarathna, D. I. M. and Subashini, B. L. C., Effect of Road Traffic Congestion on Stress at Work: Evidence from the Employees Working in Metropolitan Areas of Colombo, Sri Lanka (November 19, 2020). Proceedings of the International Conference on Business & Information (ICBI) 2020, Available a SSRN: <https://ssrn.com/abstract=3853900> or <http://dx.doi.org/10.2139/ssrn.3853900>
- [17] Yuan S., Zhao X, An Y., Identification and optimization of traffic bottleneck with signal timing. *Journal of Traffic and Transportation Engineering (English Edition)*, Volume 1, Issue 5, 2014, Pages 353-361, ISSN 2095-7564, [https://doi.org/10.1016/S2095-7564\(15\)30281-6](https://doi.org/10.1016/S2095-7564(15)30281-6).