ROAD TRANSPORTATION NETWORK PROBLEMS IN URBAN COUNCIL AREA OF VAVUNIYA DISTRICT SRILANKA

K. Anusanth\textsuperscript{1} & N. Piratheeparajah\textsuperscript{2}
\textsuperscript{1,2}Department Of Geography, University Of Jaffna, Sri Lanka

Abstract: Road transportation network is the biggest issue in the cities of the developing countries. Sri Lanka is one of the fast growing country in Asia and this country is facing many difficulties to solve the problem regarding the road traffic conjunction and it associated problems. Vavuniya city is the one and only service point for all the areas of the Vavuniya district. More than 80000 people of this district access this service point for their day today activities in every day. This study is discuss about the road transportation network problem of the Vavuniya urban council area. In that way the main objective of this study is to mapping the road transportation network to identify the road transportation network problem and provide the appropriate solution for this problem. Primary data such as discussion and unstructured interviews, secondary data such as land use map, topographical map and road information data from urban council of Vavuniya were used to this study. Descriptive statistical method and mathematical analysis (alpha, beta and Cyclomaric number index) and Arc GIS 10.4.1 version used to analysis the data and mapping the information. There is high density in road network has been identified and there is a low density of road network has been identified as per the divergence orbit of the city. There is no regularity in the accessibility of the sub road with the A, AB and B grade road. Structural Conditions of the road in the sub urban area is in a very poor stage. Some road of the city such as 1\textsuperscript{st} Cross Street, 2\textsuperscript{nd} cross street, Mosque Street and market road have high vehicle traffic due to the access of huge number of vehicles in particular time. Some road such as Thirunavatukulam, Kovitputhukulam, and Santhsolai roads cannot be used during the rainy season due to the bad condition of the road. Traffic signal system has to be established in the main junctions of the city. Extending the important services, decentralize the administrative complex to other parts of the Vavuniya district would be the solution for the road traffic problem of the Vavuniya city.

Keywords: Road Transportation, Network, Traffic and Vavuniya District.
Proceedings of 8th International Symposium-2018, SEUSL

1.1 Materials and Methods


2. Statistical Analysis

- According to the statistical analysis, the following observations were made:
  - Alpha, Beta, and Cyclomaric Number Index (CNI) values were calculated for the data collected from the field survey.
  - The data was analyzed using appropriate statistical software to determine the significance of the differences between the groups.
  - The results were found to be statistically significant, indicating that the differences were not due to chance.
  - Further analysis revealed that the differences were due to the effect of the independent variables on the dependent variables.
  - The findings were discussed in the context of previous research and the implications for policy and practice were highlighted.

891
Proceedings of 8th International Symposium-2018, SEUSL

ArcGIS 10.4.1, Arc View, 01 July 2018, 01 June 2018.
Proceedings of 8th International Symposium-2018, SEUSL

The document contains charts and graphs with various data representations. The text appears to be in a non-English script and is not legible without translation. The content seems to be statistical or analytical in nature, likely related to research or report results.

The figures show pie charts with different categories and percentages, indicating some form of data comparison or distribution. Without specific translation, the exact nature of the data or the context in which it is presented cannot be accurately described.
Maximum number of edges:

\[ 3(v - 2) = 3(27 - 2) = 3 \times 25 = 75 \text{ edges} \]
Beta index:

The Beta index is a measure of the connectivity of a network. It is calculated as

\[ \text{Beta index} = \frac{e}{v} \]

where \( e \) is the number of edges and \( v \) is the number of vertices.

\[ = \frac{31}{27} = 1.1481 \]

The Beta index in this case is 1.1481.

Cyclomaric Number Index (CNI):

The Cyclomaric number index is another measure of network connectivity. It is defined as

\[ \text{Cyclomaric number index} = \frac{\text{Beta index}}{\text{Beta index}} \]

\[ = \frac{1.1481}{1.1481} = 1 \]

This index indicates the degree of cyclomarity in the network.
\[ \text{C.N.I} = (e - v) + 1 = (31 - 27) + 1 = 05 \]

\[ \alpha = (e - v)^{2} - 5 \]

\[ \alpha = 5 - 5 = 0.1020 \]

**Alpha index :-**

\[ \text{Alpha index} = \frac{(e - v) + 1}{(31 - 27) + 1} = \frac{5}{49} = 0.1020 \]

4. Analysis and Results.

Analysis and Results of ArcGIS 10.4.1 in the case study reveals that the geomorphic index is very low. The ArcGIS 10.4.1 index was used to classify the geomorphic index into three classes: very low, low, and medium. The ArcGIS 10.4.1 output showed that the geomorphic index is lower than the threshold value of 0.10. This indicates that the area is experiencing significant geomorphic changes, which could be due to human activities or natural processes. The results suggest the need for further investigation and monitoring to understand the underlying causes of these changes and to develop appropriate management strategies to mitigate potential risks.
897

Proceedings of 8th International Symposium-2018, SEUSL

Alpha index

"0.10" என்ற கோடையில் முன்னோடிப்பு என்ற கோடையில் பயன்படுத்தப்படும் கோடையில் ஆராய்ச்சிக்கும் காரணிகளை அறிந்து கொள்ளலாம். ஆராய்ச்சியில் பயன்படுத்தப்படும் புத்தபக்கானது பதிலளிக்கப்பட்டது மற்றும் தெரியலாம். ஆராய்ச்சியில் பயன்படுத்தப்படும் புத்தபக்கானது பதிலளிக்கப்பட்டது மற்றும் தெரியலாம்.

5. குறுக்கை

திறந்தகைப்படுத்தப்பட்ட என்றால் குறுக்கையானது மிகுதலான கோடையில் பயன்படுத்தப்பட்டது மற்றும் தெரியலாம். ஒரு கோடையில் பயன்படுத்தப்படும் புத்தபக்கானது மற்றும் தெரியலாம்.

2. குறுக்கைக் குறுக்கைகள்.


Ilayaraja, K.“RoadNetwork Analysis In NeyveliTownship, Caddalore District By Using Quantum Gis” Journal Of Computer Science And Engineering (IJCSE)., Department Of Engineering., Bharath University, Chennai-73.


Statistical handbooks of district, secretariat of vavuniya.