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Faculty of Arts
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Using spatial analysis to evaluate the road network map in Qalioubia Governorate

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Summary of Thesis

The province of Qalyubia extends between $^{\circ}30\ 06'20''$, $^{\circ}30\ 36'26''$ N, and longitud $^{\circ}31\ 03'00''$, $^{\circ}31\ 35'20''$ E. It is bordered to the north by the Dakahlia and Gharbia governorates, to the south by the governorates of Cairo and Giza, Sharqia from the east and west by Menoufia governorate.

The study aims at:

- 1) Application of spatial analysis on the road network in Qalioubia Governorate.
- 2) Classification of roads in the current network.
- 3) The establishment of a geographical database for the road network in the province of Qalioubia, which inform decision makers in the development of future plans for development in the study area.
- 4) Produce a map of the road network in Qalioubia governorate, to assess the current status of the network, and what are the main proposals for its future development.
- 5) Producing an administrative map for Qalioubia Governorate correctly, because there are many incorrect circulation maps in the official authorities in the governorate.
- 6) Monitoring the problems experienced by the road network in the study area, and provide solutions proposed to address these problems.
- 7) Production of proposed maps for the development of the existing road network.
- 8) Analysis of the economic value of the road network in Qalyubia Governorate.

The study was based on the analysis of topographic maps scale 1: 50000 paintings (Anchas, Belbeis, Banha, Mount Akabia, Shebin El Koum, East Cairo, West Cairo, Mit Ghamr edition 2008 and Topographic maps Scale 1: 25000 Kalyoubia Governorate in 1997, And the soil map of the region delta on the scale of 100000: 1 edition of the Egyptian General Authority for Survey in 1987, and Egypt Geological map, scale 1: 500,000, Cairo plate, 1987 edition "Issued by Conoco Coral Petroleum Company, Egyptian General Petroleum Corporation", Landsat (TM) for the year 1972-1987 Landsat (ETM) for the years 2001, 2006, 2012, 2017, and Sentinel for 2017, And field studies and previous studies and many references and scientific messages in Arabic and foreign.

The historical and objective approach, the fundamental approach, the methodology of environmental systems, the statistical method, the cartography, the method of GIS and remote sensing have been used. The researcher used Arc GIS V10.3 to analyze and analyze space visualization, and the production of maps and shapes. Many analytical tools were used such as: Overlay analysis Network analysis and analysis Change detection and topographic analysis Topographic analysis.

The study contains four chapters preceded by an introduction and ending with a conclusion and a list of Arabic and foreign references.

Chapter 1: Construction and distribution of the road network in the province of Qalyubiya

The first chapter contains five main axes; the first axis focuses on the administrative development of the province. The second axis included the emergence of road roads in Qalyubia governorate. The third axis was concerned with the distribution of land roads in Qalioubia governorate. In the province of Qalyubiya to four degrees, the fifth axis came to include the general characteristics of the paved road network in terms of the width of the road network in the centers of the province and the widening of roads, and the extent of their impact on the flow of traffic in the province.

Chapter 2: Geographical Factors Affecting the Distribution of the Road Network

This chapter included two main axes, the first concerned the study of the natural factors and the extent of the influence of these factors on the road network in the governorate through the study of the geological characteristics represented in the composition and geological structure, The second part consisted of the morphological characteristics, including the surface level, the slope of the surface, and the third axis, which is studied. Climate characteristics of temperature, Wind, rainfall, and relative humidity. The second axis was concerned with the study of human factors. This axis dealt with the characteristics of the population in terms of growth, density and distribution. It was followed by a study of the most important economic activities in the governorate.

Chapter 3: Analysis of the road network map in Qalioubia Governorate

The third chapter deals with four aspects: the first concerned the characteristics of the road network, and the second is concerned with the study of building a model for evaluating the road network based on the distance. The third axis is concerned with evaluating the efficiency of the network based on the model to identify the areas served and not serviced by the network based on time and speed and the fourth axis dealt with the evaluation of the efficiency of the road network in Qalioubia governorate.

Chapter 4: Spatial analysis of road network problems and future vision

The fourth chapter was divided into five axes: the first of them concerned the climatic problems and the extent of the impact of these problems on the network of roads in the governorate. The second concerned the study of the pollution problems associated with traffic on the roads and the most important hazards resulting from them. And the third axis to study economic problems, and the fourth axis analyzed the weakness of the efficiency of the road network, and the fifth axis, the development of the road network in the province of Qaliubiya interested in the future vision of that network.

Conclusion: The presentation of the main findings and recommendations of the study.