### VISUALIZATION OF ROAD DAMAGE AND ALTERNATIVE ROUTES IN KAJANG, SELANGOR USING ARCGIS PRO AND ARCGIS DASHBOARD

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#### ABSTRACT

## VISUALIZATION OF ROAD DAMAGE AND ALTERNATIVE ROUTES IN KAJANG, SELANGOR

The "Visualization of Road Damage and Alternative Routes in Kajang, Selangor" effort centers on the application of Geographic Information System technology in enhancing the management of roads. Truly, these road surfaces, which are cracked, uneven, with potholes, and patched, cause delay, damage to the vehicle, and chances of risks. The lack of easily accessible data on the road condition usually offers challenges to traffic control and timely maintenance. The nature of damage, location of damage, type of defects, traffic details, and report dates will be visualized. Data is thus arranged in a Microsoft Excel sheet and saved as CSV for the purposes of integration into the dashboard. The visual aids in the form of pie charts and bar graphs will help bring out the type and frequency of road defects. Besides, practical alternative routes from the above-mentioned damaged sections are mapped out around with the aid of ArcGIS Pro software. This makes easy and efficient traveling and decongestion of traffic. Therefore, having this information on road damages and alternative routes all in one dashboard will aid in making better decisions on resource allocation between road maintenance and traffic control. It also suggests the creation of a "Kajang App" that would furnish the public with information on road conditions and updates on alternative routes. This will also enhance the communication between the community and all local authorities and serve as a case study in how GIS technology can help solve real problems and a model for areas interested in exploiting technology to better manage and have more effective transportation networks.

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#### **CHAPTER 1**

#### INTRODUCTION

#### **1.1 Background of Study**

Urban infrastructures and roads play an important role in ensuring smooth transportation within the city. Kajang is in Selangor, and road deterioration caused by traffic, weather conditions, and lack of maintenance can lead to interruption to the flow of traffic, travel time, and accidents. Common forms of road damage include surfaces, cracks, potholes, patched sections that contribute to an uneven drive. Timely monitoring and repairing of road damage are important for the efficiency of the transport network.

Of all technologies, Geographic Information System technology stands out for planning and management initiatives. The capabilities of GIS in collecting, visualizing, and analyzing spatial data effectively would highlight insights about the infrastructures. The authorities could use GIS tools to track the road conditions meticulously in pinpointing places in need of repair or enhancement measures for the enhancement of the traffic circulation process seamlessly.

The work is aimed at exploiting GIS technology, representing the occurrence of road damages and proposing routes in Kajang, Selangor. In this study, ArcGIS Dashboard is used as a way of creating visual representations by the integration of spatial data with user-friendly interfaces. This would, in turn, make the extents of problems involving road damage issues easy to assess effectively by the stakeholders and, at the same time, develop alternative route options.