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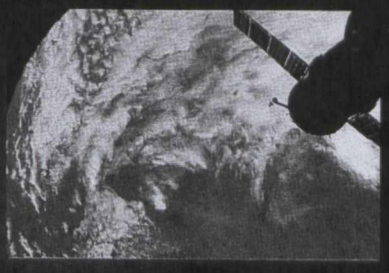

Editor
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DEVELOPMENT OF GIS-BASED KUALA LUMPUR TRANSIT INFORMATION SYSTEM

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ABSTRACT

Due to heavy traffic and congested roads, it is crucial that the most popular main public transport services in Kuala Lumpur i.e. Putra LRT, Star LRT, KTM Commuter, KL Monorail and Rapid Bus must be continuously monitored and improved to fulfill the rider's requirement and kept updated by the transit agencies. Evaluation on the current status of the services has been determined out by calculating the Transit Supportive Area (TSA) and Level of Service (LOS) for each transit station. This research study has carried out the TSA and LOS mapping based on GIS techniques. The detailed census data of the region along the line of services has been collected from the Department of Statistics Malaysia for this purpose. The service coverage has been decided by 400 meters buffer zone for bus stations and 800 meters for rails station and railways in measurement the Quality of Service along the line of services. All the required information has been calculated by using the customized GIS software called Kuala Lumpur Transit Information System (KLTIS). The Transit Supportive Area were calculated with the employment density at least 10 job/ hectare or household density at 7.5 unit / hectare and total area covered by transit supportive area is 22516 hectare and the total area that is not supported by transit is 1718 hectare in Kuala Lumpur. The Level of service is calculated with the percentage of transit supportive area served by transit for each station. In overall the percentage transit supportive areas served by transit for all the stations were less than 50% which falls in a very low Level of Service category. This research has proven its benefit by providing the current transit services operators with vital information for improvement of existing public transport services.

Keywords: GIS, Service Coverage, Transit Supportive Area, Level of Service, Transit System

BRIDGE REHABILITATION METHODS

Iman Elyasian
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ABSTRACT

Bridges are important structures and they are sections of lifelines so we should investigate and inspect them continuously and according to their construction methods they have some defects and deterioration length of their life period, so we evaluate their traditional lacks and propose some techniques for strengthening and rehabilitate them against vulnerabilities

Keywords: Bridge, retrofit, energy dissipation, base isolation, dampers, vulnerabit , defects, inspection

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Keywords: GIS, Service Coverage, Transit Supportive Area, Level of Service, Transit System

1. INTRODUCTION

Transit services such as the Putra LRT, Star LRT, KTM Commuter, KL Monorail and rapid bus is one of the main public transport services in Kuala Lumpur. Riders in Kuala Lumpur rely on this public transport to travel from one destination to another destination within the city due to heavy traffic and congested road in Kuala Lumpur. Although the public transport in Kuala Lumpur has improved and developed, yet there are some tourist attraction places such as the Titiwangsa Lake and Lake Garden that has no availability of public transport. Therefore the public transport should always be monitored and improved to fulfill the rider's requirement and be kept updated by the transit agencies.

Public transit should be encouraged because it can accommodate greater travel demand than cars. Increasing the share of public transit will reduce traffic congestion, improve air quality, reduce the number of accidents, reduce energy consumption, increase the number of viable transportation options and help improve the quality of life and create new economic opportunities. Transit agencies are always struggling with the attraction of riders in a highly competitive transportation market. One of the problems encountered by the transit agency is the presentation of the information and transit planning. Transit planning is defined as a purpose to plan, design, deliver, manage and review transit, balancing the needs of society, the economy and the environment.

Therefore, measuring the transit performance easily and accurately is very important for public transit agencies in transit planning. Transit performance measures have generated considerable components in a transit planning analysis. However, there is a need to investigate the underlying components of transit quality as this can reflect passengers' perceptions of transit performance while performance measures can reflect a wider range of perceptions, mainly on behalf of the transit agencies. Transit service coverage is one of the key components of quality of service.

The transit supportive area is the portion of the transit agency's service area that provides sufficient population or employment density to require service at least once per hour. Transit supportive area is areas determined to be having a good potential for significant transit ridership (O'Neill, W., D. Ramsey, and J. Chou., 1995). The transit level of service is based solely on the percentage of the transit-supportive area covered by transit (TCQSM 2nd Edition).

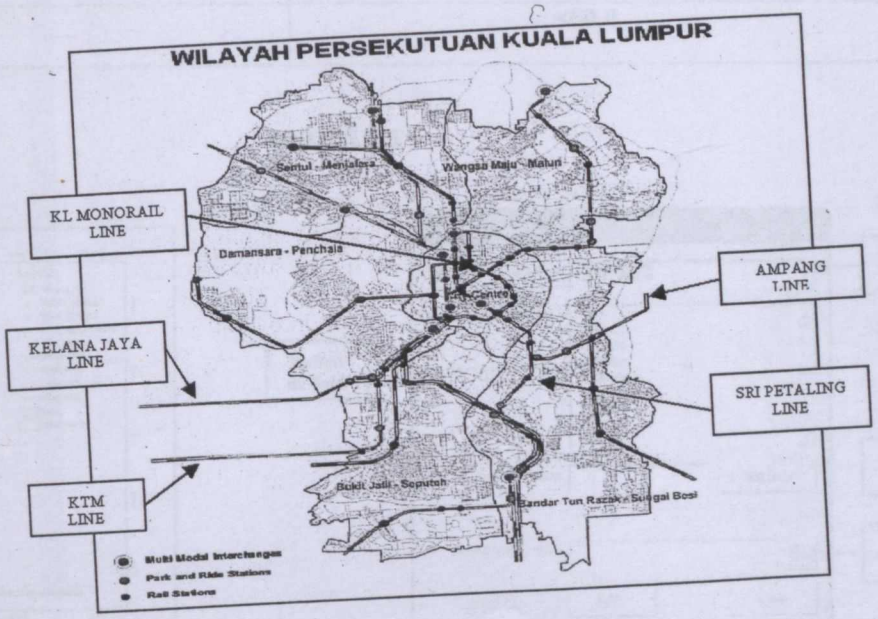
GIS-based transit system modelling is a computer-integrated tool for evaluating transit system model and performing various transit analysis methods for transit planning. The GIS applications for transit system modeling include transit service area analysis, data attribution and network representation, transit demand, transit distribution, linking transportation system and others. GIS can be employed to perform the transit supportive area analysis and calculate the level of service (LOS) based on the transit supportive area.

1.1 Objectives

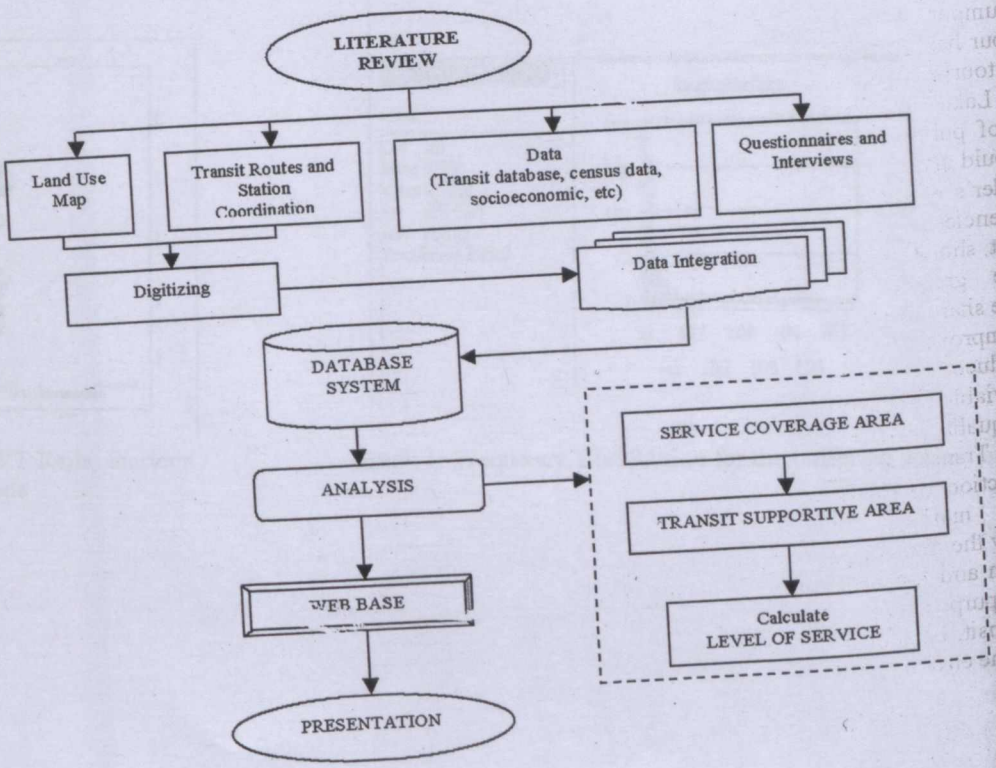
This study is carried out with the aim to:-

- Introduce the concept of GIS application for transportation planning for public transit agencies.
- Develop a GIS – based Kuala Lumpur Transit Information System (KLTIS) database system, a
- based on GIS method in developing Kuala Lumpur Transit Information System (KLTIS) customized for transit planning
- information system that was designed to serve as a one-stop data depository for transit planning in Kuala Lumpur
- Implement the transit supportive area analysis and calculating the Level of Service (LOS)
- Develop a web based Kuala Lumpur Transit Information System (KLTIS)

1.2 Study area



2. METHODOLOGY



LEVEL OF SERVICE (LOS)	% TRANSIT-SUPPORTIVE AREA COVERED
A	90.0 – 100.0
B	80.0 – 89.9
C	70.0 – 79.9
D	60.0 – 69.9
E	50.0 – 59.9
F	<50.0

3. RESULT

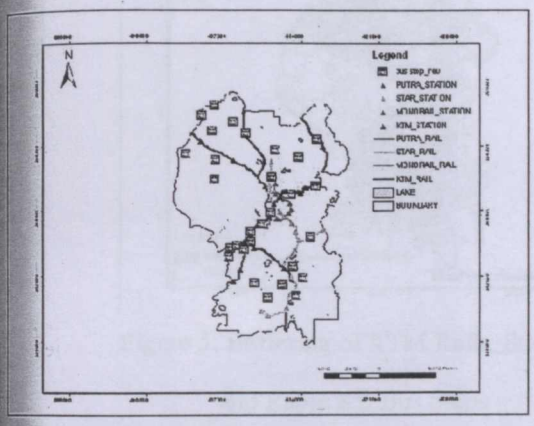


Figure 1: Combination all transit systems

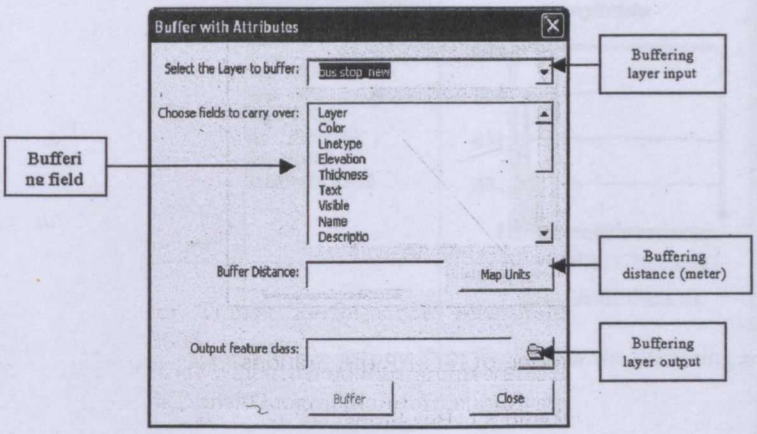


Figure 2: Service Coverage Area Application

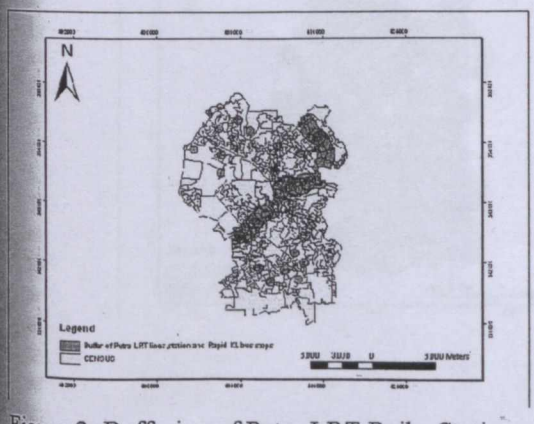
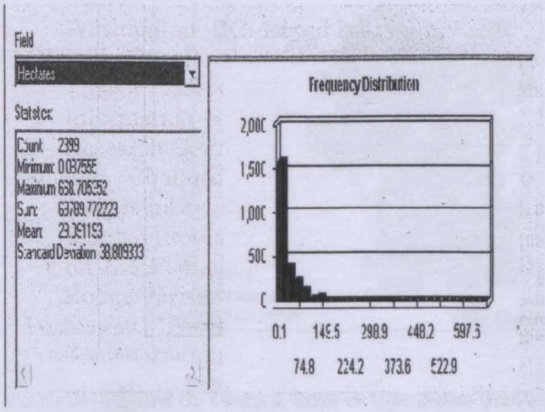


Figure 3: Buffering of Putra LRT Rails, Stations and Rapid KL Bus Stops



Graph 1: Frequency Distribution for the buffering zones

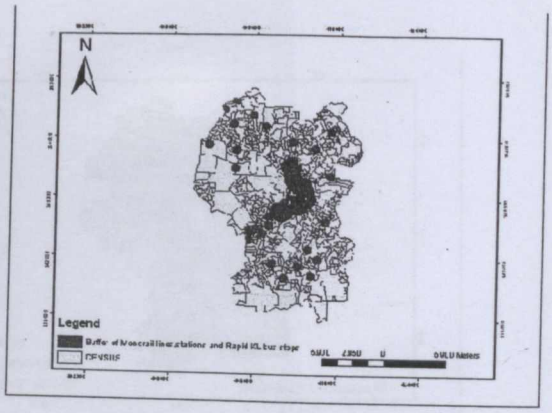
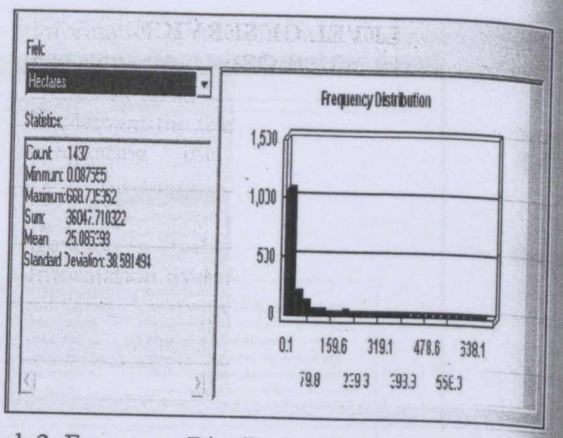


Figure 4: Buffering of Monorail Rails, Stations and Rapid KL Bus Stops



Graph 2: Frequency Distribution for the buffering zones

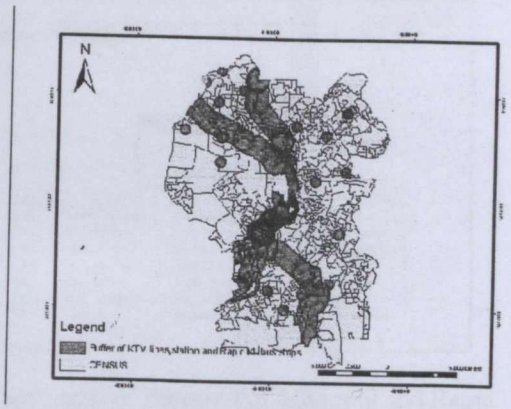
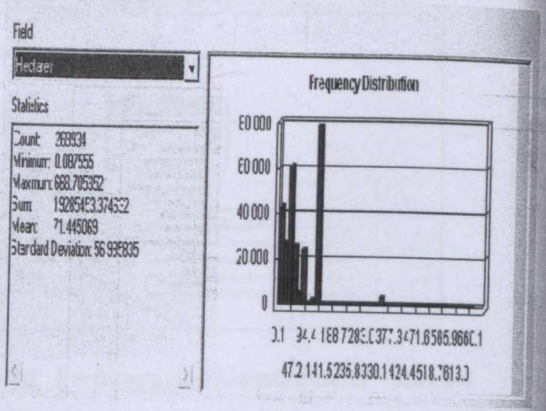
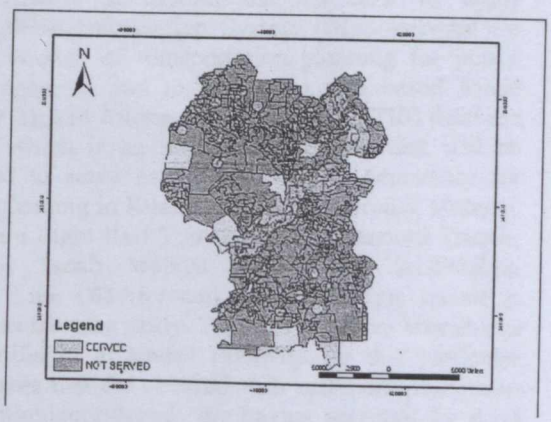


Figure 5: Buffering of KTM Rails, Stations and Rapid KL Bus Stops



Graph 3: Frequency Distribution for the buffering zones



Putra LRT and Rapid KL Bus

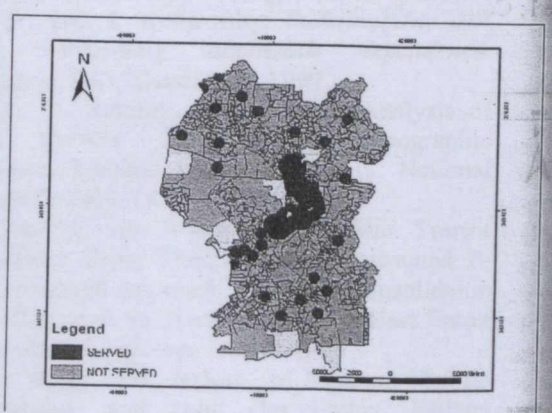


Figure 6: Transit Supportive Area Served for
Figure 7: Transit Supportive Area Served for

Monorail and Rapid KL Bus

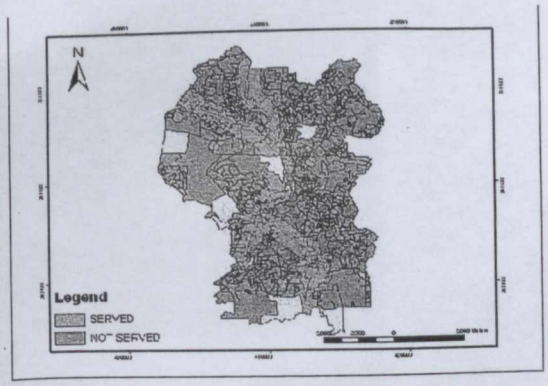


Figure 8: Transit Supportive Area Served for KTM and Rapid KL Bus

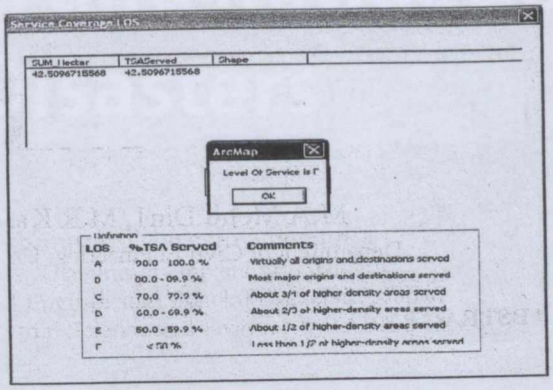


Figure 9: Level of Service for Putra LRT and Rapid KL Bus

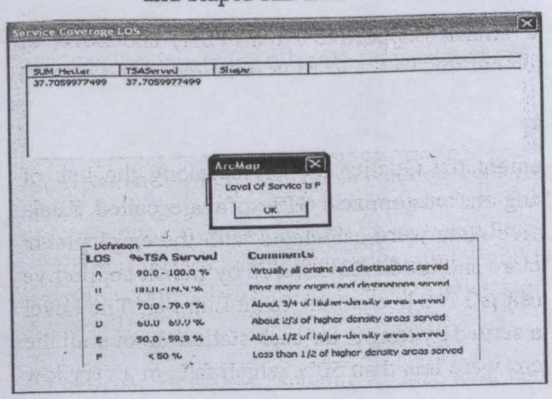


Figure 10: Level of Service f or Monorail and Rapid KL Bus

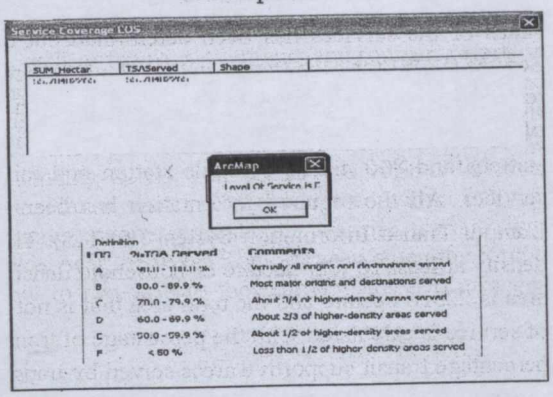


Figure 11: Level of Service for KTM and Rapid KL Bus

4. CONCLUSION

This research is carried out on how to apply Geographical Information System (GIS) software for the application of transportation planning for public transit agencies and to develop a GIS based Kuala Lumpur Transit Information System (KLTIS) database system which is an information system that will be designed to serve as a one-stop data depository for transit planning in Kuala Lumpur. Five transit systems, which are Light Rail Transit (LRT), Monorail Transit, Keretapi Tanah Melayu (KTM) and Sri-Petaling Transit Line (STAR) and Rapid KL bus transit is chosen as the case study. Transit supportive area shows the significant of transit ridership for this particular area. Areas that are covered with sufficient population and employment density are having potential for good transit ridership. The Level of service for the transit services can be calculated with the percentage of transit supportive area covered by transit.

REFERENCES

http://www.ftis.org

Peng Zhong-Ren, Lynde Eric and A. Beimborn Edward; Use of Geographic Informations Systems for Transit Performance Measurement, October 2006

http://www.nctr.usf.edu/gis/archive/presentations/FloridaTransitGeographicInformationSystem.pdf

Cherry Chris, Garg Anirudh, Dr. Mark Hickman; Map-Based Transit Itinerary Planning, December 2002

Newman, P., and J. Kenworthy; *Sustainability and Cities: Overcoming automobile dependence*. Washington, DC: Island Press, 1999

O'Neill, W., D. Ramsey, and J. Chou; Analysis of Transit Service Areas Using Geographic Information Systems. Washington, D.C.: National Research Council, 1995

Sainath Challuri; An Analysis of Public Transit Accessibility Using The Distance Constrained P-Median Problem Approach: Bus Stop Consolidaion for the Capital Area Transit System of East Baton Rouge Parish, Louisiana, August 2006

Pushkarev, Boris and Jeffrey M. Zupan; Public Transportation and Land Use Policy, Indiana University Press, Bloomington, IN, 1977

Nelson \ Nygaard Consulting Associates; Trimet Primary Transit Network Phase II Report, Portland, OR, 1997