

UNIVERSITI TEKNOLOGI MARA

TECHNICAL REPORT

**A CASE STUDY OF MINIMISING TRAVEL TIME FOR WASTE
MANAGEMENT PROBLEM WITH LIMITED PICKING
CAPACITY IN TAMAN SEREMBAN 3**

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ABSTRACT

Waste is an unneeded item that is discarded by humans when it is no longer required. The amount of waste is always rising due to the fast increase of the human population. As a result, solid waste companies must discover an effective method to collect waste by reducing the time it takes each garbage truck to gather waste in each location. There are three major issues highlighted in this study that can lead to inefficiencies in the waste collection process which are all garbage trucks used to collect waste have limited picking capacity, routes with penalties that slowing down the garbage truck and longer time taken for the garbage truck to collect waste. This study has two objectives that must be achieved. Using Dijkstra's algorithm, this project will create a travel network for garbage trucks to collect waste in Taman Seremban 3 and calculate the minimum travel time for the waste collection problem with limited picking capacity. There are four procedures that must be used to accomplish the objectives of this study. To begin, data will be gathered in Taman Seremban 3. The data will be utilised in a subsequent procedure. Second, the study will describe the model using Dijkstra's algorithm and software. Third, the model will be implemented in this study by doing data analysis using Dijkstra's method, which will be done using both math operations and software. Finally, the study will determine the minimum travel time for a garbage truck to collect waste in Taman Seremban 3. Using the Dijkstra's algorithm in Python, the minimum travel time for the garbage truck to collect waste in Taman Seremban 3 was 2.55 hours. Last but not least, this study wishes to assist other researchers in improving their research on this topic, and it is suggested that in the future, this study use a larger region as their area of study, use alternative software or programming languages, and involve more organisations.