

## Geographic Information Systems for Improvement the Garbage Truck Routes in Urban Areas of Chiang Rai

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**Abstract.** This research aims to improve the garbage truck route for the lowest possible distance. The problem of improving routes is solved by a network analyst function based on geographic information systems (GIS) with ArcGIS 10.0 on the network analyst function. The condition of consideration consists of the number of trucks and a time window of 02.00-09.00 o'clock for garbage collection, that the two sizes of garbage trucks were 6 tons and 8 tons. For garbage collection in urban areas, the truck size of 6 tons has three trucks and seven trucks of truck size 8 tons. The result of the study found that, the optimal route of the garbage truck route shows 10 routes of 10 trucks, which is route 1 to 4, reducing the highest distance to 22.34%, 17.18%, 12.42%, and 11.10%, respectively. The route numbers 5 to 9 decrease the distance of garbage truck routes by slightly less than 5% from the original routes. Route number 10 displays a similar distance to the original route. The garbage collection of all 10 conventional routes has a total distance of 148,631 meters, when the improved route analysis exhibits a reduced distance of 140,305 meters, which is a reduced distance of 8,326 meters, or 5.60% of the original route

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