Location of Electrical Jointing Using Graph Theory Based on Regulation in Indonesia

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INTRODUCTION

If the problems are occurred in underground lines, electrical jointing location must be known first

The database that are consist of underground electrical jointing is not available yet in some area in Indonesia
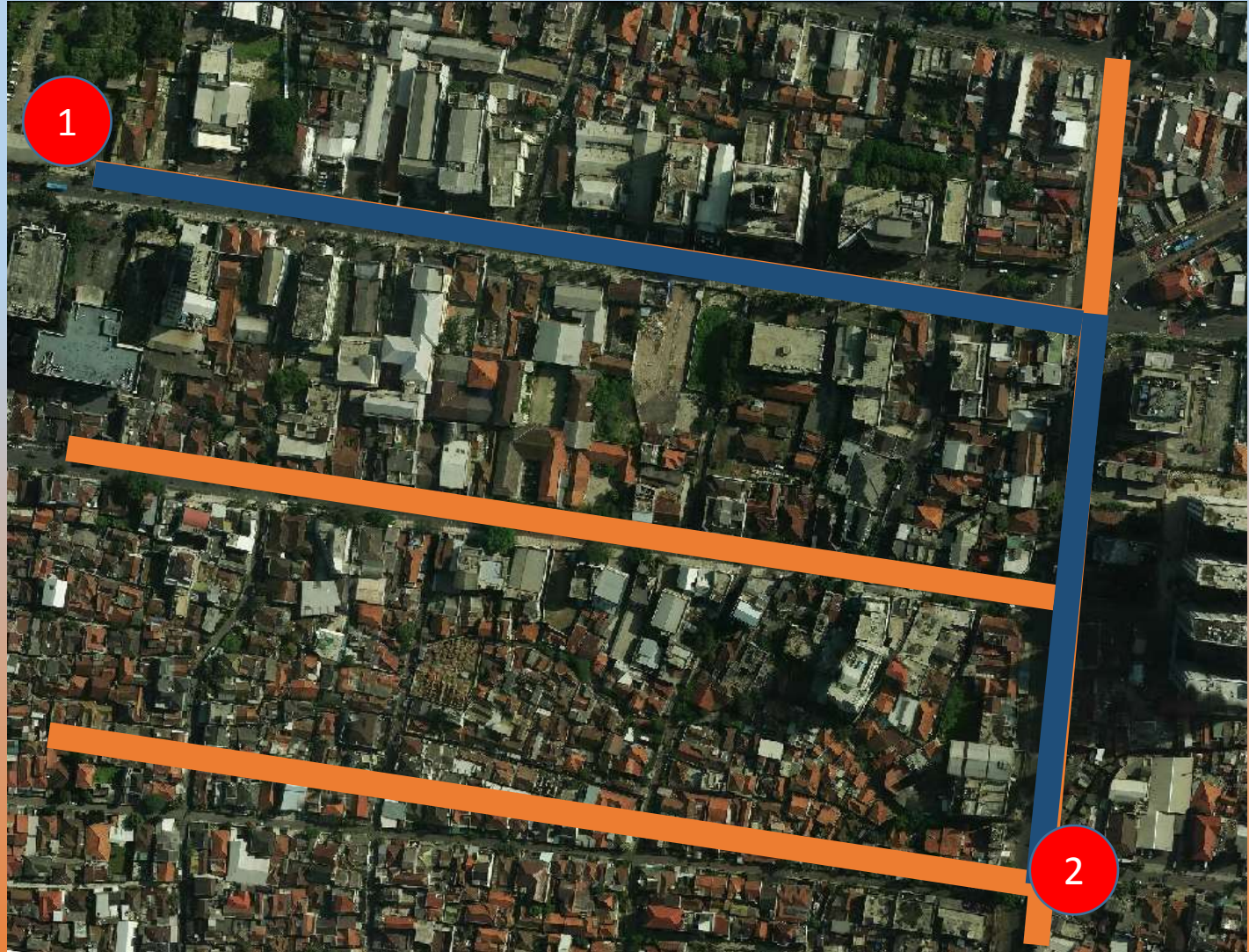
Mapping technology for underground is not efficient in large area

PURPOSE OF THIS RESEARCH

to minimize the survey area

Possible location of underground electrical jointing using graph theory

METHODOLOGY

Data Acquisition

- Road system (satellite image quickbird 2012)
- Building distribution (satellite image quickbird 2012)
- Substation location (field survey)

Data Processing

- Using Graph Theory

$$G = \{V(G), E(G), W\}$$

- G: Simple graph, V(G): set of vertices, E(G): set of edges, W: set of weighted values

Data Analyze

- Compare to the exact lines using overall accuracy

DATA PROCESSING (1)

$$J = \{V(J), E(J), W\}$$

J : graph of possible lines of electrical jointing passed

V(J) : set of vertices which passed of possible lines

E(J) : set of edges which connected from substation 1 to substation 2

W : weighted value of sum distance and building density from substation 1 to substation 2
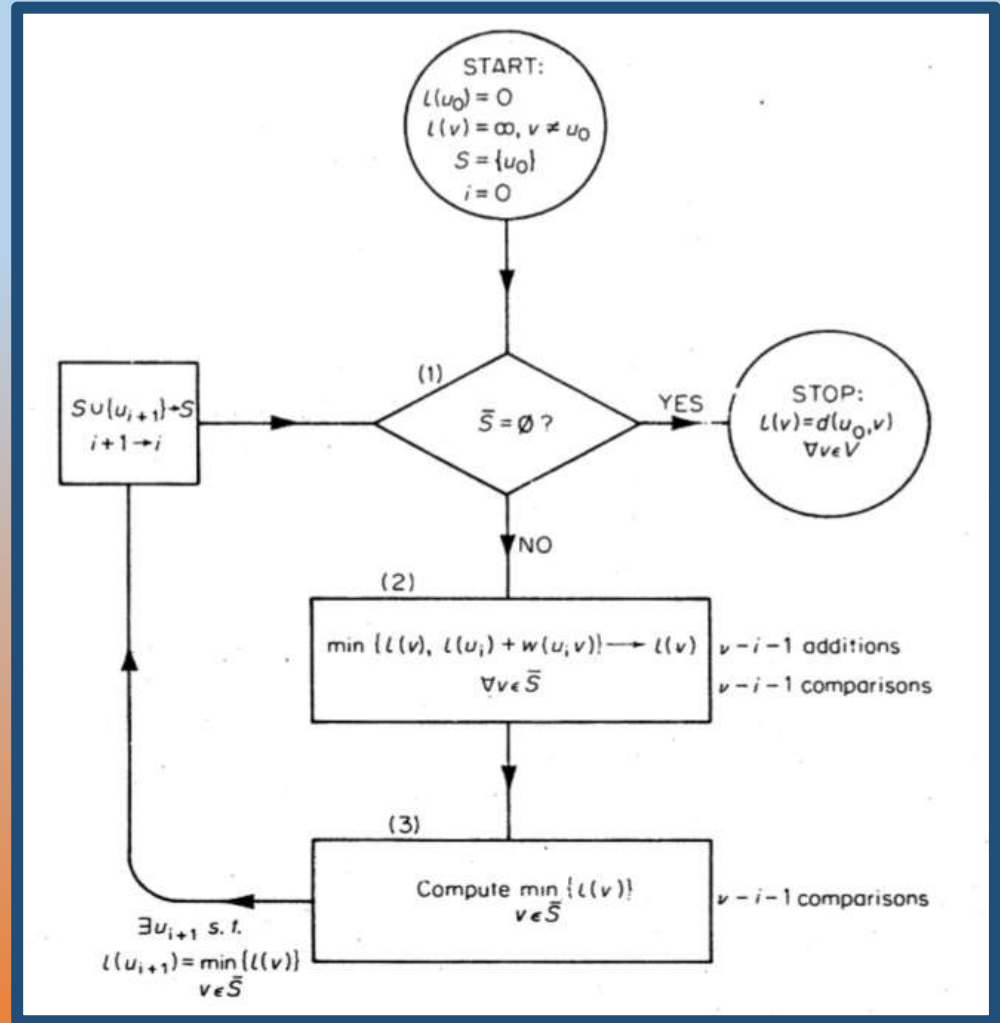
DATA PROCESSING (2)

- Crossroad is taken from digitation
- Calculate of the building density is number of building divided into block area in m^2
- Weighted value is determined from multiplication of distance value and building density value
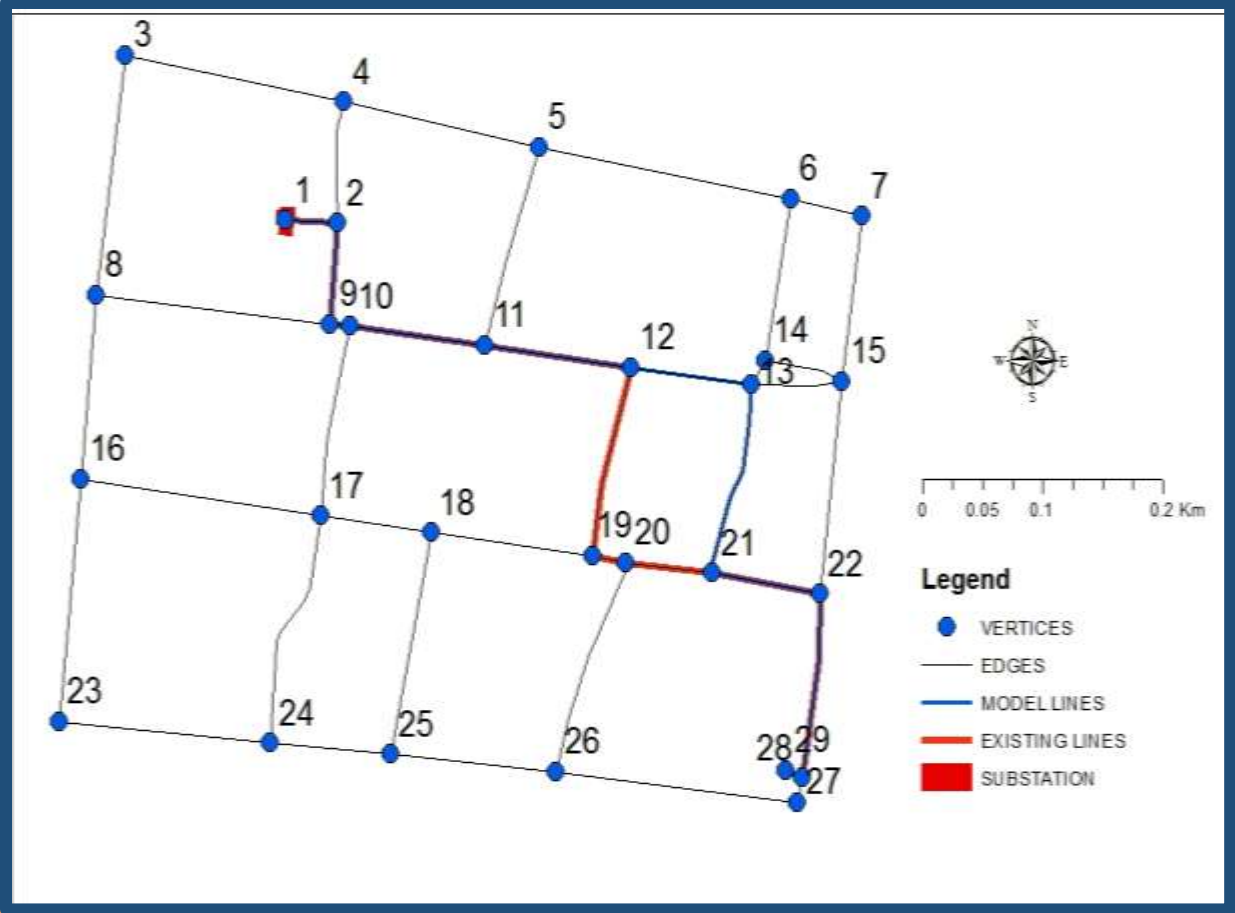
DATA PROCESSING (3)

To find the best lines is using djikstra's algorithm

DATA ANALYSE

overall accuracy		model lines										
		1	2	9	10	11	12	13	21	22	28	29
existing lines	1	8%	0	0	0	0	0	0	0	0	0	0
	2	0	8%	0	0	0	0	0	0	0	0	0
	9	0	0	8%	0	0	0	0	0	0	0	0
	10	0	0	0	8%	0	0	0	0	0	0	0
	11	0	0	0	0	8%	0	0	0	0	0	0
	12	0	0	0	0	0	8%	0	0	0	0	0
	19	0	0	0	0	0	0	0	0	0	0	0
	20	0	0	0	0	0	0	0	0	0	0	0
	21	0	0	0	0	0	0	0	8%	0	0	0
	22	0	0	0	0	0	0	0	0	8%	0	0
	28	0	0	0	0	0	0	0	0	0	8%	0
	29	0	0	0	0	0	0	0	0	0	0	8%

Overall Accuracy: 80%

CONCLUSION

Reliability percentage of model lines is 80%. This percentage indicate that the properties that would be used to determine the lines is needed more besides distance and building density