



THE IMPACT OF DRAINAGE TOWARDS ROADS IN MAINTENANCE COST

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INTRODUCTION TO THE MAIN PROBLEM

WATER AND PAVEMENT



EFFORT TO MAINTAIN AND REHABILITATE



PREVIOUS RESEARCH

- **Impacts of drainage on roads in construction**
- **Impacts of floods, overload and construction quality in roads performance**
- **Impacts of roads failure in maintenance cost**
- **Pavement maintenance**

AIMS

Examines how the impact of drainage towards the road in terms of maintenance costs

HYPOTHESIS

If the cost of drainage maintenance increases, so the cost of road maintenance decreases

THEORIES

1. factors affecting the service life of drainage and roads

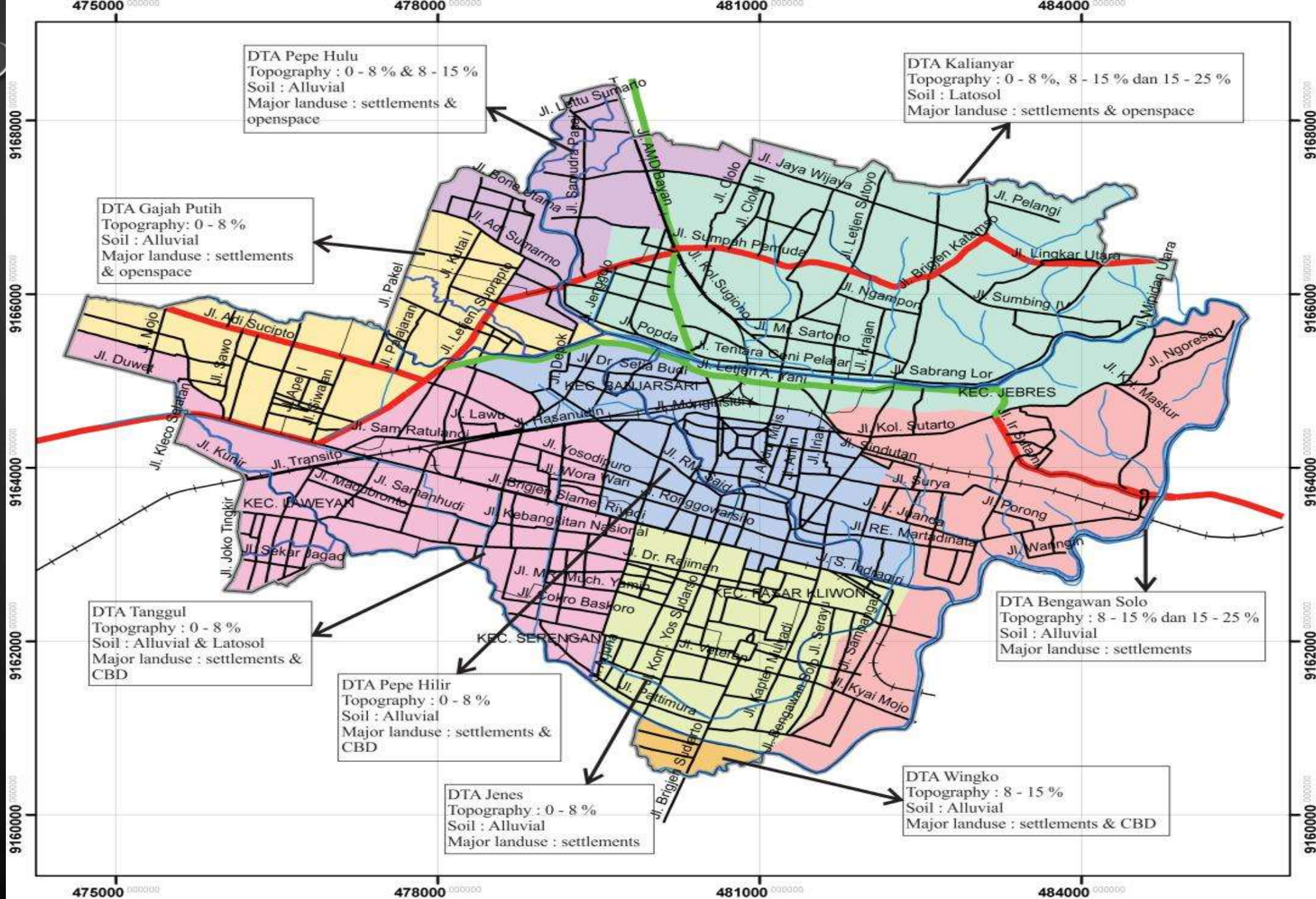
- **Aside from traffic load, overcapacity, the effect of water on road pavement has a major impact on road performance**
- **5 things that influence drainage system are : a) water resources management plan, b) urban land use planning (rutrk), c) urban/regional typology, d) water conservation, e) environmental, social, economic, and local wisdom.**
- **Flat slope of the land, saturated soil, and the high groundwater level increase the possibility of water puddles.**

2. drainage and road maintenance

- **Road maintenance includes routine maintenance activities, periodic maintenance, rehabilitation and reconstruction.**

METHODOLOGY

LOCATION

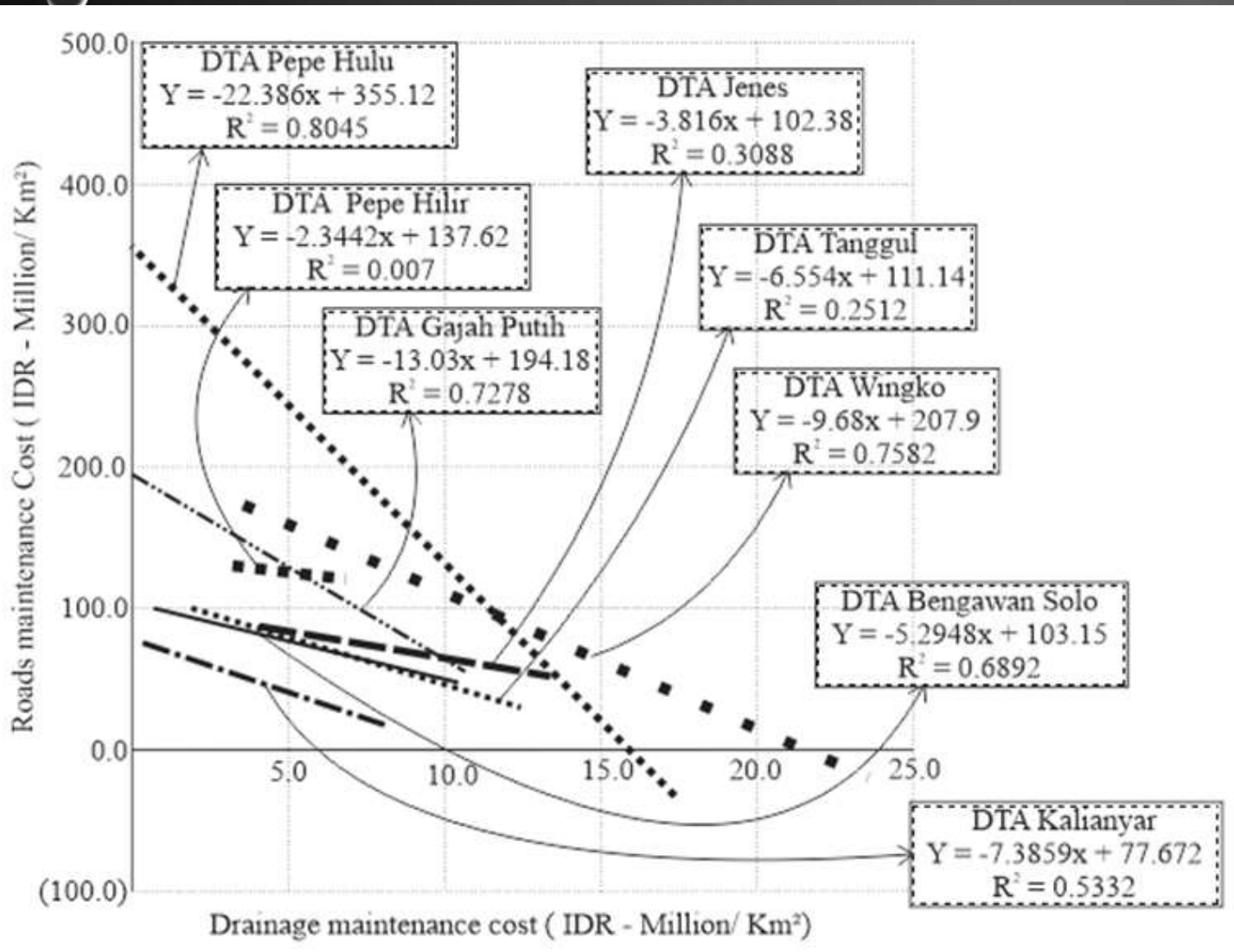


METHODOLOGY

DATA &
ANALYSIS

- **Drainage and roads maintenance cost in surakarta with the observation period of data budget from 2014 until 2017 and catchment area characteristic in the form of topography, soil type, and land use.**
- **Data analysis used regression tools to study the relationship between variable x that was maintenance cost of drainage and variable y that was road maintenance cost, both were in unit idr/km² to equalize the data unit.**
- **the data consist of name, width, length, and location of the road in surakarta city with local road type and municipal road status as well as data of the area and location of catchment area in surakarta city.**

CORRELATION ANALYSIS BETWEEN DRAINAGE AND ROADS MAINTENANCE COST



Five catchment areas have high determinant coefficient ($R^2 > 0,5$)

1. Pepe Hulu
2. Wingko
3. Gajah Putih
4. Bengawasn Solo
5. Kalianyar

Three catchment areas have low determinant coefficient ($R^2 < 0,5$)

1. Jenes
2. Tanggul
3. Pepe Hilir

five catchment areas have high determinant coefficient ($R^2 > 0,5$)

the catchment area characteristics

- diverse slopes
- contoured
- not flat
- alluvial soil types that are not ex-swamp
- dense land use
- and the existence of open space as a water absorption area.

the three catchment area shows weak relationship between drainage and road maintenance costs.

five catchment areas have high determinant coefficient ($R^2 < 0,5$)

the characteristics of Catchment Areas

there are factors that affect the complexity of the drainage system

The three catchment area have flat slopes

swampland soil type

dense land use, without any open space.

CONCLUSIONS AND RECOMMENDATIONS

- In catchment areas locations with open space, no cbd and the various of high slope there is a strong correlation between drainage and road maintenance costs. the bigger of drainage maintenance cost allocations, the required road maintenance cost will decrease.
- The recommendations for refining the research are the addition of variables related to catchment areas characteristics, drainage performance, and road performance

THANK YOU