

## The Development Of Infrastructure And Transport Service Networks As A Supporting For The Tourism Industry In Tana Toraja Regency

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**ABSTRACT:** The good road conditions, high accessibility, and transport connected to tourism object are the real manifestation of the development of infrastructure and service of the transportation network to support the tourism industry. The aims of this research are to analyze the potential of tourism object, the infrastructure network and transportation services and proposed the concept of infrastructure development. The data are derived from survey and direct interviews and matrix of origin with the GIS program. The result of research shows; Potential tourism objects in Tana Toraja Regency are religious tourism, nature and Agrotourism can be reached by various modes of transportation. The road infrastructure network is connected to the location of the tourist attraction, although there are still some roads that were not being adequate. The development of transportation network infrastructure aimed at improving the efficiency and effectiveness of services, especially on the access network in tourist areas. Tourism transportation services can be developed by providing buses of various sizes (8 seats, 12 seats and 28 seats) with consideration of routes based on distance, object location, road width and road geometry.

**KEYWORDS:** Road Network, Transportation Mode, Tourism Services

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### I INTRODUCTION

The transportation is needed in order to mobilize the movement of people and ordinary people, for the development of a region so as to affect various aspects in a region, especially economic, social, political, and environmental aspects. The transport aims to open isolated areas, promote inter-regional trade, increase population mobility, reduce intra-regional disparities, improve government administration smoothness and realize regional stability [1].

Adequate transportation networks can increase the mobility of tourists, so that the tourism industry in an area can grow and become a source of foreign exchange for the country if managed properly [2,3]. Most of the road network infrastructure to the tourist attraction in Tana Toraja Regency is adequate, visible from the ease of tourists in reaching the location of the attraction by using various modes of transportation, although there are still some road networks that cannot be reached by two-and four-wheeled vehicles. Public transport modes have not been able to serve all tourist sites in Tana Toraja Regency, so that tourists use tourist transportation in the form of mini bus vehicles and tour buses provided by the agency that the cost is quite expensive. This is also the case with some tourist objects in other countries, especially Southeast Asia, where road network infrastructure is connected to every tourist attraction, although not yet served by public transport mode [4,5,6]. Public transport mode services can support the tourism industry [7,8,5] and in accordance with KM.35 in year 2003, that public buses equipped with special signs can be used for tourism transport [9]. Rout of public transport services for tourism needs to be considered with the aspect of distance between the location of the tourist attraction, travel time to the object of tourism and travel costs to the tourist attraction [10,11].

Tana Toraja Regency is one of the tourist destinations that has several excellent tourist objects and continues to be developed up to now, such as religious tourism such as the statue of Lord Jesus and the grave in

the cliff, Agrotourism such as Agrotourism Pano-Pango and *arabica* coffee plantation and nature tourism such as waterfalls and hot water bath.

Tourism products are all things both physical and non physical related to the potential of nature, art, culture and history as well as other potentials that can attract interest and give the impression for tourists in a travel tour. There are three main components of tourism products: 1) Attractions, including nature tourism, artificial/human-built tours, cultural tourism and social tourism; 2) The facilities, including accommodation, restaurant, transportation, activities, other facilities, Retail outlet and other services; and 3) Accessibility, covering infrastructure, roads, airports, railways, seaports, marinas, equipment, - operational factors and government regulations in the form of supervision of the implementation of transport regulations [12,13,14]. Tana Toraja Regency has various types of tourist attractions such as wide open natural landscape with a stretch of mountains and green hills, rice fields, panoramic clouds and tombs of residents located in upright cliffs, and there are a variety of local cultural arts.

This research aims to analyze the potential of tourist attractions, infrastructure networks and transportation services and the concept of infrastructure development and service of transportation networks supporting the tourism industry.

### II METHODOLOGY

This research is located in Tana Toraja Regency, South Sulawesi, is a region with relatively rough and hilly topography and is one of the dominant tourist destinations in South Sulawesi. Data and information for infrastructure research and service of transportation network supporting tourism development comes from a survey and interview directly with the sample of respondents accidentally as many as 504 people consisting of hotel managers and managers of tourism, tourists, business travel agents and transportation drivers. The total sample is 504 people, the analysis based on the origin and destination matrix is described descriptively in the GIS program.

### III RESULTS AND DISCUSSION

#### The Potential of a Tourist Attraction

As a well-known tourist area, Tana Toraja Regency has 24 superior tourist attractions consisting of: Northern Region includes Object of the grave stone cemetery, Tilangga 'natural bath, Natural grave of Sirope, the statue of Lord Jesus bless. The western region includes the objects of *Assing* waterfall Sarambu waterfall, Bittuang hot water bath, *arabica* coffee tour, Talondo Tallu waterfall, Ollond island, *Tongkonan Layuk Pattan*, *Tongkonan Tumakke* stone roof. The eastern region includes the tourist attractions grave of Sanggalla kings, Kambira *babygrave*, Kalando cul-de-sac, natural cave of Allo Tumpang, Tengan pot, Makula natural *batam* and cottage *lo'ko Tongko*. The South region includes Sillanan's traditional village, Sassa ', Agrotourism *pango-Pango*, the *Uluway Sarassan* waterfall and the city area includes the Makale pond. Table 1 (appendix 1) shows potential tourist attractions in Tana Toraja Regency.

The analysis of Origin and Destination Matrix (OaDM) shows the number of tourist arrivals in 2017 was 1,210,165 people, predominantly (89.9%) of spiritual tourist visits located approximately 2 km from the city center. Visiting tourist graves of approximately 0.02%, which is located approximately 1km from the city center and Agrotourism object of 3.92% is located approximately 9 km from the city center. It shows the visit of the tourism object is influenced by the accessibility and attractiveness of the object in the form of tourism products attractions both natural and artificial.

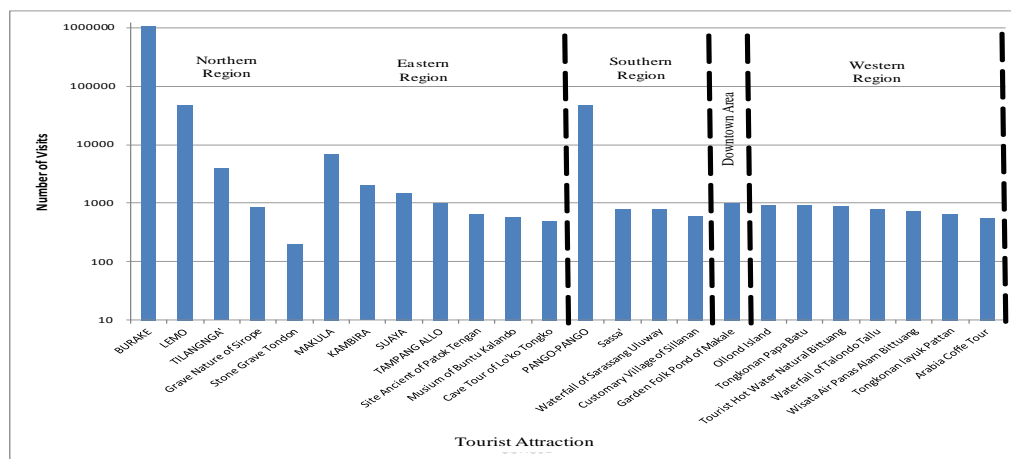


Figure 1. The number of tourist visits per tourist attraction in 2017

Figure 1 shows the large tourist arrivals in the northern region is the tourist attraction of the Lord Jesus sculpture Burake, the eastern region is the hot water bath of Makula, the southern region is the Agrotourism of Pango-Pango, the western region is Tongkonan stone roof and Ollond Island and the downtown area is the Makale pond. Most tourist arrivals in the northern region as much as 1140,785 people.

### Network Infrastructure and Transport Service

Figure 2 shows the network of road infrastructure connected to the location of the tourist attraction, although there are still some inadequate roads. The tourist attraction is located in the western region (2 attractions) and the southern region (1 object). The limitation of the road network (approximately 1 meter) is influenced by the location of the tourist attraction with a steep slope and road geometry that is not in accordance with minimum service standards.

Public transport services as shown in Figure 2, the tourist attraction located in downtown Makale and located on the east along the approximately 9 km (served 15% of tourism), as well as the west along the approximately 7 km (served 15% of tourism). Northern and southern regions that have not been served by public transport mode. Routes of existing public transport modes prioritize connectivity with local settlements and availability of modes with limited service frequency. Therefore, the tourist transport service is more dominant using the bus transportation mode from the agency with various dimensions of the bus (number of seats), or with the wheel mode of transport 2.

### Infrastructure Concept And Transport Service

The concept of development of transportation network infrastructure is directed to improve the quality of roads in accordance with the expected level of road service, especially on the road network that has not been reached by four-wheeled vehicles. Transportation network services are directed to develop tourism buses by differentiating existing service routes and planning passengers up and down stops. The location of the first Halt serves the route of tourism located in the western part of Tana Toraja Regency, the second Halt serves the location of the objects located in the north and east areas, and the third Halt serves the location of the object located in the southern region of Tana Toraja Regency (figure 3). Directed to serve individual tourists, attractions that cannot be reached by vehicle / bus and the driver serves as a tour guide.

## IV CONCLUSION

The results showed 1) Potential tourist attraction in Tana Toraja Regency is religious tourism, nature and Agrotourism, which is located approximately 2-9 km from the city center, can be reached by various modes of transportation so it has the potential to attract tourists. 2) The road infrastructure network is already connected to the location of the tourism object, although there are still some inadequate road segments. Modes of transportation services in the western and eastern regions of Tana Toraja Regency, with permanent routes can be served public transport with low frequency. 3) The development of transportation network infrastructure is directed to the improvement of efficiency and effectiveness of services, especially on the access network to the tourist object area. Tourism transportation services can be developed by providing buses of various sizes (8 seats, 12 seats and 28 seats) with consideration of routes based on distance, object location, road width and road geometry.

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### Appendix:

**Table 1. Potential Tourism Object Tana Toraja Regency**

No	Territory	Tourist Attraction	Location of Attractions	Transport access and distance from the capital
1	North	Statue of Lord Jesus, glass bridge, natural cave, Tombs in the cliff with statues ( <i>tau-tau</i> ) and a panorama of the city of Makale.	Makale	Can be reached by two-and four-wheeled vehicles to a distance of about 1-2 km from downtown Makale
		Graves in the cliff with statues ( <i>tau-tau</i> ), traditional house, nature pool	North Makale	Can be reached by two-and four-wheeled vehicles to a distance of about 6-11 km from downtown Makale
2	South	Agrotourism, pine forest, natural scenery and outbound means	South Makale,	Can be reached by two-and four-wheeled vehicles, with a distance of about 7 km from downtown Makale
		Natural panorama, Tongkonan house, graves inside the cliff with statues ( <i>tau-tau</i> ), archaeological sites and waterfalls	Mengkendek	Can be reached by two-and four-wheeled vehicles, except turtle tourism object Tipali (walking) with a distance of about 14-45 km from downtown Makale
		Tongkonan house and grave inside the cliff with statue ( <i>tau-tau</i> )	Gandang Sillanan Batu	Can be reached by two-and four-wheeled vehicles to a distance of about 18 km from downtown Makale
3	West	Natural hot springs, waterfalls and natural baths and arabica coffee plantations	Bittuang	Can be reached by two-wheeled vehicles except the natural hot water attractions Bittuang, with a distance of about 25-57 km from downtown Makale
		Tongkonan house and grave inside the cliff with statue ( <i>tau-tau</i> )	Ulusalu	Can be reached by two-and four-wheeled vehicles, with a distance of about 19 km from downtown Makale
		Waterfalls and natural baths	Malimbong	Can be reached on foot, with a distance of about 37 km from downtown Makale
		Breath taking hills and savanna landscape	Bongga Karadeng	Can be reached by two-wheeled vehicles, with a distance of about 40 km from downtown Makale
		Tongkonan roofed stone	Rembon	Can be reached by two-and four-wheeled vehicles, with a distance of about 10 km from downtown Makale
4	East	Baby graves, tombs in the cliffs with statues ( <i>tau-tau</i> ), hot water baths, natural caves and museums	Sangalla'	Can be reached by two-and four-wheeled vehicles to a distance of about 8-12 km from downtown Makale
5	City center	Makale Pool, the center of cultural and musical festival activities	Makale city center	Can be reached by two-and four-wheeled vehicles, located in downtown Makale

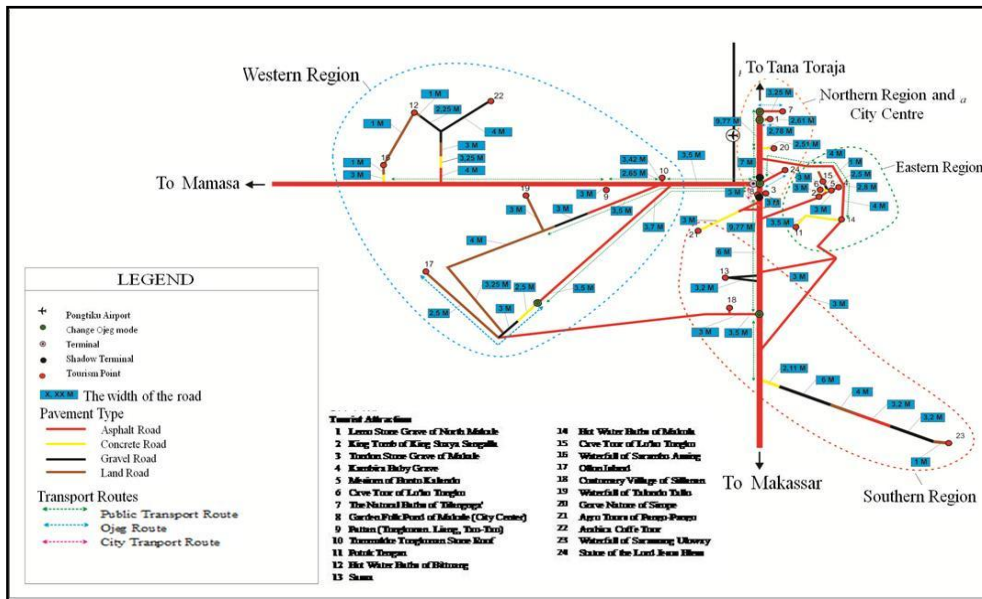


Figure 2. Condition of Road Network and Public Transport Service

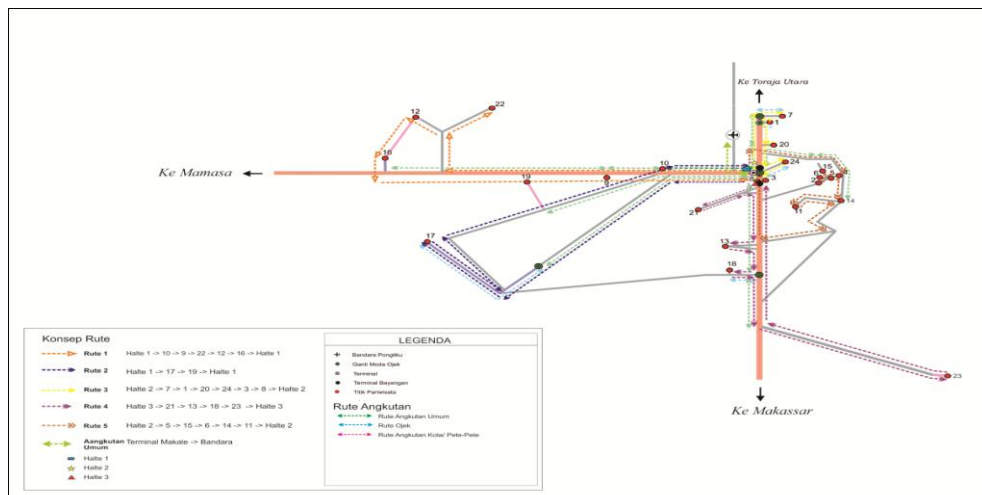


Figure 3. Plan the Transport Route Towards a Tourism Objec

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