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MORALITY BEFORE KNOWLEDGE

Spatial analysis of the suitability of online taxibike pickup points in Lampung University area

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ABSTRACT
Background: Advancements in technology and information a have significantly impacted various aspects of human life, particularly in the realm of transportation. The emergence of a online transportation services has revolutionized commuting habits, offering convenience and accessibility to users. These services encompass two main categories: two-wheeled and four-wheeled vehicles, with online motorcycle taxis being the preferred choice among the public. At Lampung University, a prominent educational institution, the demand for online motorcycle taxi services is notably high due to its status as an educational hub. However, this high level of mobility has led to challenges such as haphazard parking and congestion among online motorcycle taxi drivers. Addressing these issues requires spatial analysis techniques to inform policy-making and alleviate these problems effectively. **Methods:** This study employs Nearest Neighbor Analysis to assess the distribution pattern of existing online motorcycle taxi pick-up points at Lampung University. Additionally, the suitability of pick-up points is evaluated based on regulatory guidelines and applicator data. Quantitative descriptive research methods are utilized to analyze the collected data and derive insights. **Findings:** The findings of this research indicate the suitability of online motorcycle taxi pick-up points based on regulatory guidelines and applicator data. The results are presented in the form of suitability tables and distribution maps, highlighting nine suitable locations for pick-up points. **Conclusion:** The distribution map reveals a random pattern in the arrangement of pick-up points, as determined by the Nearest Neighbor Analysis method. These findings provide valuable insights for stakeholders to formulate policies and strategies aimed at optimizing the management of online motorcycle taxi services at Lampung University.

KEYWORDS: online ojek; pick up point; spatial analysis; suitability

1. Introduction

Spatial planning is one of the essential subjects a studied by twelfth-grade Social Sciences students. A profound understanding of this a subject is a crucial to help students comprehend how geographic spaces are optimally utilized and managed. Geographic spaces encompass areas serving various functions such as settlements, agriculture, industries, and conservation areas. Spatial planning aims to regulate and manage the utilization of these geographic spaces to provide maximum benefits for humans and the environment.

Classroom learning of spatial planning often lacks engagement and proves challenging for students to grasp easily. This situation can impede the learning process and hinder students' understanding of a spatial planning concepts. Hence, there is a need for innovative

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and effective learning media to enhance students' comprehension of spatial planning. Spatial planning involves a numerous abstract concepts and principles, leading many students to struggle with understanding them.

One of the problems in the Metro City, Lampung Province, is drought. Drought is a condition where there is a lack of water supply in a certain area so that it unable to meet the needs of life (Fathony et al., 2022). Based on data from the Central Statistics Agency (BPS) of Indonesia, it is known that several villages/neighborhoods have experienced drought in the past few years. Detailed data on the number of villages experiencing drought, see Table 1.

Table 1. Number of Villages According to Drought Disasters in Recent Years

No	Year	Number of Villages
1	2014	95
2	2018	232
3	2021	30

(Source: BPS, 2022)

According to the analysis of the three-month precipitation index, from December 2021 to February 2022, Metro City is also include one of the regions in Lampung Province that undergo a drought disaster. Some of these facts can be the basis for information that one of the issues in Metro City that needs to be solved is the potential for drought. Of course, this needs to be the concern for the local government because drought disasters can give many negative impacts on the local community.

One of the sectors most affected by drought disasters is agriculture sector. This is in accordance with the data released by BPS (2022), which indicates a decline in agricultural production from 2016 to 2020, see Table 2. Agricultural products output in Metro City were initially considered sufficient to meet the needs of the existing local community. However, along with time, there is a propencity of decreasing agricultural output in Metro City. Whereas Metro City still relies on the agricultural sector as its leading commodity.

Table 2. Agricultural Production Results in Metro City 2016-2020

Year	Production Result (Kw)
2016	64. 268, 26
2017	51. 445, 80
2018	58. 333, 35
2019	54. 520, 61
2020	35. 144, 97

(Source: BPS, 2022)

The phenomenon of drought in Metro City needs to be promptly addressed to prevent the impact from spreading and becoming more extensive and complex. Additionally, if the drought phenomenon is not promptly addressed, it will have longer-term effects (Nuarsa et al., 2015). Although it is challenging to avoid drought disasters, however we can minimize losses by monitoring the agricultural land that has the potential susceptible to drought (Sukmono et al., 2018).

Drought is a phenomenon that is closely related to the supply of water for the benefit of society and the balance between needs (Darfia et al., 2016). The lack of water supplies includes ground water and surface water. This condition can be caused by natural factors or environmental management by humans themselves (Fadlillah et al., 2018). The consequences of drought will undoubtedly have negative impacts on all living beings on the Earth's surface. The negative impacts of drought include land/forest fires, decline in agricultural yields, and increased of land degradation and dicertification.

One way to monitor the potential for drought in agricultural land is through the use of Remote Sensing (RS) technology and Geographic Information Systems (GIS). Krismayani et al. (2021) stated that Remote Sensing (RS) technology and Geographic Information System (GIS) are methods that can be used to map drought-prone areas. Remote sensing is the

science and art of obtaining information about an object, area, or phenomenon through data obtained by devices without contact with the object, area, or phenomenon being investigated (Lillesand et.al., 2006). There are many benefits provided by remote sensing, one of which is drought mitigation mapping (Wibowo, 2017). There are numerous advantages and reasons for using remote sensing, including lower costs, faster work processes, and less labor-intensive requirements.

GIS is a computerized information system to provide data in digital form and analysis of the earth's geographical surface (Awangga, 2019). GIS is a system that can organize software, hardware, and data; also used to store, process, and analyze data related to spatial aspects (Purwadhi, 1994). GIS technology developing to assist in processing data and generating information using overlay parameters. Additionally, the application of GIS technology or remote sensing can provide input related to early warning information in the formulation of policies for mitigating drought-prone agricultural land areas and can be monitored continuously (Utomo, 2022). The use of a GIS approach is important to overcome obstacles in mapping the distribution of drought or providing up-to-date or real time spatial drought information.

The combination of these two technologies (RS and GIS) can be used to extract information on the spatial distribution of drought-prone zones. Information related to the spatial distribution of drought-prone zones in agricultural land becomes crucial for anticipating potential impacts and assisting in more organized handling (Shofiyati, 2007). The main objective of this research is to identify the drought-prone zones in agricultural land in Metro City using RS and GIS technology. Both of these technologies enable spatial analysis through the digital images processing with image transformation methods using the vegetation index algorithm such as Normalized Difference Vegetation Index (NDVI), Normalized Difference Water Index (NDWI), and Normalized Difference Drought Index (NDDI). The research will generate maps contains information regarding the distribution of drought-prones zonse on agricultural land in Metro City. With this information, it is expected that the local government can make technical policies to overcome the problem of land drought in Metro City.

2. Methods

2.1 Research Methods

The research method used in this research is descriptive quantitative. According to Arikunto (2006), quantitative descriptive is a method that aims to create a picture or description of a situation objectively using numbers, starting from data collection, interpretation of the data as well as the appearance and results. This research uses quantitative descriptive methods with spatial analysis techniques to represent quantitative data from a geographical perspective.

2.2 Time and Location

The research location was carried out at the University of Lampung with the research time in September 2023. Below is a map of the research location points:

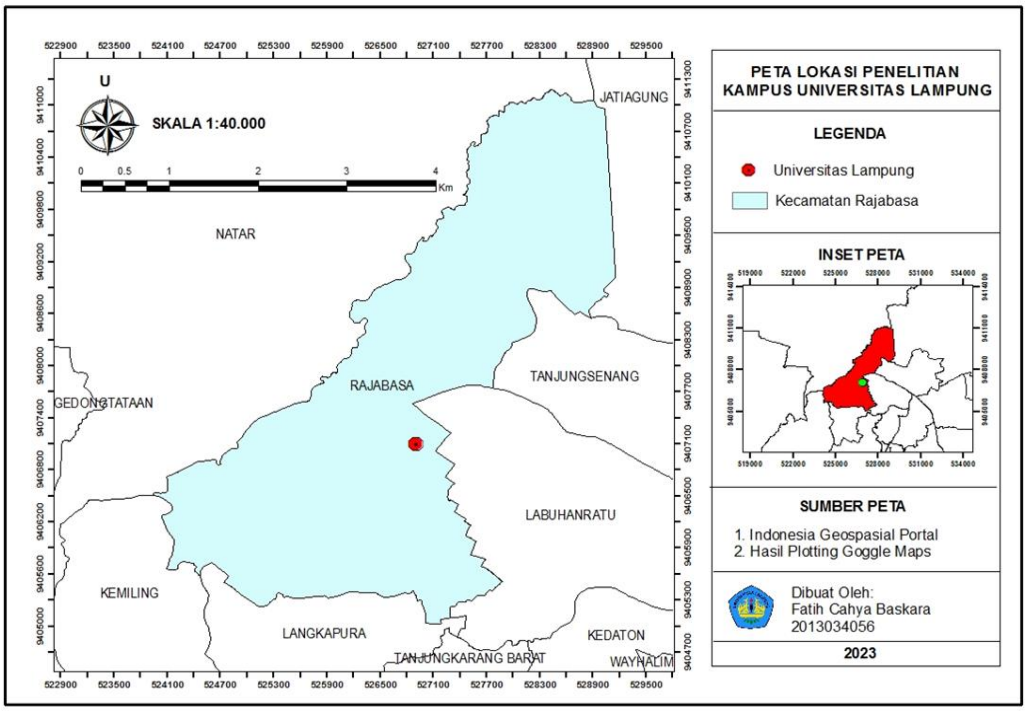

Fig 3. Map point location study

2.3 Technique Data Collection

Technique Data collection is the process of obtaining research data conducted. According to Rahmadi (2011), no a number of technique possible data collection done that is :

a. Interview
   An interview is a data collection technique through asking a number of questions verbally to the subject being interviewed. This form of information was obtained from the informants we met. The resource persons in this research were users, namely the entire University of Lampung academic community (students, lecturers, teaching staff), online motorcycle taxi drivers, and online motorcycle taxi partner companies (Go-Jek, Grabbike, and Maxim Motor).
b. Literature and Documentation Studies
   Literature studies are classified as secondary data. This data collection technique is to collect data obtained by reading books in libraries, journals, the internet and also literature related to the main research problem. Documentation is the process of taking pictures or videos of the research object you wish to examine in the form of Lampung University regulations regarding prohibitions on online motorcycle taxis , data from the Central Statistics Agency, conditions in the field regarding pick up points , and so on.
c. Observation
   Observation is the process of looking attentively. In the context of research, observation is defined as ways of systematically recording behavior by observing or observing the behavior of the individual or group being studied directly. The observations in this research were to see directly the distribution and condition of pick up point locations at the University of Lampung.

2.4 Technique Data Analysis

Data analysis techniques are the process of analyzing data that has been obtained using various methods or methods. This research is descriptive quantitative with spatial analysis methods. Spatial analysis is a view in geography that understands the processes of

formation and change in landscapes and places with reference to universal and general principles. In this case, the appropriate pick up point for online motorcycle taxis at the University of Lampung will be determined using a location map using the Nearest Neighbor Analysis method . This method is determined with the help of ArcGis software .

3. Result and Discussion

The results of this research are the suitability of online motorcycle taxi pick up points in the Lampung University area using spatial analysis in the form of a distribution map of online motorcycle taxi pick up points using the Nearest Neighbor Analysis (NNA) method. The conformity form is presented in table form with additional maps of the distribution of pick up points in each area at Lampung University. The spatial analysis used aims to determine the type of pick up point distribution pattern . The research data used is primary data sourced from interviews with users, drivers and stakeholders at the University of Lampung as well as observations in the field by plotting coordinate points and documenting the research area. Apart from that, there is secondary data as support which comes from the University of Lampung Strategy Plan for 2020-2025, the general profile of the University of Lampung for 2022, the unila.ac.id website, and data from online motorcycle taxi applicators. This research uses several stages starting from observation, interviews, and documentation. To search for observations, activities were carried out in the field by directly checking the spatial conditions of the University of Lampung. The interview stage was carried out to obtain research data from informants who are competent in their fields. The informants included 30 online motorcycle taxi drivers, 10 users who had represented them, online motorcycle taxi applicators , and Lampung University stakeholders such as security guards and BUK. Condition of Untidiness of Online Motorcycle Taxis at the University of Lampung.

The presence of online motorcycle taxis is able to provide comfort and time efficiency for users. Apart from that, the ease of ordering and promos (discounts) make this type of transportation increasingly popular. It is not surprising that the existence of online motorcycle taxis is currently increasing along with the increase in the number of users. However, on the other hand, its existence also has negative impacts, one of which is that most drivers always park or hang around carelessly in certain places. This causes untidiness on various roads. For this reason, research has been carried out in the form of direct observations on the roads at the University of Lampung with the result that many drivers park or hang around haphazardly even though there is already warning information about prohibited parking or stalling haphazardly. Drivers use the shoulders and sidewalks to wait or rest for a while while getting orders from passengers.

3.1 Potency Passenger Online Ojek at Lampung University

The number of Lampung University students reaches around 28 thousand and the number of teaching staff reaches 2 thousand, making many of them use the online motorbike taxi service as a mode of transportation . Of the 10 informants who were interviewed, many of them ordered motorbike taxis online 3-7 times a week, as many as 3 people. There are also things that make online motorcycle taxis a mandatory service, with a range of orders up to 8-10 times by 4 people and more than 10 orders a week for certain reasons by 1 person. Apart from that, there are also 2 users who order online motorbike taxis only 1-2 times a week.

The reasons the informants interviewed used online motorcycle taxi services were that it was easy, practical, efficient, effective, they didn't have a vehicle, they didn't own a vehicle, and there were lots of discounts (promos). Meanwhile, the majority of those who ordered online motorcycle taxi services came from within the faculty as many as 7 people and the remaining 3 people ordered from outside the faculty. Apart from that, the informants met were mostly university students because many of them felt the benefits of ordering online

motorbike taxi services . Below is a graph of the potential for online motorcycle taxi passengers at the University of Lampung:

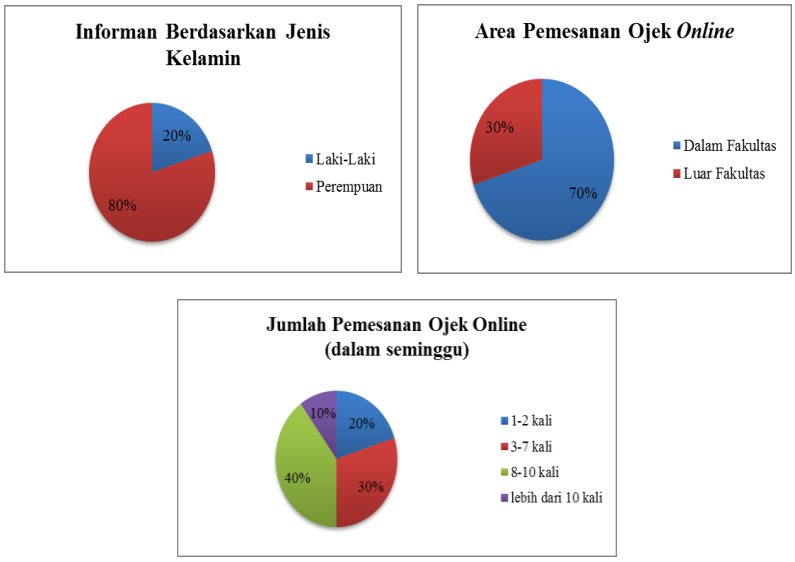

Fig 4. Results interview passenger related pick up points

3.2 Potential of Online Motorbike Taxi Drivers at Lampung University

Online motorcycle taxi drivers who always go in and out of Lampung University have different backgrounds. Of the 20 informants who were interviewed, the average driver was a man and the rest were women. Apart from that, the number of orders they get during a week is more than 40 times for 11 people, however, there are also those who get orders in the range of 30-40 times for 4 people and there are also those in the range of 21-30 times for 3 people and 10-20 times the order is 2 people.

Online motorcycle taxi drivers who were successfully interviewed had an average age of 20-30 years, 10 people, then 8 people aged 30-40 years, and 2 people over 40 years old. Meanwhile, 18 drivers also make their main job and 2 other people work as drivers as a side job.

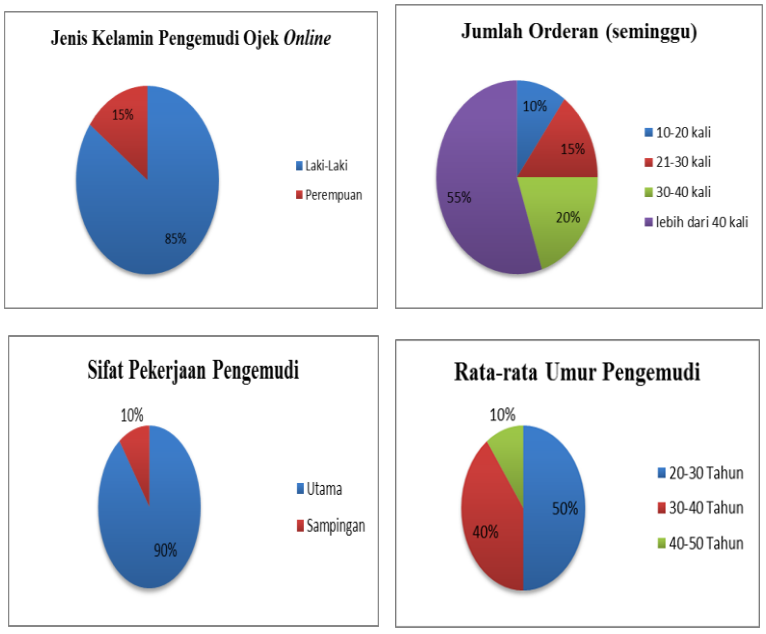

Fig 5. Results interview driver related pick up points

3.3 Online Motorbike Taxi Pick Up Point Policy at the University of Lampung

At the time of conducting research, the University of Lampung had regulations prohibiting online motorbike taxis from entering to park/hang haphazardly. This is in accordance with Advisory Letter Number 657/UN26.06/TU.00/2017 concerning Prohibition of Parking and Hanging and Circular Letter Number 02 of 2023 concerning the Use of Shuttle Buses. From this circular, with the addition of an explanation of the results of interviews with the Deputy Commander of the Unila Security Guard and the Unila BUK Household Section, it is explained that there is a distribution of passenger pick-up and drop-off points in various areas. The determination of pick up points is mandatorily handed over to each security guard and leader at each location. The following is the distribution of pick up points or online motorbike taxi transfer limits based on the results of interviews with Lampung University stakeholders on August 30 2023:

Table 4. Distribution of pick up points or online motorbike taxi pick up limits

No.	Lokasi	Sebaran Titik	X	Y
1	FKIP	Pintu Masuk FKIP	527156.9796	9406818.599
		Gedung J FKIP	527072.9083	9406885.346
		Klinik Universitas Lampung	527169.0555	9407032.008
		Gedung G FKIP	527263.5174	9406770.391
2	FMIPA	Pintu Masuk FMIPA	526994.2918	9406789.77
		Halte FMIPA	526953.4469	9406777.897
3	FK	Pintu Masuk FK	527351.7353	9406664.801
		Pintu Masuk Jurusan Farmasi	527390.0502	9406616.669
4	FP	Halte Agronomi dan Holtikultura	526892.1567	9406916.323
		Depan Dekanat FP	526859.4802	9406946.298
		Kandang Rusa	526793.2689	9407136.76
		Aula Pertanian	526955.3165	9406999.305
5	FH	Pintu Masuk FH	527073.0349	9407100.806
		Pos Satpam FH	527072.7493	9407129.883
6	FT	Gedung A Dekanat FT	526912.8611	9407185.755
		Masjid Al-Fatih FT	526869.1398	9407240.477
		Gedung H Teknik Mesin	526874.8312	9407354.568
		Gedung Teknik Komputer	526889.5436	9407361.056
7	FISIP	Pos Satpam FISIP	527108.1225	9407205.697
8	FEB	Lapangan Utama FEB	527057.0246	9407189.49
		EEC FEB	527031.1543	9407147.435
9	GSG dan Sekitarnya	GSG Universitas Lampung	526668.5198	9407325.592
		UPT Perpustakaan	526663.3259	9407375.79
		Lapangan Sepak Bola	526572.8	9407112.683
		Embung B	526491.9088	9406954.491
		Graha Mahasiswa	526909.7519	9407022.664
		Kolam Renang	526404.0082	9407110.388
		Rusunawa	526405.1454	9406978.14
		Shuttle Bus	526799.0544	9406676.631

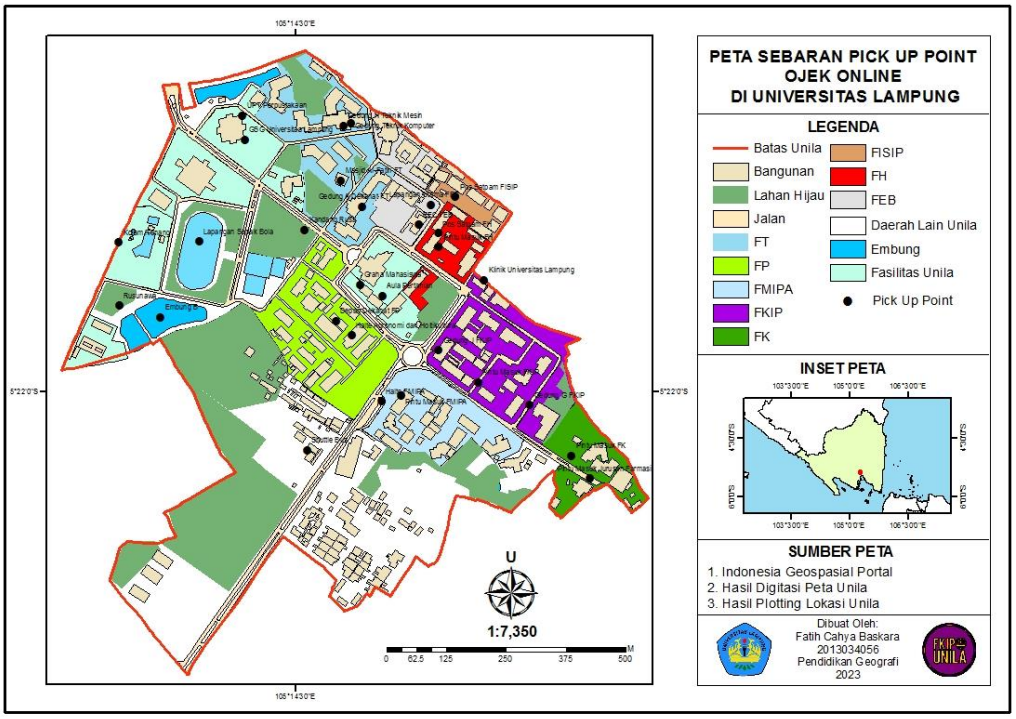

Fig 6. Map of pick up point distribution at Lampung University

3.4 Pick up Point Policy based on Applicator Data

When conducting research, the applicator has a policy in determining the location of the pick up point in a place. This determination is based on the shape of the space or location and adjusted to the level of crowds and strategic location. In this case, there is a comparison of the distribution of pick up points between the policy of the Chancellor of the University of Lampung as stated in a circular letter and the results of online motorcycle taxi applicator data.

The following are the results of the suitability of pick up points between the policies of the Chancellor of the University of Lampung as stated in a circular letter and the results of online motorcycle taxi applicator data:

Table 6. Results of suitability of pick up points between the Chancellor of Lampung University's policies and applicator data

Location	Suitability		
	Unila Policy	**Research result**	**Information**
FKIP	1. FKIP Entrance 2. Unila Clinic 3. Building J FKIP 4. Building G FKIP	1. FKIP Entrance 2. Unila Clinic	In accordance
FMIPA	1. FMIPA Entrance 2. FMIPA Bus Stop	FMIPA Entrance	In accordance
FK	1. FK Entrance 2. Pharmacy Department Entrance	1. FK Entrance 2. Pharmacy Department Entrance	In accordance
F.P	1. In front of the FP Deanery 2. Agronomy and Horticulture Stop 3. FP Deer Enclosure 4. Agricultural Hall	1. In front of the FP Deanery 2. Agronomy and Horticulture Stop 3. Agricultural Hall	In accordance

FT	1. Building A Dean of FT 2. Al-Fatih Mosque FT 3. Building H Mechanical Engineering 4. Computer Engineering Building	1. Building A Dean of FT 2. Al-Fatih Mosque FT 3. Building H Mechanical Engineering	In accordance
FISIP	FISIP Entrance	FISIP Entrance	In accordance
F.H	1. FH Entrance 2. FH Security Guard Post	1. FH Security Guard Post	In accordance
FEB	1. FEB Main Field 2. EEC FEB	FEB Main Field	In accordance
GSG and Surroundings	1. GSG Unila 2. Football field 3. Student House 4. UPT Library 5. Embung B 6. Swimming pool 7. Rusunawa 8. *Shuttle bus*	1. GSG Unila 2. Football field 3. Student House 4. UPT Library 5. Rusunawa 6. *Shuttle bus*	In accordance

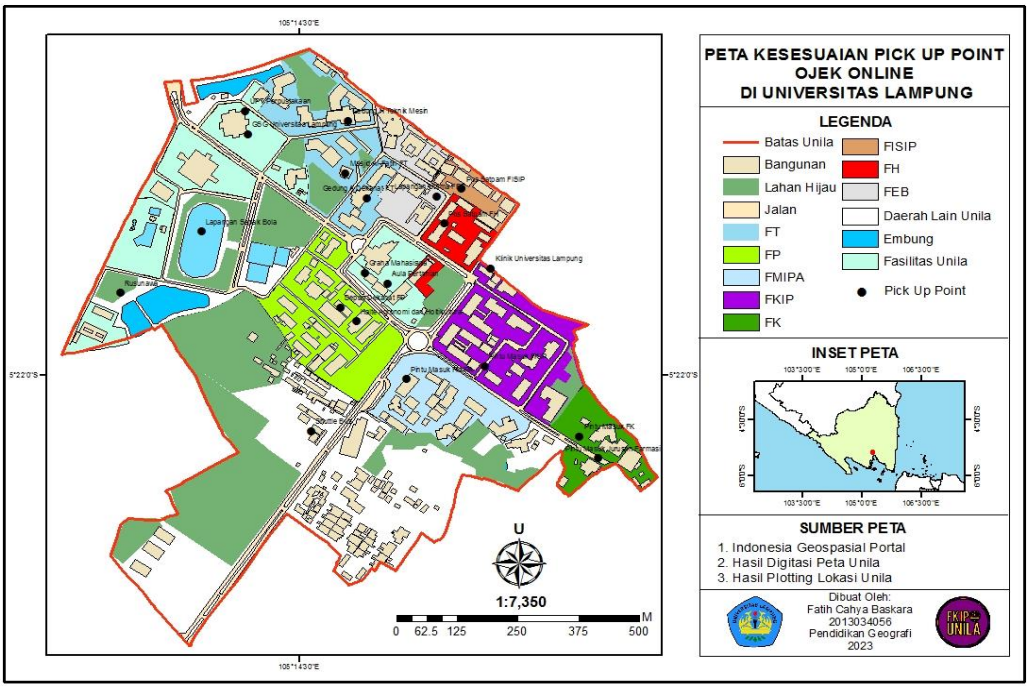

Fig 7. Map of online motorcycle taxi pick up point suitability

3.5 Discussion

Lampung University is one of the favorite state universities on the island of Sumatra and Indonesia. The location of Lampung University in the administrative area of Bandar Lampung City means that this campus has a strategic location and has high mobility. This high mobility makes it profitable for the general public to find employment opportunities, one of which is becoming an online motorcycle taxi driver. As a result, we often see many drivers coming in and out of campus to pick up, drop off, or wait for orders from passengers.

Online motorcycle taxi drivers who are always going in and out of campus has made conditions increasingly disorganized. This was triggered because many drivers always park/hang around haphazardly on every stretch of road at Lampung University. This

condition is of particular concern to Lampung University stakeholders in overcoming this problem. There have been many ways to do this, such as issuing Advisory Letter Number 657/UN26.06/TU.00/2017 concerning Prohibition of Parking and Hanging and Circular Letter Number 02 of 2023 concerning the Use of Shuttle Buses as well as installing information banners at various points. However, violations were still found in it.

The University of Lampung must immediately handle this problem in collaboration with online motorcycle taxi applicators to find a middle ground. This handling can be done by mapping the distribution pattern of pick up points using a geographic information system with the Nearest Neighbor Analysis method . In this way, the shape of the pick-up point distribution pattern can be known and can be used as consideration for making policies regarding the creation of pick -up points that are appropriate to the predetermined location. This is in accordance with Ministry of Transportation Regulation Number 12 of 2019 Article 8 point b which states:

"For motorbikes used for the benefit of the community with information technology-based applications, shelter must be provided by the Application Company."

Shelter facilities is very necessary to support public transportation services, especially those that are not on routes such as motorbike taxi transportation services. This is explained in Law Number 22 of 2009 Article 302 which states that driver partners must not stop, hail or pick up and drop off passengers at unspecified places. Then, it was confirmed by Ministry of Transportation Regulation Number 12 of 2019 concerning the necessity of providing shelter facilities to ensure aspects of order.

The existence of drop-off limits at the University of Lampung is a problem that needs to be addressed quickly. This is because violations are still found in it. However, on the other hand, this violation cannot be blamed on any party. The driver must always take his passengers to their destination. This kind of assumption can trigger violations of shuttle limits at the University of Lampung. Therefore, it is necessary to match the pick up point to see the comparison between the limits determined by the University of Lampung and the applicator data.

Of the 9 points that have been determined, Lampung University stakeholders already have drop-off limits, even though it is not written down in the chancellor's circular. Even though it is not written, this policy has indeed been conveyed to all security guards in all areas at the University of Lampung plus the installation of information banners. However, there is a difference in suitability with the applicator data. From the applicator data for 3 types of online motorcycle taxis , it is stated that there are several different limits and some are the same. However, these differences can still be categorized according to the two research data. This is because the location points are still in the same space. The same limit is true in the fact that many orders take place there. Meanwhile, the limits are different because not all of the specified limits are the busiest points for the ordering process within them. For example, the FKIP Faculty has 4 pick-up and drop-off boundaries, namely at the FKIP Entrance Gate, Unila Clinic, Building G FKIP, and Building J FKIP. However, based on applicator data, the FKIP Entrance Door and Unila Clinic are the busiest points for orders because they are the entry and exit areas for FKIP students/lecturers. Apart from that, at the FMIPA Faculty there are 2 predetermined boundaries, namely at the FMIPA Entrance Gate and the FMIPA Bus Stop. According to applicator data, the FMIPA entrance is the busiest with orders because it is also the entry and exit point for FMIPA students/lecturers or other people waiting nearby. For locations at the University of Lampung that only have 1 shuttle limit, this location is suitable. For example, FISIP only has 1 main location, the pick up point is located in front of the FISIP entrance.

Considering the results of the suitability of online motorcycle taxi pick up points , it can be determined that the suitable shelter typology planned for construction is type IV. Type IV is a shelter facility that uses the road as a place to stop and wait for passengers and is not permitted to be a place to park/hang for a long time. The reason why Lampung University is suitable for using this typology is that many drivers around campus always use the road

as a place to drop off or pick up passengers and wait for orders. Apart from that, after carrying out these activities, the driver will immediately leave to go to another place so as not to cause excessive crowding. Type IV at least has signs indicating that the area is a pick up point area like those at the Faculty of Social and Political Sciences (FISIP) and the Faculty of Medicine. This is because the two faculties only have one entrance and exit, unlike other locations which have more than one entrance and exit or are on 2-3 different routes.

Considering the suitability results of the 9 pick up point locations in the research based on applicator data, a suitable location can be determined as a pick up point . These locations are at the FKIP entrance, Lampung University Clinic, FMIPA Bus Stop, Agronomy and Horticulture Bus Stop, FK entrance, FISIP entrance, Al-Fatih FH Mosque, and the bus stop next to the UPT Library opposite GSG. Of the 8 locations, the FMIPA Bus Stop and the UPT Library side stop opposite GSG are the main locations for the pick up point , while the other 5 locations are the auxiliary pick up point locations so that there is no overcrowding and the implementation of the ban on online motorbike taxis being prohibited from entering is still enforced, but not restricts drivers from accepting orders.

Based on table 6, it can be explained that 2 locations are in perfect agreement with the University of Lampung's policies with the research results because these two locations are locations that are busy with orders and only have 1 entrance and exit location so there are no other routes. Meanwhile, 7 other locations are considered to be in accordance with Lampung University policies and research results which can be seen from 5 aspects, namely: security, order, noise, beauty and economy. For example, the pick up point location at FKIP is still considered suitable because from a security perspective, it has a high level of theft. In terms of orderliness, this creates a buildup of online motorcycle taxi drivers because many park/hang up on the roadside or under trees. In terms of noise, it will cause excessive noise because this location is also passed by other vehicles. In terms of beauty, it will cause rubbish to be strewn around and the layout of the space to be increasingly untidy. And from an economic perspective, this location is not too busy.

Another location that is still considered suitable is the Faculty of Agriculture (FP). From a security perspective, the location of the FP deer pen is not suitable because the place is a sterile area. In terms of order, it triggers a buildup of drivers so that the location of the deer pen is increasingly less sterile. In terms of noise, it triggers noise because the location of the deer enclosure is an animal breeding area. In terms of beauty, it triggers excessive buildup and lots of rubbish that will be strewn around and in the mobility area for private vehicles. And from an economic perspective, the location of the deer pen is indeed busy, but this location is not a suitable place for a public transportation stop.

According to Bintarto and Surastopo (1978), a distribution pattern is a series that has been established regarding a phenomenon itself. The distribution pattern shows the distribution of a point in a certain location which depicts or describes an industrial distribution process. Furthermore, Bintarto and Surastopo (1978) explained that there are three distribution patterns, namely:

a. Uniform distribution pattern. It is said to be uniform if the distance between one location and another is relatively the same;
b. Clustered distribution pattern. It is said to be clustered if one location is close to another location and tends to form a group in certain places;
c. Random distribution pattern. It is said to be random if the distance between one location and another is irregular.

One of the analysis techniques used is Nearest Neighbor Analysis (NNA). This classification analysis technique is the simplest analysis technique for classifying an object when viewed from its distribution. Nearest Neighbor will produce a value in the range 0 - 2.15. Where values 0 – 0.7 indicate a clustered distribution pattern, values 0.71 – 1.4 indicate a random distribution pattern, and values 1.41 – 2.15 indicate a uniform distribution pattern.

The distribution pattern of online motorcycle taxi pick up points at Lampung University is random . The distribution of online motorcycle taxi pick up points based on circulars has a ratio value of 0.971404 or in the range of 0.8 - 1.4. This random pattern was obtained from the observed mean distance value of 73.1890 meters and the expected mean distance value of 75.3435 meters. The results of statistical calculations from this distribution pattern show a z-score of -0.294601 and p-values of 0.768299. Meanwhile, the distribution of online motorcycle taxi pick up points based on applicator data has a ratio value of 1.107225 or in the range of 0.8 - 1.4. This random pattern was obtained from the observed mean distance value of 97.9491 meters and the expected mean distance value of 88.4636 meters. The results of statistical calculations from this distribution pattern show a z-score of -0.917366 and a p-value of 0.358951.

The random distribution pattern shows that the online motorcycle taxi pick-up areas are randomly spread across all areas, not focused on just one area. This shows that proposals for pick up points can be determined based on the suitability results that have been determined. Apart from that, with a random pattern, users or drivers can freely go to the designated place. Then, monitoring mobility can be handed over to security guards on duty in each area in accordance with applicable policies. This random distribution pattern is also closely related to the existence of facilities and infrastructure around the Lampung University campus area which provide easy access and affordability in the educational area. As a result, this random pattern will affect the picture of reachability between pick up point locations and the characteristics of the area.

4. Conclusion

Based on the results of the research that has been carried out, the following conclusions can be drawn in accordance with the research that has been carried out:

a. Pick up point suitability results show that there are 2 very suitable locations, namely the Faculty of Medicine and the Faculty of Social and Political Sciences and 7 locations that are considered suitable, namely FKIP, FMIPA, FP, FEB, FH, FT, and the GSG area and its surroundings.
b. The results of analysis using Nearest Neighbor Analysis (NNA) show that the pick up point distribution pattern is random.

The following are suggestions that can be used as material for consideration when conducting further research or as material for decision making for each stakeholder :

a. This research took the University of Lampung as the research location. Further research can use other suitable locations and show the busy mobility of online motorcycle taxis.
b. Determining the proposed pick up point can be done using the survey method .
c. The University of Lampung and the applicators can use the results of this research as material for consideration in determining the appropriate pick up point location at the University of Lampung.
d. It is hoped that there will be cooperation and mutual coordination between all elements including passengers, drivers and stakeholders if Lampung University officially has a pick up point so that it does not cause problems again. And can monitoring is carried out and evaluation through FGD method.

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The author declare no conflict of interest.

References

Asrahmaulyana, Q., and Ervina, L.. (2020). Kerugian Ekonomi Akibat Kemacetan Lalu Lintas Terhadap Masyarakat Muslim Yang Bermukim Di Kota Makassar. Jurnal Iqtisaduna.06.II. https://doi.org/10.24252/iqtisaduna.v6i2.19016

Bahdal, N., Amaru,K., and Macklin, B. (2011). Buku Ajar Sistem Informasi Geografis. Bandung: Universitas Padjajaran. https://pustaka.unpad.ac.id/wp-content/uploads/2012/02/pustaka_unpad_buku_ajar_sistem_informasi_geografis.pdf

Cahaya, Suci, Miswar, D., and Nugraheni, I.L. (2019). Sistem Informasi Geografis Database Rumah Sakit Dan Puskesmas di Kabupaten Lampung Timur 2018. Jurnal PSPG.01. hlm 03. https://doi.org/10.23960/jpg.v7i3.17496

Danuri, dan Maisaroh, S. (2019). Metode Penelitian Pendidikan. Bantul: Samudera Biru. https://repository.upy.ac.id/2283/1/METOPEN%20PENDIDIKAN-DANURI.pdf

Fadilah, Nur Siti. (2019). Penentuan Area Pick Up Point Ojek Online untuk Mengurangi Kemacetan Lalu Lintas di Sekitar Stasiun Kereta Api Jabodetabek. Jurnal Penelitian Transportasi Darat.02.XXI.. https://doi.org/10.25104/jptd.v21i2.1566

Handayati. F., Miswar, D., and Nugraheni, I.L. (2021). Analisis Sebaran Ruang Terbuka Hijau Di Kecamatan Banyumas Kabupaten Pringsewu. Jurnal Penelitian Geografi.01.IX. https://doi.org/10.23960/jpg.v9i1.19763

Haryono, Darunanto, D., and Wahyuni, E. (2018). Persepsi Masyarakat Tentang Kemacetan Lalu Lintas di Jakarta. Jurnal Manajemen Transportasi dan Logistik.05.III. http://dx.doi.org/10.54324/j.mtl.v5i3.278

Khisty, Jotin dan Kent Lall. (2003). Dasar-Dasar Rekayasa Transportasi. Jakarta: Penerbit Aerlangga. https://ebooktekniksipil.wordpress.com/wp-content/uploads/2014/05/dasar-rekayasa-transportasi-jilid-1.pdf

Lamria, E. and Utami, T.B. (2018). Pola Pemanfaatan Ruang Koridor Jalan Oleh Ojek Online (Studi kasus: Depan Kampus I UIN Syarif Hidayatullah, Ciputat, Tangerang Selatan). Jurnal Arsitektur, Bangunan dan Lingkungan.03.VIII. http://dx.doi.org/10.22441/vitruvian.2018.v8i1.003

Miro, Fidel. (2005). Perencanaan Transportasi. Padang: Erlangga. https://www.scribd.com/document/395274682/Perencanaan-TransportasixFidelMiro-Ok-Low

Nasution. (2004). Manajemen Transportasi (Edisi Kedua). Jakarta: Ghalia Indonesia. https://elibrary.bsi.ac.id/readbook/204031/manajemen-transportasi

Pedoman Teknis Perekayasanaan Tempat Perhentian Kendaraan Penumpang Umum Direktur Jenderal Perhubungan Darat Nomor 271 Tahun 1996. https://www.scribd.com/doc/74879620/PEDOMAN-TEKNIS-PEREKAYASANAAN-TEMPAT-PERHENTIAN-KENDARAAN-PENUMPANG-UMUM-HALTE

Pelambi, M.M., Tilaar, S., and Rengkung, M.M.. (2016). Identifikasi Pola Sebaran Permukiman Terencana Di Kota Manado. Jurnal Spasial.03.I. https://doi.org/10.35793/sp.v3i1.11651

Puspita, R.D., Sudarmi, and Haryono, E.. 2018. Menurunnya Jumlah Angkutan Kota Jurusan Metro-Kampus di Kota Metro Tahun 2017. Jurnal PSPG.01. https://digilib.unila.ac.id/32275/

Rahmadi. 2011. Pengantar Metode Penelitian. Banjarmasin: Antasari Press. https://idr.uin-antasari.ac.id/10670/

Rencana Strategis Universitas Lampung Tahun 2020-2025. https://www.unila.ac.id/download/revisi-renstra-unila-2020-2025/

Risdiyanto. 2014. Rekayasa dan Manajemen Lalu Lintas: Teori dan Aplikasi. Yogyakarta: PT Leutika Nouvalitera. https://balaiyanpus.jogjaprov.go.id/opac/detail-opac?id=308473

Sarosa, W., Sinaga, A., Laksamana, U., Tsarina, V., Pratama, D.C., Yulia, Dahlan, J.S., Extensia, G., and Hemanto, D. (2019). Panduan Praktis Penyediaan dan Pengelolaan Shelter Ojek Online. Jakarta: Ruang Waktu Knowledge Hub For Sustainable [Urban] Development. https://ruang-waktu.com/wp-content/uploads/2019/11/ojol-shelter-guide-2019.pdf

Tarigan, U., Sidabutar, R.F., and Tarigan, U.P.P. (2018). Analysis of Optimal Transport Route Determination of Oil Palm Fresh Fruit Bunches from Plantation to Processing Factory. Journal of Physics: Conf. Series 1007. http://dx.doi.org/10.1088/1742-6596/1007/1/012028

Widayanti, A., Susanti, A., and Wiyono, A. (2016). Evaluasi Kualitas Pelayanan Halte Dan Pengembangannya Di Kota Surabaya Untuk Mendukung Terwujudnya Infrastruktur Berwawasan Lingkungan. Jurnal Hasil Seminar Nasional Sains dan Teknologi Terapan IV 2016. https://ejurnal.itats.ac.id/sntekpan/article/view/1298/0

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