

## AMENITIES PERFORMANCE ON TRANSPORTATION HUB: A CASE STUDY OF MEDIUM-SIZED NON-CENTERED STATE

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### Abstract

Aiming to become a developed nation by 2020, public transportation growth are getting on par with technology, especially in urban areas such as Kuala Lumpur. Alas, there are still rural areas that is still not well connected as efficiently as the capital. Hentian Bas Kangar (HBK) is the only state hub for Perlis, a state with 254,000 population, located 500km away from Malaysian center Kuala Lumpur. HBK face common problem of amenities that consists of facility performance in term of service, information signage, weather protection, comfort & cleanliness. These problems have affected operation flow especially regarding travel time, satisfaction level, and convenience among users. Thus, to address these issues, this research implemented a quantitative method as an approach to measure user satisfaction level, and used one-way ANOVA as statistical analysis method. Research found a strong correlation or significance for each criterion being analyzed, especially related to safety and comfort.

**Index Terms**-- amenities performance, cleanliness, public opinion, service, transportation hub

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### INTRODUCTION

Transportation sector plays an important role in driving the country's economy and improving the lives of the people (Azmi and Tokai 2017). In developed countries, cities, and most of the capital, modern transport systems such as mass transit and commuting trains has a potential to reduce travel time and environmental impact (Shekarchian et al. 2017). As global population continues to increase, demand for public transport also increases creating snowball effect towards economy (Konečný et al. 2019). However, focusing on one exclusive mode of transport is costly and inefficient. Thus, most government opted to an integrated mode of transportation consists of rail for intercity travel, express busses for less accessible routes, local town bus for inner city travel, taxi and ride-hailing operators as last mile travel. Thus, public transportation system relies on open loop which consists of among others, transportation and more importantly a transportation hub where all related services are interconnected. Although past studies utilized factorial analysis, multiple regression analysis and Multiple Indicators Multiple Causes (MIMIC) models which was applied to the conventional survey sample to analyse and derive the importance of the attributes (Guirao, García-Pastor, and López-Lambas 2016), conventional survey may still be used as first iteration of troubleshooting service related issues.

An efficient and performing transportation hub excels in all five criteria in order to assist users; access, connection and reliability, information, amenities and safety and security (Iseki and Taylor 2010). Unfortunately, this luxury are often beyond reach for states with less population, and located further away major economic center such as Kuala Lumpur. The rural transport sector is often problematic in most developing countries. Inadequate and poor facility infrastructures, mismatch between demand and supply and increased rate of accidents are some of problem that users must be face (Saif, Zefreh, and Torok 2019). Located about 500 km away from Malaysian capital Kuala Lumpur, Kangar is the state capital of Perlis with population of 254,000 and GDP of USD 1.3 billion in 2018 (Department of Statistics Malaysia 2019). This location is perfect for the study as it mirrors vast majority of equally populated states around the world. This paper however, limited its focus on issues of

amenities in the transport hub which indirectly leads to positive feeling of its users. Amenities can be subdivided into categories of Aesthetics or cleanliness (absence of graffiti and litter), Weather protection (shelter to protect against rain and scorching sun), Service (commercial enterprises to purchase items such as food, photo shop, shoe shining, flowers, & cigarettes) and, Comfort (TV, benches, restrooms, telephones, lockers, water fountain, & smoking room) (Iseki and Taylor 2010). This paper hopes to assist the transportation hub operators and local government to improve the quality and efficiency of the operation flow in term of amenities performance at Kangar transportation hub, ideally in order to fulfil the level of satisfaction among passenger in Perlis through assistance of Perlis State Economic Development Corporation (PSEDC).

The Kangar Transportation Hub begins its humble beginning as local public bus services terminal with 3 bus platform. Over the years, interstate express busses begin to utilize the terminal, due to its strategic location. Even as crowded, a new shuttle bus "myBAS" by Land Public Transport Commission (SPAD) was introduced in December 2015 with 28 buses for 10 route in the area of Perlis. This efficient service was utilized by nearly 200,000 users in 2016 (Agensi Pengangkutan Awam Darat Malaysia 2017). This number does not include users of other services at Kangar Transportation Hub. Although much welcomed, introduction of this service added too much strain on existing bus terminal.



Figure 1. The only 3 platform in Hentian Bas Kangar.

**METHOD**

This study utilized strategic quantitative questionnaires method as a tool to collect the data from respondents. Results are being used in order to identify the underlying issues related to the transport terminal amenities and user comfort. The first phase involved a preliminary survey which involved 30 respondents. Result of this survey will be used to build a comprehensive questionnaire for second phase public opinion assessment in order to maintain consistency, involving 400 respondents. Data collected during second phase will be processed using one-way ANOVA as tool.

During first phase, 20 respondents are business operators in the facility, and 10 are users. First, 75% agrees that their bus operations are often interrupted due to lack of facilities in Kangar Transportation Hub. They also feel unsatisfied with the amenities provided at the area in order to run the operation and demand from customers to use the public transport. Customers also have to wait more than five minutes then scheduled for a connecting bus, which indicates poor public transit system (Ma, Hsiao, and MacKechnie 2015). Second problem involves lack of seating and waiting area. This problem is more excruciating during peak hours and peak seasons. Some of existing seat also have limited weather protection. The original bus terminal was designed without space for seating. Passengers are expected to wait in the narrow space between ticket counters and platforms.



**Figure 2.** Limited space for waiting bus in Hentian Bas Kangar. Note the gap between seat & platform.

The third problem agreed was the information announcement system. The Transportation Hub was lacking adequate audio& visual announcement system and heavy reliance on operators having to resolve using their own voice. This cause problem to hearing impaired person and elders. Facility layout provided by Perlis State Economic Development Corporation (PSEDC) also confirms this finding. This situation caused passengers to miss their transport, causing dissatisfaction, frustration and anger.

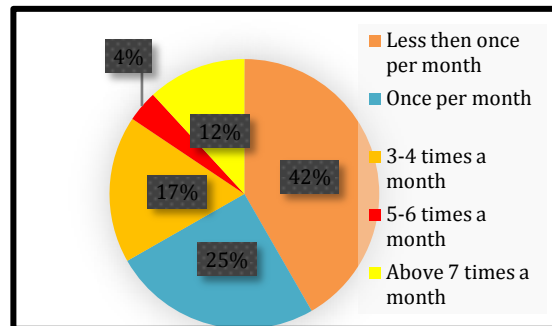
Outcome from Phase one was used to guide quantitative survey for 400 respondents utilizing Kangar Transportation Hub.

The structure of the questionnaire was covered in three section which consist of Section A: Respondents demographic, Section B: The amenities performance in Kangar Transportation Hub based on five element criteria that may influence on the customer satisfaction and Section C: Open-ended question for responded to give their suggestion or recommendation or comment. Items covered under Section B includes: Service performance, Weather Protection, Comfort, Cleanliness & Information Signage which was ranked according to Likert scale of 1 to 5. Several false positive and false negative questions were also included to ensure response consistency.

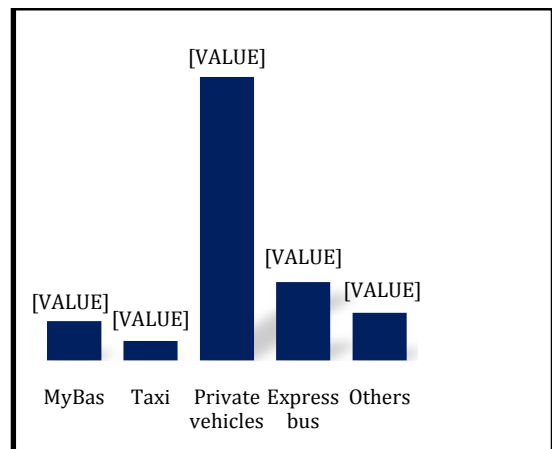
**FINDING**

The questionnaire was distributed to 400 respondents within Kangar Transportation Hub. Out of the total, 335 responses were collected where 43.5% are male and 56.5% female. This value was deemed sufficient as it exceeds sampling size recommendation with 95% confidence level with 5% margin of error based on 2000 users at one particular time (Krejcie and Morgan 1970; The Research Advisors 2020). It was estimated that the hub has the capacity of 400 passengers at one time.

The survey found that majority of users are not a frequent customer of the facility at 42% respondents (Figure 3). Some of them are first time user, and two or three times per year travelers. Second biggest group are the monthly traveler at 25%. This group are consisting mainly of students of higher learning institutes in Kuala Lumpur, Penang and Kedah. The proximity allows them to be able to travel back to their hometown every month. The transportation hub also provide service to a significant portion of frequent travelers who utilize the facility at more than 7 times a month. This user group represent 12% out of the total number of customers of this facility.

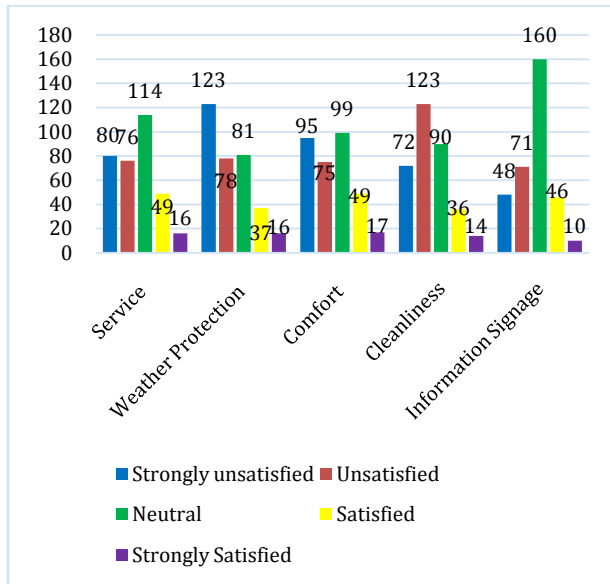


**Figure 3.** User frequency of visit at Kangar Transport Hub



**Figure 4.** User mode of transport when arriving to Kangar Transportation Hub

Research also found out that 61% of passengers arrived to the transportation hub by their own vehicle as compared to the minority public transportation method (Figure 4). This is a concern as the transportation hub was designed to be interconnecting facility between intercity mode of transport and last mile traveling. 10% of users arrived using shared ride hailing services, walking and cycling. Service quality has a direct effect on the intention to use public transport more and that this effect affects both the intention to use one's own car less and the intention to use sustainable means of transportation such as car-sharing more (Mugion et al. 2018)



**Figure 5.** Frequency the level of user’s satisfaction; Service, Weather Protection, Comfort, Cleanliness, Information Signage.

Figure 5 suggests that only minority of users are satisfied with the amenities provided in the transportation hub. Majority disagreed that the platform provided is enough and safe, which was indicated in Service tagged questions. Highest satisfaction index was found in Comfort category where approximately 20% respondents agreed that the transportation hub is comfortable for everyday usage. Upon further check, this 20% represents school students (38%), elderly (36%), and adults. The adults are 85% female aged 25-35 while the rest are male in various age group. This was probably due to overall attitude of the public who often offers available seat to the group mentioned above. Regardless, this was dwarfed by the 51% responds indicating dissatisfaction on comfort while waiting for their trip. Interesting to note that overall users also seems oblivious to the overwhelming smell of diesel smog constantly revolving the transportation hub. This was also probably due to the constant strong wind in Kangar, causing smog to constantly be blown away.

Most dissatisfaction in amenities category falls on Weather Protection related questions, with 60% feeling unsatisfied against 15.8% satisfaction. This vast majority of dissatisfaction was represented evenly by all age group with minor deviation of 0.75. Study found that the dissatisfaction was mainly due to users are forced to get on and disembark from non-express busses at an open space in-front of the transportation hub. Upon inspection, bus drivers and operators are forced to opt for this decision due to unavailable platform at most of the times. Express busses also need to queue in order to utilize the platform, and often have to allow passengers to embark away from the existing three platforms. The roof also only covers platform area which was aptly full of passengers most of the time, and made worse during peak season. Some passengers also noted that the current condition is health risk, especially during infection outbreak.

Its also worth to mention that majority answering questions related to Information Signage did not provide any preference response where 47.7% responded with ‘Neutral’. This was probably due to their existing experience, or lacking of it, in a better environment. Compared to the integrated transportation hub in Kuala Lumpur, all arrival and departure time are displayed on multiple electronic board with variable sizes. This information is constantly updated in real time. Furthermore, information was also available online. The high ‘neutral’ answer indicated that most of the users are not aware of such services and decided that the information provided are adequate enough. This category also recorded the lowest negative answer with only 35.5% unsatisfaction compared to overall average of 50.2%. This finding is a clear indication that there are more pressing matters needed to be resolved compared to initial study inference.

Research also found that the lowest positive answer are in Cleanliness category. Only 15% of responder agrees that the transportation hub is clean, while another 58% disagreed. This category also included toilet, waiting area, platform and prayer room cleanliness. Respondents also disagree that they will help with cleanliness if the condition are filthy in the first place, and agrees to maintain cleanliness if the condition are clean. Among the respondents agreeing in Cleanliness category are male (85%) against female (15%). The main cause for low index of cleanliness was from toilet related survey which recorded only 4% satisfaction level.

**Table 1.** One-way ANOVA result based on frequency of user response

		Sum of Squares	df	Mean Square	F	Sig
Service	Between groups	63.944	5	12.789	11.298	.000
	Within Groups	373.553	330	1.132		
	Total	437.497	335			
Weather Protection	Between groups	70.763	5	14.153	11.288	.000
	Within Groups	413.734	330	1.254		
	Total	484.497	335			
Comfort	Between groups	53.573	5	10.715	8.300	.000
	Within Groups	425.998	330	1.291		
	Total	479.571	335			
Cleanliness	Between groups	36.676	5	7.335	6.914	.000
	Within Groups	350.083	330	1.061		
	Total	386.759	335			

Information Signage	Between groups	11.230	5	2.246	2.4	.037
	Within Groups	307.319	330	.934	04	
	Total	318.549	335			
Service	Between groups	63.944	5	12.789	11.	.000
	Within Groups	373.553	330	1.132	29	
	Total	437.497	335		8	

**Table 2.** One-way ANOVA with demographic factor

	Demographic respondents	Significance ( <i>p value &lt; 0.05</i> )
Service	Age	.001
Weather protection	Profession	.005
Comfort	Gender	.002
Cleanliness	Income	.001
	Profession	.002
Information Signage	-	-

Based on the finding shown in Table 2, Service category have most influential from age of respondents compared to other demographic categories. Professionals emphasized more on Weather Protection. The respondents are mostly workers with monthly salary. This group are mainly breadwinner for their own family, requiring taking good care of their health. Their concern mainly related to sudden downpour often occurs in this tropical country, which often resulted to headache and fever.

Cleanliness are highly dependable on income and profession of respondents. As developing countries are constantly evolving to achieve higher income status, significant improvement is needed to be done in order to improve overall performance on public amenities. This result proven that income level can significantly have an impact on general cleanliness of public places. Last, Table 2 did not show any significant correlation between Information Signage with any of the demographic category. Research believe based on the analysis that the physical condition or infrastructure of the transport hub lead to this outcome. The facility only consists of three platforms which are dual purpose for boarding and getting off. This situation decreases the potential for distraction for all waiting passengers. However, this is not a good thing though, as other bus operators often must adjust their departure schedule due to delay caused at platforms.

**Table 3.** Answer analysis – Information Signage

	Frequency	Percent	Valid Percent
Published	6	1.8	1.8
Audio Announcement	117	35.0	35
Graphic display	152	45.3	45.3
Customer service	28	8.3	8.3
Telephone Information	6	1.8	1.8
Online information	26	7.8	7.8
<b>Total</b>	<b>335</b>	<b>100.0</b>	<b>100.0</b>

Upon further analysis of questions related to information signage in Table 3, research found that majority of respondents prefers graphic display (45.3%), and audio announcement (35.5%). This finding was found to be aligned with high number of Neutral responses. Based on observation, all bus opted to put multiple

notice on their bus including at windshield, driver-side window, at entrance door, and at first passenger window. Co-driver will also call out for passengers with assistance from ticketing officer. Although straining for operators, the questionnaire only focusses on passenger point of view, thus the neutral result.

**CONCLUSION**

The quantitative research was an eye-opening experience designed to understand the underlying causes of dissatisfaction at a medium population sized state which have significant distance from the national capital of a developing nation. It was learned that even with a strong population and strong demand, construction of a better transportation hub is not a priority.

Research also found although the location of Kangar Transportation Hub is suitable, it needs room to expand. Current land availability are scarce and Perlis State Economic Development Corporation should consider new location for the transport hub, or redesigning the facility to have multiple level with special attention on weather protection, hygiene management, and comfort by providing more space with cover, more toilet and cleaning service, and seating area with air-conditioner.

An efficient performance measurement may also use SERVQUAL to measure the quality of services being offered especially to public areas. Future research focusing on this area should consider this method.

Another point to note is that a survey will often be diluted by opinion of the majority. This will often cause a valid concern to be discarded as less important as majority found it to be unimportant. As an example, if more people with less income are being included as respondent, Cleanliness category will probably be seeing much more satisfaction compared to the findings in this study. In order to counter this problem, DELPHI method should be explored.

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