

# Assessment of Passenger Information System in Light Rail Transit Station in Klang Valley

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## ABSTRACT

Light railway transit (LRT) is one of the main public transportation that commonly used in Klang Valley. Passengers often choose to use public transportation because of many reason. For example, to avoid congestion, more convenience compared to driving by own, and many more. Signage in light railway transit is one of the important element in passenger information system. Majority of new passengers as well as frequent users depends on the signage. A good signs and markings regulate, warn and can guide the passengers to travel easily inside the station. Thus, the objective of this study is to assess the existing signage element in light railway transit in Klang Valley whether they fulfil the requirement based on the Manual on Uniform Traffic Control Devices. A rating system is used to evaluate the signage element to compare with the manual. Then, for more relevant finding a set of questionnaire survey are conducted to gather more information on passengers satisfactory. Ultimately, from the result shows that KL Sentral and Bandar Tasik Selatan station both 100% fulfil the standard requirement followed by Masjid Jamek station with 95%, Hang Tuah station with 89.5% and the least is Titiwangsa station with 84.2%. From the data obtained in the study, this paper shows how the assessment on passenger information system at LRT station is important to the users' satisfactory.

**Keywords:** Light Railway Transit, Passenger Information System, Assessment

## I. INTRODUCTION

Klang Valley has a high population, and one of the very important thing to connect from one place to another is public transportation. Every day, there are thousands of people use the public transport services. In Malaysia, there are many type of public transportation to choose such as bus, taxi, monorail, light rail transit and more. The main reason Malaysian residents choose to use public transport rather than use private vehicle is the increasing of living expenses and time management.

The convenient of the public transportation system, usually depends on how the passenger information system (PIS) is. The overall satisfaction among passengers with railway services is important to encourage the growth of railway usage. A good signage, information about arriving and departing time and other else is required to travel effectively. It is important to conduct this study to get all the variables as many as possible in improving the passenger information system

in Malaysia. The existing PIS in Malaysia will be reviewed and compare with the manual guideline selected. Therefore, from the result the identification of the factors that need to be emphasized on can be identified [1].

Signage and symbols are the crucial elements in the operation of transit systems. In order to deliver the system successfully, signage play the important role to convey an utmost information needed by the passengers. People can get confused by the signage provided inside the station if the passenger information system is poorly designed. As the result, delay can occurred and passengers due to lack of passenger information system. A research in United States, Canada, and Europe has stated that the consistency in design, content and placement of signs and symbols are significant [2]. Furthermore, the need of guidelines for the design and placement of passenger information system are necessary to provide concise and accurate information. The utmost profit of these information systems is to make the stations more user friendly, especially to the

riders that are new and infrequent and also disable people.

Railway transportation system should be evaluated and assessed within a wider context when the whole systems of public transportation in Kuala Lumpur, Malaysia become more comprehensive, integrated and coordinated, to ensure increased the number of public transportation journeys, shifted from many of the less efficient trips made by the private modes [3].

Signage system in the space building is very important in order to provide complete information and guidance to the users. Mostly, provided signage system focusing on the information related to visual instructions. Usually the visual instructions are signs that in the form of typographical elements consist of photos, maps, colours, pictograms, and many more [4]. According to [5], by providing recommendation signs would help the consumers in the choice process.

Other than static signage, digital signage also give major impact on the way-finding inside a building. Digital signage is the screens showing video located at public place. The content of the signage typically includes information, advertisements, entertainment and news. TV screens have been used in retail environments for some time but since the advent of digital control and flat screens, the use of networks of screens has made digital signage available as an effective, and easily controlled communication medium [6].

According to [6], the digital signage contain high on sensory cues evokes affective experience and strengthens consumers' experiential processing route. In contrast, digital signage messages high on "features and benefits" information evoke intellectual experience and strengthen customers' deliberative processing route. The affective experience is more strongly associated with the attitude towards the ad and the approach behaviour towards the advertiser than the intellectual experience. The effect of an ad high on sensory cues on consumers approach to the advertiser is stronger for first-timers, and therefore important in generating loyalty.

## II. METHODS AND MATERIAL

### Site selection

LRT stations in Klang Valley consist of two lines which are Ampang Line (AMG) and Kelana Jaya Line (KLJ). From the two lines, five integrated stations was selected as a case study for the research.

The selection is based on the station characteristic, which linking various rail lines in Klang Valley. Furthermore, these stations are among the busiest station because it were located near the centre of the city and surrounded by major land uses such as commercial, retails, business, and financial centres.

- KL Sentral station
- Masjid Jamek station
- Hang Tuah station
- Bandar Tasik Selatan station
- Titiwangsa station

### Data collection

The assessment of passenger information system for the selected light railway transit stations were evaluated and compared by using an established guideline. Two types of data collection involved in this study. First, by using manual observation for physical assessment and second, through the questionnaire survey which were distributed to the commuters.

Each signals has their own criteria that need to be followed to fit their purposes. For example, regulatory signs give notice of traffic laws or regulations, warning signs give notice of a situation that might not be readily apparent, and guide signs show route designations, destinations, directions, distances, services, points of interest, and other geographical, recreational, or cultural information.

For the assessment, the signage elements which were assessed by using Manual on Uniform Traffic Control Devices (MUTCD) are [7]:

- Main entrance sign - Usually shows the name of the station. The location of the sign must be located in front of the main entrance before the ticket barriers placed. The signage must be clearly visible for the users as they will not get confused which station that they intend to go. The signal head that is installed must function to direct the railway users at a correct path. The shape of the sign is usually rectangular. Can refer Fig. 1.



Figure 1: Main entrance sign



Figure 2: Flag mounted sign

- Ticket machine sign - Ticket machine sign must be located on top of the ticket machine near to main entrance and customer service counter or office. The information needed by the passengers such as fare information and route map location must be display to help the passengers travel with ease.
- Overhead sign - Overhead sign is the signage that is placed directly above the top of the head such that passengers travel below it such that a part or the entirety of the sign or its support. Typical installations include signs placed on cantilever arms that extend over the station, on sign support structures that span the entire width of the pavement and on mast arms or span wires that also support the signals.
- Flag mounted sign - Flag mounted sign is a sign structure, also referred to as a mast arm, which is rigidly attached perpendicular pole and is used to provide overhead support of the signage. The minimum height, measured vertically from the bottom of the sign to the sidewalk, of signs installed above sidewalks shall be 7 feet. As illustrated in Fig. 2.
- Side platform sign - Side platform sign is the sign that is placed to the side of the railway such that no portion of the sign or its support is directly above the railway station. The information provided usually the station name and the platforms at the station.
- Centre platform sign - Centre platform sign is the sign structure usually indicate the station name and platform name.
- Exit sign - Exit sign is to indicate the right way out from the station. It is important as it helps show the passengers the exit way during the emergencies. The sign is located near the exit way for example stairs, elevator, escalator and doors.
- Prohibited sign - Prohibited sign show the actions or behaviour that are prohibited; no smoking, bring pets, bring food and drinks etc. The sign that gives notice to users of the laws or regulations. Prohibition sign is round in shape with white background and red border and black pictogram.
- Warning sign - Warning sign is a sign that gives notice to railway users of a situation that might not be readily apparent. It shows danger and precaution that users should aware. The warning sign is yellow or red background with black wording or pictogram.
- Facilities sign - Facilities sign is the type of signal section designed to include the facilities provided. It show the facilities provided inside the station for example lift, toilet, OKU facilities. The minimum height, measured vertically from the bottom of the sign to the sidewalk, of signs installed above sidewalks shall be 7 feet.
- LED arriving time sign - LED arriving time sign is an electronic-display message signs that shows the time arrival of the train. The wording colour is either white, yellow, or orange, if used with temporary traffic control signs. As shown in Fig. 3.



Figure 3: LED arriving time sign

- Train connection map - Train connection map clearly shows link between each station and different railway such as monorail and commuter.
- Train route diagram - Train route diagram is the sign that shows route designations, destinations, directions, distances, services, points of interest, or other geographical, recreational, or cultural information.

The calculated score is based on percentage values for each of the criteria. The above stated signage then were evaluated according to the given rate.

### Questionnaire

Approximately, there are at least 265,000 users for Kelana Jaya line and 195,000 users for Ampang line daily [8]. There are possibility that the numbers of ridership will increase as the increasing of population. The number of sample size need to be determined first before conducting the survey. This was done to determine how many people that needed to participate for the survey in order to get results that precisely as needed.

Before calculating the sample size, there are the factors that need to be considered:

- Confidence interval (also called margin of error)
  - The margin of error is the plus-or-minus deviation between the opinions of respondents and the opinion of the entire population. The higher the confidence interval the lower the sample size. The factors that affect the confident intervals are sample size, percentage and population size.
- Confidence level

- The confidence level is how often the percentage of the population that actually lies within the boundaries of the margin of error. The lower the confidence level the lower the sample size.
- The calculation of sample size was calculated using sample size calculator software. Based on a confidence level of 95% and margin of error of 5% it is determined that total of 384 sets of questionnaire was distributed.

The questions asked were to find the information about the knowledge of the correspondents due to passenger information system and the satisfaction on the signage system at the stations. The questionnaire then was evaluated and rated on how satisfied or unsatisfied commuters with the statements given using a five points Likert scale ranging from “very satisfied” to “very dissatisfied”.

## III. RESULTS AND DISCUSSION

### Physical assessment

From the data, each element for each stations were evaluated based on the Manual on Uniform Traffic Control Devices (MUTCD) and the rating for each elements were given. As shown in Table 1, the results shows that KL Sentral and Bandar Tasik Selatan stations both 100% fulfil the standard requirement followed by Masjid Jamek station with 95%, Hang Tuah station with 89.5% and the least is Titivangsa station with 84.2%.

KL Sentral and Bandar Tasik Selatan stations can achieved 100% due to they are having the most railway systems in their stations compared to other stations. The railway systems in KL Sentral station are Monorail, Light Rail Transit (LRT), KTM Komuter, and Express Rail Link Transit (ERL). While, for Bandar Tasik Selatan station, they are having KTM Komuter, LRT, and ERL. This means that stations are more complex if there are lots of railway system provider in the station. Therefore, it is very crucial for the developer of the station to include sufficient information for commuters to travel through their station which integrated with various type of railway systems.

Table 2: Assessment results among five stations

Stations	Assessment (%)
KL Sentral station	100%
Masjid Jamek station	95%
Hang Tuah station	89.5%
Bandar Tasik Selatan station	100%
Titiwangsa station	84.2%

Even though there were only 2 stations managed to get 100% scores but still, the assessment results for the rest of the stations showed they are manage to get more than 80% of scores which means that they are good in providing information to the commuters.

### Questionnaire results

The questionnaire survey was conducted and there were 384 samples were taken among the LRT commuters. Based on the survey, 20% of the correspondents are 19 years and below, 25.40% are between 20 to 30 years old and 31 to 40 years old, 21.7% are between 41 to 50 years old, 4.2% are between 51 to 60 years old and 3.3% are 60 years above.

Approximately, 27.7% of the correspondents are student, 55.2% are workers and 17.1% are unemployed. There are 37.1% of correspondent that use the LRT every day, 24.4% use twice a week, 21.2% use once a week and 17.3% seldom use. For the factor users choose LRT as medium of transportation, 30% agree that it is easy and convenience, 27.7% says to avoid congestion and cheaper compared to own driving, 7.5% for the efficient and good quality services and 7.1% for the good basic facilities.

Based on the information above, mostly the LRT users are aged between 20 to 40 years old and mostly are workers. It also shows that mostly the passengers choose LRT as their public mode of transportation to travel every day because it is easy and convenience. The result shows that most of the passengers are confident enough to use LRT and comfortable to travel within the stations.

### IV.CONCLUSION

The results shown that KL Sentral and Bandar Tasik Selatan station both 100% fulfil the standard requirement followed by Masjid Jamek station with 95%, Hang Tuah station with 89.5% and the least is

Titiwangsa station with 84.2%. Therefore, it can be concluded that the signage design for LRT station in Klang Valley mostly fulfil the requirement based on Manual on Uniform Traffic Control Devices (MUTCD). To get more relevant findings, a set of questionnaire was conducted to identify the satisfaction of the passengers. Based on the questionnaire given to the passengers, it can be concluded that most of the passengers are satisfied with the passenger information system provided inside the LRT stations.

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