Designing Wayfinding at Bundaran HI MRT Station, Jakarta

Clarissa Aurelia\textsuperscript{1*}, Azis Tirtaatmadja\textsuperscript{2} and Augustina Ika Widyani\textsuperscript{3}

\textsuperscript{1,2,3} Department of Interior Design, Visual Arts and Design Faculty, Tarumanagara University, Letjen. S. Parman Street No. 1, Jakarta, Indonesia

*clarissa.615160095@stu.untar.ac.id, azzizz_tirta@yahoo.com, augustinaw@fsrd.untar.ac.id

ABSTRACT

The MRT (Mass Rapid Transit) Station of the Bundaran HI might become a new landmark for the city of Jakarta, since the MRT completes the existing transportation modes in Jakarta. The speed of this mode of transportation represents the rapid growth of Jakarta in all fields. The size of the station which is quite large with a very long aisle is often confusing for potential passengers, especially for the first time visiting the HI Roundabout MRT Station. Designing train station interior needs adjustment between high-mobility passengers flow and train speed to avoid stoppages, concourse congestion and rush passengers. Designing station by applying wayfinding system can create an informative and clear passengers flow. Design method included programming, schematic design, design development, construction drawing, and presentation drawing. Effective wayfinding system through the right placement of interior elements (floor, wall, ceiling) and physical signage can inform passengers on where they should be heading. As public transport facility, Bundaran HI MRT Station has potency for development of wayfinding problem.

Keywords: Effective, Interior Elements, Mobility, Bundaran HI MRT Station, Wayfinding

1. INTRODUCTION

MRT development in the capital city, Jakarta, is the best choice for long-term transportation. MRT has officially open by March 24, 2019, which connects Lebak Bulus Grab - Bundaran HI. MRT stations are now easily accessible by integrated transportation, TransJakarta, that is directly connected to several stations.

Nowadays people are used to using MRT for their daily activities. Among other MRT stations, the number of users at the Bundaran HI station is the most congested to reach more than 25%. While the lowest users reaching 1.9% are at ASEAN stations (Parikesit, 2020).

Figure 2. Bundaran HI MRT Station Entrance
(https://www.jawapos.com/jabodetabek/17/12/2019/jakarta-diguyur-hujan-ekskalator-stasiun-mrt-sempat-mati)

Jakarta is a city with the highest level of traffic. The construction of the MRT is one of the government's efforts to overcome this problem, which is now greatly benefiting the community (Rahman, 2020). MRT station design becomes...
important to attract the number of users so that the MRT can be utilized optimally. As stated by Maria, that a beautiful station design can attract visitors and improve the urban areas around the station (Maria, 2013).

The basic functions of railway stations as stated by Zemp et al (Dingjan, 2014):
1. Linking catchment area and transport network
2. Supporting transfer between modes of transport
3. Facilitating commercial use of real estate
4. Providing public space
5. Contributing to the identity of the surrounding area

This station is 300 meters from the Selamat Datang Monument and is surrounded by offices, shopping centres, recreation centres and hospitality centers. Station environment usually crowded by diverse pedestrian and activities, both on weekdays and holidays. Therefore, the use of limited station space needs to be maximized by considering the number of passengers, especially at peak periods. As a public area with transportation facility and all those linking area, Bundaran HI MRT Station must be provided with a good designed of wayfinding

Passengers at peak periods usually are regular passengers since their travel depend on the office hours. Passengers can be categorized as the regular passengers and the infrequent passengers (Lingqvist, 2012). The regular passengers might be commuter passengers (the employees and students), official or business travel (to meeting, to customers, etc.) and personal trips (longer destination). The infrequent passengers might spend more time at station, as leisure travel or public services visit (hospital, library, cultural center, etc.).

As the fastest train in the capital city of Jakarta, there needs to be a balance between the instant lifestyle and the speed of boarding passengers at the station. Through direct observation and interview of staff at Bundaran HI MRT station, station’s passengers are still dominated by new users, domestic and foreign. New users of MRT stations have difficulty using the station on which way to go, the lack of station information systems, to the transparent station space that its function of space is being unrecognized. This causes the passenger flow movement to be slow and passengers can be left behind by the train. In this case, designing MRT station interior must pay attention to the passenger circulation flow as well as informative design.

Wayfinding is needed to avoid disorientation, so commuters no longer need to feel stressed and frustrated because they don’t know which way to walk. The impact of disorientation is not only felt psychologically, but also has negative physical effects. Out of breath, dizzy to faint from the rush to catch a train can occur because they cannot find the concourse (Carpman & Grant, 2002)

Referred to Wilkinson (Wilkinson, 2016), there is design recommendation to optimized passengers flow in station. Station elements that should be concerned are entrances, signage/ messaging, gates, vertical movement elements, platform, concourse, and train factors.

| STATION ELEMENTS | DESIGN RECOMMENDATION SUMMARY |
|------------------|--------------------------------|
| Overall Station  | Systems bid design: integration connects with local streets and parking. |
| Entrances        | Location of entrances in relation to local streets. Multiple entrances, |
| Signage/ messaging | Real time displays of train arrivals. Location and distribution of signs on platform to avoid overcrowding. Visual displays and audible instruction for boarding and alighting. |
| Gates            | Replace turnstile with smart card/ e-wallet payment pass cards. |
| Vertical movement elements | Appropriate location, variable escalator flows, escalator sensors. |
| Platforms        | Elimination of obstacles and blind spots. Column floor design. Platform screen doors. |
| Concourse        | Arrangement of surface and lift elevator arrangements. Careful planning of ticket purchasing location. |
| Train Factors    | Longitudinal versus traverse setting. Number of doors per car. |

Wayfinding is a part of everyday life. However, wayfinding is a complex activity which is usually divided into several tasks and actions. Simple wayfinding without alternatives and obstacles still requires three stages: planning, signage, and movement. Wayfinding is individual ability to reach their goals with cognitive mapping to make connections and arrange information received from the physical environment settings to activate cognitive maps in one’s mind. (Passini, 2007).

Wayfinding in a station is to understand the key points of making decisions within the station and the influencing factors to inform passengers in finding way to their destination. According to the Rail Safety and Standards Board journal, station users need information from time to time, accurate, consistent, and concise information in navigating trains. Providing passengers with real-time carriage occupancy information would encourage passengers to spread out and reduce dwell time. When users cannot find their way or their destination, this can cause frustration, stress, and bad travel experience.
Wayfinding design can be broken down into 4 keys elements: (Goh, 2018)

1. Space
   - Impression: Commuters would have a specific image of station architectural design; it becomes station unique identity.
   - To enhance station identity and wayfinding, station design might be influenced by local culture and heritage.
   Expression: Effective circulation flow would create meeting points and landmarks that would help commuter’s movement.
   Delight: Design features and installation would enhance commuter’s experience and aid in wayfinding.

2. Light
   - Impression: continuous artificial light along the ceiling would facilitate wayfinding.
   Expression: artificial light combined with design features would naturally directs commuters towards their destination
   Delight: well-designed artificial light would create moments of delight and relief for the commuter in a crowded station.

3. Color
   - Impression: a consistent colour scheme together with signage and announcements would give commuters a visual confirmation of their destination.
   Expression: The application of colour to lines and station identity would create an intuitive environment for wayfinding.
   Delight: Colours and art installation on lift shafts and walls in a splash of bright and contrast colour would serve as visual markers in the commuters’ journey.

4. Visual
   - Impression: signage and station design together would provide important information to commuters at the various decision-making point.
   Expression: enhanced signage for a seamless wayfinding experience

Designing MRT station interior by applying wayfinding system would create an informative and clear passenger flow to speed up movement.

### Table 2. Key Elements of Wayfinding Design (Goh, 2018)

| Key Elements of Wayfinding Design |
|-----------------------------------|
| 1. Space                          |
| a. Sightlines                     |
| b. Visual cues                    |
| c. Intuition                      |
| 2. Light                          |
| Key places:                       |
| a. Entrance                       |
| b. Fare gates                     |
| c. Escalators                     |
| 3. Color                          |
| a. Color code                     |
| b. Alphanumeric color             |
| 4. Visual                         |
| a. Art Design (Graphic)           |
| b. Signage Design                 |

### 2. RESEARCH METHODS

Method used for this research is a qualitative method with data collection in the form of literature study about station design, field observation study, as well as the collection of archives for the planning process of the interior of MRT Interior Design.

Data analysis methods are used to determine the design concept. At the planning stage are:

1) Programming, sorting information and stating design problems.

2) Design Concepts, finding design solution based on space requirement and project characters, formulate a schematic concept for Interior Design of Bundaran HI MRT Station, including furniture, material, zoning, and space layout. Then devise a space schematic design.

3) Creating and exploring design alternatives based on the space program and design concept.

4) Production of work drawings includes furniture layout, floor layout, electrical plan, look pieces, interior detail, furniture detail, axonometry.

5) production of presentation drawings such as floor layout, section drawings, furniture schemes, and final perspectives.
3. RESULT AND DISCUSSION

3.1 Wayfinding Design

Design thinking of wayfinding has processed and stages of design to find solutions. Design thinking in wayfinding process included (Sushma, 2016; 6):

1. Discover insights into the problems.
2. Define areas to focus on.
3. Develop potential solutions.
4. Deliver solutions to be implemented.

Wayfinding within the station inbound shown in the figure below.

Figure 4. Wayfinding Within The Station Inbound

The process in finding way shown as numbers in the figure above are:

1. Entrance – access to concourse; connecting walkways, escalators, lift, and stairs. Transfer to other lines with signage information.
2. Faregates and concourse
   Direction-finding within station by locality maps, station entrance, integrated pedestrian. Locating station amenities; information counter, top up machines, ATM, shops and toilets.
3. Entrance
   Self-orientation by locality maps.

Following are the activities of passengers in the MRT station which are used as a reference in determining the direction and passengers flow in the MRT train facilities.

MRT station rooms need to be classified into several user groups in the space program.
Table 1: Bundaran HI MRT Station Space Program

| User Group | Room                                      |
|------------|-------------------------------------------|
| Operator   | Manager Room                              |
|            | Meeting Room                              |
| Employee   | Briefing Room                             |
|            | Loker Pekerja                             |
|            | Waiting / Resting Area                    |
|            | Ticket Counter                            |
|            | Security Information                      |
|            | Information Counter                       |
|            | Tenant Area                               |
|            | Cleaning Storage                          |
| Passenger  | Ticket Counter Queue                      |
|            | Information Counter Queue                 |
|            | Fare gates in/out                          |
|            | Toilet                                     |
|            | Medical Room                              |
|            | Prayer Room                                |
|            | Waiting Area                              |
|            | Reading Area                              |

3.2 Platform Design

Platform would be first place for commuters to step into station when getting out from train. There are several elements need to be focused on when designing platform.

Table 3. Platform Design Guideline

| Designing Platform | Requirement                                      |
|--------------------|--------------------------------------------------|
| Space              | Clear spatial orientation                        |
|                    | High space volume                                |
|                    | Clear line of sight to concourse                 |
|                    | Linear flow for inbound and outbound commuters    |
| Visual             | Integrate visual information with existing infrastructure |
|                    | Display essential information for user orientation |
| Color              | Integrate line colour and identity into station architecture |
|                    | Art to enhance wayfinding                         |

The repetition of bright yellow line above automatic doors on platform help commuter find the doors to MRT. The blue line integrated to wall treatment is a display of station name.

3.3 Faregates and Concourse Design

Faregates would be transition place for commuters to get inside and outside the station’s facilities. The faregates systems with cashless payment would help decreasing the traffic. Faregates design is significant as station identity to help commuters defines this station from another. Specially for Bundaran HI MRT Station as a starting point station, its faregate should be a landmark of the station.

Narrowing lane on faregates area and lights placement as visual indicator in wayfinding, to inform passenger to go through the area to enter and use the MRT train facilities. As an affirmation of wayfinding, interior colors will be different / contrast to their surroundings so can be easily recognize and identified.

Concourses with its facilities such as Ticket Counter, top-up machines, information counter, shops, and toilets, need clear wayfinding specially to avoid the crowded flow between commuters who are rushing to get in the train and commuters who are waiting.
Space groups are used to facilitate the placement of space in the layout. Facilities zones are placed close together.

North Concourse furniture layout placement intended so that facilities zones are close together and connected. There is extensive circulation in the facilities zone because each facility placed by the wall. Ticket counters, information counters, ATMs and Automatic Ticket machines are located close to Faregates in so that passengers can directly go into the main station. Each Ticket and Information Counter can serve up to 3 passengers at once to make purchases and return train tickets, and ATMs to support Automatic Ticket Machines that require cash for ticket transactions.

Table 4. Concourses Design Guideline

| Designing Concourses          |                                                                                           |
|-------------------------------|-------------------------------------------------------------------------------------------|
| Space                         | Clear orientation to faregates and station platforms                                        |
|                               | Intuitive way out to station entrance                                                      |
|                               | Seamless and direct connection to adjacent development                                      |
| Light                         | Brighter entrances help to identify way out of station                                      |
|                               | Use different light to identify difference spaces                                          |
|                               | Create a welcoming and inviting environment                                                 |
| Visual                        | Essential information at a glance                                                          |
|                               | Clear access to station amenities                                                          |
|                               | (Passenger Service Center, Ticketing Machines, Faregates)                                  |
|                               | Connection to transfer linkways                                                            |

The entering area to the sub-public station is closed and the inside of the sub-public area is transparent. Passengers can easily identify north and south faregates because of the differences in location and placement of faregates. Passengers flow from and to the platform by stairs, escalators, and lift is focused in one straight line.
Ticket counters interior use large alphabetic signage to provide information of the room identity. Signage can be read easily from afar and by elderly. The ceiling design shows as the stopping facilities area to go to the next area.
3.4 Entrance Design

Entrance area has a very long aisle that need several treatments to distract bored feeling. Entrance is a first place for commuters to get into the station, as also the last place to get out from the station. The design of entrance would give a sense of place as a transition between inside and outside, interior and exterior.

Table 5. Entrance Design Guideline

| Designing Entries | Space | Visual | Colour |
|-------------------|-------|--------|--------|
|                   | Entrances that reflect the public transport identity | Visual confirmation of the station | Enhance identity of the community |
|                   | Spaces to cater to user needs | Street markers that lead towards the station entrance | Colours and palettes that subtly reflect the line identity |

4. CONCLUSIONS

Designing Bundaran HI MRT Station as a public space, need to consider wayfinding to improve it function as transportation facility. A well consideration of wayfinding in station design would direct commuters to their destination.

Designing Platform, Concourse, Faregates and Entrance is having its different guideline, depend on the function of every areas. The key elements are set not to limit the design, but to manage the wayfinding reaching it optimal function.

The way-finding system applied in the design aims to place the facilities area into a continuous area so that passengers find it ease to get a direction. Further the station design are also important to improve the urban area around the station.

REFERENCES

Carpman, J., & Grant, M. (2002). Wayfinding: A Broad View. In R. Bechtel, & A. Churchman, Handbook of Environmental Psychology (pp. 427-442). New York: John Wiley & Sons Inc.

Dingjan, M. (2014). A Railway Station as a Public Space: The Case of Tokyo. Leiden: Leiden University.

Goh, S. (2018). RE:think Designing for Wayfinding. Singapore: Land Transport Authority.

Lingqvist, L. (2012). Railway Stations - Planning Manual. Borlange: The Swedish Transport Administration.

Maria, E. (2013). Stations for People – Recent Developments in Railway Station Design. www.ctie.co.jp, 53-81.

Parikesit, G. (2020, 7 2). Evaluasi Jumlah Penumpang MRT, Stasiun Bundaran HI Paling Padat. Retrieved from Tempo.co: https://metro.tempo.co/read/1190768/evaluasi-jumlah-penumpang-mrt-stasiun-bundaran-hi-paling-padat/full&view=ok

Passini, R. (2007). Wayfinding: People, Signs, and Architecture. Michigan: McGraw-Hill Book.

Rahman, R. (2020, 7 5). Gagas MRT sebagai perwujudan mimpi bebas dari kemacetan. Retrieved from antaranews.com: https://www.antaranews.com/berita/1377378/gagas-mrt-sebagai-perwujudan-mimpi-bebas-dari-kemacetan

Wilkinson, P. (2016). Station Innovation: Overcrowding and Increasing Passenger Throughput at Stations. Milton Keynes: Catapult Transport Systems.